

Sensors & Transducers

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Thermocouples and Probes

Thermocouple Colour Code

THERMOCOUPLE CABLE COLOUR CODING									
THERMOCOUPLE CONDUCTOR COMBINATION TYPE	EXTENSION CABLE	COMPENSATING CABLE	INTERNATIONAL COLOUR CODE TO IEC 584-2 1983	INTERNATIONAL COLOUR CODE TO IEC 584-2 1983	FORMER COLOUR CODES FOR THERMOCOUPLE EXTENSION & COMPENSATING CABLE				
			TABLE PART 20 1983	TABLE PART 20 1983	RUSSIAN TO BS 1843	JAPANESE TO JIS C 1510-1981	AMERICAN TO ANSI/ISA-5.1	GERMAN TO DIN 43714	FRENCH TO NFC 43314
K	KX								
		KCA							
		KCB							
T	TX								
J	JX								
N	NX								
E	EX								
R		RCA							
		RCB							
S		SCA							
		SCB							

Thermocouple Type Letter Designations

The following letter designations are established for thermocouple wire combinations as follows:

Letter	Thermocouple	Temp Range °C
T	Copper/copper-nickel	-150 to +350
J	Iron/copper-nickel	0 to +700
K	Nickel-chromium/nickel-aluminium	0 to +1200
N	Nickel-chromium-silicon/nickel-silicon	0 to +1250
S	Platinum 10% rhodium/platinum	0 to +1500
R	Platinum 13% rhodium/platinum	0 to +1600

Types	Tolerance Class 1	Tolerance Class 2
Type T		
Temperature range	-40°C to +125°C	-40°C to +133°C
Tolerance value	±0.5°C	±1°C
Temperature range	125°C to 350°C	133°C to 350°C
Tolerance value	±0.4%	±0.75%

Type J

Temperature range	-40°C to +375°C	-40°C to +333°C
Tolerance value	±1.5°C	±2.5°C
Temperature range	375°C to 750°C	333°C to 750°C
Tolerance value	±0.4%	±0.75%

Type K, Type N

Temperature range	-40°C to +375°C	-40°C to +333°C
Tolerance value	±1.5°C	±2.5°C
Temperature range	375°C to 1200°C	333°C to 1200°C
Tolerance value	±0.4%	±0.75%

Type R, Type S

Temperature range	0°C to 1100°C	0°C to +600°C
Tolerance value	±1°C	±1.5°C
Temperature range	1100°C to 1600°C	600°C to 1600°C
Tolerance value	±(1 + 0.3% of T - 1100)°C	±0.25%

Thermocouple application guide

Immersion depth

The required depth of probe immersion at which no incorrect reading will occur due to insufficient immersion.

Response times

The time in which the probe will attain a proportion of the final medium temperature. Normally quoted as the time taken to achieve a percentage of a step temperature change. The probe construction, i.e. isolated or grounded junction, application and environment will affect response times.

Type T

Copper/Copper-Nickel — 150 to 350°C

Widely used to measure low temperatures, and in applications where moisture is present. May be used in oxidising, or reducing atmospheres.

Type J

Iron/Copper-Nickel — 0 to 700°C

May be used in oxidising atmospheres, limited to below 500°C in sulphurous atmospheres. Iron conductor liable to rust at low temperatures (ice point and below).

Type K

Nickel-Chromium/Nickel-Aluminium — 0 to 1200°C

Widely used thermocouple with a useful measuring range. Not recommended for sulphur bearing atmospheres or reducing atmospheres, but good resistance to oxidising atmosphere.

Type N

Nickel-Chromium-Silicon/Nickel-Silicon — 0 to 1250°C

Very good resistance to oxidising atmospheres, and may be used when good stability at high temperatures is required.

Type R/S

Platinum — 10% Rhodium/Platinum 0 to 1500°C

Platinum — 13% Rhodium/Platinum 0 to 1600°C

Thermocouple Colour Code - continued

Recommended for very high temperature use in oxidising atmospheres. For some applications a secondary ceramic protective sheath is recommended.

The application guide above gives recommendations appertaining to the primary thermocouple wire. When protected by the appropriate outer sheath, some of the limitations given can be overcome.

212223

Thermocouple - Fine Wire, Welded Tip

Type K or T



- High sensitivity, exposed junction
- Thermocouples to IEC 60584
- 1/0.08mm single wires, 1m length
- PFA insulated wires, class 1
- Rated from -75 to +250°C

386285

Order Multiple = Pack of 5

Price Per Pack

Description	Mftrs. List No.	Order Code	1+	5+	10+
Type K tails	ZO-PFA-K-1 X 5	859-8240			
Type T tails	ZO-PFA-T-1 X 5	859-8258			

Welded Tip Thermocouples - Types J, K & T

Fibre Glass Insulated and PTFE Insulated



Fibre glass insulated

PTFE insulated

- 1 metre and 2 metre long welded tip thermocouples
- Choice of insulation: varnish-impregnated fibre glass (suitable for temperatures up to 350°C) or PTFE (suitable up to 250°C) which is chemically inert

- Manufactured to international reference tables BS4937 (Part 3 for type J, Part 4 for Type K, Part 5 for Type T)



	Type J	Type K	Type T
Fibre Glass Insulated			
Wire diameter	1/0.315mm	1/0.315mm	1/0.315mm
Overall diameter	1.5mm	1.5mm	1.5mm
Temperature range	-50°C to +350°C	-50°C to +350°C	-50°C to +350°C
Positive leg	Iron	Nickel chromium	Iron
Negative leg	Constantan	Nickel aluminium	Constantan
PTFE Insulated	—	Type K	Type T
Wire diameter	—	1/0.2mm	1/0.2mm
Overall diameter	—	1.3mm	1.3mm
Temperature range	—	-75°C to +250°C	-75°C to +250°C
Positive leg	—	Nickel chromium	Copper
Negative leg	—	Nickel aluminium	Constantan

212204

	Mftrs. List No.	Order Code	1+	10+	25+	100+
Fibre Glass Insulated						
Type J, 2m	Z3-J-2M (IEC)	706-9212				
Type J, 3m	Z3-J-3M (IEC)	163-3477				
Type K, 1m	Z3-K-1M (IEC)	706-9224				
Type K, 2m	Z3-K-2M (IEC)	707-6137				
Type K, 3m	Z3-K-3M (IEC)	163-3479				
Type T, 2m	Z3-T-2M (IEC)	707-6149				

	Mftrs. List No.	Order Code	1+	10+	25+	100+
PTFE Insulated						
Type K, 1m	Z2-K-1M (IEC)	707-6150				
Type K, 2m	Z2-K-2M (IEC)	707-6162				
Type K, 3m	Z2-K-3M (IEC)	163-3481				
Type K, 5m	Z2-K-5M (IEC)	163-3482				
Type T, 1m	Z2-T-1M (IEC)	707-6174				
Type T, 2m	Z2-T-2M (IEC)	707-6186				
Type T, 3m	Z2-T-3M (IEC)	163-3483				
Type T, 5m	Z2-T-5M (IEC)	163-3484				

FREE GLOBAL LEGISLATION SUPPORT



RoHS, REACH, WEEE, ErP, Batteries Directive - latest updates, free white papers and live online Q&A at element14.com/legislation



Overall length = 207 (4.5mm dia type), 163 (3mm dia types), Probe length = 125, Probe diameter = 3.0 or 4.5 (type K), 3.0 (types J and T), Bush thread = 1/4"BSPT, Lead length = 1m

- Thermocouple mineral-insulated probes sheathed in stainless steel, intended for temperature measurement and control applications
- Probes have an adjustable brass coupling which may be secured at any position along the length of the body to give the required depth of insertion
- Coupling includes a sealing olive which provides a gas or liquid seal
- Fitted with 1 metre of PVC-sheathed thermocouple cable



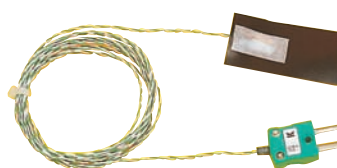
Temperature range	Type J	-40°C to +750°C	Output	Type J	50µV/°C
	Type K	-40°C to +1100°C		Type K	40µV/°C

212237

Probe Dia (mm)/Mftrs.	List No.	Order Code	Price Each		
			1+	10+	25+
Type JT/C J 3MM (IEC)	3.0	T/C J 3MM (IEC)	707-7373		
Type KT/C K 3MM (IEC)	3.0	T/C K 3MM (IEC)	707-7385		
Type KT/C K 4.5MM (IEC)	4.5	T/C K 4.5MM (IEC)	707-7397		

Magnetic Strip Thermocouple

Type K



Size 50 x 25, Thickness = 1

- Fast response
- Attach to any ferro-magnetic surface
- Easy and quick to position
- Can be transferred to other positions without damage



Type K surface thermocouple using a flexible magnetic strip which can be attached to any ferro-magnetic surface.

The 2m lead is terminated with a miniature thermocouple plug

Temperature range	-50°C to +120°C	Lead	2m PTFE insulated, twisted pair
Mftrs. List Nos:	FMS-2/PLUG (IEC)	=	707-7725

212147

	Order Code	1+	10+	25+
	707-7725			

Copper Disc Thermocouple



- Type K thermocouple junction brazed onto 7mm dia. copper disc
- Two lead length versions available, 1m and 3m
- Supplied with adhesive tape to attach to any clean surface for semi-permanent temperature measurement
- 5 adhesive tapes supplied.
- Tapes can also be used to secure the flexible PTFE lead
- For use up to 200°C

212322

Mftrs. List No.	Order Code	1+	10+	25+
Z2-K-1M DISC (IEC)	721-8771			
Z2-K-3M DISC (IEC)	163-3485			

Leaf Thermocouple - Stainless Steel Shim

Type J or K - Up to 350°C



- Grounded tip - Fast response
- Rated at 350°C
- Glassfibre stainless steel braided extension cable, 7/0.2mm
- Stainless steel shim, 25mm long x 13mm wide

386275/406061

Description	Mftrs. List No.	Order Code	1+	10+	25+
Type J, 2m lead	FL-J-2M	859-7928			
Type K, 2m lead	FL-K-2M	859-7936			
Type K, 3m lead	FL-K-3M	163-3486			

Thermocouple - Washer Eyelet

Type J or K - Up to 350°C



- Grounded tip - Fast response
- Rated at 350°C
- Choice of either 2m or 3m extension cable length
- Glassfibre stainless steel braided extension cable, 7/0.2mm
- Washer with 6mm clearance hole

386277/406071

Description	Mfrs. List No.	Order Code	Price Each		
			1+	10+	25+
Type J, 2m lead	FW-J-2M	859-7944			
Type J, 3m lead	FW-J-3M	163-3487			
Type K, 2m lead	FW-K-2M	859-7952			
Type K, 3m lead	FW-K-3M	163-3488			

Patch Surface Thermocouple

NEW



- Type K thermocouple in a moulded silicone rubber patch
- 2 metres PFA insulated twin twist 1/0.2mm cable with miniature connector
- Temperature rating -50°C TO 150°C
- Self-adhesive aluminium foil backing
- Resistant to many oils & chemicals
- Pad dimensions: L 30mm x W 5mm x H 4mm

657752

Mfrs. List No.	Order Code	Price Each		
		1+	10+	25+
SRS-K-2-C80-MP	208-1297			

Magnet Thermocouple

NEW



- Strong magnet housing type K thermocouple
- 2 metres stainless steel over-braided PFA cable fitted with miniature plug
- Temperature rating -50°C to 250°C
- Rapid, reliable temperature sensing on ferrous surfaces
- Grounded measuring junction
- Magnet has 1" diameter and 3kg pull

657753

Mfrs. List No.	Order Code	Price Each		
		1+	10+	25+
BMS-K-2-C70-MP-25.4	208-1298			

Industrial Mineral Insulated Probes

Type K



- Type K mineral-insulated stainless steel sheathed probes particularly suitable for industrial applications
- Suitable for applications up to 1100 °C
- Probes can be bent to enable fitting in awkward locations
- High reliability and stability

The thermocouple junction is located at the tip and insulated from the sheath. Smaller diameter thermocouples respond to temperature changes more rapidly than larger diameters, but larger diameters are mechanically stronger. Available in a range of lengths and diameters.

Sheath material	310 Stainless Steel
Temperature range of probe	-40°C to 1100°C-40°C to +1100°C
Pot seal	M8 x 1.0mm thread L=25
Pot temperature	200°C max.
Leads	PTFE insulated 7/0.2mm, L = 100mm

Mfrs List No: KMI/probe dia. probe length (IEC)

FOR SUITABLE COMPRESSION GLANDS SEE ORDER CODE 708-8206

222133

Probe Dia. (mm)	Probe L (mm)	Order Code	Price Each		
			1+	10+	25+
0.5	150	721-8898			
0.5	250	424-8170			
0.5	500	424-8181			
1	1501	707-8110			
1	2501	707-8122			
1	5001	707-8134			
1.5	1501.5	707-8146			
1.5	2501.5	707-8158			
1.5	5001.5	707-8160			
1.5	10001.5	707-8171			

Probe Dia. (mm)	Probe L (mm)	Order Code	Price Each		
			1+	10+	25+
3	1503	707-8183			
3	2503	707-8195			
3	5003	707-8201			
3	10003	707-8213			
6	5006	707-8237			

Industrial Mineral Insulated Probes

Type N



- Suitable for applications up to 1200°C
- In vacuum or controlled atmospheres, type-N sensors can be used in excess of 1200°C
- Excellent long-term stability, reliability and high temperature performance
- Lifetime many times that of K-type equivalents at elevated temperatures
- Particularly suitable for industrial applications
- Probes can be bent to enable fitting in awkward locations

Mineral-insulated, metal-sheathed probes using type N (Nitrosil/Nisil), a base metal thermocouple which offers significant advantages over type K. The thermocouple junction is located at the tip and insulated from the sheath.

Mfrs. List No. NM1/3 150(IEC) = 707-9072, NM1/3 250(IEC) = 707-9084

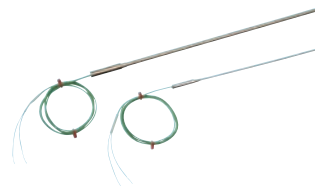
Sheath material	Nickle-chromium-silicon
Max. temperature	1200°C
Pot seal	M8 x 1.0mm thread L=25mm
Pot temperature	200°C max.
Leads	PTFE insulated, L = 100mm

212330

Probe Dia. (mm)	Probe L (mm)	Mfrs. List No.	Order Code	Price Each		
				1+	10+	25+
3	150	NM1/3X150 (IEC)	707-9072			

Industrial Mineral Insulated Probes

Type K With Standard Plug



- Type K mineral insulated thermocouples
- Very rugged and flexible
- Stainless steel (310)
- Particularly suitable for high pressure, high vacuum or high vibration applications
- Max temperature of probe 1100°C (K)
- Plain pot seal (max temp 200°C)
- 7/0.2mm PFA insulated lead 2m long

449656

Probe Dia. (mm)	Probe L (mm)	Order Code	Price Each		
			1+	10+	25+
1	100	128-9614			
1	250	128-9617			
1	500	128-9618			
1	1000	128-9619			
1.5	100	128-9620			
1.5	150	128-9621			
1.5	250	128-9622			
1.5	500	128-9623			
1.5	1000	128-9624			
1.5	2000	128-9625			
3	100	128-9626			
3	250	128-9629			
3	500	128-9630			
3	1000	128-9631			
3	2000	128-9632			
6	100	128-9633			

Mineral Insulated Type K Thermocouples

Inconel® Sheath + Pot & Tails



Excellent oxidation resistance to 1100°C (not suitable for sulphur bearing atmospheres above 550°C). Typical applications include heat treatment processes, annealing furnaces, chemical reactors, man-made fibre & synthetic material production, steam boilers, paper industry.

NEW

- Mineral insulated type K thermocouples
- Single element, junction insulated from sheath
- 310 stainless steel or Inconel® Alloy 600 sheath
- Probe temperature range -100°C to 1100°C

Mineral Insulated Type K Thermocouples - continued

Inconel® Sheath + Pot & Tails - continued

- M8 x 1.0mm threaded pot seal (200°C)
- 100mm tails, PFA twin twisted 7/0.2mm

657766

Probe Dimensions (∅ x L) Mftrs. List No.	Order Code	Price Each		
		1+	10+	25+
1.5mm x 500mm MD-ISK-115-500-P5-I	208-1299			
1.5mm x 1000mm MD-ISK-115-1000-P5-I	208-1300			
1.5mm x 1500mm MD-ISK-115-1500-P5-I	208-1302			
3mm x 500mm MD-ISK-130-500-P5-I	208-1303			
3mm x 1000mm MD-ISK-130-1000-P5-I	208-1304			
3mm x 1500mm MD-ISK-130-1500-P5-I	208-1305			

Heavy Duty Thermocouples



- Low-cost, heavy-duty, stainless steel thermocouples for a variety of applications up to 350°C
- Probes have grounded junctions for fast response
- 2 metre leads of rugged, stainless steel braided, fibreglass

Probe L=150, Dia=4.76, Lead L=2mx7/0.2

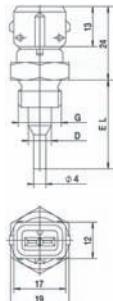
Mftrs. List No. J-HD-150X(IEC)=707 9436, K-HD-150X(IEC)=707 9448

212221

Type	Order Code	Price Each		
		1+	10+	25+
Type JJ-HD-150X (IEC)	707-9436			
Type KK-HD-150X(IEC)	707-9448			

Screw-in resistance thermometer in stainless steel

902004 / 10



Shock-proof screw-in resistance thermometers enable temperature measurements under pressure up to 25bar, in motors, compressors and plant that are subject to particular stress.

- for temperatures from -50 to +300°C
- Highly shock-proof construction
- Connector locked in for reliable contact
- IP65 protection
- Connector with gold-plated contacts
- Protection tube in stainless steel X5 CrNi; 1810 M14 x 1.5
- Mating plug with 2.5m long silicone-insulated connecting cable, 0.34mm²

333872

Description	Order Code	Price Each		
		1+	5+	10+
Screw-In Thermometer	472-4446			
Connecting Cable	472-4458			

Industrial Probes with Terminal Head

Type K



- Type K mineral-insulated thermocouple probes
- Strong 6mm diameter stainless steel stem withstands high pressures
- Waterproof terminal head gives IP67 protection
- Thermocouple junction located at tip is insulated from the sheath

The terminal head contains terminal block allowing connection to the measuring instrument via an M20 cable gland.



Sheath material 310 stainless steel
Terminal head Die cast aluminium, epoxy coated. Screwed lid with retaining chain IP67 rated

Temperature Range -40°C to +1100°C

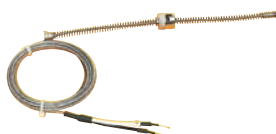
FOR SUITABLE COMPRESSION GLAND SEE ORDER CODE 254-654

222146

Probe Length	Mftrs. List No.	Order Code	Price Each			
			1+	5+	10+	25+
300mm	K-300-KNE (IEC)	707-9679				

Adjustable Bayonet Thermocouple

Types J and K



- Adjustable bayonet thermocouples designed primarily for the plastics and packaging industry, but recommended wherever spring loaded contact is required
- Thermocouple junction is housed in a rugged stainless steel tip

- Supplied with 2 metres of stainless steel braided lead fitted with a 170mm spring with adjustable fixing cap
- Separate bayonet adaptor locates via a 1/8" BSP male thread
- Fixing cap of the thermocouple is fitted to the adaptor to ensure secure spring loaded contact
- Suitable for temperatures up to 350°C

212338

Mftrs. List No.	Order Code	Price Each		
		1+	10+	25+
Type J J-ABT-2 (IEC)	707-9801			
Type K K-ABT-2 (IEC)	707-9813			
Adaptor 1/8 INCH BAYONET ADAPTOR CA-400	152-239			

Welded Tip Thermocouples with Fitted Plugs



These Welded Tip Thermocouples are available in either PTFE or Glassfibre insulation. Complete with a miniature thermocouple plug fitted, they are ready to use for most types of temperature measurement.

- Available as 1/0.2mm PTFE and 1/0.315mm Glassfibre Insulated construction
- Thermocouple types J, K, & T
- PTFE Insulation rating -75°C to +250°C
- Glassfibre Insulation rating -50°C to +350°C
- Fitted with a miniature thermocouple plug

249384

Insulation	Type	Lead	Order Code	Price Each		
				1+	5+	10+
PTFE Insulation	Type J	1m lead	410-0736			
	Type J	3m lead	163-3489			
	Type K	1m lead	410-0748			
	Type K	3m lead	163-3490			
	Type T	1m lead	410-0750			
	Type T	3m lead	163-3492			
Glassfibre Insulation	Type J	2m lead	410-0761			
	Type J	4m lead	163-3493			
	Type K	2m lead	410-0773			
	Type K	4m lead	163-3494			

Thermocouple - Welded Tip

Types J, K & T



Type K, tails



Type K, mini-plug

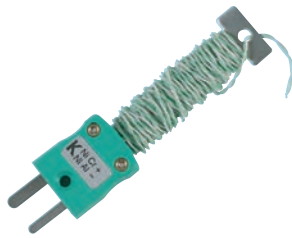
- Fast response, exposed junction
- Thermocouples to IEC 60584
- 1/0.2mm twin twist wires
- PTFE insulated wires, class 1
- Rated from -75 to +250°C

386293

Description	Mftrs. List No.	Order Code	Price Per Pack		
			1+	5+	10+
Order Multiple=Pack of 5					
2m twin twist cable					
Type K tails	Z2-K-2 X 5	859-8150			
Type T tails	Z2-T-2 X 5	859-8169			
Type K mini-plug	Z2-K-2-MP X 5	859-8185			
Type T mini-plug	Z2-T-2-MP X 5	859-8193			
Type J mini-plug	Z2-J-2-MP X 5	859-8215			
1m twin twist cable					
Type K tails	Z2-K-1 X 5	859-8223			
Type T tails	Z2-T-1 X 5	859-8231			

Thermocouple - Fine Wire

Type K - 220°C



- Class 1 PFA insulated wire - High accuracy
- Rated at 220°C continuous (plug), 250°C (PFA)
- 2m wire stored on stainless steel stem with fitted mini-plug
- High sensitivity, fast response

386279

Description	Mfrs. List No.	Order Code	Price Each		
			1+	5+	10+
Type K, 2m lead length					
Twin twist, 1/0.2mm	CT-Z2-PFA-K-2	859-8118			
Flat pair, 1/0.315mm	CT-Z4-PFA-K-2	859-8126			

Industrial Mineral Insulated Probes

Type K With 1m Lead



- Type K mineral insulated thermocouples
- Stainless Steel (316)
- Very Flexible
- Plain pot seal
- 1m PTFE flat pair 7/0.2mm cable

Mineral insulated thermocouples are extremely rugged and flexible, able to withstand temperatures up to 1100°C (pot seal max temp 180°C). The probes can be bent to enable fitting in awkward locations, they are particularly suitable for industrial applications including high pressure, high vacuum, and high vibration. The thermocouple junction is located at the tip of the sensor and is insulated from the sheath

FOR SUITABLE COMPRESSION GLANDS SEE ORDER CODE 708-8206

249373

Probe Dia. (mm)	Probe L (mm)	Order Code	Price Each		
			1+	5+	10+
Standard Thermocouple					
1	100	128-9641			
1	250	128-9642			
1.5	150	424-8193			
1.5	250	424-8200			
1.5	2000	128-9647			
3	150	424-8211			
3	250	424-8223			
3	500	128-9648			
6	250	424-8247			

Industrial Mineral Insulated Probes

Type K With Miniature Plug



Mineral insulated thermocouples are extremely rugged and flexible, able to withstand temperatures up to 1100°C (plug max temp 220°C). The probes can be bent to enable fitting in awkward locations, they are particularly suitable for industrial applications including high pressure, high vacuum, and high vibration. The thermocouple junction is located at the tip of the sensor and is insulated from the sheath

- Type K mineral insulated thermocouples
- Stainless Steel (316)
- Very Flexible
- Direct connection to miniature plug

FOR SUITABLE COMPRESSION GLANDS SEE ORDER CODE 708-8206

249378/406072

Probe Dia. (mm)	Probe L (mm)	Order Code	Price Each		
			1+	5+	10+
Standard Thermocouple					
0.5	150	424-8296			
0.5	250	424-8302			
0.5	500	128-9600			
0.5	1000	128-9601			
1.5	150	424-8314			
1.5	250	424-8326			
1.5	500	128-9602			
1.5	1000	128-9604			
3	150	424-8338			
3	250	424-8340			

Nozzle Thermocouple - Threaded Bolt

Type J or K - Up to 350°C



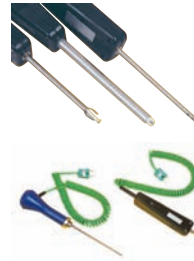
- Grounded tip - Fast response
- Adjustable insertion
- Not sealed
- Tip shape matches drill angle in blind holes
- M6 x 1mm threaded stainless steel bolt
- Glassfibre stainless steel braided extension lead, 7/0.2mm

386270

Description	Mfrs. List No.	Order Code	Price Each		
			1+	10+	25+
Type J, 2m lead	FN-J-2M	859-8045			
Type K, 2m lead	FN-K-2M	859-8053			

Handheld Probes - Type K

Fixed Probes



Surface, disc
Overall L=195, Probe L=80, Dia=4.7, Lead L=1.5m

Surface, coil
Overall L=220, Probe L=108, Dia=7.9, Lead L=1.5m

Air
Overall L=187, Probe L=74, Dia=4.7, Lead=1.5m

Insertion
Overall L=200
Probe L=105
Dia=3.3
Lead L=2m

- Hand-held type K thermocouple probes with stainless steel sheath
- Fitted with coiled PVC lead terminated with miniature thermocouple plug

Insertion probe: Tapered tip suitable for general purpose temperature measurement, immersion in liquids and penetration of semi-solids and solids including frozen food, grain etc. Maximum temperature 400°C.

Choice of **surface probes:** **Disc-type** features a spring-loaded thermocouple with copper 4mm diameter disc tip, operates up to 850°C. **'Coil' type** features a ceramic tip and coiled element for fast response, improved accuracy and maximum temperature of 900°C. Diameter of coiled element is 5.5mm.

Air probes: Thermocouple junction protected by perforated sheath allowing the free passage of gases, for fast response measurement up to 750°C.

212446

Type	Mfrs. List No.	Order Code	Price Each		
			1+	10+	25+
Surface, disc	A-K (IEC)	708-1182			
Surface, coil	C-K (IEC)	708-1194			
Air	L-K (IEC)	708-1200			

Thermocouple Cables

General Data

Thermocouple Extension and Compensation Cable

Extension cable has a temperature v e.m.f. relationship to the appropriate standard over the complete temperature range. It can, therefore, be used for producing a thermocouple junction and for joining thermocouples to their measuring instruments. It is limited in temperature, only by the rating of its insulation.

Compensating cable is of different composition to extension cable but has a similar temperature v e.m.f. relationship over a limited range, and **should only be used for joining thermocouples to their measuring instruments**. It can only be used in a limited ambient temperature, generally not higher than 80°C.

Ordinary copper wires and connectors should never be used to join thermocouples to instruments-substantial errors can result. Use only thermocouples compensating or extension cable and thermocouple connectors.

Guide to wire and Cable Insulation

Insulation Material	Usable Temperature Range	Application Guide
PVC	-10°C to 105°C	Good general-purpose insulation for 'light' environments. Waterproof and very flexible.
PTFE	-75°C to 250/300°C	Resistant to oils, acids, other adverse agents and fluids. Good mechanical strength and flexibility.
Glass-fibre (varnished)	-60°C to 350/400°C	Good temperature range but will not prevent ingress of fluids. Fairly flexible but does not provide good mechanical protection.
Glass-fibre (varnished) stainless steel overbraid	-60°C to 350/400°C	Good resistance to physical disturbance and high temperature (up to 400°C). Will not prevent ingress of fluids.

Single or Multi-Strand?

The choice is mainly determined by the application (e.g. termination considerations and internal diameter of associated sheath). Generally, single-strand wires are used for thermocouple junctions and multi-strand or thicker single-strand for extensions of the thermocouple. The greater the effective conductor diameter, the lower the value of thermocouple loop resistance, an important consideration with long cable runs.

Source: LABFACILITY TEMPERATURE HANDBOOK- Order Code 656-069.

229884

Thermocouple Cables - continued

Thermocouple Cables Type J & K

PVC Flat Pair



Un-screened Type J

386260

Description	Mftrs. List No.	Order Code	Price Each		
			1+	10+	25+
Unscreened 7/0.2 100m					
Type K	WK-150	859-8460			
Type J	WJ-200	859-8479			
Screened Extension Cable, 7/0.2					
Type K, 100m	WK-359	859-8487			
Type J, 100m	WJ-241	859-8495			

PFA Insulated Cable

NEW



- PFA insulated twisted or flat pair
- Good mechanical strength and flexibility, resistant to oils, acids and other adverse fluids
- Solid 1/0.2mm or 1/0.315mm, or
- Tolerance Class 1 for optimum accuracy
- Insulation rating -75°C to 260°C
- IEC584 colour coded

657753

Reel Length	No. Strands / Size	Type	Mftrs. List No.	Order Code	Price Per Reel		
					1+	10+	25+
Twisted Pair							
50m	1 x 0.2mm	T	WT-304-D-50M	208-1273			
100m	1 x 0.2mm	T	WT-304-D-100M	208-1274			
50m	1 x 0.315mm	T	WT-306-D-50M	208-1275			
50m	7 x 0.2mm	T	WT-307-D-50M	208-1276			
50m	1 x 0.2mm	K	WK-203-D-50M	208-1277			
100m	1 x 0.2mm	K	WK-203-D-100M	208-1278			
50m	1 x 0.315mm	K	WK-204-D-50M	208-1279			
50m	7 x 0.2mm	K	XS-752-D-50M	208-1280			
Flat Pair							
25m	7 x 0.2mm	J	WJ-248-D-25M	208-1281			
50m	7 x 0.2mm	J	WJ-248-D-50M	208-1282			
25m	1 x 0.315mm	K	WK-356-D-25M	208-1284			
25m	7 x 0.2mm	K	XS-751-D-25M	208-1285			
50m	7 x 0.2mm	K	XS-751-D-50M	208-1286			
100m	7 x 0.2mm	K	XS-751-D-100M	208-1287			
25m	1 x 0.315mm	T	WT-203-D-25M	208-1288			
25m	7 x 0.2mm	T	WT-305-D-25M	208-1289			
50m	7 x 0.2mm	T	WT-305-D-50M	208-1290			
100m	7 x 0.2mm	T	WT-305-D-100M	208-1291			
25m	7 x 0.2mm	N	WN-121-D-25M	208-1292			

Extension Cable and Compensating Cable, PVC



Types J, K, T, N, R/S and Vx

Colour coded to BS4937 Part 30:1993.



Extension Cable

Extension cable suitable for thermocouples. The cable is 7/0.2 twin flat with PVC covered conductors with an overall sheath of PVC. The cable is ideally suited for extending thermocouples away from the heat source via the connectors listed below.

Compensating Cable (Type K)

The Vx cable is type K compensating at ambient temperatures up to 80°C.

Mftrs. List No.	WJ-200/10M (IEC)	= 708-2289	WV-100/25M (IEC)	= 708-2370
	WJ-200/50M (IEC)	= 708-2290	WJ-200/10M (IEC)	= 708-2289
	WK-150/10M (IEC)	= 708-2307	WT-009/50M (IEC)	= 708-2368
	WK-150/50M (IEC)	= 708-2319	WV-009/100M (IEC)	= 708-2400
	WN-001/10M (IEC)	= 708-2320	WU-100/100M (IEC)	= 708-2423
	WT-200/50M (IEC)	= 708-2344		

212427

Extension Cable	Order Code	Price Each			
		1+	5+	10+	25+
Type J, 7 / 0.2mm 10m	708-2289				
Type J, 7 / 0.2mm 50m	708-2290				
Type K, 7 / 0.2mm 10m	708-2307				
Type K, 7 / 0.2mm 50m	708-2319				
Type N, 7 / 0.2mm 10m	708-2320				
Type T, 7 / 0.2mm 50m	708-2344				
Type T, 13 / 0.2mm 50m	708-2368				
Compensating Cable					
Type Vx, 7 / 0.2mm 25m	708-2370				
Type Vx, 13 / 0.2mm 100m	708-2400				
Type RC/SC, 13 / 0.2mm 100m	708-2423				

Extension Cable, PTFE



Types K and T

- Flexible extension cable for type K thermocouples
- Comprises pair of PTFE-insulated flexible conductors with overall flat PTFE sheath
- Good chemical resistance

Conductor size 7 / 0.2mmmm
Approx. overall size 2.4 x 2mm
Maximum continuous temperature 250°C

212332

	Mftrs. List No.	Order Code	Price Each		
			1+	10+	25+
Type K, 25m	WK-302/25M (IEC)	708-5904			

Extension Cable, Glass Fibre Insulated



Types J, K and T

- Suitable for high ambient temperature applications
- Each conductor insulated with silicon varnish-impregnated fibre glass
- Overall fibre glass sheath impregnated with silicon varnish

	Type J	Type K
	Wire diameter	1 / 0.315mm
Overall diameter	1.5mm	1.5mm
Max continuous temperature	350°C	350°C
Positive conductor	Iron	Nickel chromium
Negative conductor	Constantan	Nickel chromium

212438

	Mftrs. List No.	Order Code	Price Each		
			1+	10+	25+
Type J, 10m coil	WJ-032/10M (IEC)	708-5928			
Type K, 10m coil	WK-041/10M (IEC)	708-5930			
Type K, 50m reel	WK-041/50M (IEC)	708-5941			
Type T, 10m coil	WT-056/10M (IEC)	708-5953			

Extension Cable with Stainless Steel Overbraid



Glass Fibre, Types J and K

- Rugged extension cable for types J and K thermocouples
- Excellent mechanical protection
- Flexibility
- High temperature resistance
- Overbraid can be used for electrical screening

Cable comprises one pair of glass fibre insulated flexible conductors, a glass fibre sheath and an overall rugged stainless steel braid.

212333

	Mftrs. List No.	Order Code	Price Each		
			1+	10+	25+
Type K 25m	WK-075/25M (IEC)	708-6337			
Type J 25m	WJ-040/25M (IEC)	708-6349			

Screened Extension and Compensating Cable



Types K and Vx



Screened thermocouple cable reducing electromagnetic and electrostatic interference of thermocouple signals. The cable comprises one pair of stranded 7/0.2mm conductors, PVC

insulated and twisted together. The pair are screened with mylar/aluminium tape in contact throughout with a copper drain wire. The cable has an overall round PVC sheath, approximate diameter 5mm.

Maximum temperature 105°C (type K) and 80°C (type Vx).

Mftrs. List No. WK-074/10M (IEC) = 708-6131, WK-074/50M (IEC) = 708-6143, WV-029/100M (IEC) = 708-6155

212222

	Order Code	Price Each		
		1+	10+	25+
Extension Cable				
Type K 10m coil	708-6131			
Type K 50m coil	708-6143			
Compensating Cable				
Type Vx (K) 100m reel	708-6155			

Silicon Insulated Cable



NEW

- 7/0.2mm single pair
- Silicone rubber insulated twisted cores
- Silicone rubber insulated jacket
- Round cross section
- Colour coded to IEC584
- Temperature rating -40°C to 200°C

657760

Reel		Price Per Reel		
Length	Type	Mfrs. List No.	Order Code	
25m	J	WJ-270-D-25M	208-1293	
25m	K	WK-395-D-25M	208-1294	
50m	K	WK-395-D-50M	208-1296	

Thermocouple wire, PTFE TW-TW



- PTFE insulated, twin-twist construction
- 1/0.2mm diameter conductor
- Thermocouple types J, K, T
- High accuracy Class 1 tolerance
- Insulation rating -75°C to +250°C
- Supplied on 25m, 50m or 100m reels

231796

Thermocouple Type	Order Code	1+	10+	25+
Type Thermocouple Type J x 25M Reel	335-8150			
Type Thermocouple Type K x 25M Reel	335-8161			
Type K x 50M Reel	163-3495			
Type K x 100M Reel	163-3497			
Type Thermocouple Type T x 25M Reel	335-8173			
Type T x 50M Reel	163-3498			
Type T x 100M Reel	163-3499			

Self-adhesive Attachment Pads



- Self-adhesive PTFE coated glass cloth
- Each pad has pre-cut hole through which thermocouple junction is passed and held down in contact with surface to be measured
- Temperature range -50°C to +250°C
- Supplied in pack of 20

Pad (nom.)=18x13

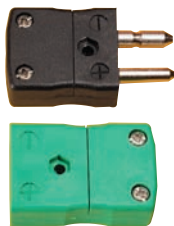
Self-adhesive pads for locating welded tip thermocouples.

212325

20 Per Pack		Price Per Pack		
Mfrs. List No.	Order Code	1+	10+	25+
THERMOPADS (X20)	721-8849			

Thermocouple Connectors and Accessories

Connectors - Standard Types J, K, R/S, T and Copper



- A range of standard sized connectors with round pins to suit the thermocouple type being used
- Intended for use in more industrial applications
- All contacts are polarised to ensure correct connection
- Maximum continuous operating temperature 220°C
- Cable clamps available for securing cable to free plugs and sockets
- Colour coded to BS4937 Part30:1993

212475

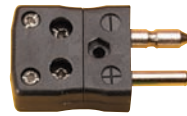
Line Plug	Mfrs. List No.	Order Code	1+	10+	25+	100+	500+
Type J	FSTC-J-M	148-823					
Type K	IS-K-M (IEC)	708-7925					
Type N		NEW 381-0203					
Type N	IS-N-M	NEW 208-1266					
Type T	IS-T-M	381-0215					

Line Plug	Mfrs. List No.	Order Code	1+	10+	25+	100+	500+
Type R	IS-R-M (IEC)	708-7950					
Copper	IS-C-M	381-0227					
Copper	FSTC-CU-M	NEW 208-1265					
Line Socket							
Type J	FSTC-J-F	148-824					
Type K	IS-K-F (IEC)	708-7937					
Type N	IS-N-F	381-0239					
Type N	IS-N-F	NEW 208-1268					
Type T	IS-T-F	381-0240					
Type R	IS-R-F (IEC)	708-7962					

Connectors, Standard, Quick Wire



Types J and K



- Physically compatible with alternative standard, round pin connectors
- These quick connect versions allow rapid termination
- Quick, easy 'jab-in' connection just push in wire and tighten screw
- Wide range of wire sizes
- 220°C continuous rating
- IEC colour coded bodies to BS4937 Part 30:1993

231221

Mfrs. List No.	Order Code	1+	10+	25+	100+	500+
Quick Wire Plug						
Type J	IS-J-MQ	381-0264				
Type K	IS-K-MQ	381-0276				
Quick Wire Socket						
Type J	IS-J-FQ	381-0320				
Type K	IS-K-FQ	381-0331				
Accessories						
Cable Clamp	FSTC-EXCL	674-084				

Thermocouple Connectors Standard Line Pairs



- Polarised to ensure correct connection
- 220°C continuous rating

386256

Description	Mfrs. List No.	Order Code	1+	10+	25+	100+
Type J	IS-J-M/F	859-8363				
Type K	IS-K-M/F	859-8371				

Thermocouple Connectors Miniature Sockets



High quality, low cost, single sprung sockets which accept all types of flat pin miniature plugs

- Polarised to ensure correct connection
- 220°C continuous rating

386246

Description	Mfrs. List No.	Order Code	1+	10+	25+
Type J	IM-J-LCF	859-8274			
Type K	IM-K-LCF	859-8282			

FREE GLOBAL LEGISLATION SUPPORT

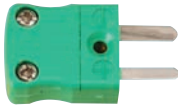


RoHS, REACH, WEEE, ErP, Batteries Directive - latest updates, free white papers and live online Q&A at element14.com/legislation

Thermocouple Connectors and Accessories - continued

Miniature Connectors

Type - J, K, N, T and Copper



- A range of miniature thermocouple connectors with flat pins
- Terminal and contact materials available to suit thermocouple type
- Uncompensated copper connectors also available (White)
- Contacts polished to ensure correct connection
- Connectors accept thermocouple cable up to 3mm in diameter
- Maximum operation temperature 220°C



621964

Description	Mfrs. List No.	Order Code	Price Each		
			1+	10+	25+
Line Plug					
Type J	FMTC-J-M	151-128			
Type K	IM-K-M (IEC)	708-6362			
Type N	IM-N-M (IEC)	708-6430			
Type T	IM-T-M (IEC)	708-6404			
Copper	FMTC-CU-M	721-8874			
Line Socket					
Type N	IM-N-F (IEC)	708-6428			

Cable Support Grommet for Miniature Connectors



NEW



- Flexible Rubber
- Highly effective cable strain relief
- Suits fine wire, twisted and/or jacketed cables
- Can be trimmed to suit different wire diameters up to 3.0mm
- Suits either miniature in-line plug or socket connectors
- Quickly & easy to fit

657747

Mfrs. List No.	Order Code	Price Per Pack		
		1+	10+	25+
FMTC-SRG	208-1270			

Thermocouple Connectors

Miniature Line Pairs



- Single sprung contact socket
- Polarisated to ensure correct connection
- 220°C continuous rating
- Interchangeable with all types of flat pin miniature connectors

386254/406073

Description	Mfrs. List No.	Order Code	Price Each			
			1+	10+	25+	100+
Type T	IM-T-M/LCF	859-8320				
Type J	IM-J-M/LCF	859-8339				
Type K	IM-K-M/LCF	859-8347				

Connectors, Miniature, Quick Wire

Types J and K



- These quick connect versions allow rapid termination
- Quick, easy 'jab-in' connection just push in wire and tighten screw
- Wide range of wire sizes
- 220°C continuous rating
- IEC colour coded bodies to BS4937 Part 30:1993

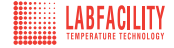


231275

Order Code	Price Each				
	1+	10+	25+	100+	500+
Quick Wire Plug					
Type J	381-0380				
Type K	381-0392				
Type T	381-0410				
Copper	381-0422				
Quick Wire Socket					
Type J	381-0434				
Type K	381-0446				
Type T	381-0460				
Copper	381-0471				

Quick Wire Thermocouple Connectors

Panel fitting, miniature



- Stainless steel brackets
- Reliable and rugged fitting into panel
- Quick, easy "jab-in" connection. Push in wire and tighten screw
- Maximum continuous operating temperature 220°C

386251

Description	Mfrs. List No.	Order Code	Price Each		
			1+	10+	25+
Type T	IM-T-LCF	859-8266			
Type K	IM-K-SSPFQ	859-8304			

Very High Temperature Plastic Plugs and Sockets

Miniature Type K



Miniature plug



Miniature socket

- Type identification on white body
- 560°C continuous rating
- Heavy duty ceramic body

386259/406077

Description	Mfrs. List No.	Order Code	Price Each			
			1+	10+	25+	100+
Miniature, Very High Temperature						
Type K - Plug	IM-K-M-HTC	859-8428				
Type K - Socket	IM-K-F-HTC	859-8436				

Connectors, Panel, Clip Mount

Types J, K, N, T, R and Copper



- Quick, simple fixing to panel
- Rated for use up to 220°C

Dimensions:
Miniature:- H = 23.30, W = 14.25, D = 21.50
Standard:- H = 38.10, W = 18.50, D = 31.50

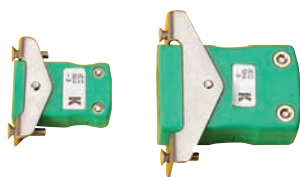
231277

Order Code	Price Each				
	1+	10+	25+	100+	500+
Miniature					
Type J	151-130				
Type K	708-6386				
Type N	708-6441				
Type T	708-6416				
Copper	721-8886				
Standard					
Type J	148-825				
Type K	708-7949				
Type T	381-0495				

Panel Connectors - Stainless Steel Bracket



Type K



- Miniature sockets with stainless steel brackets
- Rugged and Reliable fixing into panel
- Quick, simple fixing to connector
- Allows for continuous use at 220°C

622012

Description	Mfrs.	Order Code	Price Each		
	List No.		1+	10+	25+
Miniature	IM-K-SSPF	381-0525			
Standard	IS-K-SSPF	381-0574			

Miniature Connector - PCB



Type - K

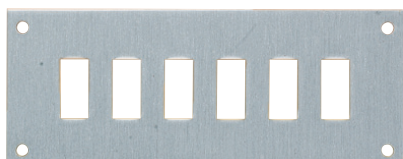


- Versatile, high quality circuit board mounting socket
- Specially designed for PCB's
- High reliability interconnection for high duty use
- Provision for CJC sensor
- 220°C continuous rating
- Colour coded to BS4937 Part 30:1993

622025

Description	Mfrs.	Order Code	Price Each		
	List No.		1+	10+	25+
Type K	IM-K-PCB	381-0628			
Type N	FMTC-CU-PCB	NEW 208-1269			

Connector Panels



Miniature: Thickness = 1.8mm
6-way L = 115, H = 45mm
Standard: Thickness = 2.4mm
6-way L = 145, H = 66mm

- Anodised aluminium panels
- Pre-cut holes for thermocouple panel sockets
- Suitable only for clip mounting sockets
- 4 Fixing holes

621998

Description	Mfrs.	Order Code	Price Each		
	List No.		1+	10+	25+
Miniature, 6-way	FMP-6	708-8164			
Standard, 6-way	FSP-6	708-8188			

Connector Blocks



- Blocks can be interlocked to produce required number of channels (max 5) and allowing thermocouple types to be mixed
- Each block has 2 fixing holes

Connecting blocks with single pair of positive and negative contacts of thermocouple material.

Block L = 36, W = 30, H = 13

Max. working temperature 220°C
Wire size for crimp terminals 0.5 to 1mm (0.2 to 0.8mm²), 25-19 SWG

212323

Connector Block	Order Code	Price Each			
		1+	5+	10+	25+
Type J	721-8783				
Type K	721-8795				

Bench Selector Switch - Type K



H=57, W=130, D=145

- 6 way bench selector switch in moulded housing with aluminium front and rear panels
- Allows up to 6 type K sensors to be measured by one instrument
- Inputs/output via miniature thermocouple sockets

222182

Mfrs. List No.	Order Code	Price Each		
		1+	5+	10+
TCS-6K (IEC)	708-8190			

Thermocouple and Fine Wire Welder



- Designed For Producing Thermo-couple Junctions
- Suitable for wires up to 1.1mm diameter
- Argon gas shield facility
- Can join wires to each other or metal surfaces
- Includes footswitch for convenient operation
- 110/230Vac power supply

The L60+ welder is designed for sensor manufacturers to produce commercial grade thermocouple junctions, and by users of large numbers of exposed junction thermocouples such as test and development laboratories where multi-point temperature sensing of test pieces is required. No special skills are required and most people will be capable of producing quality work with minimal practice. A satisfactory thermocouple junction is produced without using argon, but where argon is available a momentary purge is automatically triggered immediately prior to the weld to give optimum weld integrity.

249383

Order Code	Price Each		
	1+	5+	10+
410-0669			

Compression Glands



Brass - BSPT Thread

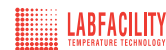


- Brass compression glands suitable for fitting temperature sensor probes of various diameters
- Suitable for probe diameters of 1.5, 3mm

519811

Bore Dia.	Mfrs. List No.	Order Code	Price Each		
			1+	10+	25+
1/8" BSPT Thread size					
1.5mm	FC-001	708-8206			
3mm	FC-002	708-8218			

Locknuts



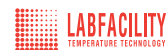
Brass and Stainless Steel



519869

Thread Size	Mfrs. List No.	Order Code	Price Each		
			1+	10+	25+
Brass					
M8 x 1mm	FL-240	163-3434			
1/8" BSP	FL-236	163-3435			
1/4" BSP	FL-235	163-3436			
1/2" BSP	FL-237	163-3437			
Stainless Steel					
M8 x 1mm	FL-253	163-3438			
1/8" BSP	FL-250	163-3439			
1/4" BSP	FL-252	163-3440			
1/2" BSP	FL-255	163-3441			

Thermopocket



Stainless Steel



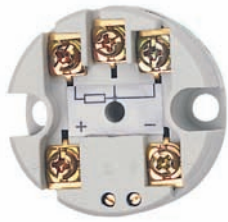
- Process connection 1/2" BSPP
- 1/8" BSPP sensor connection
- Outside diameter 7/16"
- Wall thickness 0.08"
- Sensor probe should be 50mm longer than pocket stem

519851

Pocket Length	Mfrs. List No.	Order Code	Price Each		
			1+	10+	25+
100mm	TP-100-X	673-961			

Thermocouple Connectors and Accessories - continued

PT100 or Thermocouple to 4-20mA



- Two transmitters, one PT100 input, one J, K or T thermocouple input (user selectable)
- Both have 4-20mA output
- Din sized for in head installation
- Screw terminals for inputs and outputs
- Corrosion resist plastic case
- 0.2°C accuracy
- Tested to EN55011, IEC 801-2, 3, 4 for EMC compatibility

H = 23.0, Dia. = 41.8
2 Mounting holes dia. 5.5 @ 33 cntrs.
Centre hole (sensor wire entry) Dia. = 4.0mm

Output 4-20mA loop powered max. 30mA
Loop supply 10 to 30 Vdc reverse polarity protection
Loop resistance 700Ω @ 24V
Loop sensitivity 10μA/volt
Temperature stability Zero drift typ. 0.02%/°C, Span typ. 0.005%/°C
Ambient temperature 0 to 70°C, (95% humidity, max. non-condensing)

PT100 Version	Thermocouple Versions (J,K, T)
Input to DIN 43760 100R @ 0°C (2 or 3 wire)	Insulated junction J K or T sensor
Accuracy ±0.2°C and +0.2% rdg.	±0.1% FS and cold junction errors
Offset adjustment range dependant	±100°C, solder link & potentiometer
Gain/adjustment 25°C to 500°C	100 to 1000°C
Impedance >1MΩ	
Burn out Up scale standard (downscale option)	
Cold junction Automation 0 to 70°C ±0.2%	J=0 to +400°C, K=0 to +1000°C,
Temperature range -30°C to +400°C	T=0 to +400°C

229914

Sensor Type	Mftrs. List No.	Order Code	Price Each			
			1+	5+	10+	25+
Pt100	SEM104PT100	615-675				
Thermocouples, Type J, K, T	SEM104TC	615-687				

Temperature Transmitter

4 - 20mA, 2 wire loop Output



- Wide range of span adjustment
- Minimal interaction span and zero potentiometer action
- In-head mounting with DIN standard fixing
- Input noise rejection
- Pt100
- CE compliant

520050

Input Type	Mftrs. List No.	Order Code	Price Each		
			1+	10+	25+
Temperature Range					
PT100 - IEC 751, 3 Wire					
0 to 100°C	SI-050	163-3458			

Temperature Transmitters

Push Button Calibration



A simple push button operation selects the range and calibrates the SEM203 4 - 20mA temperature transmitter, eliminating the need for soldering links, potentiometers or PC's.

The devices connect to an appropriate sensor and convert the output to a linear 4 - 20mA output signal. The SEM203 is linearised to comply with all common RTD sensor standards, all common thermocouple types and up to 10KR potentiometers.

- Push button calibration
- Re-rangeable without a PC
- Drift free linearisation
- LED over-range indication

Specifications

Approvals EMC Emissions to BS / EN
Operating temperature -20 to 80°C
Lead Length (Max.) 3m
Accuracy ±0.01% full scale
Loop Drop <4.0V @ 20 mA

Input - Sensor & Range	8840172 Pt100 -200 to +850°C	8840180 K - 200 to 1370°C J - 200 to 1200°C T - 200 to 400°C
------------------------	--	--

Default Range <4.0V @ 20 mA
Input ±0.01% full scale
Default Range <4.0V @ 20 mA

386395

Input	Mftrs. List No.	Order Code	Price Each			
			1+	5+	10+	25+
3 wire, PT100	SEM203/P	884-0172				
Thermocouple (Selectable)	SEM203/TC	884-0180				

PT100, Thermocouple, mV & Slidewire to 4-20mA



Smart Converter



- Accept temperature sensor, slidewire or mV signal and convert the output to 4-20mA
 - Sensor type and range can easily be programmed by windows based software or DIP switches at the back of the unit
 - Galvanically isolated
 - CE marked
 - Can be mounted on 35mm top hat DIN rail
- Output Current (loop powered)
Loop supply 10-35Vdc (reverse polarity protected)
Input PT100
Operating temp. -40°C to 85°C



H=99.5, W=18.25, D=90

204850

Mftrs. List No.	Order Code	Price Each			
		1+	5+	10+	25+
Converter SEM215	161-834				

Platinum Resistance Sensors

Platinum Resistance Thermometry

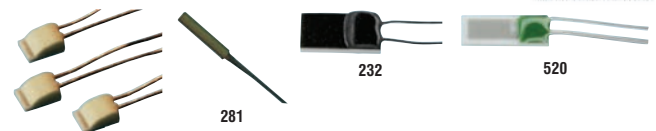
The platinum sensing resistor, Pt100 to IEC 751, is dominant in Europe and in many other parts of the world. Its advantages include chemical stability, relative ease of manufacture, the availability of wire in a highly pure form and excellent reproducibility of its electrical characteristic. The result is a truly interchangeable sensing resistor which is widely commercially available at a reasonable cost.

Source: LABFACILITY TEMPERATURE HANDBOOK - Part No. 656-069

224663

Platinum Thin Film Sensors

PT Series



Measuring Range	Resistance	Operating Temperature	Mftrs. List No.	Order Code
PT100 Series				
-200°C to +600°C	100Ω	-200 to 600°C	P0K1.161.6W.B.010	126-6922
-200°C to +600°C	100Ω	-200 to 600°C	P0K1.161.6W.A.010	126-6923
-200°C to +600°C	100Ω	-200 to 600°C	P0K1.161.6W.Y.010	126-6924
Up to 150°C	100Ω	-50°C to +150°C	P0K1.161.1E.B.200	177-8047
-200°C to +600°C	100Ω	-200 to 600°C	P0K1.232.6W.B.010	126-6926
-200°C to +600°C	100Ω	-200 to 600°C	P0K1.232.6W.A.010	126-6927
-200°C to +600°C	100Ω	-200 to 600°C	P0K1.232.6W.Y.010	126-6928
Up to 200°C	100Ω	-50°C to +200°C	P0K1.232.2I.B.1000-3	177-8048
-200°C to +600°C	100Ω	-200°C to +600°C	P0K1.281.6W.B.007	177-8045
Up to 200°C	100Ω	-50°C to +200°C	P0K1.281.2K.B.150.R.S	177-8046
-200°C to +600°C	100Ω	-200 to 600°C	P0K1.520.6W.B.010	126-6929
-200°C to +600°C	100Ω	-200 to 600°C	P0K1.520.6W.A.010	126-6930
-200°C to +600°C	100Ω	-200 to 600°C	P0K1.520.6W.Y.010	126-6931
-60°C to +150°C	100Ω	-200 to 200°C	P0K1.1206.2P.B	126-6932
-60°C to +150°C	100Ω	-200 to 200°C	P0K1.1206.2P.A	126-6933
-60°C to +150°C	100Ω	-200 to 200°C	P0K1.0805.2P.B	126-6934
-60°C to +150°C	100Ω	-200 to 200°C	P0K1.0805.2P.A	126-6935
PT1000 Series				
-200°C to +600°C	1000Ω	-200 to 600°C	P1K0.161.6W.B.010	126-6936
-200°C to +600°C	1000Ω	-200 to 600°C	P1K0.161.6W.A.010	126-6938
-200°C to +600°C	1000Ω	-200 to 600°C	P1K0.161.6W.Y.010	126-6939
-200°C to +600°C	1000Ω	-200 to 600°C	P1K0.232.6W.B.010	126-6940
-200°C to +600°C	1000Ω	-200 to 600°C	P1K0.232.6W.A.010	126-6941
-200°C to +600°C	1000Ω	-200 to 600°C	P1K0.232.6W.Y.010	126-6942
-200°C to +600°C	1000Ω	-200 to 600°C	P1K0.520.6W.B.010	126-6943
-200°C to +600°C	1000Ω	-200 to 600°C	P1K0.520.6W.A.010	126-6944
-200°C to +600°C	1000Ω	-200 to 600°C	P1K0.520.6W.Y.010	126-6945
-50°C to +150°C	1000Ω	-150 to 150°C	P1K0.1206.2P.B	126-6946
-200°C to +200°C	1000Ω	-200 to 200°C	P1K0.1206.2P.A	126-6947
-200°C to +200°C	1000Ω	-200 to 200°C	P1K0.0805.2P.B	126-6948
-60°C to +150°C	1000Ω	-200 to 200°C	P1K0.0805.2P.A	126-6951

453899

Mftrs. List No.	Order Code	Price Each		
		1+	10+	25+
PT100 Series				
P0K1.161.6W.B.010	126-6922			
P0K1.161.6W.A.010	126-6923			
P0K1.161.6W.Y.010	126-6924			
P0K1.161.1E.B.200	177-8047			
P0K1.232.6W.B.010	126-6926			

Mfrs. List No.	Order Code	1+	10+	25+
POK1.232.6W.A.010	126-6927			
POK1.232.6W.Y.010	126-6928			
POK1.232.2I.B.1000-3	177-8048			
POK1.281.6W.B.007	177-8045			
POK1.281.2K.B.150.R.S	177-8046			
POK1.520.6W.B.010	126-6929			
POK1.520.6W.A.010	126-6930			
POK1.520.6W.Y.010	126-6931			
POK1.1206.2P.B	SMD 126-6932			
POK1.1206.2P.A	SMD 126-6933			
POK1.0805.2P.B	SMD 126-6934			
POK1.0805.2P.A	SMD 126-6935			
PT1000 Series				
P1K0.161.6W.B.010	126-6936			
P1K0.161.6W.A.010	126-6938			
P1K0.161.6W.Y.010	126-6939			
P1K0.232.6W.B.010	126-6940			
P1K0.232.6W.A.010	126-6941			
P1K0.232.6W.Y.010	126-6942			
P1K0.520.6W.B.010	126-6943			
P1K0.520.6W.A.010	126-6944			
P1K0.520.6W.Y.010	126-6945			
P1K0.1206.2P.B	SMD 126-6946			
P1K0.1206.2P.A	SMD 126-6947			
P1K0.0805.2P.B	SMD 126-6948			
P1K0.0805.2P.A	SMD 126-6951			

PT100 Elements



L=25, Dia=2.8, Lead L=8.0 L=25.4, W=3.2, Thickness=0.8, Lead L=8.0

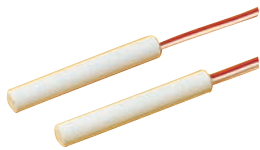
- Meets requirements of **BS1904 Class B** and **DIN43760**
- Suitable for air and gas temperature measurement
- Cylindrical wire-wound element also particularly suitable for use within protective stainless steel tubular sheath
- Flat element features thick film technology giving particularly good vibration resistance and long term stability

	Cylindrical (541-102)	Thin-film (721-8850)
Temperature range	-200°C to +800°C	-50°C to +500°C
Ice point resistance	100±0.12Ω	100±0.12Ω
Fundamental interval (0°C to 100°C)	38.5Ω (nominal)	38.5Ω (nominal)
Self heating	<.003°C/mW	Use <2mA excitation
Thermal response	0.4s	0.3s
Stability	±0.05%	±0.06%

Mfrs. List Nos. P100/2528 = 541-102, DM503 (5) = 721-8850
 FOR SUITABLE EXTENSION CABLE (SILVER PLATED COPPER CONDUCTOR),
 SEE **ORDER CODE 277-095**

	Order Code	1+	10+	25+
Cylindrical element P100/2528/B	541-102			
Price Per Pack				
Thin film element (Pack of 5)	721-8850			

PT100 Elements with Extension Wires



High quality PT100 sensing resistor of wire-wound construction fitted with extension wires for convenient application.

- PT100 sensing element to **IEC 751 Class B**
- PTFE insulated stranded tails, 2 or 4 wire configuration
- For use from -60°C to +250°C

725-5731: L=35, Dia.=5, 2 leads L=50 725-5743: L=35, Dia.=5, 4 leads L=450

Mfr. List No.	Order Code	1+	5+	10+	25+
2-wire	010011TD				
4-wire	010010TD				

Pt100 & Pt1000 Elements

Thin Film (100 Ohms)



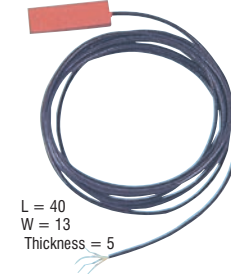
- Pt100 & Pt1000 elements to **IEC 751 Class A & B**
- Thin Film construction
- Suitable for surface & immersion applications where protected
- Operating temperature -70°C to +600°C
- Vibration resistant

Sensor Type	Pt100 (100 Ohms @ 0°C)	Pt1000 (1000 Ohms @ 0°C)
Construction	Thin film, 10mm tails	Thin film, 10mm tails
Temperature Range	-50 to 550°	-50 to 550°
Ice point resistance	100 Ω	1000 Ω
Fundamental interval (0°C to 100°C)	38.5 Ω (nominal)	385 Ω (nominal)
Self heating	<0.05°C/mW	<0.5°C/mW
Thermal response	0.1s	0.1s
Stability	± 0.05%	± 0.05%

386236/406078

Description	Mfrs. List No.	Order Code	1+	5+	10+	25+
PT100 Elements						
1 x 3mm, Class A	DM-514	NEW 208-1259				
1 x 3mm, Class A	DM-513	NEW 208-1257				
1.2 x 1.6mm, Class A	DM-314..	128-9670				
1.2 x 1.6mm, Class B	DM-315..	128-9671				
1.2 x 4.0mm, Class A	DM-312..	128-9668				
1.2 x 4.0mm, Class B	DM-313..	128-9669				
2 x 2.3mm, Class A	DM-303..	128-9667				
2 x 2.3mm, Class B	DM-301..	859-8541				
2 x 2.3mm, 1/3 DIN	DM-304	NEW 208-1261				
2 x 5.0mm, Class A	DM-508..	128-9666				
2 x 10mm, Class A	DM-334..	859-8525				
2 x 10mm, Class B	DM-333..	859-8533				
2 x 10mm, 1/3 DIN	DM-509	NEW 208-1262				
PT1000 Elements						
1 x 3mm, Class B	DM-504	NEW 208-1263				
1.25 x 1.7mm, Class B	DM-318	NEW 208-1264				
2 x 10mm, Class A	DM-310..	859-8550				
2 x 10mm, Class B	DM-507..	774-5655				
PT100 PCB Surface Mount with Solder Pads						
1.6 x 3.2mm, Class B	DM-317..	128-9672				

PT100 Patch Sensor



L = 40
W = 13
Thickness = 5

- PT100 sensor to **BS1904 Class B**, mounted on the reverse side of self-adhesive foil
- Rugged sensor encapsulated within a waterproof silicone rubber
- 4 wire connection
- PTFE insulated, twisted pair lead, 4 core, 7/0.2mm
- Temperature range -50 to 150°C
- High accuracy PT100 surface temperature measurement
- Good resistance to many oils and chemicals



212150

Mfrs. List No.	Order Code	1+	10+	25+
RTF4-2/NAH.. (2m lead)	254-678			
RTF4-3 (3m lead)	163-3500			

PT1000 Patch Sensor



NEW

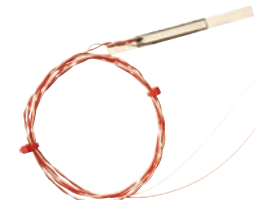
- PT1000 (1000Ω @ 0°C), thin film Class B to IEC751
- Temperature range -50oC to +150oC
- Element encapsulated in a silicone rubber patch with self-adhesive, aluminium foil backing
- 1 metre 7/0.2mm Teflon® insulated twin twisted lead
- Resistant to many oils & chemicals
- Patch dimensions: L 30mm x W 15mm x H 4mm
- 2 wire tails



657767

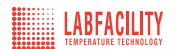
Mfrs. List No.	Order Code	1+	10+	25+
RTF-1000-S2B-1.0-C8	208-1306			

PT100 Surface Strip Sensor



NEW

- Sheathed PT100 (100 Ω @ 0°C), element in thin stainless steel body
- Ideally suited for surface temperature measurement
- PT100 element to IEC 751, 2 wire Class B
- Temperature range -50°C to 250°C
- 1 metre 7/0.2mm insulated twin twisted lead
- Strip dimensions: L 35mm x W 6mm x D 2mm



657768

Mfrs. List No.	Order Code	1+	10+	25+
RTS-100-S2B-1.0-C8	208-1307			

Platinum Resistance Sensors - continued

PT100 Probe



Probe L=117, Dia.=4, Overall length=146, Bush thread= " BSP, Lead L=1m

- Multi-purpose fast response 2-wire platinum resistance probe
- Manufactured from seamless stainless steel tube
- Tube is fitted with a 1/8" BSP compression fitting moveable over its entire length to allow flexibility in siting the probe
- Excellent stability and resistance to vibration and shock
- Sensor meets requirements of **BS1904 Class B**

Temperature range	-70°C to +200°C	Thermal response	1.2s typical
Ice point resistance	100±0.1Ω		
			212164
		Price Each	
Order Code	1+	10+	25+
146-885			

General Purpose Temperature Sensor



Pt 100



- Heavy duty, industrial probe
- Tough, silicone rubber insulated lead-out
- Class B, 4 wire
- 6mm diameter stainless steel rigid sheath
- 4 core 7/0.2mm silicone rubber insulated lead
- Sensor temperature range -50°C to +200°C

386232/406080

				Price Each	
Description	Mfrs. List No.	Order Code	1+	5+	10+
50mm probe - 2m lead	DRG 010632A	859-8096			
100mm probe - 2m lead	DRG 010632B	859-8100			
50mm probe - 4m lead	DRG101632C	163-3501			
100mm probe - 4m lead	DRG101632D	163-3502			

PT100 Probe, PTFE Insulated



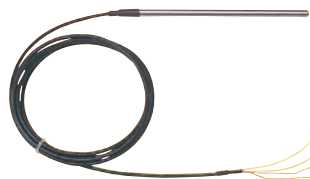
- Rigid, 6mm diameter, multi-purpose stainless steel probe
- Temperature measuring range up to 250°C
- Recommended where the superior accuracy of a PT100 sensor over a thermocouple is required
- Fitted with a PTFE lead
- Suitable for connection to any PT100 instrument - 2, 3 or 4 wire

Sensor Pt100, 4 wire to **BS1904 (1984) Class B** and **DIN 43760** 100Ω @ 0°C
 Temperature range -50°C to +250°C
 FOR SUITABLE COMPRESSION GLAND, ORDER CODE 254-654

222144

Dimensions	Mfrs.		Price Each
Probe Length	Probe Dia.	List No.	Order Code
1+	10+	100+	
1m Lead length			
150mm	3mm	XF-314-FAR	410-0670
250mm	3mm	XF-315-FAR	410-0682
150mm	6mm	PT46X150	560-170
250mm	6mm	PTE 6X250 (IEC)	708-8358
2m Lead length			
100mm	3mm	RAA-S4B-3.0-100-NP-2.0-C2-T	NEW 208-1308
150mm	3mm	PT4 3 X150	163-3504
250mm	3mm	PT4 3 X250	163-3505
150mm	6mm	PT4 6 X150	163-3503

Mineral Insulated PT100 Probes



- Mineral Insulated PT100, Class B, 4 Wire
- Flexible sheath
- Can withstand up to 500°C
- 310SS sheath material
- 1000mm PTFE 4 core screened cable

Mineral Insulated PT100 probes are extremely rugged and are able to withstand temperatures up to 500°C. These probes can be bent to fit applications, which enables them to be used in the most awkward locations. Being mineral insulated allows them to withstand high vibration.

249385

Probe	Probe		Order Code	1+	5+	10+
Dia. (mm)	L (mm)					
3	150		410-0694			
3	500	NEW	208-1309			
3	1000	NEW	208-1310			

Precision PT100 Probe



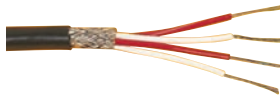
- High accuracy 6mm diameter stainless steel PT100 probe
- Ideal for use as temperature reference for comparison calibration of other temperature sensors, and for other high accuracy applications
- Accuracy better than ±0.06°C at 0°C and suitable for use up to 250°C

Dimensions Dia = 6, Probe L = 250, Lead L = 2mm
 Sensor Pt100, 4 wire to **BS1904 (1984)**
 Accuracy Better than ±0.06°C @ 0°C
 Temperature range -50°C to +250°C
 Insertion length 150mm, minimum recommended

212320

	Mfrs.		Price Each
	List No.	Order Code	1+
			5+
			10+
Precision PT100 ProbePt100	L250	721-8758	

Screened Extension Cable - Type PRT



- Suitable for joining 2, 3 or 4-wire PT100 and other PRT sensors to instrumentation
- Colour coded to industry standard **IEC751** (red, red, white, white)
- For use up to 80°C

Flexible 4-wire extension cable comprising 4 PVC-insulated copper conductors size 7/0.2mm, with electrical screen and overall PVC sheath. Nominal O/D=4mm.

212319

	Mfrs. List No.	Order Code	1+	5+	10+
PRT cable, 10m coil	WC-006/10M	721-8734			
PRT cable, 25m coil	WC-006/25M	721-8746			

Industrial Probes with Terminal Head



- Strong 6mm diameter stainless steel stem
- Waterproof aluminium terminal head
- **IP67** protection
- Suitable for connection to any PT100 instrument - 2, 3 or 4 wire



The head of the probe contains a terminal block allowing connection to the measuring instrument via a M20 gland.

Sensor Pt100, 4 wire to **BS1904 (1984) Class B** and **DIN 43760** 100Ω @ 0°C
 Temperature head Die cast aluminium, epoxy coated, Screwed lid with retaining chain
IP67 rated
 Temperature range -50°C to +450°C
 Mfr. List Nos. PT4 6 x 150 = 560-157, PT4 6 x 300-KNE = 560-169
 PT4 6 x 400 = 708-8449

FOR SUITABLE COMPRESSION GLAND SEE **ORDER CODE 254-654**

222145

			Price Each
Probe Length	Order Code	1+	5+
			10+
150mm	560-157		
300mm	560-169		
400mm	708-8449		

Industrial Process Probes



- Accurate rugged construction
- Pt100 sensor to **IEC 751 Class B**
- Terminal head can accommodate DIN form transmitter or DIN terminal block
- Wide temperature range: -100°C to +450°C
- For use with 4, 3 or 2 wire instruments

Probes: Dia.=6, L=100, 150, 200
 Mounting: 1/2"BSPP male thread
 Lagging extension: Dia.=12.7, L=75

- All stainless steel below aluminium head
- Suitable for many industrial applications
- **IP67** rated

This industrial Pt100 assembly is mounted into the process via 1/2" BSPP male thread below which the probe length is measured. Above the thread hexagon is a stainless steel lagging extension. The sensor has a fitted aluminium terminal head with a captive threaded cover.

FOR SUITABLE Pt100 4 - 20MA TRANSMITTER, SEE **ORDER CODE 615-675**

222175

	Mfrs.		Price Each
Probe Length	List No.	Order Code	1+
			5+
			10+
100mm	010007TD	725-5421	
150mm	010008TD	725-5433	

External/Cold Store PT100 Probe



- Rugged wall-mounting stainless steel probe with weatherproof connection box
 - Recommended for outdoor use, cold stores and other 'heavy-duty' applications
 - PT100 sensor suitable for connection to 2, 3 or 4 wire PT100 instrument
 - Perforated outer stainless steel sheath acts as radiated heat shield and mechanical protection
- Sensor PT100 4-wire to **BS1904 (1984), Class B**
 Temperature range -50°C to +150°C
 IP rating **IP67**

Case H=80, W=74, D=54; Probe L=75, Dia=12.5 212321

Mfrs. Price Each

List No.	Order Code	1+	5+	10+
RTP-PT100	721-8760			

Clean Room Pt100 Assembly



- Wall mounting Pt100 sensor, mounts on standard electrical conduit
 - Pt100 to **IEC 751 Class B**
 - Suitable for use with any 2, 3 or 4 wire instrument
 - Flame retardant vented moulded case
- H=85, W=85, D=30 212383

Mfrs. Price Each

List No.	Order Code	1+	5+	10+
010014TD	725-5720			

Digital Thermometer / Data Logger

Digital Thermometer and Data Logger

L200 Series



- Simple operation
- Low cost - high performance
- USB PC interface
- 8 thermocouple (type J,K,T,E,N,R,S & B) or Pt100 (3 wire) inputs
- Built-in display for selected channel or all channels
- auto-scrolling
- Resolution 0.1°C on L200 display, 0.01°C in software

NEW

H = 62, W = 214, D = 138mm

- Self-calibration feature
- Select °C or °F
- PC software included for remote control and measure, logging and calibration
- Supplied with a power supply adaptor, USB lead, PC software CD and instruction manual
- PC software is compatible with Xp, VISTA and WINDOWS 7

The Labfacility L200 Pt100 and thermocouple thermometers can be used in conjunction with a PC to provide accurate, versatile 8 channel thermocouple and Pt100 temperature measurement, scanning and logging of measured values. It can also be used as a stand-alone indicator/logger and incorporates a digital display of measured temperature. The in-built, self-calibration facility for the thermocouple version is a rapid and convenient method for on-site calibration and does not require any additional equipment other than a special, external link. Self-calibration of Pt100 ranges is equally simple and uses plug-in precision resistors. The L200 is designed to provide exceptional stability with high measurement resolution and represents an ideal crossover between plant practicality and laboratory performance.

630953

Mfrs. Price Each

Input Type	List No.	Order Code	1+	3+	5+
Thermocouple	L200-TC	189-4550			
Pt100	L200-PT	189-4551			

Digital Thermometer for Pt100 Sensors

Tempmaster PRO



H = 70, W = 190, D = 250mm

The Tempmaster PRO provides precise Platinum Resistance Thermometer temperature measurement and logging for exacting applications in both laboratory and site locations. It is an exceptionally accurate and stable digital thermometer particularly suitable for use

NEW

with thermal calibration baths as a reference standard. Applications include medical, pharmaceutical, food, environmental testing, R & D and educational establishments. Displayed values and user information are indicated on a bright clear OLED screen with diffused backlighting.

There are two input ports for 3 or 4 wire Pt100 sensors; the instrument automatically recognises 3 or 4 wire configurations. The measured temperature can be displayed directly from one of the inputs or differentially between the two inputs. Differential temperature and the two individual channel temperatures are displayed simultaneously. Individual calibrated sensors can have their appropriate calibration values programmed into the Tempmaster PRO using either the keypad or the PC software supplied. The PC software al-

so allows corrections in the form of constants for individual Pt100 sensors to be programmed in. The nonvolatile memory ensures that the values are retained (until such time as they are changed) even after switch-off. Where the calibration certificate relating to a particular probe states specific Ω values at stated temperatures, up to ten such values are entered into the Tempmaster PRO with their relevant temperature points using the front panel keypad or the software. The instrument then digitally self-calibrates to the associated probe over the range embraced in the calibrated values used; the temperature readout is corrected accordingly. Additional manual procedures are not required to compute precise temperature readings since these are displayed directly; miscalculation errors are thus eliminated. Corrections which are programmed in can be displayed for confirmation. However, initial input, adjustment, enabling and disabling of corrections are protected For by a special key sequence to prevent accidental or unauthorised changes. Values can be changed by an authorised user at any time. For the Pt100 inputs, SMART probes can be used which incorporate dedicated correction values within the connector of each probe. When a SMART probe is connected to input A or B or both inputs, the corrections are automatically applied without the need for user intervention.

The adjustable contrast OLED display screen provides data readout, user prompts and mode annunciation. This very important feature ensures a high degree of user friendliness and confidence. User prompts indicate which buttons to press in the appropriate sequence when selecting parameters and functions and when setting calibration values. Mode annunciation indicates which mode of operation is currently selected. A flash drive USB port is provided to allow data to be stored and/or exported. Firmware update are also facilitated via this port. PC software running in WINDOWS is provided as standard; it allows programming of custom calibration, remote control & measure and logging functions.

- Reference standard thermometer for Pt100 sensors
- High accuracy $\pm 0.01^\circ\text{C}$ Pt100
- 40 milliKelvin (0.040°C) system accuracy
- Precise linearisation conformity is realised by a hybrid maths polynomial technique
- Simple, fast digital matching to calibrated sensors, up to 10 points per channel retained in memory
- Additional digital matching to Pt100 sensors using custom constants
- Clear, comprehensive user information on alpha numeric display
- Resolution 0.01°C for Pt100 inputs
- Smart sensor capability Pt100 for corrections stored on probe
- Data logging
- Readout directly in °C, °F, K, Ω
- Input circuitry configured to eliminate thermal voltages
- Two sensor input ports
- Channel A, B or A-B reading
- USB serial communications
- USB flash drive port
- Highly precise linearisation tracking
- Excellent long term stability
- Supplied with PC software and external mains powered battery charging unit
- PC software is compatible with Xp, VISTA and WINDOWS 7
- Programmable analogue (retransmission) output

630962

Mfrs. Price Each

List No.	Order Code	1+	3+	5+
TEMPMASTER-PRO	189-4552			

Digital Thermometer for Pt100 Sensors

Labcal PRO



H = 70, W = 190, D = 250mm

The Labcal PRO is fully characterised for Pt100 sensors and all major thermocouples J,K,N,T,E,R,S and B. Exceptionally stable automatic cold junction compensation with a rejection of 100:1 is incorporated for thermocouple ranges. Alternatively, external or

NEW

manual referencing can be selected as required. Displayed values and user information are indicated on a bright clear OLED screen with diffused backlighting. Data can be displayed in °C, °F, K, Ω or mV as required; nine front panel push keys, the only user controls, are used in conjunction with the display screen. It is this arrangement which makes for very simple and user-friendly operation. Resolution is a user selectable 0.001 or 0.01°C for Pt100 sensors and 0.1°C for thermocouples. All computations are performed digitally without drift. Overall stability is optimised by utilising only the highest quality components including high precision, expensive metal film resistor networks.

There are four input ports, two for thermocouples and two for 3 or 4 wire Pt100 sensors; the instrument automatically recognises 3 or 4 wire configurations. The Labcal PRO can accept two Pt100 sensors and/or two thermocouples of similar or different types (J,K,N,T,E,R,S and B). The measured temperature can be displayed directly from one of the inputs or differentially between similar or different inputs. Differential temperature and the two individual channel temperatures are displayed simultaneously. Individual calibrated sensors can have up to 10 appropriate calibration values programmed into the Labcal PRO. The instrument then digitally self-calibrates to the associated probe over the range embraced in the calibrated values used; the temperature readout is corrected accordingly. A flash drive USB port is provided to allow data to be stored and/or exported. Firmware update are also facilitated via this port. PC software running in WINDOWS is provided as standard; it allows programming of custom calibration, remote control & measure and logging functions.

- High accuracy $\pm 0.01^\circ\text{C}$ Pt100, $\pm 0.18^\circ\text{C}$ thermocouple
- 25 milliKelvin (0.025°C) system accuracy with Pt100
- Precise linearisation conformity is realised by a hybrid maths polynomial technique
- Simple, fast digital matching to calibrated sensors, up to 10 points per channel retained in memory
- Additional digital matching to Pt100 sensors using custom constants
- Clear, comprehensive user information on alpha numeric display
- User selectable resolution, 0.001/0.01°C for Pt100 inputs

Digital Thermometer / Data Logger - continued

Digital Thermometer for Pt100 Sensors - continued

Labcal PRO - continued

- Smart sensor capability Pt100 for corrections stored on probe
- Data logging
- Wide temperature ranges
- Measures Pt100 and thermocouples J, K, T, E, R, S, B and N
- Readout directly in °C, °F, K, Ω or mV
- Exceptional automatic CJC performance, 100:1 rejection
- Input circuitry configured to eliminate thermal voltages
- External and manual CJ function
- Four sensor input ports
- Channel A, B or A-B reading including dissimilar sensor types
- USB serial communications
- USB flash drive port
- Supplied with PC software and mains powered charging unit
- PC software is compatible with Xp, VISTA and WINDOWS 7
- Programmable analogue (retransmission) output
- Front panel data entry and function keys
- Rechargeable internal Lithium Ion battery

630965

Mfrs. List No.	Order Code	1+	3+	5+
LABCAL-PRO	189-4553			

Thermal Switches

Bi-Metallic - Auto Reset



Style A
H = 21 (overall), W = 31, D = 19mm
Fixing centres = 24mm (Holes M3)

Style B
H = 16 (overall), W = 30, D = 17mm
Fixing centres = 24mm (Hole Dia. = 3.7mm)

Normally closed (opening on temperature rise) and normally open (closing on temperature rise) types are available. All switches reset when the temperature falls to the reset level.

- Automatically re-setting thermal switches
- Snap-action bi-metallic SPST contacts
- Contacts are isolated from the mounting base
- Reset level is specified to within a close tolerance band
- Indication of switch temperature is given on base of switch

Contact rating (all types) 10A 250V ac, 15A 125Vac (100,000 cycles)
Material - Body Phenolic (Style A), Thermoplastic (Style B)
Material - Base Aluminium
Material - Mounting flange Stainless steel (Style A), Aluminium (Style B)
Connections 1/4" (6.3 x 0.8mm) terminals

622029

Operating Reseting Case		Mfrs. List No.		Order Code	1+	50+	100+
Temp.	Temp.	Style	Mfrs.	List No.			
Normally Closed Types							
15°C	5°C	A	A 15	03EN 175	732-400		
20°C	10°C	A	03EN15T044(20/10)		732-412		
30°C	20°C	A	03EN15T044(30/20)		606-686		
40°C	25°C	A	03EN15T044(40/25)		491-445		
50°C	35°C	B	T23A050ASR2-15		100-6842		
70°C	55°C	B	T23A070ASR2-15		100-6843		
90°C	70°C	B	T23A090ASR2-20		100-6844		
100°C	85°C	B	T23A100ASR2-15		100-6845		
112°C	97°C	B	T23A112ASR2-15		100-6846		
125°C	110°C	B	T23A125BSR2-15		100-6847		
150°C	135°C	B	T23A150BSR2-15		100-6849		
Normally Open Types							
30°C	20°C	A	03EN35T044(20/30)		732-424		
40°C	25°C	A	03EN35T044(25/40)		491-524		
45°C	60°C	A	T23B060ASR2-15		100-6852		
50°C	35°C	A	T23B050ASR2-15		100-6851		
70°C	55°C	A	T23B070ASR2-15		100-6853		
90°C	70°C	A	T23B090ASR2-20		100-6854		

Bi-Metallic, Auto Reset, High Temperature



H=21 (overall), W=31, D=19
Fixing centres = 24 (holes M3)

Contact rating (all types) 10A 250V ac, 15A 125Vac (100,000 cycles) (UL/CSA)
Connections 6.3 x 0.8 (1/4") spade terminals

- Automatically re-setting thermal switches with snap-action bi-metallic SPST contacts
- Contacts are normally closed, and are isolated from the mounting base
- Range of switching temperatures from 170°C to 250°C
- Indication of switch temperature is given on base of switch

Opening Temp.	Reclosing Temp.	Body Material	Mfrs List No.	Order Code
200°C ± 10°C	160°C ± 10°C	Ceramic	52N12T944(200/160)	No Order Code
225°C ± 10°C	175°C ± 10°C	Ceramic	52N12T044(225/175)	No Order Code
250°C ± 10°C	200°C ± 10°C	Ceramic	55H12T944(250/200)	No Order Code

212351

Type	Body	Order Code	Price Each			
			1+	25+	100+	250+
200°C N/C	Ceramic	732-450				
225°C N/C	Ceramic	732-461				
250°C N/C	Ceramic	732-473				

Bi-Metallic, Manual Reset



- Snap-action bi-metallic SPST contacts are isolated from the mounting base
- Horizontal tab connections allow easy access to reset pin
- UL Recognised and CSA approved

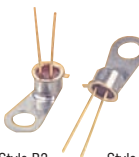
The switches are normally closed and open on temperature rise, then remain open until manually reset. Connection is by 6.3 x 0.8 (1/4") spade terminals.

Contact rating	10A 250Vac (10,000 cycles), 15A 120Vac (6,000 cycles)	Contact material	Silver alloy	Price Each				
Operating Temp.	Mfrs. List No.	Order Code	90°C ± 5°C	05EN1034(90/M)	732-552	100°C ± 4°C	05EN1034(100/M)	732-564
45°C ± 4°C	05EN1034(45/M)	732-515	115°C ± 5°C	05EN1034(115/M)	732-576	130°C ± 5°C	05EN1034(130/C)	732-588
55°C ± 4°C	05EN1034(55/M)	732-527	150°C ± 5°C	05EN1034(150/C)	732-590			
65°C ± 4°C	05EN1034(65/M)	732-539						
80°C ± 5°C	05EN1034(80/M)	732-540						

212352

Order Code	1+	10+	25+	100+	250+
	All Order Codes				

Solid State



Style B3
Lead L = 12.7
Lead spacing = 2.54 Hole dia = 3.5

Style C3
Mounting tab style B3 L = 14, W = 6.5, H = 4.2
Mounting tab style C3 L = 5.5, W = 6.5, H = 14

- Very specific transition region
- High sensitivity and reliability
- Low noise and low shunt capacitance
- TO-18 housing with choice of mounting tab style

Transition Temp (centre)	Mfrs. List No.	C3 Mtg. Tab	B3 Mtg. Tab	C3 Mtg. Tab
57°C	TS3-57-B3	TS3-57-C3	151-597	151-600
75°C	TS3-75-B3	TS3-75-C3	151-598	151-601
85°C	TS3-85-B3	TS3-85-C3	151-599	151-602

212188

Transition Temp.	Order Code	1+	25+	100+	250+
B3 Mounting Tab					
57°C	151-597				
75°C	151-598				
85°C	151-599				
57°C	151-600				
75°C	151-601				
85°C	151-602				

Bi-Metallic Thermal Switch



Manual Reset - Normally Closed



- Snap-action bi-metallic strip operated switch
- SPST contacts - isolated from mounting base
- 1/4" Quick connect terminals with positive lock

The switches are normally closed and open on temperature rise, then remain open until manually reset. Connection is by 1/4" (6.3 x 0.8mm) Quick Connect terminals, which have a positive lock facility.

H = 27.6, W = 31 (across terminals), D = 36.5mm (across terminals), Dia. = 16.2, Fixing centres = 24.5 (hole dia. 3.2 x 3.7mm)

555053

Opening	Mfrs. List No.	Order Code	Price Each			
45°C	23ENT234(45/M)	178-1398				
56°C	23ENT234(56/M)	178-1393				
67°C	23ENT234(67/M)	178-1394				
80°C	23ENT234(80/M)	178-1395				
90°C	23ENT234(90/M)	178-1401				
100°C	23ENT234(100/M)	178-1396				
112°C	23ENT234(112/M)	178-1399				
132°C	23ENT234(132/M)	178-1397				
150°C	23ENT234(150/M)	178-1400				

2455R Series Thermostats

B203S Mounting Bracket and T146 Terminals



- Open on rising temperature and close on rising temperature versions available
- Standard mounting bracket: B203S
- Horizontal T146 terminals
- Operating temperatures in 10°C steps
- Up to 15A and up to 250V ac
- Silver contact system

419439/436284

Temperature (°C)	Mftrs. List No.	Order Code	1+	10+	25+	100+
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Normally Closed - Open on rising temperature Contacts

Opening Closing

Opening Temp. (±5°C)	Reclosing Temp. (min)	Differential (min)	Mftrs. List No.	Order Code
30	15	2455R-100-84	108-2187	●
40	25	2455R-100-72	108-2189	●
50	35	2455R-100-73	108-2191	●
60	45	2455R-100-85	108-2192	●
70	55	2455R-100-74	108-2193	●
80	65	2455R-100-75	108-2194	●
90	75	2455R-100-76	108-2195	●
100	80	2455R-100-77	108-2196	●
110	90	2455R-100-86	108-2197	●
120	98	2455R-100-98	108-2198	●
130	110	2455R-100-88	108-2199	●
140	115	2455R-100-89	108-2200	●
150	120	2455RC-9100-373	108-2201	●

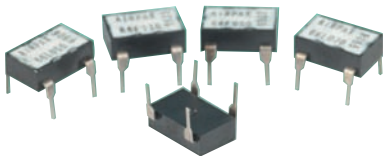
Normally Open - Close on rising temperature Contacts

Closing Opening

Closing Temp. (±5°C)	Reopening Temp. (min)	Differential (min)	Mftrs. List No.	Order Code
50	35	2455R-100-78	108-2202	●
45	60	2455R-100-79	108-2203	●
65	80	2455R-100-92	108-2204	●
90	75	2455R-100-93	108-2205	●
100	80	2455R-100-94	108-2207	●
120	100	2455R-100-95	108-2208	●
140	115	2455R-100-96	108-2209	●

Bi-Metallic, Dual in Line Package

AIRPAX



H = 3.30mm, W = 10.16mm, D = 6.35mm

- Automatically resetting thermal switches with snap-action bi-metallic SPST contacts
- Available normally open or normally closed
- Suitable for printed circuit boards and suitable for auto-insertion.
- UL recognised, CSA certified
- Sealed to withstand wave soldering and board washing operations

Contact rating	1A @ 48VDC, 120VAC, (30000 cycles) (down to) @ (100000 cycles)
Contact material	Gold Plated Silver
Pin spacing	7.5mm x 8.25mm

Normally Closed Types

Opening Temp. (±5°C)	Reclosing Temp. (min)	Differential (min)	Mftrs. List No.	Order Code
50°C	30°C	4°C	66L050	441-8311
70°C	50°C	4°C	66L070	441-8323
80°C	55°C	6°C	66L080	441-8335
90°C	60°C	6°C	66L090	441-8347

Normally Open Types

Closing Temp. (±5°C)	Reopening Temp. (min)	Differential (min)	Mftrs. List No.	Order Code
50°C	30°C	4°C	66F050	441-8372
70°C	50°C	4°C	66F070	441-8384
100°C	70°C	6°C	66F100	441-8414
110°C	80°C	6°C	66F110	441-8426

311217

Order Code	1+	25+	100+	250+
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All Order Codes

FREE GLOBAL LEGISLATION SUPPORT



RoHS, REACH, WEEE, ErP, Batteries Directive - latest updates, free white papers and live online Q&A at element14.com/legislation

Bi-Metallic

TO-220 Package



- Automatically resetting thermal switches
- Snap-action bi-metallic SPST contacts
- Available normally open or normally closed
- High temperature epoxy sealed TO-220 package
- Ideal for PC boards, direct mounting on heatsinks etc.
- UL recognised, CSA certified

H (including pins) = 30, W = 10.2, D = 4.6mm
Hole Dia. = 3.6, Pin spacing = 5.1mm

Contact rating	1A @ 120V ac, 1A @ 48V dc
Contact material	
Contact Resistance	20 mR Max
Operating Temperature Range	40°C to 130°C

Normally Closed Types

Opening Temp. (±5°C)	Reclosing Temp. (min)	Differential (min)	Mftrs. List No.	Order Code
70°C	50°C	4°C	67L070	152-4711
80°C	55°C	6°C	67L080	152-4704
90°C	60°C	6°C	67L090	152-4705
100°C	70°C	6°C	67L100	152-4706
110°C	80°C	6°C	67L110	152-4712

Normally Open Types

Closing Temp. (±5°C)	Reopening Temp. (min)	Differential (min)	Mftrs. List No.	Order Code
30°C	50°C	4°C	67F050	152-4708
50°C	70°C	4°C	67F070	152-4709
60°C	90°C	6°C	67F090	152-4710
80°C	110°C	6°C	67F110	152-4713

Price Each

Order Code	1+	25+	100+	250+
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Bi-Metallic, Insulated

MICROTHERM



- Normally closed bi-metal thermal cut-outs
- Fully insulated with an epoxy coating
- Suitable for over-temperature protection and temperature control applications
- Approved to VDE, CSA, OVE, SEMKO and BEAB
- UL Recognised

H = 14, W = 10, D = 6, Lead L = 100mm

Voltage rating	250V ac	Temperature tolerance	±5°C
Current rating	resistive 2.5A cos φ = 1.0 inductive 1.6A cos φ = 0.6	Contact resistance	40mΩ
Sealing insulation	160 type = polyolefine (blue) other types = textile/lacquer (yellow)	Operating temperature	-30°C to +180°C

212162

Opening Mftrs.

Temp.	List No.	Order Code	1+	25+	50+	100+
70°C	T11A07005U112L310100	187-2111	●			
80°C	T11A08005U112L310100	187-2112	●			
100°C	T11A10005U112L310100	187-2106	●			
110°C	T11A11005U112L310100	187-2107	●			
125°C	T11A12505L310100U112	187-2108	●			
140°C	T11A14005U112L310100	187-2109	●			
150°C	T11A15005U112L310100	187-2110	●			
160°C	T11A16005U112L340100	187-2113	●			

Control Thermostats

Adjustable



Control Body - H = 28.5,
W = 32, D = 44mm



Knob - D = 36, H = 14mm
Bezel - D = 55.5, H = 5mm

Capillary thermostats operate from a remote liquid-filled sensing bulb through a one metre length of capillary tube.

- 16A @ 250V ac switching capacity
- Changeover (SPDT) contacts enable use for both heating and cooling applications
- Supplied with knob and mounting bezel
- Remote liquid-filled sensing bulb
- 1 metre length of capillary tube
- 4 - 6.3x0.8mm Faston terminals
- Terminals opposite to operating knob

Switching	Mftrs. List No.	Order Code	1+	10+	25+	50+
0°C to +40°C	540043/556360/556501	184-6342	●			
	540030/556343/556501	184-6343	●			
	540010/556301/556501	184-6340	●			
0°C to +120°C	540160/556303/556501	184-6341	●			
0°C to +210°C	540140/556313/556501	184-6344	●			
0°C to +300°C	540020/556326/556501	184-6345	●			

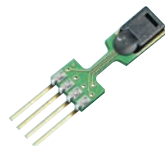
535951

Humidity and Temperature Sensors

SENSIRION
THE SENSOR COMPANY

Humidity and Temperature Sensor

SHT Series



SHT 71/75

- Relative humidity & temperature
- Precise dew point calculation
- Individually calibrated
- Fully interchangeable, no re-calibration
- Ultra fast response time
- Excellent long term stability
- Pin-Type Package (pluggable)
- Thermally isolated
- For High-End applications

SHT 71 & 51

H = 3.1, W = 5.08, D = 19.5mm



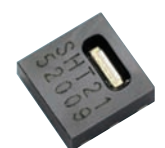
SHT 11/15

- Relative humidity & temperature
- Precise dew point calculation
- Fully calibrated
- Ultra fast response time
- Excellent long term stability
- Fully immersible
- Digital 2-wire interface
- Ultra small size
- Cost-effective

SHT 11 & 15

H = 3.1, W = 5.08, D = 7.62mm

SHT 21 & 25



SHT 21/25

- Relative humidity & temperature
- Fully calibrated
- Digital output, I²C interface
- Low power consumption
- Excellent long term stability
- DFN type package - reflow solderable



SF1

- Low cost filter solution
- Provides IP67 protection for SHT11 & SHT15
- Facilitates mounting of SHT11 & SHT15
- 99.99% filtration efficiency @ 0.05 m/s air velocity
- Response time of 30s in slow moving air

SF1

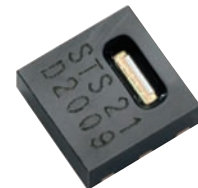
H = 8.2, W = 9.38, D = 10.12mm

234886

Type	Mfrs. List No.	Order Code	1+	10+	25+
SMT - Standard	SHT11	SMD 159-0511			
SMT - High accuracy	SHT15	SMD 159-0512			
4-Pin SIL - Standard	SHT71	159-0513			
4-Pin SIL - High accuracy	SHT75	159-0514			
SMT - Standard	SHT21	NEW SMD 185-5468			
SMT - SDM Interface	SHT21S	NEW SMD 188-8014			
SMT - PWM Interface	SHT21P	NEW SMD 188-8015			
SMT - High accuracy	SHT25	NEW SMD 185-5469			
Accessories					
Filter Cap	SF1	139-9624			
Filter Cap	SF2	NEW 189-2485			

Temperature Sensor IC

STS21



Using the same CMOSens® technology as Sensirion's successful and industry proven SHT2x humidity and temperature sensors, the STS21 offers superior performance and reliability. Every sensor is individually calibrated and tested. Lot identification is printed on the sensor and an electronic identification code is stored on the chip - which can be read out by command. Furthermore, the resolution of STS21 can be changed by command (11bit up to 14bit), low battery can be detected and a

NEW

checksum helps to improve communication reliability. With made improvements and the miniaturization of the sensor the performance-to-price ratio has been improved - and eventually, any device should benefit from the cutting edge energy saving operation mode.

- Fully calibrated
- Digital output, I²C interface
- Low power consumption
- Excellent long term stability
- DFN type package - reflow solderable

Mfrs. List No.	Order Code	1+	10+	50+
STS21	208-5052			

658459

SENSIRION
THE SENSOR COMPANY

Capacitive Humidity Sensor

P14 Series



- Excellent long term stability
- Dewing resistant
- Fast recovery after dewing
- Very high dewpoint temperatures
- High resistance to various chemicals
- Wide temperature operating range

Humidity - H = 0.4, W = 6.35, D = 2.54mm
Humidity & Temp. - H = 0.4, W = 4, D = 2mm

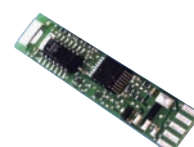
	177-8041	177-8042	177-8044
Temperature Sensor			Pt1000 Ω DIN KI. B
Humidity operating range	0 to 100% RH	0 to 100% RH	0 to 100% RH
Operating Temp. range	-50 to +150 °C	-50 to +150 °C	-50 to +150 °C
Capacity	180pF ± 50pF	180 ± 50pF	180 ± 50pF
Sensitivity	0.3 pF / % RH	0.3 pF / % RH	0.3 pF / % RH
Loss Factor	< 0.10		< 0.10
Accuracy	< 1.5 %RH	< 1.5 %RH	< 1.5 %RH
Hysteresis	< 1.5 %RH		< 1.5 %RH
Response time	< 5 sec	< 3 sec	3 s
Frequency range	1 to 100 kHz	1 to 100 kHz	1 to 100 kHz
Operating Voltage (Max.)	< 12 V _{pp} AC	< 12 V _{pp} AC	< 12 V _{pp} AC

553001

Sensor Type	Mfrs. List No.	Order Code	1+	10+	25+
Humidity	P14 SMD-G	177-8041			
Humidity	P14 FEMTOCAP-G	177-8042			
Humidity and P14 FEMTO-THERMO-G Temperature		177-8044			

Capacitive Humidity and Temperature Sensor

DigiPicco™ Module



- Very fast response time
- Calibration free
- Ready to use
- Precise humidity measurement
- Excellent drift stability
- Mechanically robust

Module - H = 2.8, W = 10, D = 47mm

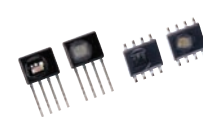
- Dewing resistant
- Digital output
- Calibrated humidity and temperature signals output onto one single bus

Sensor type	P14 SMD	Supply current	<3 mA
Measurement principle	Capacitive	Temperature sensor	PT1000
Humidity measure range	0 to 100% RH	Response time	< 5 sec
Operating Temp. range	-20 to +85 °C	Accuracy - Humidity	< ±3 %RH
Supply voltage	5V dc	Accuracy - Temperature	< ±5 °C

553081

Mfrs. List No.	Order Code	1+	10+	25+
DIGIPICCO (TM) BASIC I2C-G	177-8051			

HumidCon™ Digital Humidity/Temperature Sensors



- Uses a laser trimmed, thermoset polymer capacitive sensing element
- Industry-leading Total Error Band (TEB) (± 5% RH)
- Industry-leading long term stability (1.2% RH over five years)
- Industry-leading reliability

- Lowest total cost solution
- True, temperature-compensated digital I2C output
- Ultra-small package: SOIC-8 SMD
- Energy efficient

Operating temperature -25°C to 85°C
Supply Voltage 2.3 V to 5.5 V

	Humidity Specifications	Temperature Specifications
Humidity range	10 to 90% RH	-
Accuracy	4% RH	±1% °C
Response time	6 - 8 sec	5 - 30 sec

638407

Description	Mfrs. List No.	Order Code	1+	10+	25+	50+
SOIC Package						
No Filter	HIH-6130-021-001	196-1727				
Hydrophobic Filter	HIH-6131-021-001	196-1729				
SIP Package						
No Filter	HIH-6121-021-001	214-5997				
Hydrophobic Filter	HIH-6120-021-001	214-5998				
5 Per Pack						
			1+	5+	10+	
No Filter	HIH-6130-021-001S	196-1728				
Hydrophobic Filter	HIH-6131-021-001S	196-1730				

Honeywell

NEW



TROUBLESHOOTING TIPS

Chat online to one of our technical engineers at **farnell.com**

Humidity and Temperature Sensor

Surface Mount - SOP 14 Package



- Surface mount, SOP 14 package
- Simultaneous relative humidity and temperature outputs
- Resolution 0.4% RH
- Factory calibrated, ready to use
- Designed for automated assembly
- Supply voltage 3.0V to 5.5V dc
- Low quiescent current: 0.5mA@5V, 25°C
- Operating temperature -40°C +85°C

Body - H = 3.22, W = 6, D = 9.5mm

ChipCap is based on a capacitive polymer sensing technology, this device offers signal conditioning and temperature compensation for a single SoC (System-on-Chip) solution. The device is very simple to use, fully tested and calibrated for accuracy on delivery and no further calibration is needed.

ChipCap can be incorporated into an assembly or finished sensor to meet customer specifications. The measurement is accurate to $\pm 2\%$ from 20% to 80%RH and $\pm 3\%$ across the entire humidity range. Long term stability is excellent. The temperature accuracy is $\pm 1^\circ\text{C}$ from 0°C to $+70^\circ\text{C}$. Dual outputs provide humidity and temperature as 0V to 1V, or 0.5V to 4.5V ratiometric or available with digital output via the ZACwire one-wire interface.

552377

Pressure Type	Pressure Range	Mfrs. List No.	Order Code	1+	10+	25+	Price Each
0 to 1V dc Linear Output							
	0 to 10 inch H2O	NPA-100B-10WD	SMD 177-6493				
0.5 to 4.5V dc Ratiometric Output (5V dc nominal)							
	0 to 15psi	NPA-500B-015A	SMD 177-6503				
Digital Output							
	0 to 10 inch H2O	NPA-600B-10WD	SMD 177-6504				
	0 to 15psi	NPA-600B-015D	SMD 177-6505				
	0 to 15psi	NPA-600B-015A	SMD 177-6506				

Fully Calibrated Humidity and Temperature Module

T9600 Series



The T9600 series humidity sensor offers a new standard in the field of accurate relative humidity measurement.

Based on a capacitive polymer sensing technology, this device offers signal conditioning and temperature compensation for a single SoC (System-on-Chip) solution. The device is very simple to use, fully tested

and calibrated for accuracy on delivery - no further calibration is needed. T9600 can be incorporated into an OEM solution to meet customer specifications. The measurement is accurate to $\pm 2\%$ from 20% to 80% RH and $\pm 3\%$ across the entire humidity range. Long term stability is excellent. The temperature accuracy is $\pm 1^\circ\text{C}$ from 0°C to $+70^\circ\text{C}$. Dual outputs provide humidity and temperature as 0V to 1V, or available with digital output (the ZACwire one-wire interface).

- Ready to install package
- Simultaneous relative humidity and temperature outputs
- Conformal coated PCB for corrosion protection
- Included filter to protect humidity element

659266

Output	Mfrs. List No.	Order Code	1+	5+	+	Price Each
Digital	T9600-D	211-4181				
0-1VDC Linear	T9600-L	211-4182				

Humidity and Temperature Sensor

Evaluation Kits - EK Series

SENSIRION
THE SENSOR COMPANY



EK-H2
Supplied with European power supply only

The EK-H2 evaluation kit offers a plug-and-play environment to demonstrate the unique features of all Sensirion humidity and temperature sensors. It can easily be adapted to your specific application and therefore provides an outstanding development and demonstration tool for your future product, enabling fast prototyping.

EK-H2 Kit Contents:

- 2 x SHT11, 2 x SHT15 & 2 x SHT7 humidity sensors (incl. connecting cables)
- Serial interface cable (9-pole)
- Power supply 230 VAC/ 9 VDC for board
- Microprocessor and display board ASD11
- Humi Viewer (visualization) software on CD ROM
- Documentation
- Packed in a handy box

The evaluation kit EK-H4 combines an easy-to-use plug-and-play system for sensor evaluation with a data logging equipment for simultaneous recording of humidity and temperature. EK-H4 allows for applying 4 SHTxx humidity and temperature sensors, no matter what generation, simultaneously and reading out relative humidity, temperature, calculated dew point and energy consumption at the same time. EK-H4 is working with SHT1x, SHT7x as well as with SHT2x sensors and interfaces to the computer via USB. The data-logging software is able to integrate signals from various EK-H4 multiplexers such that only

the USB channels of the computer are limiting the number of read out sensors. The application of EK-H4 does not require any software programming, calibration nor does it need additional hardware - with the exception of data-logging software that requires a personal computer.



EK-H4

EK-H4 Kit Contents:

- EK-H4 multiplexer box with 4 channels
- 4 x SHT71 sensors
- 4 x SHT21 sensors
- 4 x Sensor cables, 3m long with RJ45 plug for multiplexer box
- 1 x USB cable for PC connection
- 1 x Power Supply with US, EU and AU adapter
- 1 x Memory stick with multi viewer software for running EK-H4 as a data-logger

The evaluation kit EK-H5 is made for running Sensirion's humidity and temperature sensors and display measured values. It is held very simple: A USB dongle with USB to i²C translator capabilities connects with a sensor cable and sensor. With viewer software it is able to communicate with SHT1x, SHT7x as well as the new generation SHT2x and display measured values. The viewer software can be downloaded from the Sensirion web page and owns some simple datalogger features. The main purpose of the evaluation kit is demonstrating the unique performance of Sensirion's humidity and temperature sensors without any own hard or software design work.



EK-H5

EK-H5 Kit Contents

- 1 x USB Stick with cable and connector
- 1 x Sensor cable, 1m long
- 1 x SHT21 on PCB with connector

For Technical Humidity Sensor Data see Order Codes [159-0511](#), [159-0512](#), [159-0513](#) & [159-0514](#)

234885

	Order Code	1+	Price Each
EK-H2 - Evaluation Kit V2.1	120-7219		
EK-H4	185-5470		
EK-H5	185-5471		

Telaire Humidity and Temperature Transmitters

Wall Mount



NEW

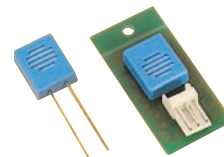
- Precision humidity and temperature transmitter for HVAC control applications
- Mounting plate with two-piece terminal blocks provide quick, easy wiring
- Gas permeable, water resistant humidity sensor filter prevents particulate and water contamination of the sensor
- Field replaceable humidity sensor
- Locking screw secures cover and sensor to the mounting bracket for tamper resistance
- Sensors are shipped factory calibrated
- Active and passive temperature sensor outputs on all models

659287

Type	Mfrs. List No.	Order Code	1+	5+	+	Price Each
No Display	T8700-E	211-4191				
With Display	T8700-E-D	211-4192				

Humidity Sensors

Resistive Module, 20-90% RH Range



The module incorporates the 732-837 sensor to give a ready-to-use unit.

Resistance of the sensor decreases with increasing RH.

Output voltage of the module (1.5V to 3.1Vdc) corresponds linearly to RH (25 to 100%)

NEW

Module: L = 35, W = 20, H = 75 (above PCB), Mounting hole dia = 3.2

Operating humidity range 20% to 90%
Operating temperature range 0°C to $+50^\circ\text{C}$
Measurement accuracy $\pm 5\%$ RH

Working voltage $7 \pm$
Storage temperature 0°C to $+50^\circ\text{C}$
Storage humidity 0 to 100% RH
Measurement range 20 to 90% RH
Current 2mA max.
Output voltage 1.5 to 3 V

212358

	Order Code	1+	10+	25+	100+	250+	Price Each
Module	207-0548						

Low Voltage Humidity Sensors

HIH-5030/5031 Series - SMD



- Molded thermoset plastic housing
- Near linear voltage output vs %RH
- Laser trimmed interchangeability
- Low power design
- Enhanced accuracy
- Fast response time
- Stable, low drift performance
- Chemically resistant

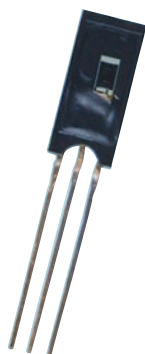
H = 8.59, W = 4.17, D = 2.67mm

The HIH-5030/5031 Series Low Voltage Humidity Sensors operate down to 2.7V dc, often ideal in battery-powered systems where the supply is a nominal 3V dc. Direct input to a controller or other device is made possible by this sensor's near linear voltage output. With a typical current draw of only 200 μ A, the HIH-5030/5031 Series is ideally suited for many low drain, battery operated systems. The HIH-5030/5031 Series delivers instrumentation-quality RH (Relative Humidity) sensing performance in a solderable SMD package. The HIH-5030 is a covered integrated circuit humidity sensor. The HIH-5031 is a covered, condensation-resistant, integrated circuit humidity sensor that is factory-fitted with a hydrophobic filter allowing it to be used in many condensing environments including industrial, medical and commercial applications. The RH sensor uses a laser trimmed, thermoset polymer capacitive sensing element with on-chip integrated signal conditioning. The sensing element's multilayer construction provides excellent resistance to most application hazards such as condensation, dust, dirt, oils and common environmental chemicals.

610251

Description	Mfrs. List No.	Order Code	1+	10+	25+
Covered IC	HIH-5030-001	178-4720			
Covered IC with Filter	HIH-5031-001	178-4721			

HIH-4000 Series Humidity Sensors



- Moulded thermoset plastic housing with cover
- Linear voltage output vs %RH
- Laser trimmed interchangeability
- Low power design
- High accuracy
- Fast response time
- Stable, low drift performance
- Chemically resistant
- Typical applications: refrigeration, drying, meteorology and OEM assemblies

Package Style	Solderable SIP
RH Accuracy	3.5 %
RH Interchangeability	$\pm 5\%$ RH, 0-60% $\pm 8\%$ @ 60-100% RH Typ.
RH Hysteresis	3% of RH Span Maximum
RH Repeatability	0.5% RH
RH Response Time, 1/e	15 s in slow moving air @ 25°C
RH Stability	$\pm 0.2\%$ RH Typical @ 50% RH in 1 Year
Supply Voltage	4.0 to 5.8VDC
Supply Current	500 μ A Max.
Operating Humidity Range	0 to 100% RH, non-condensing
Operating Temperature Range	-40 to 85°C

447994

Lead Pitch	Mfrs. List No.	Order Code	1+	5+	10+	25+	50+
2.54mm	HIH-4000-001..	118-7547					
1.27mm	HIH-4000-002..	118-7548					

Humidity Sensors

Impedance



- Small chip size
- High performance and reliability
- Good long term stability
- 2.54mm pin pitch
- 1V_{rms} Rated voltage
- 0.2mW rated power
- 0.5kHz to 2kHz operating frequency range
- 0°C to 60°C operating temperature range

NEW

B - Without Housing
H = 10, W = 5,
D = 1.8mm

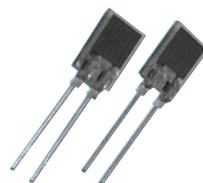
A - With Housing
H = 13.5, W = 8.3,
D = 4mm

629371

Impedance Range	Mfrs. List No.	Order Code	1+	10+	25+	50+	100+
Without Case							
19.8kohms to 50.2kohms	HCZ-D5-B	189-1427					
22.9kohms to 41.9kohms	HCZ-H8-B	189-1429					
14.2kohms to 38.5kohms	HCZ-J3-B	189-1432					
With PBT case							
19.8kohms to 50.2kohms	HCZ-D5-A	189-1428					
22.9kohms to 41.9kohms	HCZ-H8-A	189-1430					
14.2kohms to 38.5kohms	HCZ-J3-A	189-1433					

Humidity Sensor - SIP

Analog voltage output



- Polymer sensing for enhanced resistance to contamination
- Reduced temperature dependence
- Low hysteresis
- Enhanced sensitivity and response
- Long term stability
- High operating temperature

Uncased - H = 7, W = 5, D = 0.65mm
Cased - H = 10.18, W = 6.52, D = 2.96mm

The HCH-1000 Series humidity sensor is a capacitive polymer sensor designed for relative humidity measurement. The sensor converts humidity value into capacitance, which can be measured electronically. Polyimide is used as a humidity sensing material in these devices because of its inherent IC processing compatibility, reduced temperature dependence and resistance to contamination. The sensor consists of a grid top electrode, a polyimide layer and a bottom electrode. This construction provides enhanced sensitivity when compared to the standard structure. Two versions are available, a cased version for enhanced dust protection and an un-cased version.

Sensitivity	0.55 to 0.65 pF / %RH	Response time	15s
Operating humidity range		Operating Temperature	-40 to 120°C

505708

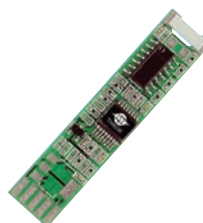
Case Style	Mfrs. List No.	Order Code	1+	5+	10+	25+	50+
Un-Cased	HCH-1000-001	156-6264					
Cased	HCH-1000-002	156-6265					

Analogue humidity module

LinPicco™ basic series



INNOVATIVE SENSOR TECHNOLOGY



- For accurate relative humidity measurement
- Low power consumption, current loop version supplied from current loop
- Temperature-compensated
- Rapid response
- Good linearity
- Drift-stable
- Low hysteresis
- Very small dimensions
- Mechanically robust

Sensor Type

Measurement principle:

Specification range:

Accuracy:

Humidity range

Operating temperature range:

Humidity measurement range:

Current consumption:

Storage temperature range:

Dimensions:

Terminal connectors:

P14 SMD

Capacitive humidity sensor

15...85 % RH

< 3 %rF @ 23°C

0...99.9 % RH, non condensing

-25...+85 °C

+85 °C

< 3 mA

-40...+100 °C @ max. 95 % RH, non condensing

L=47,0 x W=10,0 x H=2,8 mm

Soldering terminals for VCC, Analog Out,

Loop-through of optional temperature sensor

Type	Order Code	Outputsignal 0...100% RH	Input Voltage
LINPICCO (TM) BASIC A01	959-6100	0...1V	8...32V=
LINPICCO (TM) BASIC A05	959-6119	0...5V	8...32V=
LINPICCO (TM) BASIC A0545	959-6127	10...90% Vcc	4,5...5,5V
LINPICCO (TM) BASIC A420	959-6135	4...20mA	8...32 V

408198/436281

Type	Order Code	1+	10+	25+
LINPICCO (TM) BASIC A01	959-6100			
LINPICCO (TM) BASIC A05	959-6119			
LINPICCO (TM) BASIC A0545	959-6127			
LINPICCO (TM) BASIC A420	959-6135			

Pressure Sensors

MEMS Gauge Pressure Sensor

NEW



- Ultra-miniature
- Superior electrical characteristics to capacitive type pressure sensors
- Offset voltage of -2.5 \pm 4 mV
- Span voltage of 31 \pm 3.1 mV
- Low Power consumption of 0.2 mW
- Low Temperature Influence

H = 8.2, W = 4.7mm, D 6.1mm

Sensing type	Piezo resistive	Supply Current	100 μ A
Pressure range	0 to 37kPa	Life expectancy	300,000 ops min
Burst Pressure	53kPa	Operating temperature	0°C to +50°C

659232

Mfrs. List No.	Order Code	1+	25+	100+	250+	500+
2SMPP-02	211-3270					

Pressure Sensor - Silicon

TruStability™ Range



- Fully calibrated
- On-board Application Specific Integrated Circuit (ASIC)
- Long term stability
- High accuracy

- Miniature package size
- Extremely power consumption
- Low operating voltage
- Insensitive mounting orientation

The sensing element consists of 4 piezoresistors galvanized with a thin, chemically etched silicon diaphragm. A pressure change will flex the mechanism, causing a strain in the diaphragm and buried resistors. The resistor values will change in proportion to the stress applied, which produces an electrical output. These devices have potential applications in dialysis equipment, blood analysis, centrifusion and oxygen and nitrogen gas distribution, HVAC devices, data storage, process controls, industrial machinery, pumps and robotics.

Order Code Case Style Port Type Pressure Range DC Supply Voltage Output Type

HSC Series					
Absolute					
182-3254	SIP	Axial, single port	0psi to 15psi	3.3V	Digital
182-3256	SMD	Axial, single port	0psi to 15psi	5V	Digital
182-3245	SIP	Axial, single port	0psi to 100psi	5V	Digital
182-3250	SIP	Axial, single port	0psi to 150psi	5V	Digital
Differential					
182-3232	SIP	No Ports, O-Ring Seal	±1psi	3.3V	Analogue
182-3228	SIP	No Ports, Manifold Mount	±1psi	3.3V	Digital
182-3226	SIP	Axial, dual port	±1psi	5V	Analogue
182-3233	DIP	Radial, dual ports, same side	±5psi	5V	Digital
196-1732	DIP	Radial, dual ports, same side	-1 to 1inch-H2O	5V	Digital
196-1733	DIP	Radial, dual ports, same side	-2 to 2inch-H2O	3.3V	Analogue
196-1734	DIP	Radial, dual ports, same side	-10bar to 10mbar	3.3V	Digital
Gauge					
177-8674	SMD	Radial, single barbed port	0psi to 1psi	3.3V	Digital
182-3227	DIP	Axial, single port	0psi to 1psi	5V	Digital
182-3234	DIP	Axial, single port	0psi to 5psi	5V	Digital
182-3261	SMD	Axial, single port	0psi to 30psi	5V	Analogue
182-3244	SMD	Axial, single port	0psi to 100psi	3.3V	Analogue
182-3249	DIP	Axial, single port	0psi to 150psi	5V	Digital
196-1735	DIP	Axial, single port	0bar to 4mbar	5V	Digital
196-1736	DIP	Axial, single port	0bar to 6mbar	5V	Analogue
196-1737	DIP	Axial, single port	0 to 4inch-H2O	3.3V	Digital

SSC Series					
Absolute					
182-3258	DIP	Radial, single port	0psi to 15psi	5V	Analogue
182-3262	DIP	Axial, single port	0psi to 30psi	5V	Analogue
182-3240	DIP	Axial, single port	0psi to 60psi	5V	Analogue
Differential					
182-3230	SIP	Dual axial, same side	±1psi	5V	Analogue
182-3253	SMD	Radial, dual on same side	±5psi	3.3V	Analogue
182-3235	SIP	Dual axial, same side	±5psi	5V	Analogue
182-3257	SIP	Dual axial, same side	±15psi	5V	Analogue
182-3260	DIP	Radial, dual on same side	±15psi	5V	Analogue
182-3238	SIP	Dual axial, same side	±30psi	5V	Analogue
182-3263	DIP	Radial, dual on same side	±30psi	5V	Analogue
182-3242	SIP	Dual axial, same side	±60psi	5V	Analogue
182-3248	SIP	Dual axial, same side	±100psi	5V	Analogue
182-3252	SIP	Dual axial, same side	±150psi	5V	Analogue
196-1738	DIP	Radial, dual ports, same side	-5 to 5inch-H2O	5V	Digital
196-1739	DIP	Radial, dual ports, same side	-25bar to 25mbar	3.3V	Analogue
196-1742	DIP	Radial, dual ports, same side	-20 to 20inch-H2O	5V	Analogue
Gauge					
177-8676	SIP	Radial, single barbed port	0bar to 1bar	5V	Analogue
182-3251	SIP		0bar to 10bar	5V	Analogue
182-3229	SMD		0psi to 1psi	3.3V	Digital
177-8677	SIP	Radial, single barbed port	0psi to 1psi	5V	Analogue
182-3236	SIP	Axial, single port	0psi to 5psi	3.3V	Analogue
182-3259	DIP	Axial, single port	0psi to 15psi	3.3V	Digital
182-3237	SIP		0psi to 30psi	3.3V	Analogue
182-3239	SMD	Axial, single port	0psi to 60psi	3.3V	Digital
182-3241	SIP	No Ports, O-Ring Seal	0psi to 60psi	3.3V	Analogue
182-3246	DIP	Axial, single port	0psi to 100psi	5V	Analogue
182-3247	SIP	No Ports, O-Ring Seal	0psi to 100psi	5V	Analogue
196-1740	DIP	Axial, single port	0 to 10inch-H2O	3.3V	Digital
196-1741	DIP	Axial, single port	0bar to 40mbar	5V	Digital
196-1744	DIP	Axial, single port	0 to 20inch-H2O	3.3V	Digital

553100

Pressure		Price Each				
Range	Mfrs. List No.	Order Code	1+	10+	25+	50+
HSC Series						
0psi to 15psi	HSCSANN015PA2A3	182-3254	●			
0psi to 15psi	HSCMAND015PAA5	SMD 182-3256	●			
0psi to 100psi	HSCSANN100PA2A5	182-3245	●			
0psi to 150psi	HSCSANN150PA2A5	182-3250	●			
±1psi	HSCSMN001PDA3	182-3232	●			
±1psi	HSCSNN001PDA3	182-3228	●			
±1psi	HSCSAAN01PDA5	182-3226	●			
±5psi	HSCDRR005PD2A5	182-3233	●			
-1 to 1inch-H2O	HSCDRR001ND2A5	NEW 196-1732	●			
-2 to 2inch-H2O	HSCDRR002NDA3	NEW 196-1733	●			
-10bar to 10mbar	HSCDRR010MD2A3	NEW 196-1734	●			
0psi to 1psi	HSCMRN001PG2A3	SMD 177-8674	●			
0psi to 1psi	HSCDANN01PGSA5	182-3227	●			
0psi to 5psi	HSCDANN005PGSA5	182-3234	●			
0psi to 30psi	HSCMAND030PAA5	SMD 182-3261	●			
0psi to 100psi	HSCMANN100PAA3	SMD 182-3244	●			

Pressure		Price Each				
Range	Mfrs. List No.	Order Code	1+	10+	25+	50+
HSC Series						
0psi to 150psi	HSCDANN150PG2A5	182-3249	●			
0bar to 4mbar	HSCDANN004MGSA5	NEW 196-1735	●			
0bar to 6mbar	HSCDLN006MGAA5	NEW 196-1736	●			
0 to 4inch-H2O	HSCDANN004NG2A3	NEW 196-1737	●			
SSC Series						
0psi to 15psi	SSCDRNN015PAAA5	182-3258	●			
0psi to 30psi	SSCDANN030PAAA5	182-3262	●			
0psi to 60psi	SSCDANN060PAAA5	182-3240	●			
±1psi	SSCSNBN001PDA5	182-3230	●			
±5psi	SSCMRRN005PDA3	SMD 182-3253	●			
±5psi	SSCSNBN005PDA5	182-3235	●			
±15psi	SSCSNBN015PDA5	182-3257	●			
±15psi	SSCDRRN015PDA5	182-3260	●			
±30psi	SSCSNBN030PDA5	182-3238	●			
±30psi	SSCDRRN030PDA5	182-3263	●			
±60psi	SSCSNBN060PDA5	182-3242	●			
±100psi	SSCSNBN100PDA5	182-3248	●			
±150psi	SSCSNBN150PDA5	182-3252	●			
-5 to 5inch-H2O	SSCDRRN005ND2A5	NEW 196-1738	●			
-25bar to 25mbar	SSCDRRN025MDAA3	NEW 196-1739	●			
-20 to 20inch-H2O	SSCDRRN020NDA5	NEW 196-1742	●			
0bar to 1bar	SSCSANN001BGAA5	177-8676	●			
0bar to 10bar	SSCSMNN010BGAA5	182-3251	●			
0psi to 1psi	SSCMRRN001PG2A3	SMD 182-3229	●			
0psi to 1psi	SSCSANN001PGAA5	177-8674	●			
0psi to 5psi	SSCSANN005PGAA3	182-3236	●			
0psi to 15psi	SSCDANN015PG2A3	182-3259	●			
0psi to 30psi	SSCSMNN030PAA3	182-3237	●			
0psi to 60psi	SSCMANN060PG2A3	SMD 182-3239	●			
0psi to 60psi	SSCSMNN060PAA3	182-3241	●			
0psi to 100psi	SSCDANN100PAA5	182-3246	●			
0psi to 100psi	SSCSMNN100PAA5	182-3247	●			
0 to 10inch-H2O	SSCDANN010NG2A3	NEW 196-1740	●			
0bar to 40mbar	SSCDLNN040MGSA5	NEW 196-1741	●			
0 to 20inch-H2O	SSCDANN020NG2A3	NEW 196-1744	●			

NSC Series
TruStability™ Range



Honeywell

- Long term stability - even after long-term use and thermal extremes
- Extremely tight accuracy of ±0.25
- Small size
- Provides excellent repeatability
- Extremely low power consumption
- Suitable for medical and industrial applications

The TruStability NSC Series-Uncompensated/Unamplified is a piezoresistive silicon pressure sensor offering a ratiometric analog output for reading pressure over the specified full scale pressure span and temperature range. It offers infinite resolution on the pressure signal and frequency response is limited only by the end user's system.

The NSC Series allows customers the flexibility of self-calibration while still benefiting from the industry-leading stability, accuracy, and repeatability that the Honeywell TruStability® Pressure Sensors provide. Additionally, the NSC Series offers numerous package styles and mounting options, making it easier for the device manufacturer to integrate the product into their application.

These sensors measure absolute, differential, and gage pressures. The NSC Series sensors are intended for use with non-corrosive, non-ionic gases, such as air and other dry gases and for non-corrosive, non-ionic liquids. All products are designed and manufactured according to ISO 9001.

Order Code	Case Style	Port Type	Pressure Range	DC Supply Voltage
Absolute				
208-4204	SIP	Radial, dual on same side	0psi to 15psi	12V
Differential				
208-4205	SIP	Radial, dual on same side	0psi to 1psi	12V
208-4202	SIP	Radial, dual on same side	0psi to 5psi	12V
208-4209	SIP	Radial, dual on same side	0psi to 15psi	12V
208-4210	SIP	Radial, dual on same side	0psi to 30psi	12V
208-4207	SIP	Radial, dual on same side	0psi to 100psi	12V
Gauge				
208-4206	DIP	Axial, single port	0psi to 1psi	12V
208-4203	SIP	Radial, dual on same side	0psi to 100psi	12V
208-4208	DIP	Axial, single port	0psi to 100psi	12V

NSC Series - continued

TruStability™ Range - continued

Pressure Range	Mfrs. List No.	Order Code	Price Each			
			1+	10+	25+	50+
Opsi to 15psi	NSCSHHN015PAUNV	208-4204				
Opsi to 1psi	NSCSHHN001PDUNV	208-4205				
Opsi to 5psi	NSCSHHN005PDUNV	208-4202				
Opsi to 15psi	NSCSHHN015PDUNV	208-4209				
Opsi to 30psi	NSCSHHN030PDUNV	208-4210				
Opsi to 100psi	NSCSHHN100PDUNV	208-4207				
Opsi to 1psi	NSCDANN001PGUNV	208-4206				
Opsi to 100psi	NSCSHHN100PGUNV	208-4203				
Opsi to 100psi	NSCDANN100PGUNV	208-4208				

658447

Pressure Sensors

24PC SMT Series



- Alignment pins for position accuracy
- Small package size
- 3.18mm diameter pick up feature for use in pick and place machines
- Max peak reflow temperature of 260°C
- True wet/wet differential sensing
- Proven elastomeric interconnections of the 20PC family
- Sensor consists of only five components
- Elastomeric construction

- Wide operating temperature range -40 to 85°C

Excitation Voltage	10VDC Typ.	Storage Temperature Range	-55 to 100°C
Max. Excitation Voltage	12VDC	Vibration	150g half sine 11ms
Input Resistance	5 kΩ	Shock	Qualification tested to 150g
Output Resistance	5 kΩ	Weight	0.5g
Operating Temperature Range	-40 to 85°C		

Pressure Range	Max. Overpressure	Mfrs. List No.	Order Code
0 to 1psi	20psi	24PC01SMT	122-5330
0 to 5psi	20psi	24PC05SMT	122-5331
0 to 15psi	45psi	24PC15SMT	122-5332

449821

Mfrs. List No.	Order Code	1+	10+	25+	+	+
24PC01SMT	122-5330					
24PC05SMT	122-5331					
24PC15SMT	122-5332					

Pressure Sensors

26PC SMT Series



- Alignment pins for position accuracy
- Small package size
- 3.18mm diameter pick up feature for use in pick and place machines
- Max peak reflow temperature of 260°C
- True wet/wet differential sensing
- Proven elastomeric interconnections of the 20PC family
- Temperature compensation
- End point calibration

- Sensor consists of only five components
- Elastomeric construction
- Wide operating temperature range -40 to 85°C

Excitation Voltage	10VDC Typ.	Storage Temperature Range	-55 to 100°C
Max. Excitation Voltage	16VDC	Vibration	150g half sine 11ms
Input Resistance	7.5 kΩ	Shock	Qualification tested to 150g
Output Resistance	2.5 kΩ	Weight	0.5g
Operating Temperature Range	-40 to 85°C		

Pressure Range	Max. Overpressure	Mfrs. List No.	Order Code
0 to 1psi	20psi	26PC01SMT	122-5333

449825

Mfrs. List No.	Order Code	1+	10+	25+	+	+
26PC01SMT	122-5333					

Temperature Compensated Sensors - SCX Series



Pins
1 Temp output +
2 VS
3 Output +
4 Ground
5 Output-
6 Temp output-

This low cost range is designed for applications where the user can typically provide fine adjustment of zero and span in external circuitry.

- Very tight offset and full scale calibration
- Guaranteed temperature compensation to max 1% over a 70°C temperature range
- For non-corrosive, non-ionic fluids, eg. dry gases
- Rugged plastic package
- Differential types can be used for gauge or differential pressure measurement

H=25.4, W=27.9, D=26.2,
Pressure ports O/D=4.83,
Fixing centres=21.6, Pin spacing=2.54

Honeywell

Honeywell

Honeywell

Reference V_s 12V dc
Reference Temp 25°C
Supply voltage, V_s +30Vdc max.
Linearity & hysteresis 0.1% FS typ, 0.5% FS max (precision)
0.2% FS typ, 1% FS max (low cost)
Repeatability 0.2% FS typ, 0.5% FS max (precision)
Span shift with temp (0°C to 70°C) 0.2% FS typ, 1.0% FS max (precision)
0.4% FS typ, 2.0% FS max (low cost)
Offset shift with temp (0°C to 70°C) ±0.1mV typ, ±0.5mV max (precision)
±0.2mV typ, ±1.0mV max (low cost)
Output impedance 4kΩ typ
Operating temp range -40°C to +85°C
Offset calibration 0 ± 0.3mV (precision), 0 ± 1.0mV max (low cost)

212337

Pressure	Order Code	1+	10+	25+
0 to 15psiaSCX15ANC	414-839			
0 to 1psidSCX01DNC	414-840			
0 to 15psidSCX15DNC	414-852			
0 to 15psia	414-864			
0 to 1psidSCX01DN	414-888			
0 to 15psidSCX15DN	414-906			
0 to 30psidSCX30DN	414-918			
0 to 100psidSCX100DN	414-920			

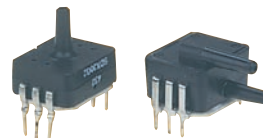
Temperature Compensated Sensors

DIP Package — SDX Series

Honeywell

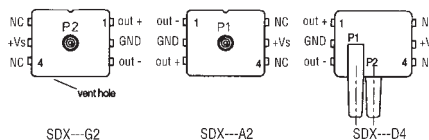
SenSym

Single Port
SDX A2 Series
SDX G2 Series
H=15.1, W=13.97,
D=11.94
Pressure port O/D=2.67



Dual Port
SDX D4 Series
H=9.65, W=13.97,
D=11.94
Pressure port O/D=2.28

Pin Spacing=15.24x2.54



The polarity indicated is for pressure applied to:

SDX--G2	:	P2	(backward gage)	12V
SDX--A2	:	P1	(forward gage)	20V
SDX--D4	:	P2	(backward gage)	0.2%1 -40°C85°C

This family of compensated and calibrated sensors is the second generation of Honeywell SCX Series. Incorporating "constraint-wafer" technology the SDX Series provides:-

- Up to 5 times improvement of long term stability and repeatability
- Greater immunity to package stress
- Tight calibration of offset and span
- Temperature compensation of offset and span, giving an accurate and stable output over 0-50°C range
- New DIP package features standard IC dimensions and pin spacing for easy PCB mounting
- For use with non-corrosive, non-ionic media, eg. air and dry gases

Reference conditions V_s = 12V, T_A = 25°C
Max. supply voltage V_s = 20V
Linearity & hysteresis ±0.2%FS typ, ±1% FS max
Repeatability ±0.2% FS typ, ±0.5% FS max
Span shift with temp. (0°C to 50°C) ±0.4% FS typ, ±2% FS max
Offset shift with temp. (0°C to 50°C) ±0.2mV typ, ±1mV max
Output impedance SDX = 4kΩ typ, SDXL = 6kΩ typ.
Operating temp. range -40°C to +85°C
Offset calibration 0 ± 1mV
Common mode voltage 1.5V min, 3.0V typ, 5V max

Operating Pressure Range	Proof Pressure	Full Scale Span	Operating Pressure Range	Proof Pressure	Full Scale Span
0 to 10" H ₂ O	5 psi	25mV	0 to 15psig	30 psi	90mV
0 to 1psig	20 psi	18mV	0 to 100psig	150 psi	100mV
0 to 5psig	20 psi	60mV			

212227

Operating Pressure	Mfrs. List No.	Order Code	1+	10+	25+
Low Pressure					
0 to 5" H ₂ O	SDX005IND4	434-6063			
0 to 10"H ₂ O	SDX010IND4	434-6075			
Standard Pressure					
0 to 15psia	SDX15A2	674-114			
0 to 1psig	SDX01G2	674-126			
0 to 1psid	SDX01D4	674-138			
0 to 5psig	SDX05G2	674-140			
0 to 15psid	SDX15D4	674-175			
0 to 100psig	SDX100G2	674-205			

Pressure Sensor

Low Differential Pressure



- Pressure ranges 250 and 500 Pa (1 and 2 inch H₂O)
- 10 Pin DIP with 2 Ports (Same Side)
- Pressure sensor based on thermal micro-flow measurement
- Calibrated and temperature compensated
- Linear 0.5 to 4.5 V output
- High flow impedance up to 200 kPa/(ml/s)

NEW

Body - H = 6.8, W = 18.03, D = 12.7mm

629156

Mfrs.		Price Each				
Calibration	List No.	Order Code	1+	5+	10+	25+ 50+
Pressure Range = 250 Pa (1 Inch H₂O)						
Bidirectional	LBAS250BF6S	189-1413				
Unidirectional	LBAS250UF6S	189-1414				
Pressure Range = 500 Pa (2 Inch H₂O)						
Bidirectional	LBAS500BF6S	189-1415				
Unidirectional	LBAS500UF6S	189-1416				

Ultra Low Pressure Sensors - Sursense™

Honeywell



- Differential or Gauge pressure
- Self-compensating
- Small outline dimensions
- Superior linearity
- Almost no position sensitivity
- Exceptional stability
- Pressure media must be clean, non-corrosive and non-ionising, i.e. dry gases

DUXL: H=7.1, W=19.1 (excl. pins), D = 12.7

DCXL & DCAL: H=26.2 (incl. ports), W = 27.4(excl. pins), D=20.3

The SURSENSE™ family of low-pressure sensors is based upon proprietary, DSC (Dynamic Self-Compensation), technology designed to reduce all output offsets and common mode errors. Changes in output due to temperature, warm-up, long term stability and position sensitivity have all been significantly reduced when compared with conventional sensors. In addition, all models utilise a stress relieved construction that reduces zero offset and linearity errors due to mounting induced stresses.

DUXL differential & gauge	310-6986	Temp. effect on offset (0-50°C)	100µV
Supply voltage	1" H ₂ O	Temp. effect on span (0-50°C)	100µV
Output span (Ratiometric @ 4.5V)	≤8	Combined linearity and hysteresis	0.1% nom.
Offset voltage	4-8mV	Input resistance	1-3KΩ
Offset warm-up shift (first 10secs.)	<10	Storage temperature	-40°C to +125°C
Offset position sensitivity (±1g)	±10µV	Common mode pressure	50psig
	±15µV		

Amplified, PCB Mounting Differential, bidirectional gauge

Pressure range	310-6883	310-6895
Supply voltage	±1 in H ₂ O	±5 in H ₂ O
Full scale span	5V dc	5V dc
Null offset	±2V	±2V
Sensitivity	2.25V dc	2.25V dc
Combined linearity and hysteresis error	0.4 V/in H ₂ O	0.8 V/in H ₂ O
Storage Temperature	≤±0.25% Span	≤±0.25% Span
Media - P1	-40 to +125°C	-40 to +125°C
Media - P2	Wetted materials	Wetted materials
Operating temperature	DRY Gasses only	DRY Gasses only
	-25 to +85°C	-25°C to +85°C

212422

Operating		Price Each				
Pressure	Mfrs. List No.	Order Code	1+	10+	25+	
Differential and Gauge						
0 to 1" H ₂ O	DUXL01D	310-6986				
Amplified, PCB Mounting Differential						
0 to 1" H ₂ O	DC001NDC4	310-6883				
0 to 5" H ₂ O	DC005NDC4	310-6895				

Note: Differential units have an offset voltage of 2.25V and span of ±2V nominal

Basic Sensors - 24PC Series

Honeywell



Gauge, Absolute:
H=8.0 (excl. pins),
W=12.7, D = 21.8,
Pressure port O/D=5.1

Differential:
H=8.0 (excl. pins)
W=12.7, D=34.4
Pressure ports O/D = 5.1

High pressure gauge:
H=8.0 (excl. pins),
W=12.7, D=23.8,
flange dia.=9.14
Pressure port= 1/4-28UNF,

Connections (2.5 spacing): 1=V_s (+) (notched pin), 2=Output (+), 3 = Ground (-), 4 = Output (-)

- Measure vacuum or positive pressures in air, gas or liquids
- High pressure gauge types (100psig and 250psig) have threaded ports

A range of miniature low cost basic sensors. The sensors have wet/wet capability, incorporating a seal either side of the diaphragm, one of which is unique conductive seal offering improved reliability for the product range.

Supply voltage	10V dc (nom.), 12V dc (max.)
Linearity (typ.)	Gauge, differential=0.25% span, 30mV 15 psia = 15mV/psia typ, 30 psia = 11mV/psi typ. (see note below)0.25%
Repeatability and hysteresis	Gauge, differential = ±0.15%, absolute = 0.5%
Input/output resistance	5kΩ
Temperature range	-40°C to +85°C
Media	Wet or dry, compatible with polyetherimide,

Note: Although non-compensated, these sensors exhibit extremely good temperature stability (0.5% of span) when driven by current rather than voltage (1.6 to 2.0mA recommended).

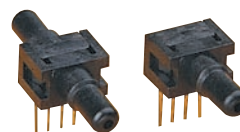
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Mfrs.		Price Each				
List No.	Order Code	1+	10+	25+	50+	
Absolute						
2 to 30psia	24PCDFA6A	723-7765				
Differential						
0 to 0.5psid	24PCEFA6D	731-626				
0 to 1psid	24PCFA6D	731-638				
0 to 5psid	24PCBFA6D	731-640				
0 to 30psid	24PCDFA6D	731-663				
Gauge						
0 to 0.5psig	24PCEFA6G	731-675				
0 to 1psig	24PCFA6G	731-687				
0 to 5psig	24PCBFA6G	731-699				
0 to 15psig	24PCCFA6G	731-705				
0 to 30psig	24PCDFA6G	731-717				
0 to 100psig	24PCFFM6G	731-729				
2 to 15psia	24PCCFA6A	723-7753				
2 to 30psia	24PCDFA6A	723-7765				

Temperature Compensated Sensors

Honeywell

- 26 PC Series



Differential:
H=8.0 (excl. pins),
W=12.7, D = 34.4,
Pressure ports O/D=5.1

Gauge:
H=8.0 (excl. pins),
W=12.7, D=21.8,
Pressure port O/D = 5.1

Connections (2.5 spacing)
1=Vs (+) (notched pin) 2=output (+)
3=Ground (-) 4=output (-)

- Calibrated null and span
- Temperature compensated for span
- Can be used to measure vacuum or positive pressures in air, gas or liquids

Miniature low cost pressure sensors with compensated outputs. Wet/wet capability of the sensor incorporates a seal either side of the diaphragm, one of which is a unique conductive seal offering improved reliability for the product range.

Supply voltage	10v dc(nom) 16v dc(max)	Input resistance	7.5kohm
Null offset	±1.5mV	Output resistance	2.5kohm
Linearity	0.25% span	Temperature range	-40°C to +85°C
Sensitivity shift (0-50°C)	±1.0% span	Media	(0-50°C compensated) Wet or dry, compatible with polyetherimide, silicon and
Repeatability and hysteresis	0.2% span		
Response time	1ms (max.)		

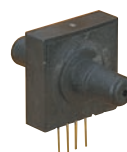
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Mfrs.		Price Each				
Differential	List No.	Order Code	1+	10+	25+	50+
0 to 1psid	26PCFA6D	731-742				
0 to 5psid	26PCBFA6D	731-754				
0 to 15psid	26PCCFA6D	731-766				
0 to 30psid	26PCDFA6D	731-778				
Gauge						
0 to 1psig	26PCFA6G	731-780				
0 to 5psig	26PCBFA6G	731-791				
0 to 15psig	26PCCFA6G	731-808				

Low Pressure Differential Sensors

Honeywell

Temperature Compensated - 176 PC Series



- Miniature package
- Low pressure measurement
- Calibrated null and span
- Temperature compensated for span over 0 °C - 50°C

This range of very low pressure sensors utilizes the latest silicon technology to achieve a higher sensitivity and lower null shift than was previously achievable.

Higher sensitivity requires less amplification and improves the signal to noise ratio.

H=21.5, W=21.5, D= 34.3 (overall).
Pressure port O/D = 7

Connections
1. V_s (+)
2. Output A
3. Ground (-)
4. Output B

Low Pressure Differential Sensors - continued

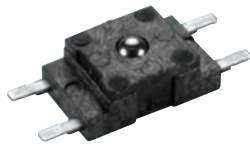
Temperature Compensated - 176 PC Series - continued

Supply voltage	10V dc (nom.), 16V dc (max.)
Null offset	±2mV
Linearity	0.25% FS
Sensitivity shift (0-50°C)	4.0% span (0-14"), ±3.5% span (0-28")
Repeatability and hysteresis	0.25% span
Temperature range	-40°C to +85°C (0°C to 50°C compensated)
Media	Port 2: wetted compatible with polyester housing, epoxy adhesive silicon, borosilicate and silicon-to-glass bond.

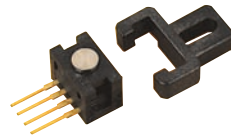
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Operating Pressure	Mftrs. List No.	Order Code	Price Each			
			1+	5+	10+	25+
0 to 7"H2O	176PC07HD2	731-821				
0 to 14" H2O	176PC14HD2	731-833				

Force Sensor



SMD Version
H = 3.75, W = 9.14, D = 5.99mm



PCB Mount and Bracket
Body - H = 9, W = 12.7, D = 8mm

- Robust performance characteristics
- Extremely low deflection, typically 30 microns at full scale
- Precise force sensing
- Electrically ratiometric output
- Mounting brackets available separately

Piezo-resistive sensing element in Wheatstone bridge circuit. Force is applied through stainless steel plunger directly to sensing element. Applications include load and compression sensing, variable tension control, contact sensing, robotic end effectors, medical.

Supply voltage	721-6671	310-7620
Force range	10V dc (nom.)	5V dc (nom.)
Overforce	1500grams	0g to 1500g
Span	5500 grams (max.)	4500 grams (max.)
Response time	290 to 430mV (360mV typ.)	60mV (at 5V dc)
Temperature range	1m sec	-40°C to +85°C
	-40°C to +85°C	

212310

	Order Code	Order Code	Price Each		
			1+	5+	10+
Force sensor	FSG-15N1A	721-6671			
Force sensor - SMD	FSS1500NSB	SMD310-7620			
Mounting brackets, pack of 5	PC-15132	721-6683			

Pressure Sensor

Surface Mount - SOIC14 Package



Packaged in an industry standard surface mount SOIC14 pin package, the NPA Series is available in Differential or Absolute pressure ranges from 0 to 10" H₂O to 0 to 30PSI with either uncalibrated mV outputs or in fully calibrated, amplified analog or 14bit digital outputs.

Body - H = 2.16, W = 7.52, D = 11.36mm

- Surface Mountable, SOP 14 package
- Differential and Absolute versions available
- Barbed Pressure Port
- Recommended tubing 3/32" ID, 7/32" OD, 1/16" wall thickness
- Digital pressure signal: 14 bit ADC / 11 bit DAC
- On chip temperature sensor in digital mode
- Operating temperature range of -40°C to +125°C

552283

Pressure Type	Pressure Range	Mftrs. List No.	Order Code	Price Each		
				1+	10+	25+
mV Output, Ratiometric, Uncalibrated sensor						
	0 to 10 inch H2O	NPA-100B-10WD	SMD177-6493			
	0 to 1psi	NPA-100B-001D	SMD177-6494			
	0 to 5psi	NPA-100B-005D	SMD177-6495			
	0 to 15psi	NPA-100B-015D	SMD177-6497			
	0 to 15psi	NPA-100B-015A	SMD177-6498			
Analog Amplified Output, 5V dc Excitation, Calibrated sensor						
	0 to 10 inch H2O	NPA-500B-10WD	SMD177-6499			
	0 to 1psi	NPA-500B-001D	SMD177-6500			
	0 to 15psi	NPA-500B-015D	SMD177-6501			
	0 to 15psi	NPA-500B-015A	SMD177-6503			
Digital Serial Output, Calibrated sensor						
	0 to 10 inch H2O	NPA-600B-10WD	SMD177-6504			
	0 to 15psi	NPA-600B-015D	SMD177-6505			
	0 to 15psi	NPA-600B-015A	SMD177-6506			

Air Velocity Sensors

Uni-directional



These sensors are designed for the detection of clogged air intake filters and air velocity flows in office automation equipment, including consumer portable products such as PC projectors and other PC related peripherals, domestic products like Air Purifiers, coolers and many other more conventional HVAC products requiring to monitor airflow efficiency for product protection and environmental comfort.

They may also be considered as a suitable alternative to single point Pitot tubes and Thermal dispersion sensors in heating ducts and building/ environmental management systems.

H = 9, W = 39, D = 20mm

Inside each sensor is a highly sensitive MEMS flow chip that is only 1.5 square x 0.5 mm thick. The MEMS flow chip has two thermopiles either side of a tiny heater element used to measure the deviations in heat symmetry caused by the passing gas flow in either direction. A thin layer of insulating film protects the sensor chip from exposure to the gas. When there is no flow, temperature distribution concentrated around the heater is uniform. When a flow is subjected, temperature on the side of the heater facing the flow cools and on the side away from the flow, warms up (heat symmetry collapses). This difference of temperature appears as a difference in the thermopile's electromotive force, the mass flow velocity and mass flow rate can be measured.

Supply voltage - VDC	Min. 10.8	Max. 26.4	Operating Humidity	Min.	Max. 85% RH
Current Consumption		15mA	Operating Temperature	-10°C	+60°C
Output voltage - VDC	0	5.7			

418081

Flow Range	Mftrs. List No.	Order Code	Price Each		
			1+	5+	10+
0 - 1 m/sec.	D6FW-01A1	100-7615			
0 - 4 m/sec.	D6FW-04A1	100-7616			
Connecting Cable					
200mm	D6FW-CABLE	100-7617			

Pressure Sensor

Digital Differential



- Digital output (I²C)
- Accuracy better than 0.2%
- Calibrated and temperature compensated
- Designed to measure pressure of air and non-aggressive gasses
- Require a stabilised 3.3V power supply

531087

Mftrs. List No.	Mftrs. List No.	Order Code	Price Each		
			1+	10+	25+
SDP500	0pa to 500Pa	NEW 208-5054			
SDP510	0Pa to 500Pa	NEW 208-5055			
SDP600-025PA	-25Pa to +25Pa	NEW 208-5056			
SDP600-125PA	-125Pa to +125Pa	NEW 208-5058			
SDP600	-500Pa to 500Pa	169-6080			
SDP601	-500Pa to +500Pa	NEW 208-5059			
SDP606	-500Pa to +500Pa	NEW 208-5060			
SDP610-025PA	-25Pa to +25Pa	NEW 208-5061			
SDP610-125PA	-125Pa to +125Pa	NEW 208-5062			
SDP610	-500Pa to 500Pa	169-6081			
SDP611	-500Pa to +500Pa	NEW 208-5063			
SDP616	-500Pa to +500Pa	NEW 208-5064			

Evaluation Kit

EK-P3



The evaluation kit EK-P3 contains everything needed for fast evaluation and qualification of the SDP600 series differential pressure sensors. It contains a USB dongle, a SDP610 differential pressure sensor and an adapter cable to connect the sensor to the USB-dongle. With this equipment, first measurements can be done within a couple of minutes. The viewer software can be downloaded from the Sensirion web page and includes some simple datalogger features.



- Applicable to SDP5xx/6xx/7xx sensors
- Easy connection via USB interface
- Viewer software for download

658462

Mftrs. List No.	Order Code	Price Each		
		1+	5+	10+
EK-P3	208-5065			

Differential Pressure Sensor

SDP1000 / SDP2000 Series



The Differential Pressure Transducer SDP1000/SDP2000 measures the mass flow caused by a differential pressure. Suppose that the gas is known and leakage is allowed smallest pressure differences can be reliably detected due to its outstanding characteristics based upon Sensirion's CMOSens™ technology.

- For cost sensitive OEM applications in HVAC
- Detects ultra low differential pressure
- Zero drift, offset & hysteresis free
- Outstanding accuracy and reproducibility (even below 10 Pa)
- Ultra fast response time
- CMOSens™ technology driven
- Fully calibrated & temperature compensated

H = 22, W = 30, L = 44
(incl. ports),
Port ctrs. = 16, Port dia. = 3.4,
Pin spacing = 2.54

- Not sensitive to mounting orientation
- Direct PCB mounting with simple snap-on system
- Linear or square root extracted output characteristics
- Analogue voltage output

Parameter	Condition	Min.	Max.	Units.
Accuracy / Linearity	@ 23°C / 73°F	-	1%	FS
		-	1	%m.v.
Ambient temperature	Working	-10°C	60°C	°C
Power supply	DC	4.75	5.25	V
Operating current (max.)	VDD=5.0V, no load	-	5	mA
	VDD=5.0V, loaded	-	10	mA
Output voltage @ 0	RI=100kΩ	0.243	0.257	VDC
Output voltage @ FS	RI=100kΩ	3.93	4.07	VDC
Recommended load		10	∞	kΩ

Connecting tubes - Recommended inner diameter 3/16"

Mfrs.		Price Each		311245	
Output	List No.	Order Code	1+	10+	25+
Linear					
0.25 - 4.0V	SDP1000-L	120-7221	●		
0.25 - 4.0V	SDP1000-L05	122-5681	●		
0.25 - 4.0V	SDP2000-L	120-7224	●		
0.20 - 4.0V	SDP1000-L025	169-6083	●		
Square root					
0.25 - 4.0V	SDP1000-R	120-7223	●		

Pressure Sensor - Differential

Low Range with Fast Response Time



- For cost sensitive HVAC and medical applications
- Unsurpassed performance with CMOSens™ technology
- Offset & hysteresis free
- Outstanding accuracy and reproducibility, even below 10 Pa
- Fully calibrated & temperature compensated
- Not sensitive to the mounting orientation
- Direct PCB mounting with simple snap-on system
- 3.18 to 3.8mm hose connections
- 5V dc power supply voltage

H = 18.3, W = 30, D = 30.5mm

Mfrs.		Price Each		531088	
List No.	Pressure Range	Order Code	1+	10+	25+
SDP1108-R	0Pa to 500Pa	169-6082	●		
SDP2108-R	0Pa to 3500Pa	NEW 208-5053	●		

Differential Pressure Meter - ASP1400



The Differential Pressure Meter ASP1400 measures the mass flow caused by a differential pressure. Suppose that the gas is known and leakage is allowed smallest pressure differences can be reliably detected due to its outstanding characteristics.

- Detects ultra low differential pressure
- Zero drift & offset free
- Outstanding accuracy
- Ultra fast response time
- CMOSens™ technology driven
- Calibrated & temperature compensated
- Digital output signal (RS 232 & SPI)
- CE - certified

Measurement Range:	0.002 to 100 Pa (bi-directional)
Lowest detect. Press:	0.002 Pa
Resolution:	0.001 to 0.04 Pa
Reproducibility:	0.002 % full scale or 0.08 % measured value
Accuracy:	0.05 % full scale or 1.5 % measured value
Response time:	142 ms
Flow rate:	400 sccm @ 100 Pa
Max. overpressure:	2.0 bar
Operating temperature:	0 °C to 70 °C

Electrical Data

Supply voltage range:	7 to 18 V
Input current:	20 mA @ 9 V (typical), 27 mA @ 9 V (max.)
Output signal:	RS 232 or SPI compliant

234888

SENSIRION
THE SENSOR COMPANY

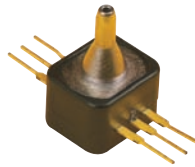
Order Code	1+	10+	25+
120-7218	●		

Pressure Transducers and Transmitters

Transducers, Signal Conditioned

Honeywell

Miniature



- Excellent liquid media compatibility
- Fully signal conditioned (4V output)
- 6 pin DIP package
- Operating temperature -40°C to +125°C
- Smallest amplified sensor package

H=19.1, W=11.2 (pin 30.9), D=13.2

The smallest fully signalled pressure transducer with excellent temperature stability. These 6 pin DIP gauge packages are available in pressure ranges from ±50mm Hg to 250 psi.

Pressure Range	Over Pressure	Null	Supply Current	Excitation	Hysteresis	Repeatability	Mfrs. List No.	Order Code
± 50mm Hg	170mm Hg	2.5V dc	10mA	5V dc ±0.25	0.15% Span		40PC001B1A	310-7425
0 to 15psi	45psi	0.5V	10mA	5V dc ±0.25	0.15% Span		40PC015G1A	310-7437
0 to 100psi	200psi	0.5V	10mA	5V dc ±0.25	0.15% Span		40PC100G1A	310-7449
0 to 150psi	300psi	0.5V	10mA	5V dc ±0.25	0.15% Span		40PC150G1A	310-7450
0 to 250psi	500psi	0.5V	10mA	5V dc ±0.25	0.15% Span		40PC250G1A	310-7462

Pressure Range	Order Code	Price Each		
		1+	5+	10+
± 50mm Hg	310-7425	●		
0 to 15psi	310-7437	●		
0 to 100psi	310-7449	●		
0 to 150psi	310-7450	●		
0 to 250psi	310-7462	●		

Transducers 5V Output - 140PC Series

Honeywell



- High level voltage output and complete calibration and temperature compensation
- For use with non-corrosive, non-ionic gases and liquids
- Differential devices can be used as gauge or differential sensors

Pins
1 Output
2 Ground
3 Supply +

L=59.8, W=30.0, D=18.5 (excl.pins)
Port O/D=5.00, Ctrs.=52.4.

Supply current Typ.	8mA	Operating temperature range	-40°C to +85°C
Supply current Max.	20mA	Storage temperature range	-55°C to +125°C
Current sourcing output	10mA	Response time	1.00ms

Operating Pressure Range	Linearity, B.F.S.L.	Repeatability & Hysteresis	Sensitivity	% Span	Mfrs. List No.	Order Code
0 to 15	---	±	0.333	±0.15	142PC15A	438-8045

310980

Operating Pressure		Price Each		
Order Code	1+	10+	25+	
0 to 15	438-8045			

Transducers, 0.5 - 4.5V Output

SENSORTECHNICS

Low Profile - HCX Series

H=13, W=35, D=39
(including ports)
Pressure Port O/D=5



Connections
1 Voltage output
2 Internal connection
3 -V_s (GND)
4 Internal connection
5 +V_s
6 Internal connection

- Compensated, calibrated and amplified pressure transducers
- Small low-profile package with in-line pinning for easy PCB mounting
- Internal voltage regulation allows a calibrated output for a supply voltage ranging from 4.8 to 15V
- Suitable for measuring differential gauge and absolute pressures
- Designed for use with non-corrosive, non-ionic media eg. dry air and gases

Supply voltage	4.8V to 15V dc
Output	0.5 to 4.5V
Full scale output (FSO)	4.5V ± 50mV
Operating temperature range	-10°C to +70°C
Linearity and hysteresis (BSL)	0.5%
Zero pressure output	0.5V ± 50mV
Thermal stability	±5 mBar devices at 50 mBar
	0.2% FSO/°C (0°C TO +50°C)
	0.12% FSO/°C (0°C TO +50°C)

Pressure Transducers and Transmitters - continued

Transducers, 0.5 - 4.5V Output - continued

Low Profile - HCX Series - continued

Long term stability (1 yr)	at 100 mBar	0.10% FSO/°C (0°C TO +50°C)
Proof pressure	at other pressures	0.05% FSO/°C (0°C TO +50°C)
	5-20 mBar devices	±0.20% FSO typ.
	at 50/100/350 mBar	350 mBar
	at 1 Bar and 5 Bar	1.40 Bar
		2 rated pressure

212183

Operating Pressure	Mftrs. List No.	Order Code	Price Each		
			1+	10+	25+
-5mbar to 5mbar	HCXPM005D6V	306-9540			
0mbar to 10mbar	HCXM010D6V	306-9552			
-10mbar to 10mbar	HCXPM010D6V	306-9564			
0mbar to 50mbar	HCXM050D6V	540-638			
0mbar to 100mbar	HCXM100D6V	540-640			
0mbar to 350mbar	HCXM350D6V	540-651			
0bar to 1bar	HCX001D6V	540-663			
0bar to 1bar	HCX001A6V	540-687			

Stainless Steel Pressure Sensor

Amplified Analogue Output



- Gauge Pressure Mode
- Uni-directional Calibration
- Amplified analog output
- G 1/8" Hex Mounting
- Precision ASIC signal conditioning
- Calibrated and temperature compensated
- Rugged stainless steel isolated package

NEW

Body - L (OA) = 28.5mm, Wires (4) 100mm

629168

Pressure Range	Mftrs. List No.	Order Code	Price Each				
			1+	5+	10+	25+	50+
1 bar	SSIB001GU9AH5	189-1410					
10 bar	SSIB010GU9AH5	189-1411					
35 bar	SSIB035GU9AH5	189-1412					

Compact Silicone Diaphragm Transmitters

CTE7000 Series



L = 72, Dia. = 21.8, Thread = 1/8" BSP

- Single supply (9 to 32V dc)
- Field interchangeable
- Rugged stainless steel housing
- Protection class IP 64
- Gauge pressure mode
- Output signal 0 to 5V

Designed for use in Non-corrosive, non-ionic media such as air, dry gases and the like compatible with stainless steel 1.4404 (316), nylon, silicon, silicone-sealant and epoxy.

622157

Operating Pressure	Mftrs. List No.	Order Code	Price Each		
			1+	10+	25+
0mbar to 350mbar	CTEM7035GY7	419-7781			

Compact Ceramic Diaphragm Transmitters CTE8000 Series



L=72 Dia=21.8 Thread=1/8BSP Male

- 0 to -1Bar to 50 to 100 Bar ranges
- For many industrial gases and liquids
- Field interchangeable
- Choice of 0 to 5V or 4 to 20mA outputs
- Gauge pressure sensing
- Rugged stainless steel construction
- Applications include Pneumatic contro and instrumentation

The CTE8000 series is a compact ceramic diaphragm transmitter, offering a low cost solution for many industrial gases and liquids.

This family of sensors offers a choice of electrical outputs and process connections.

	1 to 5 V	4 to 20mA
Supply Voltage	9 to 30 Vdc	9 to 30 Vdc
Full Scale Output	5 Vdc (±50mV)	16mA (±0.2mA)
Zero Pressure Output	0 Vdc (±50mV)	4mA (±0.2mA)
Operating Temperature	-40°C to 100°C	
Response Time	10 ms	
Proof Pressure	2 x rated pressure	

249441

Operating Pressure	Mftrs. List No.	Order Code	Price Each		
			1+	10+	25+
Gauge, 4 to 20mA Output					
0bar to 50bar	CTE8050GY4	419-7902			
Gauge, 0 to 5V Output					
-1bar to 1bar	CTE8N01GY7	419-7938			
0bar to 10bar	CTE8010GY7	419-7963			

Transducers & Transmitters - BTE6000



Stainless Steel, Flush Diaphragm and High Pressure

High Pressure
H = 35, W = 48, D = 160
(including connector)
Dia. = 27, Thread = 1/2" BSP



Flush
H = 35, W = 48, D = 135
(including connector)
Dia. = 27, Thread = 3/4" BSP

- Flush mount versions
- Designed for use with any corrosive or non-corrosive media compatible with 303 stainless steel
- 1 to 6V and 4 to 20mA outputs
- Field interchangeable
- Protected against reverse polarity and sealed to IP65
- Suitable for harsh environments
- Flush diaphragm type transducers avoid the problem of particulate build up and minimise dead volume
- Flush diaphragm types are particularly suitable in the food industry and applications using thick liquids and semi-solids

Fully temperature compensated, signal conditioned transducers offering flush mounted stainless steel diaphragms for gauge and absolute pressure and DIN standard 'manometer thread' versions for high pressure.

Connections	
1 - 6V output	4 - 20mA output
1 +V _s	1 +V _s
2 -V _s	2 -V _s
3 V out	3 NC
⊕ case	⊕ case

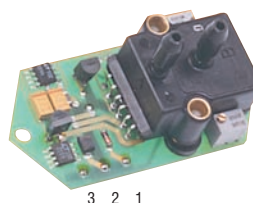
	1 to 6V Output	4 to 20mA Output
Supply voltage	12 to 30V dc	12 to 36V dc
Zero offset	1.0V ± 150mV	4.0mA ± 150µA
Full scale span	5.0V ± 100mV	16.0mA ± 100µA
Operating temperature	-40°C to +100°C	
Linearity and hysteresis	± 0.2% FSO nom.	
Repeatability	± 0.1% FSO nom.	
Thermal stability (0 to +70°C)	0.05% FSO/°C	
Long term stability (1 year)	± 0.2% FSO	
Proof pressure	2 rated pressure	

Operating Pressure	Mftrs. List No.	Order Code	Price Each	
			1+	10+
Flush diaphragm style				
0 to 1 Bar A				
-1bar to 1bar	BTE6N01G1-FL	678-650		
0 to 5bar G				
0 to 10bar G				
0 to 16bar G				

212181

Operating Pressure	Order Code	Price Each		
		1+	10+	25+
Voltage Output				
-1bar to 1bar	678-650			
Flush Diaphragm, 4 to 20mA Output				
-1bar to 1bar	678-703			
0bar to 5bar	678-715			
0bar to 10bar	678-727			

Barometric Pressure Transducer



Connections:
1 +V_s H=32 (including ports)
2 GND W=30, D=60
3 V out Fixing centres 52.4mm, 3.5mm dia.

- Transducer covers barometric pressures 800mBar to 1100mBar
- Calibrated and signal conditioned 0 to 5V output
- Applications in barometry, weather stations, absolute pressure compensation in sensitive equipment

The transducer provides a true 0 to 5V output over the barometric pressure range. Internal voltage regulation allows the device to operate from a single rail power supply between 7 and 24V. A potentiometer is provided to adjust for changes in altitude. The transducer is designed for use with non-corrosive, non-ionic media eg. dry air and gases.

Reference conditions	V _s = 8V, T (ambient) = 25°C, RL = 100KΩ
Supply voltage	7 to 24V dc
Operating pressure	800mbar to 1000mbar
Proof pressure	2 bar
Voltage output (span)	5V ± 500mV
Operating temperature	-40°C to +85°C
Compensated range	-10°C to +60°C
Non-linearity and hysteresis	0.05% FSO (max.)
Repeatability	0.2% FSO (typ.)
Temperature shift (-10°C to +60°C)	0.3% FSO/10°C (max)
Response time	1ms (typ.)
Long term stability	0.1% FSO (typ.)

Mftrs. List No. 144SC0811-BARO

212180

Operating Pressure	Order Code	1+	10+	25+
800mbar to 1000mbar	540-894			

Very Low Pressure Differential Transducers

Signal Conditioned - 160PC Series



- High sensitivity pressure transducers enabling pressures as low as 0 to $\pm 2.5''$ H₂O to be measured
- Transducers are temperature compensated and fully signal conditioned, with calibrated null and FSO

L=59.8, W=30.0, D=33.7 (excl. pins)
Pressure port O/D=5.0
Fixing centres=52.4

Pins:
1. OUT,
2. GND,
3. IN+

Utilising the latest silicon technology, a higher sensitivity and lower null shift is achievable. Higher sensitivity requires less amplification and improves the signal to noise ratio.

Supply voltage 8V dc (nom.), 6V dc (min.), 16V dc (max.)
Supply current 8mA max.
Null offset 1.0 \pm 0.05V (162/164PC), 3.50 \pm 0.05V (163PC)
Output at full pressure/vacuum 6.0 \pm 0.1V (162/164PC), 1.0 \pm 0.2V (163PC)
Span 5V
Ratiometric error 7-8V and 8-9V \pm 0.5% span, 9-12V \pm 2.0% span
Repeatability and hysteresis \pm 0.15% span (162 type \pm 0.15% span)
Temperature range -40°C to +85°C (-18°C to +63°C compensated)
Media Port 2: wetted compatible with polyester housing, epoxy adhesive, silicon, borosilicate glass and silicon-to-glass bond.

212247

Operating Pressure	Mfrs. List No.	Order Code	1+	5+	10+	25+
0 to 28" H ₂ O	162PC01D	731-857				
0 to 10" H ₂ O	164PC01D37	731-870				
0 to $\pm 2.5''$ H ₂ O	163PC01D75	731-882				
0 to 5" H ₂ O	164PC01D76	731-894				

OsiSense Pressure Sensors

XM Series

NEW

Schneider Electric



XMLF



XMLG

Voltage rating 24 VDC
Output current 4 to 20 mA
Electrical connection 4 pins male connector M12
Fluid connection G 1/4 (female) conforming to ISO 228
Contact material FPM (Viton) Stainless steel type AISI 303
IP degree of protection IP67 conforming to EN/IEC 60529
Operating temperature -25°C to +80°C
Operating rate \leq 50 Hz
Output response time 5 to 500 ms in steps of 1 ms

639848

Rising Pressure	Falling Pressure	Permissible Pressure max.	Mfrs. List No.	Order Code	1+	3+	5+
Fixed scale 1 threshold - 1 C/O							
0.8 to 10 bar	0.5 to 9.7 bar	40 bar	XMLF010D2015	197-4009	●		
0.8 to 10 bar	0.5 to 9.7 bar	40 bar	XMLF010D2025	197-4010	●		
8 to 100 bar	5 to 97 bar	400 bar	XMLF100D2025	197-4011	●		
10 bar	-	22 bar	XMLG010D21	197-4012	●		
10 bar	-	-	XMLG010D71	197-4013	●		

Miniature Transmitters

Stainless Steel - 21R Series



- Two output options: 0 - 5V dc and 4 - 20mA
- 316L Stainless steel wetted parts
- Compatible with most corrosive media
- Good repeatability and linearity with negligible hysteresis
- Fitted G1/4" male port with integral pressure seal
- Supplied with mating mPm micro-connector
- Sealed to IP67

Body L = 76mm (excluding connector), Dia = 17mm,
Fitting = G1/4 (1/4" BSP) male port

Precision piezo-resistive silicon sensors with gauge or absolute measurement versions. The silicon sensor is mounted in an all welded oil filled stainless steel capsule, providing a highly stable measuring cell with negligible hysteresis, unrivalled linearity, high output and a life of millions of pressure cycles.

Accuracy is achieved by very large scale predictable production quantities of the pressure capsule (over 2 million produced today).

Reliability is assured by the inherent properties of the perfectly elastic silicon chip, and ensuring that neither the pressure media nor the reference media (in the gauge version) come into contact with any sensitive parts.

Temperature Compensation: Each unit is fully tested and compensated. Span errors are reduced by selecting the semiconductor doping levels so that the gauge factor of the strain gauges is constant with temperature. Thermal zero compensation is achieved by an automatic test procedure which fits a single resistor across one arm of the bridge.

Shock and vibration performance is excellent due to the silicon chip being suspended in the oil-filled capsule. It is isolated mechanically from the body. Similarly, the effects of mounting

622194

Operating Pressure	Mfrs. List No.	Order Code	1+	5+	10+
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Output - 0 to 5V dc

0 to 2.5bar G	PR21SR/80444.3-2.5	709-9472			
0 to 10bar G	PR21SR/80444.3-10	709-9484			
0 to 25bar G	PA21SR/80395.3-25	709-9496			
0 to 250bar G	PA21SR/80395.3-250 0-5VDC	709-9514			
0 to 400bar G	PA21R/80096.3-400	709-9526			
0 to 1bar A	PAA21SR/80444.3-1	709-9540			
0 to 2.5bar A	PAA21SR/80444.3-2.5	709-9551			

Output - 4 to 20mA

0 to 2.5bar G	PR21S/80549.3-2.5 4-20MA	710-0723			
0 to 10bar G	PR21SR/80444.3-10 4-20MA	710-0735			
0 to 25bar G	PA21SR/80395.3-25 4-20MA	710-0747			
0 to 250bar G	PA21SR/80395.3-250 4-20MA	710-0760			
0 to 1bar A	PAA21SR/80444.3-14-20MA	710-0796			

MEDIAMATE® Transducer - 50mV Output

Stainless Steel Housing - MM Series



L = 70mm (including connector),
Dia = 25.4mm,
Thread = 1/8"-27 NPT,
Cable length = 1000mm

Full Scale Output 50 \pm 1mV dc at rated excitation voltage @ 25°C
Zero Output 0.0 \pm 2.5mV dc @ 25°C
Excitation 5.0V dc recommended, 6.0V dc Max.
Input impedance 500R nominal
Output impedance 900R nominal
Operating temperature range -40°C to 90°C
Compensated temperature range -1°C to 82°C

- Mediamate® Series
- Miniature vented gauge pressure transducer
- Case and wetted parts in 300 series stainless steel
- Suitable for a wide range of corrosive media eg. freon, ammonia, water and hydraulic fluids
- Fully temperature compensated
- High degree of unit-to-unit interchangeability
- Supplied with mating Hirschmann connector (mini DIN)

622163

Operating Pressure	Part Number	Mfrs. List No.	Order Code	1+	10+	25+
Opsi to 100psi	MM 100 13	9307604	615-754			

Pressure Sensors

BSP Standard Sensors



- 18V dc to 36V dc Operating voltage
- 500mA Maximum Output Current
- -25°C to +85°C Ambient Temperature Operating Range
- IP67 Protection as per IEC 60529
- 2 Programmable Switching Points (NO or NC) PNP Output
- Reverse Polarity Protected
- Short-circuit Protected
- PA 6.6 Stainless Steel Housing
- 4-Pin, M12 Connector
- G 1/4" Process Connection

H = 90, Dia. = 34mm

BSP pressure sensors are designed for measuring the pressure of gases and liquids. A rotary housing and two-button programming make these sensors flexible to install and easy to operate. The bright LED display provides up-to-date information on the current system pressure.

The exceptionally compact sensor has independently rotating display and connection housings. The user is able to view the system pressure at a glance using the large, brightly illuminated LED display. Clear menu navigation for the quick and easy adjustment of pressure parameters enable the user to configure the sensor using 2 buttons in line with VDMA standards.

634443

Pressure Measuring Range	Mfrs. List No.	Order Code	1+	3+	5+
-1bar to 10bar	BSP V010-EV002-D00A0B-S4	190-3537	●		
0bar to 10bar	BSP B010-EV002-D00A0B-S4	190-3538	●		
0bar to 100bar	BSP B100-EV002-D00A0B-S4	190-3539	●		
0bar to 250bar	BSP B250-EV002-D00A0B-S4	190-3540	●		

Pressure Switches

Miniature Pressure Switches

25.4mm Square Body

SPC multicom



PSF100A Body - H = 9.2mm



PSF102 Body - H = 7.9mm

- External (PSF100A Series) or Recessed (PSF102 Series) Quick Connect terminals
- Miniature size
- Quick response time
- Dependable long life

Miniature Pressure Switches - continued

25.4mm Square Body - continued

Case Material Polycarbonate
 Material Polyurethane Diaphragm ★
 ★ 173-4671 has PTFE
 Switch Type SPST - 1NO
 Contact Rating - Current 40mA - 30V ac/dc - Resistive Load
 Operating Temperature +4.5°C to +65.5°C (40°F to 150°F)
 Switching Medium Air, compatible fluids on "High" side
 Porting Two - 0.2" Diameter barbed ports for use with 3/16" ID Tubing

540686

Set Point Pressure	Mfrs. List No.	Order Code	Price Each			
			1+	10+	25+	50+

PSF 100A Series - Patented shock and vibration resistant

0.004 - 0.018psi	PSF100A-0.5	173-4664				
0.054psi	PSF100A-1.5	173-4665				
0.108psi	PSF100A-3.0	173-4666				
0.217psi	PSF100A-6.0	173-4667				
0.361psi	PSF100A-10.0	173-4668				
0.541psi	PSF100A-15.0	173-4669				
1.804psi	PSF100A-50.0	173-4670				

PSF 102 Series - Field adjustable set point

0.004 - 0.018psi	PSF102-7652-710	173-4671				
0.018 - 0.072psi	PSF102-7651-711	173-4673				
0.072 - 0.541psi	PSF102-7651-712	173-4674				
0.541 - 2.17psi	PSF102-7651-713	173-4675				
2.17 - 3.6psi	PSF102-7651-723	173-4676				
3.6 - 25psi	PSF102-7651-714	173-4677				

Pressure Switch - High Current

PSF 103 Series - Adjustable Set Point



- Controllable Hysteresis (Deadband)
- Field adjustable pressure point
- Snap action basic switch @ 125 / 250V ac
- Small, lightweight size
- Dependable long life of 10 million cycles

OA - H = 45.7, W = 25.4, D = 43.2mm

Case Material Polycarbonate
 Material Polyurethane Diaphragm
 ★ 173-4671 has PTFE
 Switch Type SPST - 1NC / 1NO
 Contact Rating - Voltage 125 / 250VAC
 Operating Temperature (40°F to 150°F)
 Porting Two types available - Smooth Port, 0.156" Dia. and 1/8" NPT port

540732

Set Point Pressure	Current Switching	Mfrs. List No.	Order Code	Price Each			
				1+	10+	25+	50+

Smooth Port, 0.156" Dia. for 1/8" ID tubing

0.11 - 0.4psi	3A	PSF103-9011-902	173-4678			
0.4 - 1psi	10A	PSF103-9011-903	173-4679			
1 - 4psi	15A	PSF103-9011-904	173-4680			

1/8" NPT port

4 - 15psi	15A	PSF103-9061-905	173-4681			
15 - 60psi	15A	PSF103-9061-906	173-4682			

Vacuum Switch - High Current

PSF 109S Series - Adjustable Set Point



- Controllable Hysteresis (Deadband)
- Field adjustable pressure point (Inside port)
- Snap action basic switch @ 125 / 250V ac
- Small, lightweight size
- Dependable long life of 10 million cycles

Case Material Polycarbonate
 Material Polyurethane Diaphragm
 Switch Type SPST - 1NC / 1NO
 Contact Rating - Voltage 125 / 250VAC
 Operating Temperature +4.5°C to +65.5°C (40°F to 150°F)
 Porting 0.25" (6.4mm) Diameter

OA - H = 45.7, W = 25.4, D = 43.2mm

540764

Set Point Pressure	Current Switching	Mfrs. List No.	Order Code	Price Each			
				1+	10+	25+	50+

Smooth Port, 0.156" Dia. for 1/8" ID tubing

-0.3 to -0.1psi	3A	PSF109S-3-8	173-4683			
-2.9 to -0.3psi	10A	PSF109S-9-80	173-4685			
-11.9 to -2.9psi	15A	PSF109S-81-330173-4686				

Pressure Switch

GT Series - Adjustable Set Point



- Large diameter silicon diaphragm
- Snap action switch
- Multi-barb port connections
- 1/4" x 0.03" Quick Connect terminals
- Proof pressure 1 psi, burst pressure 3.5 psi

OA - H = 45.75, Dia. = 80, D = 99mm

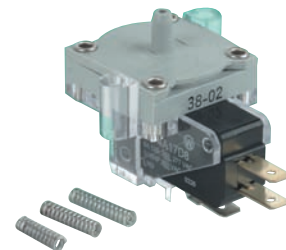
Case Material Noryl (PPO)
 Material Silicon Diaphragm
 Switch Type SPDT
 Contact Rating 5A @ 125 / 250VAC
 Operating Temperature -25°C to +105°C (40°F to 150°F)
 Porting Multi-barb - For 1/4" and 5/16" inside diameter flexible plastic or rubber tubing

540842

Set Point Pressure	Mfrs. List No.	Order Code	Price Each			
			1+	10+	25+	50+
0.003 - 0.005psi	GT27012(PSF117)	173-4687				
0.007 - 0.036psi	GT27027(PSF117)	173-4688				
0.036 - 0.18psi	GT27028(PSF117)	173-4689				

Sensitive Pressure Switches

herga



Sensitive, pressure, vacuum and differential pressure measurement switches, housed in a glass filled polyester case.

- Externally adjustable
- Can be mounted in any orientation
- Suits a wide variety of applications
- UL and CSA recognised

Series 1: Adjustable miniature pressure, vacuum and differential switch for air measurement

Series 2: Gauge pressure only, supplied with 4 colour coded springs, 1 fitted, to cover pressure ranges from 0.07 bar and full setting instructions

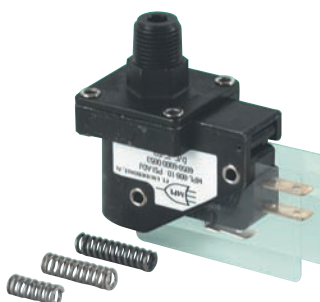
Case Material	Electrical	Contact Rating	Fluid Medium	Burst Pressure	Mechanical Life	Operating Temperature	Diaphragm Material	Weight	Mounting	Series 1		Series 2	
										Glass filled polyester	SPST Momentary NO	SPDT (N/O or N/C)	5 A, 250 Vac
		20 mA, 250 Vac	Air / Gases	1.75 Bar	10 ⁹	-40°C to 120°C	Phosphor Bronze / 18 ct Gold	10g	Lugs or pressure stub				
							Polyurethane					18g	

249526

Pressure Range	Mfrs. List No.	Order Code	Price Each		
			1+	5+	10+
Series 1					
25 to 125mbar	6101-0021	427-6530			
0.25 to 1.35bar	6101-0019	427-6553			
Series 2					
0.025 to 2.75bar	6101-0018	427-6565			

Miniature Medium Pressure Switches

herga



Miniature pressure switch with all die cast housing and integral 1/8" NPT connection. The switch is designed for moderately high pressure with external vernier adjustment screw.

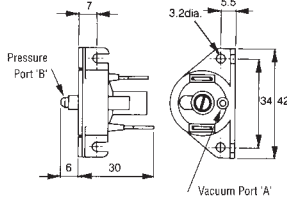
The switch can be mounted in any orientation to suit a wide variety of applications. UL and CSA recognised. Supplied with 4 colour coded springs, 1 factory fitted, to cover pressure ranges from 0.7 bar to 16 bar and full setting instructions.

Case Material	Die Cast	Mechanical Life	10 ⁶
Electrical	SPST Momentary (NO or NC)	Operating Temperature	-40°C to 85°C
Contact Rating	5 A, 250 Vac	Diaphragm	Polyurethane
Fluid Medium	Wide range of media	Weight	57g
Burst Pressure	34 Bar		

249528

Pressure Range	Mftrs.		Price Each		
	List No.	Order Code	1+	5+	10+
0.7 to 16bar	6101-0016	427-6577			

Low Pressure 1" - 16" H₂O



herga

- Miniature pneumatic switch for very sensitive pressure, vacuum and differential pressure switching
- Housed in a glass filled nylon 12 surface mounting body with neoprene diaphragm
- Switch can be set for normally open or normally closed operation
- Sensitivity can be adjusted from 1" to 16" H₂O
- Supplied with 1 metre of PVC connecting tube
- Air bleed version has adjustable air bleeds on both sides of the diaphragm

Pressure/Vacuum range	25mm (2") H ₂ O (min), 400mm (16") H ₂ O (max/max. differential)
Pressure, factory setting	50mm (2") H ₂ O (Contact normally open)
Differential between pressure connection	0.34 Bar (5 psi) max.
Body withstand pressure	1.0 Bar (14.7 psi)
Temperature Range	-5°C to +50°C
Switch	SPST-1NO / 1NC
Contact rating	0.5A, 250V ac (resistive)
Dry switching, minimum	5mA, 4V dc
Contact resistance	50mΩ
Pressure connections	4mm dia. spouts

212230/406081

Type	Mftrs.		Price Each			
	List No.	Order Code	1+	10+	25+	50+
Standard	6753-AEJA-A000	731-912				
Air Bleed	6753-OF	723-0497				

Vacuum Switch

75" to 270" H₂O



- Robust low vacuum switch suitable for industrial applications
- Pressure fully adjustable on increasing vacuum
- Suitable for use with butane, compressed air, water, mineral and fuel oils, citric acid, etc.

H=38, Dia.=43,
Fixing holes=5 to suit No. 4 self-tap screws

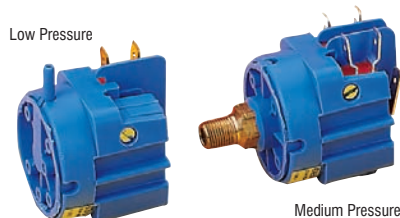
Pressure range (on increasing vacuum)	1900 to 6860mm H ₂ O (75" to 270" H ₂ O)
Electrical switch	SPCO 21(8)A 250V ac
Vacuum connection	Side entry spout 4mm O/D
Temperature range	-5°C to +70°C
Materials	Nylon 12 body, neoprene diaphragm
Spring (in vacuum cavity)	Spring steel

222172

Mftrs.			Price Each			
	List No.	Order Code	1+	10+	25+	50+
	6721-40	723-0448				

Low/Medium Pressure

5 to 25" H₂O, 3 to 5.5 psi, 8 to 18 psi



Low pressure: H=38, Dia.=43, Fixing holes=5 to suit No. 4 self-tap screws
Medium pressure: H=38 (body), 58 (overall), W=40, D=43, Fixing holes=4 to suit No. 4 self-tap screws

herga

- Robust pressure switches suitable for industrial applications
- Pressure fully adjustable throughout range
- All types suitable for use with butane, compressed air, water, citric acid, etc.
- Low pressure types also suitable for use with mineral and fuel oils, detergent solution, etc.

Pressure range	Low pressure type: 127 to 635mm water gauge (5" to 25" water gauge) Medium pressure types: 3 to 5.5psi(0.20 to 0.37 Bar) 8 to 18psi(0.54 to 1.22 Bar)
Electrical switch	Low pressure type: SPCO Medium pressure type: DPCO 21(8)A 250V ac
Pressure connection	Low pressure type: Side Entry Spout 4mm O/D Medium pressure types: 1/8" BSPT brass
Temperature range	-5°C to +70°C
Materials	Nylon 12 body, neoprene diaphragm, steel spring

212380

Pressure Range	Mftrs.		Price Each			
	List No.	Order Code	1+	10+	25+	50+
5" to 25" water gauge	6731-06	723-0450				
Medium Pressure						
3 to 5.5psi	6742-30	723-0461				
8 to 18psi	6742-50	723-0473				

Industrial



- Connections
1. Common
 2. N.C., opens on pressure rise
 3. N.O., closes on pressure rise

H=130, W=82, D=38
Fixing centres
(2 holes dia.=4)=45x69, Pressure input= 1/4" BSP brass

- Pressure switching can be set externally
- Switching hysteresis between rising and falling pressure can be preset
- Double insulated GFS nylon housing, sealed to IP65
- Pressure setting can be made tamper-proof by 1.5mm A/F Hex. key
- Approximate pressure setting may be seen through a window in the cover

Industrial pressure switch supplied with 3 colour coded springs to give 3 pressure ranges covering 20 psi to 200 psi, the mid-range spring being supplied ready fitted. Switching is through two separate SPCO V3-style microswitches with 1/4" fast-on spade connections, and cable entry is via M20 tapped conduit hole.

Brass and nitrile rubber are the only materials in contact with the pressure system, making the pressure switch suitable for most commonly used operating fluids, for example in regulating water flow lines or in factory air systems.

Operating pressure ranges (on rising pressure)	Red spring: 20 to 50 psi (1.4 to 3.5 bar) White spring: 40 to 100 psi (2.7 to 6.9 bar) Blue spring: 80 to 200 psi (5.5 to 13.8 bar) Adjustable 20% to 50% of operating pressure ±2 psi @ 50 psi rising pressure
Switching hysteresis	Adjustable 20% to 50% of operating pressure
Switch setting accuracy	±2 psi @ 50 psi rising pressure
Withstand pressure	500 psi
Contact rating	15A 250V ac(resistive)
Operating temperature	-5°C to +70°C

212426

Mftrs.			Price Each		
	List No.	Order Code	1+	10+	50+
	6702-0002	213-317			

Extended Duty Pressure Switch

5000 Series



- 1/8-27 NPT male thread
- 1/4" blade terminals with 8-32 screws
- Plated steel base
- Glass reinforced polyester cover
- Direct action blade contact
- Silver alloy contact, gold plated

The 5000 Series switch is specifically designed to stand up to demanding pressure applications. The switch is factory set but capable of customer adjustment. It features a Kapton diaphragm for compatibility with a wide variety of fluids.

Dia. = 37.34mm (1.47"), H = 58.42mm (2.3")

Contact rating - Resistive	15A @ 6VDC, 4A @ 24VDC
Contact rating - Inductive	1A @ 120VAC, 0.5A @ 240VAC
Proof pressure	500 psi
Burst pressure - 4 to 15 psi Set pressure range	750 psi
Burst pressure - 35 & 60 psi Set pressure range	1250 psi
Temperature range	-40 to 250°C

510969

Pressure	Range	Mftrs.		Price Each		
		List No.	Order Code	1+	5+	10+
4psi	3.1 to 7psi	76575	160-5366			
4psi	3.1 to 7psi	76577	160-5368			
10psi	8 to 13psi	76578	160-5370			
15psi	14 to 24psi	76052	160-5371			
35psi	25 to 50 psi	76053	160-5373			
60psi	51 to 90psi	76054	160-5375			

Pressure Switches - continued

Industrial - 0184 Series



L=90 (overall), Dia.=34,
Mounting=27 hex., Thread= G1/4
(1/4" BSP)

- Rugged industrial pressure switches with a wide range of possible setting pressures
- Adjustable switching hysteresis of 10 to 30% between rising and falling pressure
- Switch output by 4A/250VAC changeover contacts
- Connection by industry standard DIN connector
- When used in conjunction with the connector the switch is sealed to **IP65**
- NBR seal material type suitable for use with hydraulic oil, gasoline, engine oil, heating oil, turpentine and air

- EPDM seal material type suitable for use with water, hydrogen, sea water, acetylene
- Stainless steel body versions suitable for process and chemical industries and pharmaceutical, agricultural applications etc.

Output Rating	4A	Mechanical Life	1000000 operations
Maximum operation	200 operations/min	Temperature range	-30°C to +100°C
Hysteresis	10%	Body Material	Zinc plated steel

Adjustment Range	Tolerance at Room Temp.	Over Pressure
0.3 to 1.5bar	±0.2 bar	100bar
1 to 10bar	±0.5 to 1.0 bar	300bar
10 to 50bar	±3.0 bar	300bar
10 to 100bar	±3.0 to 5.0 bar	300bar
50 to 200bar	±5.0 bar	600bar

212264

Operating Pressure Range	Mfrs. List No.	Order Code	1+	5+	10+
Zinc Plated Steel Body, NBR Diaphragm					
0.3 to 1.5bar	0184-45703-1-003	679-057			
1 to 10bar	0184-45803-1-042	679-069			
10 to 50bar	0184-45903-1-009	679-070			
10 to 100bar	0184-46103-1-012	679-082			
50 to 200bar	0185-46003-1-003	679-094			
Zinc Plated Steel Body, EPDM Diaphragm					
0.3 to 1.5bar	0184-457032-003	721-3086			
1 to 10bar	0184-458032-042	721-3098			
10 to 50bar	0184-459032-009	721-3104			
Stainless Steel Body, NBR Diaphragm					
0.5 to 5bar	0184-457031-SS	721-3037			
1 to 10bar	0184-458031-SS	721-3049			
10 to 50bar	0184-459031-SS	721-3050			
10 to 100bar	0184-461031-SS	721-3062			

OsiSense Pressure Switches

NEW



XM Series



- SPDT contact configuration
- Electrical connection by screw termination
- Operating current 1.5A @ 240 VAC, 0.1A @ 250 VDC
- Operating temperature ranges from -25°C to +70°C
- IP degree of protection: **IP66** conforming to **EN/IEC 60529**
- Approvals: **CE, CSA C22-2 No 14, EN/IEC 60947-5-1 and UL 508**
- Contact material: Nitrile Zinc alloy

H= 75mm, D= 113mm, W= 35mm

Operates with pressures up to 600bar providing the user with switched, analogue, and volt free contact in robust housing for use on oil, air, and water.

Applications: Pressure control or monitoring on water pumps, compressors, moulding presses, injection moulders, grinding machines and machining centres.

639792

Rising Pressure	Falling Pressure	Permissible	Mfrs.	Price Each			
Pressure max. List No.				Order Code	1+	3+	5+
Fixed scale 1 threshold - 1 C/O							
0.4 to 4 bar	0.05 to 3.65 bar	5 bar	XMLA004A2S11	197-3992			
0.6 to 10 bar	0.1 to 9.5 bar	12.5 bar	XMLA010A2S11	197-3993			
0.7 to 20 bar	0.6 to 19 bar	25 bar	XMLA020A2S11	197-3994			
1.5 to 35 bar	0.25 to 33.75 bar	45 bar	XMLA035A2S11	197-3995			
1.5 to 70 bar	2 to 62.5 bar	90 bar	XMLA070D2S11	197-3996			
10 to 160 bar	4.5 to 142 bar	200 bar	XMLA160D2S11	197-3997			
20 to 300 bar	3.5 to 265 bar	375 bar	XMLA300D2S11	197-3998			
30 to 500 bar	10 to 455 bar	625 bar	XMLA500D2S11	197-3999			
Adjustable scale 2 thresholds - 1 C/O							
0.25 to 4 bar	0.05 to 3.75 bar	5 bar	XMLB004A2S11	197-4000			
0.7 to 10 bar	0.13 to 9.15 bar	12.5 bar	XMLB010A2S11	197-4001			
1.3 to 20 bar	0.3 to 18.4 bar	25 bar	XMLB020A2S11	197-4003			

Rising Pressure	Falling Pressure	Permissible	Mfrs.	Price Each			
Pressure max. List No.				Order Code	1+	3+	5+
Adjustable scale 2 thresholds - 1 C/O							
3.5 to 35 bar	1.8 to 32.45 bar	45 bar	XMLB035A2S11	197-4004			
7 to 70 bar	2.3 to 61.2 bar	90 bar	XMLB070D2S11	197-4005			
10 to 160 bar	0.7 to 139.2 bar	200 bar	XMLB160D2S11	197-4006			
22 to 300 bar	2.6 to 263 bar	375 bar	XMLB300D2S11	197-4007			
30 to 500 bar	30 to 500 bar	625 bar	XMLB500D2S11	197-4008			

Load Cells

Single Point, Aluminium, 3-50Kg (30-500N)

5/10/20/50/100kg



1022



1040

- Off-centre loading capability
- Easy to mount and use
- Versatile for use in test equipment
- Ideal for supporting weighing platforms
- High sensitivity and high accuracy

Low profile, aluminium single-point load cells, with industry standard mounting dimensions. Off-centre loading capability allows ease for use in force measurement applications or for weighing platforms.

Rated capacity in Kg	3/5/10/20/50	Kg
Rated capacity in Newtons (approx.)	30/50/100/200/500	N
Output at rated capacity	2.0 to ±0.2%	mV/V
Total errors	0.02	% of applied load
Temperature range: operating	-30 to +70	°C
Temperature range: compensated	-10 to +40	°C
Safe overload	150	% of rated capacity
Ultimate overload	300	% of rated capacity
Excitation: recommended	10	Volts AC or DC
Excitation: maximum	15	Volts AC or DC
Input impedance	415± 15	ohm
Output impedance	350± 3	ohm
Deflection at rated capacity	≤0.4	mm
Threaded mounting holes	M6x1.0	4 Places
Environmental protection	1022 Series = IP66, 1040 = IP54	
Cable types	1022 Series = 4-Wire 1040 = 6-Wire	
Cable length	1022 Series = 0.5, 1040 = 1	m
Maximum platform size	1022 Series = 350 x 350, 1040 = 400 x 400	mm
Dimensions L x W x H	725-6139, 725-6140 10x25x22 725-6152, 725-6164 130x30x22 700-0911: 150x29.4x40	mm

224684

Capacity	Mfrs. List No.	Order Code	1+	5+	10+
3kg	1022M-3M-F-106	725-6139			
5kg	1022M-5M-F-106	725-6140			
10kg	1022M-10M-F-106	725-6152			
20kg	1022M-20M-F-106	725-6164			
50kg	1040M-50M-F	700-0911			

'S' Type, Tension/Compression

250-1000 Kg (2.5 - 10KN)



601/616



620

- Designed for tension or compression operation
- Versatile and adaptable
- Compact, rugged designs
- Simple to mount and use
- Rod-end bearings available

Designed to tolerate either tension or compression forces, 'S' type load cells are easy to mount and use. The threaded mounting holes allow easy adaptation to force measurement applications such as pneumatic/hydraulic actuators, and the self-aligning capability when used with rod-end bearings results in high accuracies, suitable for mechanical scale conversions or reaction torque measurements.

Rated capacity in Kg	300	500	1000	kg
Rated capacity in Newtons (approx.)	2500	5000	10000	N
Output at rated capacity	2.0 ±0.1%	2.0 ±0.1%	2.0 ±0.1%	mV/V
Total error	0.025	0.03	0.025	% of applied load
Operating temp. range	-30 to +70	-30 to +70	-30 to +70	°C
Compensated temp. range	-10 to +40	-10 to +40	-10 to +40	°C
Safe overload	150	150	150	Capacity
Ultimate overload	300	300	300	% of rated Capacity
Excitation: recommended	10	10	10	% of rated V ac or dc
Excitation: maximum	15	15	15	V ac or dc
Input impedance	415± 15	385± 15	400± 20	ohms

Output impedance	350±3	350±3	350±3	ohms
Deflection at rated capacity	<±0.4	<±0.4	< ±0.4	mm
Environmental protection	IP65	IP67	IP68	
Cable type				
Cable length	3	3	5	m
Dimensions L x W x H	70 x 34 x 80	62 x 26 x 80	70 x 32 x 90	mm
Threaded mounting holes	M12 x 1.75	½" 20 UNF	M16 x 2.0	2 places
Mfrs. List No.	614-300M-D2	616-500U-F	620-1000M-F	
Order Code	704-3820	704-3831	704-3843	

213401

		Price Each		
Capacity	Order Code	1+	5+	10+
Load Cells	300kg	704-3820		
	500kg	704-3831		
	1000kg	704-3843		

Accelerometers

Acceleration / Vibration Sensing



Acceleration Sensing

These units have a crystal of piezo-electric material to which is attached a seismic mass. When the crystal is stressed in tension or compression, it generates an electrical charge which is proportional to the acceleration or vibration level it is experiencing. Internal circuitry converts this signal into a voltage or current 4 to 20mA output for data collectors or process control loops. These robust sensors have no moving parts and offer long-term stability and reliability. They have a wide frequency range and signals can be integrated to give velocity and displacement values.

Piezo-Resistive Accelerometers

These modules have a seismic mass attached to a cantilever beam. The beam is deflected whilst experiencing 'g' forces and this movement is converted into an electrical signal by resistance changes in a semiconductor sensing element. Internal circuitry provides amplification of the signal and temperature compensation. The frequency range of these devices is lower than the piezo-electric moduls, having the advantage of being able to monitor static or DC acceleration levels.

622195

Lightweight



- Small size and mass
- Ideal for modal analysis
- Can be configured into three axes format
- No moving parts
- Long term stability and reliability

Piezo-electric accelerometer for acceleration sensing in laboratory and R and D applications. Mount by bonding.

Frequency response	5Hz to 14Hz (3dB point 3kHz)	Temperature coefficient	5% (over full temp. range)
Resonant frequency	25kHz (nom.)	Supply Voltage	20 to 30 Volts DC
Measurement range	± 10g	Connection	5m cable with 50Ω BNC connector
Sensitivity	1000mV/g	Case material	Aluminium base
Amplitude non-linearity	1% Max. over full scale	Weight	9g (nom.)
Operating temp. range	-10°C to +85°C	Sealing	IP65

212336

Mfrs. List No.	Order Code	1+	10+	25+
MTN/1800	707-7415			

Process Control, 4-20mA



- Direct velocity output
- Two wire 4 to 20mA industrial standard
- Easy process control loop interface
- Stand-alone use with digital meter

H=42 (excl. stud), Hex=28 A/F

Output	4 to 20mA	Transverse Sensitivity	Less than 5%
Frequency response	2Hz to 1kHz ±10%	Supply voltage	10-32 volts (smoothed)
Mounted resonance	18kHz min.	Standard cable	5 metres armoured PVC
Measurement range	50g peak	Case material	Stainless Steel
Isolation	Base isolated	Weight	150g
Operating temp. range	-25°C to +80°C	Sealing	IP67
Temperature Sensitivity	0.08%/°C	Mounting thread	M8
Electrical noise	0.3mg max.		

212340

Sensitivity	Mfrs. List No.	Order Code	1+	10+	25+
	MTN/1185CM8-10	706-8219			
	MTN/1185CM8-25	706-8268			

Float Switches



Vertical Float

Magnetic Level Sensor



- The world's smallest magnetic Level Sensor
- Ruthenium (Ru) contact material
- Operating temperature -20°C to +80°C
- Polypropylene case, float and nut
- Suitable for use in water and/or dilute acids
- Designed for applications such as coffee machines, tank level control and water dispensers

155-5936 155-5937 155-5938 177-5048 177-5049 177-5050 177-5051

Contact style	Form A	Form A	Form A	Form A	Form B	Form A	Form A
Travel - Float	3.5mm	8.5mm	18.5mm	5.5mm	8.5mm	8.5mm	18.5mm
Switching current	0.7A	1.5A	1.5A	0.7A	1.5A	1A	1A
Carry current	1.0A	2.0A	2.0A	1A	2A	1.2A	1.2A
Contact power rating	10VA	50VA	50VA	10VA	50VA	10VA	10VA
Switching voltage (Max.) dc	180V	200V	200V	180V	200V	200V	200V
Switching voltage (Max.) ac	130V	250V	250V	130V	250V	140V	140V

502073

Mfrs. List No.	Order Code	1+	5+	10+	25+	50+
MCPLS-020-A-3	155-5936					
MCPLS-031-A-6	155-5937					
MCPLS-041-A-6	155-5938					
MCPLS-020-B-3	177-5048					
MCPLS-031-B-6	177-5049					
MCPLS-031-A-3	177-5050					
MCPLS-041-A-3	177-5051					

Horizontal



- Level rise or fall sensing (rotate housing 180)
- Temperature range to 60°C
- Specific Gravity to 0.8
- External fitting
- Repeatability and reliability due to Reed Switch characteristics

Typical Sensing Applications

- Windscreen washer bottles
- Recycled water systems
- Condensate level alarm

Float dia = 15.5
Mounting hole dia = 20.6

Switching voltage	100-6773
Switching current	100Vdc, 250Vac
Switching power	1A
Min S.G	15VA
Material	0.80
Temperature Range	Acetal Copolymer (Housing), Foamed Polypropylene (Float Material)
Sealing Components	-30°C to +60°C
Cable	EPDM
	2 x 22AWG PVC insulated, 0.1m long

233624

Description	Mfrs. List No.	Order Code	1+	25+	100+
Float switch 85.5mm	FLCS-01..	100-6773			

Horizontal



- Specific Gravity to 0.65
- Temperature range to 130°C
- Suitable for a wide range of liquids
- Level rise or fall sensing (rotate housing 180)
- International Standards Approvals and recognition (UL, WRC, EN)
- Repeatability and reliability due to Reed Switch characteristics

Float dia = 17.3
Mounting hole dia = (16.5 internal, 23 external fitting)

Typical Sensing Applications

- Vending machines - water level
- Coolant level indication - automotive
- Boiler heating - element protection
- Drinking water level - fountain
- Fuel level - engine
- Oil level - engine

Switching voltage	120Vdc, 120Vac
Switching current	1A
Switching power	15VA
Min S.G	0.65
Material	Glass Filled Polypropylene
Temperature Range	0°C to + 80°C
Sealing Components	Silicone
Cable	2 x 18AWG PVC insulated

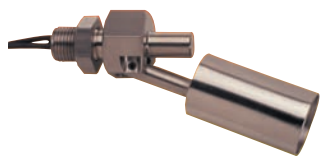
233603

Type	Mfrs. List No.	Order Code	1+	25+	100+
Polypropylene(120V)	FLS801-51..	100-6780			

Float Switches - continued

Horizontal Float - Model SSF211

Internal Fitting



- 304 Grade stainless steel
- Internal mounting
- Compact design
- Temperature range to 120°C
- User configurable N/O or N/C action
- Reversible switch action

L = 95, Float dia. = 17

Contact type	1NC / 1NO	Max. temperature	120°C
Max. switching voltage	300VAC/dc	Mounting Style	Internal
Max. switching current	0.5A	Mounting thread	1/8" BSP NPT
Max. switching power	50 VA	Lead length	500mm
Min. S.G. of liquid	0.80	Max. wall thickness	17mm
Material	Stainless steel		

249053

Mfrs.	List No.	Order Code	1+	5+	10+
	SSF211X050	424-9100			

Horizontal Float - Model SSF212

External Fitting



- 304 Grade stainless steel
- External mounting
- Compact design
- Temperature range to 120°C
- User configurable N/O or N/C action
- Reversible switch action

L = 102, Float dia. = 17

Contact type	1NC / 1NO	Max. temperature	120°C
Max. switching voltage	300VAC/dc	Mounting Style	Internal
Max. switching current	0.5A	Mounting thread	1/2" NPT
Max. switching power	50 VA	Lead length	500mm
Min. S.G. of liquid	0.80	Max. wall thickness	10mm
Material	Stainless steel		

249054

Mfrs.	List No.	Order Code	1+	5+	10+
	SSF212X050	424-9112			

Horizontal Stainless Steel Float Switch

External Fitting - Hi, Low and Hi/Low Level



- Manufactured from High Grade 316 Stainless Steel
- Can be fitted to achieve either NO or NC by rotating through 180°
- Available with either flying leads or MPM Connector
- Fitted with high quality reed-switches for optimum performance

XLPE Wires



MPM Connector

626486

Mfrs.	Termination	List No.	Order Code	1+	5+	10+
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3/4" NPT - External Fitting

1m XLPE Wires SSH66TE34N100S **187-7544**

MPM Connector SSH66TE34NPS **187-7545**

1m XLPE Wires SSH66XE34N100 **187-7546**

MPM Connector SSH66XE34NP **187-7547**

1/2" NPT - Internal or External Fitting

1m XLPE Wires SSH66XU12N100 **187-7548**

Level Sensors - Internal Mount

Stainless Steel



H (O/A) = 85, D (O/A) = 75.2, Dia. (Float) = 28.4mm

H (O/A) = 59.5, H (Float) = 28.5, Dia. (Float) = 28.4mm

Order Code	177-5046	177-5047	177-5052
Contact type	Form A	Form A	Form A
Max. switching voltage	140V ac / 200V dc	300V ac / 350V dc	300V ac / 350V dc
Max. switching current	500mA	500mA	500mA
Max. carry current	1000mA	2500mA	500mA
Max. switching power	10W / 10VA	50W / 50VA	50W / 70VA
Material	V2A 304 Stainless steel	Stainless steel	SUS304 Stainless steel
Max. temperature	125°C	125°C	125°C
Mounting Style	Internal	Internal	Internal
Mounting thread	M10	M10	M10

552570

Mfrs.	List No.	Order Code	1+	5+	10+
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Vertical Float

MCPLS-045A-3VAI **177-5046**

MCPLS-045A-6VAI **177-5047**

Horizontal Float

MCPLS-080A-6VAL **177-5052**

Horizontal Float - Model SSF212P

External Fitting



L = 136, Float dia. = 17

- 304 Grade stainless steel
- External mounting
- Compact design
- Temperature range to 120°C
- User configurable N/O or N/C action
- Reversible switch action
- Plug-in connection

Contact type	1NC / 1NO	Max. temperature	120°C
Max. switching voltage	300VAC	Mounting Style	Internal
Max. switching current	0.5A	Mounting thread	1/2" NPT
Max. switching power	50 VA	Connection	Plug
Min. S.G. of liquid	0.80	Max. wall thickness	10mm
Material	Stainless steel		

249055

Mfrs.	List No.	Order Code	1+	5+	10+
	SSF212XP	424-9124			

Horizontal Float - Model SSF24

Internal Fitting



H = 75, L = 55, Float dia. = 28

- 316 Grade stainless steel
- Internal mounting
- Compact design
- Temperature range to 120°C
- User configurable N/O or N/C action
- Reversible switch action

Contact type	1NC / 1NO	Max. temperature	120°C
Max. switching voltage	300VAC	Mounting Style	Internal
Max. switching current	0.5A	Mounting thread	1/8" BSP
Max. switching power	50 VA	Lead length	350mm
Min. S.G. of liquid	0.80	Max. wall thickness	10mm
Material	316 Grade Stainless steel		

Mfrs.	List No.	Order Code	1+	5+	10+
	SSF24X035	424-9150			

Horizontal Float - Model SSF29

Internal Fitting



H=90, L = 55, Float dia. = 43

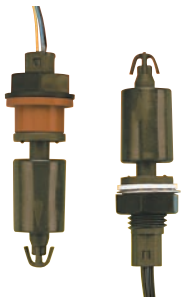
- 316 Grade stainless steel
- Internal side mounting
- Pressure to 40 bar
- Temperature range to 120°C
- User configurable N/O or N/C action
- Reversible switch action

Contact type	1NC / 1NO	Max. temperature	120°C
Max. switching voltage	300VAC	Mounting Style	Internal
Max. switching current	0.5A	Mounting thread	1/8" BSP
Max. switching power	50 VA	Lead length	350mm
Min. S.G. of liquid	0.70	Max. wall thickness	10mm
Material	316 Grade Stainless steel		

249141

Mfrs.	List No.	Order Code	1+	5+	10+
	SSF29X035	424-9185			

Vertical



- SPST Switching
- Repeatability and reliability due to Reed Switch characteristics
- Top or bottom entry
- 500mm connecting lead
- Internal or External fitting
- Level rise or fall sensing (rotate housing 180°)
- Suitable for a wide range of liquids
- Nylon 6.6 or Glass Filled Polypropylene case
- UL Recognised

H=89(58 into vessel)
Float dia = 22.2
Mounting hole dia = (16.5 internal, 23 external fitting)

Typical Sensing Applications

- Deionised water
- Vending machines - Drinking water
- Food processing
- Boiler heating element protection
- Drinking water level - Hot and cold
- Irrigation systems
- Oil level
- Photographic chemicals

	100-6798	100-6797	100-6799
Switching voltage	100VDC	250VAC	250VAC
Switching current	1A	1.0A	1.0A
Switching power	15W	15W	15W
Min S.G	0.7	0.85	0.7
Material - Case	Polypropylene	Nylon 6.6	Polypropylene
Temperature Range	0°C to +80°C	-30°C to +130°C	-30°C to +110°C

233606

Body	Mfrs.	Price Each			
Colour	List No.	Order Code	1+	25+	100+
Charcoal	VS801-51	100-6798			
Blue	VS303-51N	100-6797			
Charcoal	VS803-51	100-6799			



Vertical



Typical Sensing Applications

- Fracking equipment
- Oil tanks
- Agricultural equipment
- Condensate level - alarm system

H = 59mm (45 into vessel), Float dia. = 22mm
Mounting hole dia = 8.5mm, Max. Container wall thickness = 3.5mm

- Level rise or fall sensing (rotate float 180°)
- Suitable for a wide range of liquids
- Temperature range to 70°C
- Specific Gravity to 0.7
- Polypropylene housing
- M8 internal fitting
- Foamed or hollow float (foamed float maintains buoyancy if punctured)
- Top or bottom entry
- Repeatability and reliability due to Reed Switch characteristics

	100-6795	100-6796
Switching voltage	250VAC	250VAC
Switching current	1A	1A
Switching power	15W	15W
Min S.G	0.65	0.65
Float Type	Foam	Hollow
Material - Housing	Polypropylene	Polypropylene
Temperature Range	-30 to +60°C	-30 to +70°C
Sealing Components	Silicone	Silicone
Cable	2 x 22AWG PVC insulated, 0.1m long	2 x 22AWG PVC insulated, 0.1m long

233612

Model Type	Mfrs.	Price Each			
	List No.	Order Code	1+	25+	100+
Foamed Polypropylene (float Material)	VCS-Q2	100-6795			
Polypropylene (Housing), Hollow Polypropylene (Float Material)	VCS-Q4..	100-6796			

Vertical - Stainless Steel



- Level rise or fall sensing (rotate float 180°)
- Suitable for a wide range of liquids
- Temperature range to 120°C
- Specific Gravity to 0.7
- Stainless Steel
- Robust construction
- Internal fitting
- Top or bottom entry
- Repeatability and reliability due to Reed Switch characteristics
- Interface unit available Order Code 730-816

Typical Sensing Applications

- Vending machines - Drinking water
- Food processing
- Drinking water level - Hot and cold
- Boiler heating element protection

H=78(47 into vessel), Float dia = 28
Mounting hole dia = 16.5, Max wall thickness = 10



Switching voltage 100Vdc,250Vac
Switching current 1A
Switching power 15VA
Min S.G 0.75

Material
Temperature Range
Sealing Components
Cable

Stainless Steel
-30°C to +120°C
Silicone
2 x 18AWG PVC insulated

233601

Mfrs.	Order Code		Price Each	
List No.			1+	25+
FVSS-01	100-6801			

Vertical Float - Model SSF22

Internal Fitting



H=53, Float dia. =28

- 316 Grade stainless steel
- Internal mounting to top or bottom
- Compact design
- Temperature range to 120°C
- User configurable N/O or N/C action
- Reversible switch action

Contact type 1NC / 1NO
Max. switching voltage 300VAC
Max. switching current 0.5A
Max. switching power 50 VA
Min. S.G. of liquid 0.80
Material 316 Grade Stainless steel
Max.temperature 120°C
Mounting Style Internal
Mounting thread 1/8"BSP
Lead length 350mm
Max. wall thickness 20mm

249137

Mfrs. List No.	Order Code	1+	5+	10+
SSF22X035	424-9148			



Vertical Float - Model SSF26

Internal Fitting



H=95, Float dia. =50

- 316 Grade stainless steel
- Internal mounting at top or bottom of tank
- Tank access required
- Temperature range to 200°C
- User configurable N/O or N/C action
- Reversible switch action

Contact type 1NC / 1NO
Max. switching voltage 300VAC
Max. switching current 0.5A
Max. switching power 50 VA
Min. S.G. of liquid 0.65
Material 316 Grade Stainless steel
Max.temperature 200°C
Mounting Style Internal
Mounting thread 3/8"BSP
Lead length 350mm
Max. wall thickness 14mm

249139

Mfrs. List No.	Order Code	1+	5+	10+
SSF26X035	424-9161			



Vertical Float - Model SSF28

Internal Fitting



H=74, Float dia. =43

- 316 Grade stainless steel
- Internal mounting at top or bottom of tank
- Tank access required
- Temperature range to 120°C
- Pressure up to 40 bar
- User configurable N/O or N/C action
- Reversible switch action

Contact type 1NC / 1NO
Max. switching voltage 300VAC
Max. switching current 0.5A
Max. switching power 50 VA
Min. S.G. of liquid 0.70
Material 316 Grade Stainless steel
Max.temperature 120°C
Mounting Style Internal
Mounting thread 1/8" BSP
Lead length 350mm
Max. wall thickness 10mm

249140

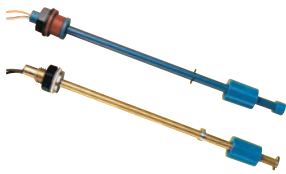
Mfrs. List No.	Order Code	1+	5+	10+
SSF28X035	424-9173			

TROUBLESHOOTING TIPS

Chat online to one of our technical engineers at farnell.com

Float Switches - continued

Extended Vertical Float



- Two position level switch
- High and low level sensing
- Suitable for a wide range of liquids
- Temperature range to 130°C
- Specific Gravity to 0.8
- Nylon 6.6 or Brass housing
- M8 internal or external fitting
- Top or bottom entry
- Both switches closed with float down
- High repeatability and reliability due to Reed Switch characteristics

H=260(224 into vessel), Float dia = 30
Mounting hole dia = 16.5 internal, 23 external fitting
Max wall thickness = 10 internal, 4 external fitting

Typical Sensing Applications

- Water level, high and/or low
- Boiler heating element protection
- Coolant level indication
- Waste water level
- Cooking oil level
- Sump level

233615

Switch Specifications - (When mounted from the top)

Contact Form	SPST
Switching voltage	100V dc
Switching current	0.3 A
Switching power	3W
Min S.G	0.8
Cable	3 x 18AWG PVC insulated, 0.5m long
Cable Colours	Black/White

Type	Mftrs List No.	Order Code	Price Each		
			1+	10+	25+
Nylon 6.6	FEVS312-51	100-6764			
Brass	FEVS722-51	100-6765			

Dual Position Float - RSF66 Series

Internal Fitting



- WRAS Approved
- Simple to mount and use
- PPS material
- Switching capability to 240VAC

Material	PPS
Temp. range	-10 °C to 85 °C
colour	Grey
Min. Fluid SG	0.85
Switching volt- age	DC : 120 V - AC : 240V
Switching pow- er	25VA
Switching cur- rent	0.6A

All ratings are for resistive load only

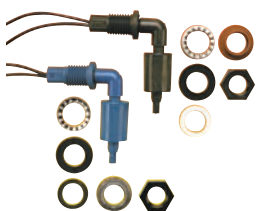
Order Code	Upper Switch Level	Lower Switch Level	Total Length
424-9318	25mm	75mm	102mm
424-9320	25mm	100mm	127mm
424-9331	25mm	125mm	152mm
424-9343	25mm	150mm	177mm
424-9355	25mm	175mm	202mm

Notes: Upper switch is open when level is low, closing when level rises to 25mm from top. Lower switch is open when level is high, closing when level falls to the lower switch level as indicated in the chart.

249264

Mftrs. List No.	Order Code	Price Each		
		1+	5+	10+
RSF66A25B75	424-9318			
RSF66A25B100	424-9320			
RSF66A25B125	424-9331			
RSF66A25B150	424-9343			
RSF66A25B175/538	424-9355			

Right Angle



- Level rise or fall sensing (rotate float 180°)
- Suitable for a wide range of liquids
- Temperature range to 80°C
- Specific Gravity to 0.7
- Glass Filled Polypropylene
- UL Recognised
- Side tank entry
- Internal or External fitting
- Repeatability and reliability due to Reed Switch characteristics

Float dia = 22.2
Mounting hole dia = 16.5mm internal, 23mm external fitting
Max wall thickness = 10mm internal, 4mm external fitting

Typical Sensing Applications

- Coolant level indication
- Condensate level alarm
- Vending machines - Drinking water
- Boiler heating element protection
- Drinking water level - (WRC approved for Cold)



	100-6791	100-6792
Switching voltage	100Vac/dc	250VAC, 100VDC
Switching current	1A	1A
Switching power	15W	15W
Min S.G	0.65	0.65
Material	Polypropylene	Polypropylene
Temperature Range	-30 to +80°C	-30°C to +80°C
Sealing Components	Silicone	Silicone
Approvals	UL	UL
Cable	2 x 18AWG PVC insulated	2 x 18AWG PVC insulated

233594

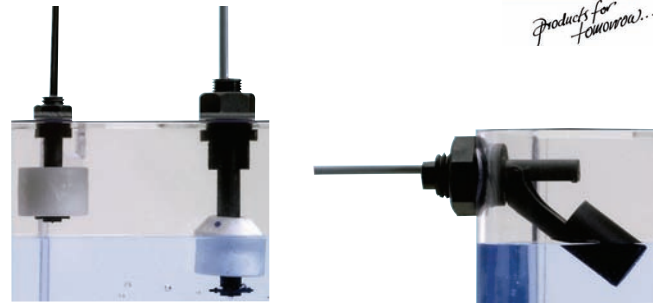
Colour	Mftrs. List No.	Order Code	Price Each		
			1+	25+	100+
Charcoal	RS801-51	100-6791			
Blue	RS803-51	100-6792			

Reed Level Sensor

Water or Dilute Acid



Products for tomorrow.



LS02 - L (overall) = 75, Dia. (float) = 23.5mm

LS03 - L (overall) = 80, Dia. (float) = 17.2mm

Standard liquid level sensors for water applications and dilute acids.

The shaft, nut and float are manufactured from black polypropylene, the seal from nitrile rubber. They are terminated by a PVC cable with across section of 0.14mm² and a length of 500mm.

The LS02 has to be mounted vertically; the LS03 version should be mounted horizontally.

Contact Form	1 Form A / 1 Form A	Switching current A (max)	0.5
Contact resistance mR (max)	150	Switch carry current A (max)	1
Switch power W (max)	10	Breakdown voltage V dc	240
Switch voltage V dc (max)	200	Temperature, operating °C	-20 to +90°C

417823/436283

Mftrs. List No.	Order Code	Price Each			
		1+	10+	25+	50+
LS02-1A66-PP-500W	107-9489				
LS02-1B71-PP-500W	107-9490				
LS03-1A71-PP-500W	107-9491				

Horizontal Float - RSF40 Series



Internal Fitting



The units are supplied with Normally Open contacts. By inverting the float bobbin, the contacts become Normally Closed.

The switches are designed to be mounted on the side of a vessel from the inside.

Contacts close when the pivoted actuator magnet comes close to the reed switch in the main body. Supplied with fixing nut, sealing ring and PVC connecting cable.

151-643 - Compact size. Suitable for use with non-corrosive fluids with temperatures up to 100°C

151-644 - Compact size. Significantly longer life at sustained temperatures of 80°C to 100°C. Also compatible with a variety of industrial chemicals.

732-709 - Compact size. 120°C maximum operating temperature. Ideal for applications with continuous exposure to boiling water. Good resistance to a wide range of chemicals and to water absorption.

Order Code	151-643	151-644	732-709	146-300
Style	Compact	Compact	Compact	Standard
Case Material	Nylon	Polypropylene	PPS	Nylon
Mtg. Hole Dia.	12.7mm	16.5mm	16.5mm	12.7mm
Max. switching voltage	250VAC, 140VDC	440VAC, 1000VDC	440VAC, 1000VDC	250VAC, 120VDC
Max. switching current	0.5A	0.5A	1A	2A
Max. power	15VA	15VA	25VA	100VA
Min. S.G. of liquid	0.85	0.85	0.85	0.80
Temperature range	-20°C to +75°C	-20°C to +100°C	-10°C to +120°C	-20°C to +75°C
Case colour	Dull Black	Opaque	Grey	Dull Black

624183

Body Material	Mftrs. List No.	Order Code	Price Each		
			1+	25+	100+
Compact Size					
Nylon	RSF43Z100JC032	151-643			
Polypropylene	RSF44Z100JF035	151-644			
PPS	RSF46Y050TG515	732-709			
Standard Size					
	RSF33W100NC	146-300			

Horizontal Float - Compact

Side Fitting



NEW

- Compact design
- Reliable reed switch contacts
- NO Contacts
- Switching 100VA, 300V ac/300V dc and 1A Maximum
- Switch action may be reversed by rotating the device through by 180°
- Connection via 1m PVC Leads
- **WRAS** Approved

626458

Body	Mftrs.	Price Each				
Material	List No.	Order Code	1+	5+	10+	25+

Internal Fitting - Nitrile Gasket - Integral Thermistor Output

Nylon	TSF43H100DF	187-7517 ●				
PP (Polypropylene)	TSF44H100DF	187-7518 ●				
PPS (Polyphenylene Sulphide)	TSF46H100DF	187-7519 ●				

External Fitting - Nitrile Gasket - Integral Thermistor Output

Nylon	TSF73H100DN	187-7520 ●				
PP (Polypropylene)	TSF74H100DN	187-7521 ●				
PPS (Polyphenylene Sulphide)	TSF76H100DN	187-7522 ●				

Internal Fitting - Nitrile Gasket

Nylon	RSF43H100RF	187-7523 ●				
PP (Polypropylene)	RSF44H100RF	187-7524 ●				
PPS (Polyphenylene Sulphide)	RSF46H050TG	187-7526 ●				
PPS (Polyphenylene Sulphide)	RSF46H100RF	187-7527 ●				

External Fitting - Nitrile Gasket

Nylon	RSF73H100RN	187-7528 ●				
PP (Polypropylene)	RSF74H100RN	187-7529 ●				
PPS (Polyphenylene Sulphide)	RSF76H050TV	187-7530 ●				
PPS (Polyphenylene Sulphide)	RSF76H100RN	187-7531 ●				

External Fitting - 1/2" NPT Taper Thread

Nylon	RSF83H100R	187-7532 ●				
PP (Polypropylene)	RSF84H100R	187-7533 ●				
PPS (Polyphenylene Sulphide)	RSF86H050T	187-7534 ●				
PPS (Polyphenylene Sulphide)	RSF86H100R	187-7535 ●				

Horizontal Float - RSF70 Series

External Fitting



- UK Water Research Council Approved
- **UL** Recognised
- Rotate 180°, rise or fall to operate

L=88 (overall), 55 (actuator),
Mounting hole dia.=23.0,
Max. wall thickness=4.0, Leads L=0.5m

Horizontal liquid level switches similar to RSF40 (Compact) Series, but incorporating a compression seal to permit fitting from outside the vessel. SPST switch action using reed switch.

	730-609	730-610	732-722
Max. switching voltage	240VAC, 120VDC	240VAC, 120VDC	240V, 120V
Max. switching current	0.6A	0.6A	0.6A
Max. power	25W	25W	25W
Min. S.G. of liquid	0.85	0.85	0.85
Material	GFS Nylon	GFS Polypropylene	PPS
Temperature range	-20°C to +75°C	-20°C to +100°C	-10°C to +120°C
Case colour	Black	Opaque	Grey

212280

	Mftrs. List No.	Order Code	1+	10+	50+
GFS Nylon	RSF73Y050RM	730-609			
GFS Polypropylene	RSF74Y050RM	730-610			
PPS	RSF76Y050TV518	732-722			

Horizontal, Drop Float



L=102 (overall), 69 (inside vessel)
Mtg. hole dia.=16.5, Max. wall thickness=6.0, Leads L=0.5m

- Special 'drop-float' actuator allows the switch housing and float pivots to be located above the surface of the liquid
- Eliminates problems caused by the pivot points on a conventional float switch sticking due to limescale build-up etc.
- Polypropylene type is compatible with a variety of industrial chemicals

- Polysulfone type is **FDA** approved, suitable for food grade applications
- PPS type will withstand continuous exposure to boiling water
- PPS type has good resistance to wide range of chemicals and to water absorption
- High 25W rating
- **UL** Recognised and **WRC** approved

The switch provides a normally closed contact, opening as the liquid level rises. it is mounted on the side of the vessel from the inside.

	730-622	732-692
Max. switching voltage	240VAC, 120VDC	240VAC, 120VDC
Contact rating	25VA	25VA
Max. switching current	0.6A	0.6A
Min. S.G. of liquid	0.80	0.80
Material	Polypropylene	PPS
Temperature range	-20°C to +100°C	-10°C to +120°C
Case colour	Opaque	Grey

212272

	Mftrs. List No.	Order Code	1+	10+	50+
Polypropylene	RSF14Y050RF502	730-622			
PPS	RSF16Y050TG517	732-692			

Vertical Float - Compact

Internal Fitting



- Compact design
- Reliable reed switch contacts
- NO Contacts
- Switching 100VA, 300V ac/300V dc and 1A Maximum
- Switch mounting is either from the top or bottom of the tank
- Connection via 1m PVC Leads
- Nitrile gasket
- **WRAS** Approved and **UL** Recognised



NEW

626482

Body	Mftrs.	Price Each				
Material	List No.	Order Code	1+	5+	10+	25+
Nylon	RSF53H100RC	187-7536 ●				
PP (Polypropylene)	RSF54H100RC	187-7538 ●				
PPS (Polyphenylene Sulphide)	RSF56H050TB	187-7539 ●				
PPS (Polyphenylene Sulphide)	RSF56H100RC	187-7540 ●				

Vertical Float - RSF50 Series



- **UL** recognition on N/O contact versions
- High 25W rating on N/O versions
- Float reversal, rise or fall to operate (N/O versions)
- Nylon, polypropylene or PPS (polyphenylene sulphide) body
- Normally open or changeover contacts
- PPS type withstands continuous exposure to boiling water
- PPS type gives good chemical and water absorption resistance

H=70 (overall), 44 (inside vessel)
Float dia.=27, Mtg. hole dia.=12.2
Cable L=1m

	730-646	730-658	730-660	730-671	732-710
Contacts	1NO	1CO	1NO	1CO	1NO
Case material	Nylon	Nylon	Polypropylene	Polypropylene	PPS
Switching current @ 0-30V	0.6A ac/ 0.5A dc	--	0.6A ac/ 0.5A dc	--	0.6A ac/ 0.5A dc
Switching current 120V	0.2A ac/ 0.15A dc	--	0.2A ac/ 0.15A dc	--	0.2A ac/ 0.15A dc
Switching current 240V	0.1A ac	--	0.1A ac	--	0.1A ac
Max. switch current	--	0.25A	--	0.25A	--

Float Switches - continued

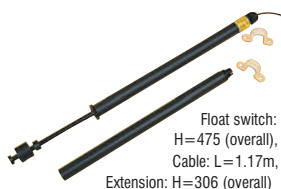
Vertical Float - RSF50 Series - continued

	730-646	730-658	730-660	730-671	732-710
Max. switch voltage	--	48V ac/28V dc	--	48V ac/28V dc	--
Max. power	25VA	3VA	25VA	3VA	25VA
Min. S.G. of liquid	0.80	0.80	0.80	0.80	0.80
Temperature range °C	-20 to +75	-20 to +75	-20 to +100	-20 to +100	-10 to +120
Case colour	Black	Black	Opaque	Opaque	Grey

212278

	Mfrs. List No.	Order Code	Price Each		
			1+	25+	100+
Nylon N/O	RSF53Y100RC	730-646			
Nylon C/O	RSF53V100MC	730-658			
Polypropylene N/O	RSF54Y100RC	730-660			
Polypropylene C/O	RSF54V100MC	730-671			
PPS N/O	RSF56Y050TB516	732-710			

Variable Insertion Depth Vertical Float



Float switch:
H=475 (overall),
Cable: L=1.17m,
Extension: H=306 (overall)

- Variable insertion depth float switch is capable of a maximum insertion depth of 450mm
- Insertion depth can be increased by the use of extension tubes, each 306mm long including the connection adaptor
- A maximum of 3 extension tubes can be utilised to achieve a maximum insertion depth of 1350mm
- UL Recognised

The extension tube is fitted by initially removing the cable gland from the float switch and screwing the extension tube to the float switch. The cable gland is then reassembled into the end of the extension tube. The float switch is mounted at the desired level using the clamp supplied.

Temperature range	0°C to +75°C	Min. SG of liquid	0.85
Max. voltage	50V ac/dc	Float material	Polypropylene
Max. current	0.5A ac	Stem material	Polyphenylene sulphide (PPS)

Max. power	10W/VA	Body/extension	PVC, class 7
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212273

	Mfrs. List No.	Order Code	Price Each				
			1+	5+	10+	25+	50+
Switch	RSF64EXS	730-683					
Extension	RSF64EXT	730-695					

Vertical Float



- Liquid level float switch for vertical mounting, suitable for either high or low level indication
- Suitable for use in fresh and salt water, diesel oil, paraffin and various dilute acid and alkaline solutions

The units are supplied with normally open contacts, but by inverting the float bobbin the contacts become normally closed. Supplied with a 1m PVC cable.

Max. switching current	1A
Max. switching voltage	240VAC, 300VDC
Max. switching power	24VA
Min. S.G. of liquid	0.80
Temperature range	-10°C to +75°C
Case Material	Polypropylene

L=48 (overall), Mtg dia = 3/8",
Float travel = 9.5, Float dia = 25

212429

Order Code	Price Each			
	1+	25+	100+	250+
103-846				

Vertical Float Switch

Fast Lift



The LLF range of vertical float-switches have been developed for applications where ultra low levels are required to be detected.

Unlike conventional float arrangements, the LLF uses a large diameter Buna float to allow SGs as low as 0.45 to be sensed with very little fluid due to its' extremely low freeboard. The float will start operating in as little as 6mm of fluid. Available in 2 lengths the LLF is ideal for drip tanks, hatch alarms and other applications where sensitive fluid level detection is required.

- Internal Mounting style
- 10mm Switch Actuation level
- Low SG operation (0.45)
- Float material - Buna
- 200mm and 50mm variants
- Connection by 2 core PVC covered cable 1m long
- Switching 25VA, 240V ac/120V dc and 600mA
- High quality reedswitch contacts for optimum performance

626522

Switching Action	Mfrs. List No.	Order Code	1+	5+	10+	25+
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50mm Length

Make on Rise	LLF59Y100JC	187-7551				
Break on Rise	LLF59Y100JC004	187-7552				

200mm Length

Make on Rise	LLF69A198	187-7553				
Break on Rise	LLF69B198	187-7554				

Stainless Steel, Vertical Float

Horizontal/Vertical Mounting



Stainless steel liquid level sensors with vertical float, versions available for vertical mount and horizontal mount with right angle stem. Designed to operate in a wide range of environments. SPST switch action.

- Internal vessel mounting
- 50W switching capability
- Float reversal, rise or fall to operate
- UL Recognised
- Top or bottom tank mounting
- Silicone sealing washer

Mounting hole dia. = 10, Leads L = 0.3m

Switching Capacity	50W	Min. S.G. of liquid	0.75
Switching Voltage	240VAC/200VDC	Case material	Stainless Steel 304
Switching/Carry current	0.5A/1A	Operating pressure	0bar to 10bar
Operating temperature	-10°C to +120°C (intermittant to 200°C)		

212238

Type	Mfrs. List No.	Order Code	Price Each			
			1+	5+	10+	25+
Vertical mount	RF3001A/VFS30	730-180				
Horizontal mount	RF3002A/HFS30	730-191				

Submersible Float Switch

Cable Mounted



This is a single switch point liquid level probe, for use in water or aqueous liquids, designed to be suspended into the liquid by its cable. It can be configured to give make or break action on either rise or fall, by removing the protective shield and reversing the float orientation. The switching level may be adjusted by varying the cable length. The reed-switch contact is suitable for switching signal levels, up to 50 volts. The main uses for this probe are level switch for narrow boreholes, or applications with restricted space and also as a signal switch for reservoir high or low level monitoring. It are manufactured with standard PVC cable lengths of 15 metres.

NEW

H(Overall) = 160, Dia. = 35mm

- Float in Polypropylene
- Housing and shield manufactured from stainless steel
- Operating temperature range from 0°C to +55°C
- Minimum fluid SG 0.8
- Maximum working pressure 5 bar
- Switching power 25VA, 50V ac/dc @ 600mA maximum

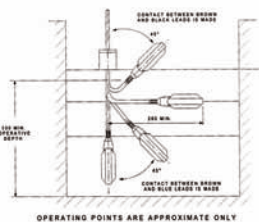
626522

Mfrs. List No.	Order Code	Price Each			
		1+	5+	10+	25+
SLP4AP15	187-7567				

Level Regulators - Overview of Operation



TRITON CONTROLS LTD.



The sealed float chamber swings vertically about a weight attached to the cable, which causes the contacts to change as the liquid level falls and rises.

234882

Level Regulators - LR02 & LR02IS - ATEX Approved

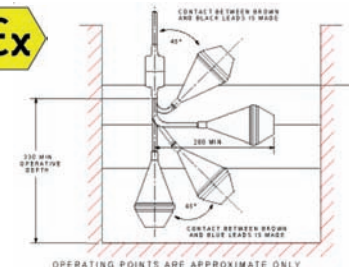


TRITON CONTROLS LTD.

5m, 10m, 20m cable



Float: L = 170, Dia. = 90



OPERATING POINTS ARE APPROXIMATE ONLY

Sealed float chamber in synthetic rubber housing. Float swings vertically about weight. Contacts change state as liquid level falls or rises.

- Chemical-resistant HYPALON rubber housing
- Simple to install
- Changeover contacts, three core cable
- Trouble-free operation

Contact rating	LR02 = .250V5A	Actuation	LR02 : Internal roller ball and microswitch arrangement
Max. temperature	70°C	Position of weight	Fixed, 120mm from float
Specific Gravity	0.80 to 1.3		
Max. submerged depth	20 metres		

WARNING: MERCURY SWITCHES SHOULD NOT BE OPENED

212313

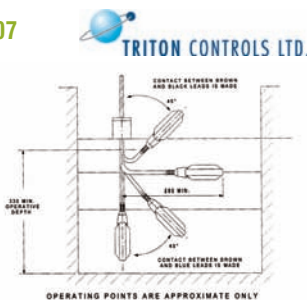
Cable Length	Mftrs. List No.	Order Code	1+	5+	10+	25+	Price Each
Non-mercury Regulators							
5m	LR02-L05M	706-3830					
10m	LR02-L10M	706-3842					
20m	LR02-L20M	706-3854					
ATEX Rated							
5m	LR02IS-L05M-ATEX	129-9548					
10m	LR02IS-L10M-ATEX	129-9549					
20m	LR02IS-L20M-ATEX	129-9550					

Level Regulators - LR03, LR06, LR07

PVC, CPE, PUR and EPDM cable



Float: L = 103, W = 81 Weight: L = 57, Dia. = 50



Sealed float chamber in plastic housing. The float swings vertically about a weight attached to the cable or the cable attachment point on the side of the vessel, which causes the contacts to change as the liquid level drops or rises.

- Change over contacts, three core cable available with:
- LR03, PVC cable for general use
 - LR06, PUR cable for use in DIESEL OIL
 - LR07, WRAS Approved EPDM cable for use in POTABLE WATER
 - Easy to install and inexpensive
 - Non mercury construction
 - Trouble-free operation
 - Optional adjustable ballast weight
 - Non-mercury level regulator

Contact rating	250V, 15A	Max. submerged depth	20 metres
Max. temperature	70°C	Actuation	Internal steel roller ball and microswitch arrangement
Specific Gravity	0.90 to 1.3	Position of weight	Adjustable, 280mm minimum from end of float

212312

Cable Length	Cable Type	Mftrs. List No.	Order Code	1+	5+	10+	25+	Price Each
5m	PVC	LR03-L05M.	706-4263▲					
10m	PVC	LR03-L10M.	706-4275▲					
5m	PUR	LR06 L05M.	388-9841▲					
10m	PUR	LR06 L10M.	388-9853▲					
5m	EPDM	LR07 L05M.	388-9877▲					
10m	EPDM	LR07 L10M.	388-9889▲					
5m	CPE	LR03-L05M-CPE	129-9545●					
10m	CPE	LR03-L10M-CPE	129-9546●					
Weight LR03/LR06		LR03-W.	706-4287▲					
Weight LR07		LR07-W.	390-6541▲					

Float Switch - Non Mercury

LR08 and LRW8 Series



Float - L = 174, Dia. = 100mm

- Contact Rating @ 250V ac - 15A non-inductive, 10A inductive
- 70°C Maximum temperature
- 20m maximum submerged depth
- Operational in specific gravities from 0.8 to 1.3

Float Switches are inexpensive and efficient liquid level detectors. They are simple to install, and designed for trouble free operation over a long life.

The LR08 is a plastic float switch using a CPE (Chlorinated Polyethylene) synthetic rubber 3 core cable. Actuation is via a roller ball and micro-switch arrangement within the switch thereby eliminating all heavy metals from these products.

The unit comprises two major components:

1. The float chamber which houses the micro-switch arrangement, totally sealed within a polypropylene casing, with a single pole double throw action.
2. The three-cored cable CPE, connected to the micro-switch assembly inside the float chamber and supplied in three standard lengths.

Two versions are available:

1. LR08 - The float is a standard buoyant type and an optional stabilizing weight may be fixed at any point on the cable.
2. LRW8 - The counter weight is inside the polypropylene chamber, hence giving the float a self tilting action.

Whilst no hard and fast rules apply to the mounting of these units, the lead should be supported in an enclosed vessel, and in an open vessel it is advantageous to clip the lead to

the side, especially if excessive turbulence is experienced. To obviate the effects of rapid switching conditions that would result if such turbulence is experienced, it is advantageous to use a maintaining circuit which both safeguards the micro-switch and cuts out any chatter in the starters of associated pumps etc

631016

Cable Length	Mftrs. List No.	Order Code	1+	5+	10+	25+	Price Each
Buoyant Type							
5m	LR08-L05M	189-4660●					
10m	LR08-L10M	189-4661●					
20m	LR08-L20M	189-4662●					
Internal Counter Weight Type							
5m	LRW8-L05M	189-4664●					
10m	LRW8-L10M	189-4665●					
20m	LRW8-L20M	189-4666●					
Accessories							
1kg Weight for LR08	LR08-W	189-4669●					

Float Switch - Non Mercury

LR09 Series



Float - L = 103, Dia. = 42mm

- Contact Rating @ 250V ac - 2A non-inductive, 2A inductive
- 70°C Maximum temperature
- 10m maximum submerged depth
- Operational in specific gravities from 0.8 to 1.3

NEW

Float Switches are inexpensive and efficient liquid level detectors. They are simple to install, and designed for trouble free operation over a long life.

The LR08 is a plastic float switch using a CSP (chlorosulphonated Polyethylene) synthetic rubber 3 core cable. Actuation is via a roller ball and micro-switch arrangement within the switch thereby eliminating all heavy metals from these products.

The unit comprises two major components:

1. The float chamber which houses the micro-switch arrangement, totally sealed within a polypropylene casing, with a single pole double throw action.
2. The three-cored cable CSP, connected to the micro-switch assembly inside the float chamber and supplied in three standard lengths.

The optional stabilizing weight may be fixed at any point on the cable using the rubber O ring supplied. The weight is sealed within a moulded polypropylene housing. In order to provide total positional security in lubricants and similar liquids, a nylon cable-tie is provided for attachment to the cable beneath the weight.

Whilst no hard and fast rules apply to the mounting of these units, the lead should be supported in an enclosed vessel, and in an open vessel it is advantageous to clip the lead to the side, especially if excessive turbulence is experienced. To obviate the effects of rapid switching conditions that would result if such turbulence is experienced, it is advantageous to use a maintaining circuit which both safeguards the micro-switch and cuts out any chatter in the starters of associated pumps etc.

The micro-switch assembly inside the float, axially mounted in line with the weight, changes contacts according to the float's position, as in the diagram below. Therefore as the liquid level drops or rises slowly, a pump or flow control suitably connected, can be switched in or out to maintain an average level of the liquid. By connecting only one side of the switch, the unit can be also used to fill or empty the tank as required.

631018

Cable Length	Mftrs. List No.	Order Code	1+	5+	10+	25+	Price Each
1m	LR09-L01M-CSP	189-4667●					
5m	LR09-L05M-CSP	189-4668●					
Accessories							
275g Weight	LR03-W.	706-4287▲					

Cable End Float - FFS Series WRAS Approved

Internal Fitting



- Hermetically sealed
- Direct power switching
- Cable mounting
- 100 metre depth capability
- WRAS Approved

Material	Polyethylene, High Density
Temp. range	0 °C to 55 °C
Lead length	5m
Max. working pressure	10 bar
Switching voltage	AC : 250 V - DC : 110V
Specification	10A Switches
Power rating	AC : 750VA - DC : 180W
Switching current Max. resistive	10A
Switching current Max. inductive	AC : 4A - DC : 1A

L = 333, Float h. = 130, Float dia. = 60mm

Contact type	Mftrs. List No.	Order Code	1+	5+	10+	Price Each
10A Switches						
1C0	FFS10CW	424-9276				

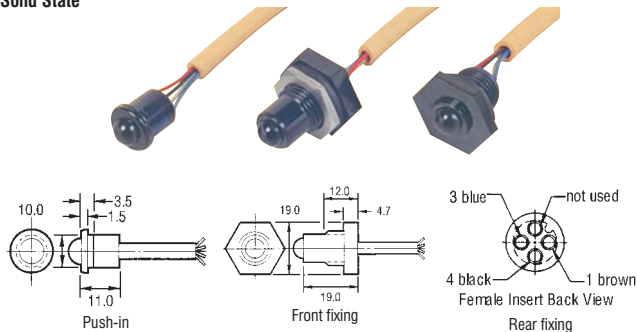
249262

Optical Level Switches

Optical Liquid Level Sensor

Solid State

Honeywell



Solid state liquid level sensors incorporate an optoschmitt trigger which provides a digital output that denotes the present or absence of a liquid. The plastic dome contains an LED and the optoschmitt sensor, arranged so that when it is not covered by a liquid, a light path is established between them by total internal reflection.

Three mounting styles are available. The two threaded styles have a stainless steel fixing nut and fluorosilicone rubber gasket supplied, which fix the sensor from one type and from the rear on the other. The push-in style may be fitted into metal housings or plastic bodies, in some cases an O-ring is recommended to help in the sealing of the finished product.

- Solid state reliability
- Fast response
- Wide temperature range -25°C to +100°C
- Polysulphone body compatible with most industrial liquids
- Suitable for venting machines, food processing and tank level applications

Power Supply	Optoschmitt LED	4.5VDC to 12VDC (5V dc above 85°C) 40mA 5V dc, 30 to 40mA (1.1 to 1.4V dc typ)
Output current		200mA max sinking
Mounting thread		-40°C to +125°C
Connections		250mm flying leads

383310/406083

Type	Mfrs. List No.	Order Code	1+	10+	25+	100+
Push-in	LLE105100	868-8303▲				
Front fixing	LLE102101	868-8311▲				
Rear fixing	LLE103101	868-8320▲				

Level Sensors

Capacitive

BALLUFF



Barrel Style

- Smartlevel 15
- Adjustment free installation
- Freedom from cleaning in most applications
- Self adjusting switching distance
- Non-flush mounting barrel style
- 10 to 35V dc supply
- Reverse polarity and short circuit protection

DC Smartlevel 15 sensors are factory adjusted for standard applications and can reliably detect liquid, conductive media through glass and plastic walls. The factory setting automatically hides glass and plastic walls approximately 0.5 to 6mm thick and compensates for internal or external foam, moisture and contamination. The Smartlevel sensors can be used with liquid, conductive media in otherwise tricky or impossible applications such as seeing through glass and plastic walls even greater than 6mm thick if needed by recalibration at the factory.

552183

Output Type	Mfrs. List No.	Order Code	1+	5+	10+
Barrel Style - M30 X 1.5mm - M12, 4-pin A-coded Connector					
PNP - NO/NC Selectable BCS M30BBM2-PPCFAG-S04G		177-5736●			

Solid State, Industrial

Honeywell



L=90 (overall)

Thread=3/8" BSP, Hex=24 A/F, Connection thread = M12 1

- TTL-compatible 200mA sinking output, fast response

Industrial version of Honeywell solid state liquid level sensor, working on principle of total internal reflection and providing a digital output that denotes the presence or absence of liquid.

Supply voltage	10V DC to 40V DC	Hysteresis	1mm dependent on liquid
Supply current	35mA (LED), 8mA typ. (opto-Schmitt)	Repeatability	±1mm

222174

Price Each

Mfrs. List No.	Order Code	1+	5+	10+	25+
LLN865172-1	723-4612				

Conductive Level Controllers

Miniature Controller - 61FGPN

OMRON



H = 50, W = 38, D = 70

- Space saving version of the 61F-GP general purpose conductive level controller
- Suitable for single or two point level control of conductive materials (liquid or solid)

Electrical connections are via a plug-in octal base.

Operating voltage	110VAC or 240V ac (-15%, +10%)
Electrode voltage	8V ac
Output changeover relay	5A @ 240VAC/24V
Dielectric strength	1500V ac 50/60Hz
Power consumption	3.2VA max.
Temperature range	-10°C to +55°C

224703

Operating Voltage	Mfrs. List No.	Order Code	1+	5+	10+
110VAC	61F-GPN2 110AC	177-887			
240V ac	61F-GPN2 240AC	177-888			
			1+	25+	50+
Surface/DIN	PF083A-E	134-0949●			

Controllers - 61FGP Series

OMRON



- Plug-in conductive level controllers ideally suited to control top and/or bottom levels of fluids
- For use in conjunction with appropriate electrode assembly

General Purpose Type: Single point or differential level control of all conductive liquids. Also suited for refrigeration as an ice bank controller.

H = 92 (overall), W = 64, D = 68

Operating voltage	110% to 240VAC 50/60Hz
Operating voltage range	85 to 110%
Contact rating	3A @ 250V ac (Resistive load), 1A @ 250V ac (Inductive load)
Insulation resistance	@ 500V dc
Dielectric strength	2000VAC
Power consumption	3.5VA max.
Temperature range	-10°C to +55°C

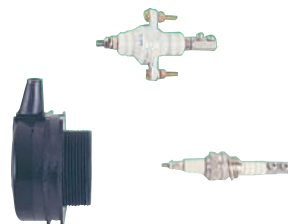
Type	Probe Voltage	Operate Resistance	Release Resistance (Max.)
General purpose	8V ac	4kW	15kW
High sensitivity	24V ac	70kW	300kW

224704

Operating Voltage	Mfrs. List No.	Order Code	1+	5+	10+	+
General Purpose						
110VAC	61FGPN8110AC	160-3070●				
240VAC	61FGPN8240AC	160-3071●				
Screw terminal base			1+	5+	10+	
	8PFA1	160-3074●				

Electrode Holders

OMRON



- Single electrode holder for low specific resistance liquid applications, suitable for acids, alkalis and seawater. Electrode holders will operate correctly when they are up to 1 metre apart
- Triple electrode holder, suitable for three electrodes, has protective terminal cover. Suitable for city water and other general applications
- Single electrode holder available for temperatures up to 250°C and pressures up to 20kg/cm² at the lower portion of the electrode screw. Withstand temperature at the upper portion of the screw is 150°C

224705

	Mfrs. List No.	Order Code	1+	5+	10+
Triple	PS3S	160-3075●			
Single (high temp./pressure)	BS1	160-3076●			

Triple Electrode Set

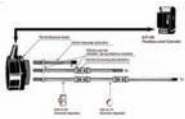


- Triple electrode holder complete with three 1 metre 4mm diameter probes
- Small size and light weight for where limited space is available

224706

Mfrs.	Supply Voltage	Order Code	1+	5+	10+	Price Each
PS31	3.3VDC	160-3077				

Electrodes and Accessories



- Stainless electrodes are 1 metre length 6mm diameter and threaded at each end
- Electrodes can be used in fresh water, drained water, sea water, alkalis and dilute acids
- Electrode separators are used to prevent mutual contact between electrodes
- Electrode connectors connect electrodes together to make longer lengths

The electrodes suit electrode holders Order Code 103-268, 160-3075 & 160-3076

Electrode separators are particularly useful where electrodes are being coupled together to form longer lengths.

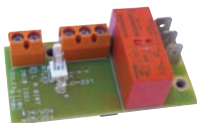
224707

Mfrs.	Supply Voltage	Order Code	1+	5+	10+	25+	Price Each
Electrode	F0301	160-3080					
Electrode separator	F03143P	160-3078					
Electrode connector	F0302	160-3079					

Liquid Level Sensors



ISOLEX8™



The ISOLEX8™ chassis mounting modules utilise advanced ferromagnetic technology to provide full galvanic isolation to liquid level sensing probes. The novel, low impedance technique, which essentially passes no current through the liquid, detects free ions in the liquid, providing reliable level sensing even in conditions of probe deposit build up. The unit has an integral 16 amp changeover relay to control external power loads and is suitable for aqueous based liquids only. A five second re-operate delay prevents sporadic relay operation during 'water slop' conditions. The module has an on board LED to indicate relay active/inactive and diagnostic conditions.

NEW

Supply voltage	230V AC ±15%, 110V AC
Supply current (nominal)	Relay off: 2.5mA Relay on: 10mA
Operation	Relay on when probes in/out liquid, link selectable
Switch circuit power	>30 μW
Relay output	SPCO, 16A resistive @ 240V AC
Operating temperature	-20°C to 65°C
Connection	5 off screw terminals, 3 off 6.3mm blades (relay contacts)

626382

Mfrs.	Supply Voltage	Order Code	1+	5+	10+	50+	Price Each
ISOLEX8 240V	230V	187-5323					
ISOLEX8 110V	110V	187-5324					

Mass Airflow Sensors

Digital Airflow Sensor



Zephyr - HAF Series



Body - H = 12.8, W = 26, D = 19.8mm

- High accuracy
- Full calibration and temperature compensation
- High sensitivity at low flows
- High stability
- Low pressure drop
- Linear output
- Fast response time
- High 12-bit resolution
- Low operating voltage
- ASIC-based I²C digital output
- Bidirectional flow sensing capability
- Insensitive to mounting orientation
- Insensitive to altitude
- Small size

609720

Mfrs.	Supply Voltage	Order Code	1+	10+	25+	50+	Price Each
Short Port - Snap Mount							
HAFBSS0200C2AX3	3.3VDC	182-3264					
HAFBSS0200C2AX5	5VDC	NEW 189-4995					
Short Port - Fastener Mount							
HAFBSF0200C2AX3	3.3VDC	NEW 189-4993					
HAFBSF0200C2AX5	5VDC	NEW 189-4994					
Long Port - Fastener Mount							
HAFBLF0200C2AX3	3.3VDC	NEW 189-4992					
HAFBLF0200C2AX5	5VDC	NEW 189-4996					

Precision mass Airflow Sensor



0 to 3 litres per minute



- Precision unidirectional mass airflow up to 3 l/m
- Stable output across full scale
- Ultra-compact size
- Low power consumption

Power Supply voltage	10.8VDC to 26.4VDC
Current consumption	15mA (no load)
Max. Output voltage - V _{OH}	5V dc to 5.7VDC
Min. Output voltage - V _{OL}	0VDC to 1V dc
Sealing	IP40
Operating temperature	0°C to 50°C

H = 16.8 (Overall), W = 36.6, D = 8mm

435502

Mfrs.	Supply Voltage	Order Code	1+	5+	10+	Price Each
Sensor						
D6F-03A3-000		120-4011				
Connector Cable						
D6F-CABLE2		120-4018				

MEMS Uni-directional Mass Flow Sensor



Dust Resistant



H = 27.2, W = 23.3, D = 10mm (body)

- Unique Dust Segregation System (DSS)
- Cyclone flow structure diverts particulate from sensor element
- PCB Mounted and Connector models available
- High accuracy, reliable mass flow measurement
- Alternative to differential pressure sensing
- Measure over 200 l/m with a bypass set-up

Supply voltage - VDC	5VDC to 10VDC
Current Consumption	15mA
Operating Humidity	Under 85% RH
Operating Temperature	-10°C to 60°C

NEW

518082

Connection	Mfrs.	Order Code	1+	5+	10+	Price Each
PCB Terminals	D6F-P0010A1	157-3150				
3 Pin Connector Version	D6F-P0010A2	157-3151				

Mass Flow Sensor



D6F-01A1
H = 33, W = 33, D = 9mm



D6F-05N2
H = 22.1, W = 62, D = 21.6mm

These small mass flow sensors combine high accuracy with fast response. Therefore they have many applications sensing air, non-corrosive gas and Liquid Natural Gas (LNG) in medical apparatus, combustion control and analysis equipment. Output is via a Molex 3 pin connector. The devices are supplied complete with the connector and 100mm lead.

Supply voltage - VDC	Min. 10.8	Max. 26.4	Operating Humidity	Min. -25°C	Max. Under 85% RH
Current Consumption		60mA	Operating Temperature		+55°C

418055

Gas	Mfrs.	Order Code	1+	5+	10+	Price Each
Air Flow, 0l/min to 1l/min	D6F-01A1-110	100-7612				
Air Flow, 0l/min to 5l/min	D6F-05N2-000	100-7614				

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Mass Airflow Sensors - continued

MEMS Flow Sensor

Dust Resistant



- Dust resistant design
- Incorporates the patent pending Dust Segregation System (DSS)
- 99.5% of dry airborne particulates separated
- Consistent air velocity measurement

Supply voltage - VDC 3.45VDC
 Current Consumption 15mA
 Operating Humidity Under 85% RH
 Operating Temperature -10°C to 60°C

H = 13, W = 8, D = 22mm

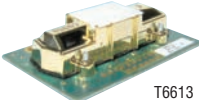


508860

Flow Range	Mftrs. List No.	Order Code	1+	+	+	+	Price Each
0 to 3m/s	D6F-V03A1	157-3149					

Telaire CO₂ Sensor Module

Single and Dual Channel Output



T6613



T6615

- Non Dispersive Infrared gold plated optics
- Diffusion or flow through sampling models
- UART @ 19200 Baud digital output
- 0 to 4V dc Analogue output
- 5V dc Regulated supply required
- Diffusion and Flow Through versions available

T6613 Modules - Factory calibrated eliminating the need for calibration in most applications with Telaire's patented ABC Logic™ software. Lifetime calibration warranty.

T6615 Modules - Dual channel optical system and three point calibration process for enhanced stability, accuracy and reliability. Designed for applications where ABC Logic cannot be used. Sensor may be field calibrated.

552275

Mftrs. List No.	Order Code	1+	5+	10+	Price Each
T6613 - ABC Logic					
T6613	177-6487				
T6613-F	177-6488				
T6615 - Dual Channel					
T6615	177-6490				
T6615-F	177-6491				
T6615-5K	177-6492				

Precision mass Airflow Sensor

0 to 50 litres per minute



A6

- Precision unidirectional mass airflow up to 50 l/m
- Stable output across full scale
- Straight connect Rc 1/4 screw (A6 Type)
- Compact size
- Low power consumption

H = 30, W = 78, D = 30mm

Power Supply voltage 10.8VDC to 26.4VDC
 Current consumption 15mA (no load)
 Max. Output voltage - V_{OH} 5V dc to 5.7VDC
 Min. Output voltage - V_{OL} 0VDC to 1V dc
 Sealing IP40
 Operating temperature -10°C to 60°C

435503

Flow Range	Mftrs. List No.	Order Code	1+	5+	10+	Price Each
A6 Type Sensors						
	D6F-10A6-000	157-3145				
	D6F-20A6-000	157-3146				
0l/min to 50l/min	D6F-50A6-000	157-3148				
Connecting Cable						
200mm	D6F-CABLE1	120-4016				

Thermal Mass Flow Sensor

FS1 & FS5 Series



Standard
 Body - H = 0.15, W = 2.4, D = 7mm
 Lead = 195mm



Molded
 Body - Dia. = 6, L = 14mm
 Lead = 184mm

The flow sensor element consists of two temperature dependent platinum resistors, both deposited on one chip. The low resistance resistor, with a small area, is used as a heater. The other resistor serves to measure the reference temperature. Using a bridge circuit, the differing resistance value of the two elements leads to different (self) heating. The (self) heating is dependent upon the applied voltage, the mass flow and the media in which the sensor is located. Higher voltage increases self heating, a higher flow rate increases cooling. If the self heating is kept constant by a suitable controller, the voltage increases with higher flow rates and therefore becomes a measure of the mass flow.

The FS5 is characterised by a thermally more efficient sensor structure which exhibits the same electrical connected loads and a higher chip temperature and is thus more sensitive.

- Easy adaptable for different applications or into housings
- Simple signal processing and calibration
- Insensitive to contamination
- Excellent reproducibility
- Excellent long-term stability
- Ideal for HVAC, medical devices, food industry etc.
- Measuring range up to 100 m/s
- Sensitivity 0.01 m/s
- Temperature range -20°C to +150°C
- Temperature sensitivity <0.1%K (dependent on electronic)

453906

Body Style	Mftrs. List No.	Order Code	1+	10+	25+	Price Each
Gas Sensors						
Standard	FS1.0.1L.195	126-6952				
Molded	FS1.A.1L.195	126-6953				
Standard	FS5.0.1L.195	177-8049				
Molded	FS5.A.1L.195	177-8050				
Liquid Sensors						
Standard	FS1L.0.1L.195	126-6954				
Molded	FS1L.A.1L.195	126-6955				

Microbridge

0 - 0.2 l/min to 0 - 1 l/min



- Sensors give signal-conditioned output proportional to the air/gas flow through the device
- Wide range of applications

Connections
 1 Output voltage
 2 +ve supply voltage
 3 Ground

H = 31.5 (excl pins), W = 20.5 (excl ports), D = 15.5 Port O/D = 5.08, Pin spacing = 2.54, Fixing centres = 12.7

Microbridge mass airflow sensors give a signal conditioned output (1V to 5V dc for a 10V dc supply) proportional to the air/gas flow through the device. They are sensitive to flows up to 1 litre/min (0 - 1000 standards cc's/min). The transducers are uni-directional, the air flow going from P1 to P2.

Applications: Air conditioning (variable air volume), medical ventilation/anaesthesia control, gas analysers, gas metering, fume cabinet and process control.

Excitation voltage 10VDC±10mVDC
 Output voltage 5V at full span
 Null voltage 1.00V dc±50mV dc
 Repeatability and hysteresis ±0.5% of reading
 Response time 3ms (max.)
 Operating temperature -25°C to +85°C
 Overpressure 25 psi

Operating range	147-0604	147-0602
Mftrs. List No.	Oscm to 200scm (0 to 0.2 litres/min) AWM3100V	Oscm to 1000scm (0 to 1 litre/min) AWM3300V

212424

Flow Range	Order Code	1+	+	+	+	Price Each
Oscm to 200scm	147-0604					
Oscm to 1000scm	147-0602					

Microbridge

0 - 5 l/min to 0 - 20 l/min



L = 163 (overall), W = 32, D = 35, Fixing centres = 43.2 20.3

- Flow ranges from 0 to 5 litres/min. up to 20 litres/min.
- Device has two 1/4" NPT snap-on fittings enabling simpler connection

Microbridge uni-directional mass airflow sensors featuring higher flow ranges. Electrical connection is via 4-pin connector (3 pins on device), the mating connector being supplied with the sensor.

Applications: Mass flow testing/calibration systems, medical insufflators, environmental sampling equipment, oxygen concentrators and patient monitors.

Excitation voltage 10VDC ±10mVDC
 Output voltage 5V dc at full span
 Null voltage 1.00V dc ±50mV dc
 Repeatability and hysteresis ±0.5% of reading
 Response time 60ms (max.)
 Operating temperature -25°C to +85°C
 Overpressure 50 psi
 Calibration Nitrogen N₂

212167

Flow Range	Mftrs.		Price Each			
	List No.	Order Code	1+	5+	10+	25+
0l/min to 5l/min	AWM5101VN	516-090				
0l/min to 10l/min	AWM5102VN	516-107				
0l/min to 15l/min	AWM5103VN	516-119				
0l/min to 20l/min	AWM5104VN	516-120				

Mass Air-flow Sensor - AWM 720



H=80, W=37, D=40

- Port Style; Tapered 22mm
- Flow rates upto 200 Standard Litres per minute (SLPM)
- Highly stable null and full scale
- Extremely low hysteresis and repeatability errors, less than 0.35% of reading
- Fast response time, 6ms typical
- Low power consumption, less than 65mW
- Low pressure drop 2.5 cms H2O at full scale

The AWM 720P1 Microbridge mass air - flow sensor provides inline flow measurement with a specifically designed bypass flow housing

Supply Voltage	8 Vdc min, 15 Vdc max	Span Offset	4 Vdc
Output Voltage	1 - 5VDC	Operating Temperature	-25°C to 85°C
Null Shift over temp	± 0.025 Vdc	Media Compatibility	Dry gas only
Output Shift over temp	-2% -25°C to 10°C & +2% 25°C to 40°C	Weight	34g
Null Offset	1V, ± 0.05 Vdc	Shock	100g peak

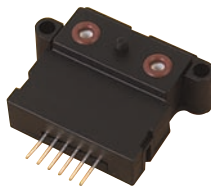
248245

Mftrs. List No.	Order Code	Price Each		
		1+	5+	10+
AWM 720P1	424-5568			

Microbridge Amplified Sensors



Manifold Mount



- Mass airflow sensors
- Wheatstone bridge technology
- O-ring sealed
- 3-pin signal conditioned output
- Operating temperature up to +125°C
- May be used in high common mode pressure range of 150psi

H = 30.2 (excl pins), W (Body) = 30.5mm
Ports - Bore = 2.3mm
O-ring - Dia. = 6.2mm

624193

Flow Range	Mftrs. List No.	Order Code	Price Each			
			1+	5+	10+	25+
0l/min to +1l/min	AWM43300V	721-6713				
0l/min to +6l/min	AWM43600V	721-6725				

Mass Flow Meter - EcoLine EM1



The Mass Flow Meter enables fast and economical measurement of gas flows over a very wide dynamic range. It is based on Sensirion's unsurpassed CMOSens™ sensor technology which combines a sensor element with the amplification and A/D converter circuit on a single CMOS chip. This results in good performance, fast response time and large dynamic range.

- CMOSens™ technology driven
- Calibrated & temperature compensated
- Digital output signal (RS 232 & SPI)
- Various flow ranges: up to 200 l/min (FS)
- High output data speed (up to 200Hz)
- Wide dynamic range (1:40 with 3% m.v. accuracy)

Flow Range:	1207226 : EM1 (V)	0 - 200 l/min	Maximum Pressure:	Operating:	8bar
	1207227 : EM1 (R)	0 - 20 l/min		Burst:	40bar
	2085066 : EM1 (L)	0ln/min to 0.5ln/min	Electrical Data:	Supply voltage range:	7 to 18 V
	1888016 : EM1 (N)	0ln/min to 0.05ln/min		Electrical connector:	Molex
Temperature Range:	Operating:	0°C - 50°C		Output signal:	RS 232 or SPI compliant
	Dynamic:	0°C - 60°C			

337768

Mftrs. List No.	Order Code	Price Each			
		1+	3+	5+	10+
EM1-VOROV-1N	120-7226				
EM1-ROROV-1N	120-7227				
EM1NH4ROV_1N	188-8016				
EM1_L	NEW 208-5066				



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Bidirectional Mass Flow Meter

ASF1430



The Mass Flow Meter enables extremely accurate measurement of fast changing gas flow over 4 orders of magnitude. The performance is based on CMOSens™ sensor technology, which combines a high precision sensor element with the amplification and A/D converter circuit on one single CMOS chip. This results in high resolution, fast response time and a large dynamic range at very low power consumption. All measurement data is fully calibrated and temperature compensated by means of an internal microcontroller. Mounted in a rugged, chemically inert PBT housing the ASF1430 is suitable for such applications as mass flow metering for process control, medical applications, heating ventilation and air conditioning solutions as well as gas flow metrology.

The sensor housing provides two inlets for measuring the gas flow and withstands overpressures of 2 bar (29 psi). The unit requires a supply voltage of between 7 and 18V dc and provides an RS-232 and SPI compliant electrical interface.

- Total mass flow integrator
- Data rates up to 200 Hz
- Dynamic range 0.01 sccm to 400 sccm
- Calibrated and temperature compensated
- RS-232 and SPI digital interface

Measurement Range:	-400 to 400 sccm (bi-directional)
Resolution:	0.1 sccm
Repeatability:	0.0025 % full scale or 0.025 % measured value
Accuracy:	0.05 % full scale or 1 % measured value
Response time:	5 ms (min) to 640ms (max)
Operating temperature:	0 °C to 70 °C

Electrical Data	
Supply voltage range:	7 to 18V dc
Input current:	20 mA @ 9 V (typical), 27 mA @ 9 V (max.)
Output signal:	RS 232 or SPI compliant

243055

Sensor ASF1430	Order Code	Price Each		
		1+	10+	25+
	120-7220			

Milliliter Flow Meter

SLQ-HC60



The SLQ-HC60 Liquid Flow Meter enables fast, non invasive measurements of liquid flow. This product line is especially suited for process monitoring applications in automation technology which require high sensitivity in the milliliter range. It is suited for use with almost all hydrocarbons, as for example, alcohols, oils, gasoline, diesel, etc. and many other chemicals. Excellent chemical resistance is ensured.

NEW

The flow path of the SLQHC60 Liquid Flow Meters is formed by a simple, straight glass capillary. This Swiss made, non invasive flow meter is based on Sensirion's patented CMOSens™ Technology. An internal fourth generation MEMS sensor chip combines a thermal high precision sensor element with amplification circuits and digital intelligence for linearization and temperature compensation on one single microchip - the product's core element.

- Maximum flows up to 80 ml/min
- Sensitive to lowest flows
- Straight flow path, no moving parts
- Fast response time: < 50 ms
- Optimized for hydrocarbons

Flow Measuring Range	2.5ml/min to 80ml/min	Supply Voltage	16V to 26V
Accuracy	10%	Pressure (Max.)	40mbar

658932

Mftrs. List No.	Order Code	Price Each		
		1+	5+	+
SLQ-HC60	208-5067			

CO2 Sensors

Telaire Duct Mount Sensor

Ventostat®



The Ventostat® T8031 duct mount CO₂ transmitter offers accuracy and versatility. This product line touts an unobtrusive form factor that is easy to install, simple to use, and remains accurate over the expected life of the device using Telaire's patented ABC Logic™ (Automatic Background Calibration) technology.

NEW

- Simple installation
- Offers standard 0-10 volt output
- Patented absorption infrared/gas sensing engine provides high accuracy in a compact, low-cost package
- Patented ABC Logic™ self-calibration system eliminates the need for manual calibration in most applications
- Gas permeable, water-resistant diffusion filter prevents particulate and water contamination of the sensor
- Lifetime calibration guarantee

Measurement Range	0ppm to 2000ppm	Non-linearity	<1% of full scale
Duct Air Velocity	0ft/min to 1500 ft/min	Operating temperature range	0°C to 50°C
Accuracy	40 ppm	Output	Analog 0 to 10 VDC

CO2 Sensors - continued

Telaire Duct Mount Sensor - continued

Ventostat® - continued

659240

Mfrs.			Price Each		
List No.	Order Code	1+	5+	+	
T8031	211-4170				

Telaire CO₂, Humidity and Temperature Transmitters

Ventostat® Wall Mount



Improper ventilation can have a negative impact on occupant health and performance, increase the risk from litigation, and/or waste energy. Demand-controlled ventilation using CO₂ sensors prevents energy losses from over-ventilation while maintaining indoor air quality. The most energy savings potential is in buildings where occupancy fluctuates during a 24-hour period. Wall mount sensors are used to control a specific area such as a conference room, classroom, meeting hall, etc. The Telaire 8000 Ventostat series are easy to install and have a clean, modern look that suits most indoor environments.

- Patented, Absorption Infrared Gas sensing engine provides high accuracy in a compact low cost package
- Patented ABC Logic™ self-calibration system eliminates the need for manual calibration in most applications
- Mounting plate with two-piece terminal blocks provide quick, easy wiring
- Gas permeable, water resistant CO₂ diffusion filter prevents particulate and water contamination of the sensor
- Locking screw secures cover and sensor to the mounting bracket for tamper resistance
- Sensors are shipped factory calibrated

659250

Type	Mfrs.		Price Each		
List No.	Order Code	1+	5+	+	
Single Channel					
CO ₂	T8100-E	211-4187			
With Display	T8100-E-D	211-4188			
CO ₂ , Humidity and Temp	T8100-E-HD	211-4189			
Single Channel with Pitot Tube Kit					
With Display	T8300-DB	211-4190			
Dual Channel					
CO ₂	T8200-E	211-4176			
With Display	T8200-E-D	211-4178			
CO ₂ , Humidity and Temp	T8200-E-HD	211-4180			

Wall-Mounted Switch for Ventilation Control

T8013 Telaire®



The Telaire® T8013 series CO₂ switch is a low-cost wall mounted sensing solution for ventilation control. The 8013 provides an intuitive VLI (Visual Level Indicator) display for CO₂ thresholds, to maintain air quality in enclosed spaces. The simple LED array indicates increased CO₂ concentrations based on predetermined thresholds. The LED smoothly transitions between blue, green, yellow and red as the CO₂ concentration increases. Unlike scientific displays, training to understand PPM values is not prerequisite with this innovative product. Indication shows under ventilation (red) or over ventilation (blue), which translates to low air quality (red) or too much energy being used to heat or cool unnecessary outside air (blue). In a heating only application the blue should be ignored if windows are opened to provide cooling.



Indication shows under ventilation (red) or over ventilation (blue), which translates to low air quality (red) or too much energy being used to heat or cool unnecessary outside air (blue). In a heating only application the blue should be ignored if windows are opened to provide cooling.

- Reliable (15 years of low-cost infrared sensor manufacturing)
- Intuitive Light display (VLI)
- 115/230 Vac power supply
- 230 V 8A rated output relay
- Pre-calibrated
- Maintenance free (calibration maintained with patented ABC Logic)
- User selectable output switch point

Measurement range	600ppm to 2000ppm
Stability	<2% of FS over life of sensor (15 year typical)
Response time	<2 minutes for 90% step change typical
Signal update	Every 4 seconds
Operating temperature range	0°C to 50°C
Output	SPDT Switch 230 V 8A resistive
Power requirements	85 VAC to 265 VAC

659272

Mfrs.			Price Each		
List No.	Order Code	1+	5+	+	
T8013	211-4183				

Telaire CO₂ Duct Probe Transmitters

Ventostat® T8041/T8042



A new generation of Telaire CO₂ transmitters targeting indoor air quality and energy conservation applications. The Ventostat® T8041/T8042 duct mount CO₂ transmitters offer accuracy and versatility at an affordable price. This exceptional product line touts an unobtrusive form factor that is easy to install, simple to use, and remains accurate over the expected life of the device using Telaire's patented ABC Logic™ (Automatic Background Calibration) technology.



● Simple installation (mounting hardware and instructions included)

- Two models with different probe lengths to suit a variety of return air duct sizes
- Patented absorption infrared/gas sensing engine provides high accuracy in a compact low-cost package
- Patented ABC Logic™ self-calibration system eliminates the need for manual calibration in most applications
- Gas permeable, water resistant diffusion filter prevents particulate and water contamination of the sensor

Measurement Range	0ppm to 2000ppm
Duct Air Velocity	0ft/min to 1500 ft/min
Stability	<2% of full scale over the life of the sensor
Non-linearity	<1% of full scale
Operating temperature range	0°C to 50°C
Output	Analog 0 to 10 VDC

659284

Mfrs.			Price Each		
Probe Length	List No.	Order Code	1+	5+	+
103.77mm	T8041	211-4184			
205.08	T8042	211-4186			

Handheld Indoor Air Quality (IAQ) Monitors

Telaire® T7000 Series



Equipped with Telaire's patented dual beam Absorption Infrared™ technology, the Telaire T7001 is an easy-to-use CO₂/temperature monitor designed for use in residential or commercial applications.



With the ability to display CO₂ readings and calculate air ventilation rates in cfm/person, the monitor is an ideal tool for: identifying energy saving opportunities in over-ventilated spaces, determining if air quality complaints are due to insufficient ventilation, or locating the presence of combustion fumes generated from vehicles and appliances. It comes

with a power adapter and international adapter kit.

- Identify areas with low or substandard ventilation
- Identify hidden energy savings in overventilated spaces
- Determine if ventilation is a factor in air quality complaints
- Locate the presence of combustion fumes from vehicles and appliances
- Use as a reference to calibrate wall mounted CO₂ sensors

Method	Dual beam, Absorption Infrared	Accuracy	±1°C
Warm up time	<60 seconds	Operating temperature range	0°C to 50°C

659295

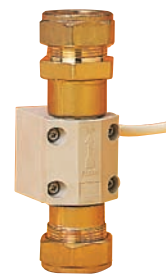
Mfrs.			Price Each		
List No.	Order Code	1+	+	+	
T70011	211-4193				
Data Logger Kit					
T2077	211-4194				

Liquid Flow Sensors and Flow Switches

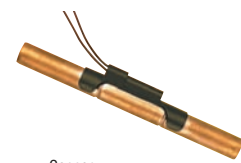
Liquid and Air Flow Switches



Noryl



Brass



Copper

- Operates from a small head of liquid
- Maximum pressure 10 Bar @ 20°C
- Low pressure drop
- Vertical mount ±15°
- Suitable for various pipe sizes
- Triac switching (AC)
- Reed Switch switching (DC)
- Suitable for liquid and air
- Power shower
- Central heating systems
- Mains water control
- Flow sensing
- Leak detection
- Cooling systems

	100-6766	100-6767	100-6768	100-6771	100-6772
Switching voltage	250V rms	300VDC	250VAC	300VDC	300VDC
Contact	1 Form A	SPST	1 Form A	SPST	SPST
Switching current	3A	1A	3A	1A	1A
Switching power	15W	15W	15W	15W	15W
Material	Noryl	Noryl	Brass	Brass	Copper
Temperature Range	-30°C to +100°C	-30°C to +85°C	-30°C to +100°C	-30°C to +100°C	-30°C to +80°C
Flow Rate	1l/min	1l/min	1l/min	1l/min	0.5litre / minute
Fitting	BSP	BSP			

233632

Connection Type	Mfrs.		Price Each			
	List No.	Order Code	1+	10+	25+	
BSP	FS-01	100-6766				
BSP	FS-02	100-6767				
	FS-05	100-6768				
	FS-06	100-6771				
	FS-10	100-6772				

Liquid Flow Switches

1.5l/min and 3.5l/min



- Flow switches in Acetal resin housing, WRC approved for use in potable water systems
- Suitable for use with hot or cold water and alcohol or dilute (including organic) acids up to 5% concentration
- Flow switches can be mounted vertically or horizontally, with the cap upwards

15mm types: L=107, W=56 (standard type), Dia.=15, Cable L=250

22mm types: L=114, W=58 (standard type), Dia.=22, Cable L=250

Available 15mm and 22mm diameter for 1.5 litre/min and 3.5 litre/min flows respectively. Greater sensitivity is achieved with vertical installation.

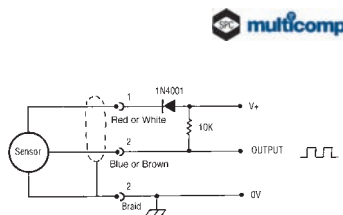
Switch point	1.2 to 1.5l/min (15mm types), 1.2 to 1.5l/min (22mm types)
Switch off flow (max.)	0.5 litres/min. (15mm types), 1.0 litres/min. (22mm types)
Operating temperature	85°C (max.)
Switching voltage	240V rms/dc
Max. full cycle on state surge	1.0A @ 50Hz (standard types)
Max. full cycle continuous	1.0A @ 50Hz (standard types)
Max. switching power	15VA (standard types)

212240

	Mfrs.		Price Each			
	List No.	Order Code	1+	10+	50+	
1.5 l/min, 15VA	FS15	730-889				
3.5 l/min, 15VA	FS22	730-890				

Liquid Flow Sensor

0.05 - 1.67l/min.



H=78, W=32.5, D=27, Lead L=1.9 metres

- Ideal for use with water, petrol etc.
- Bi-directional inlet and outlet

- Use for flow ratio measurement, flow safety, automotive applications etc.

This accurate flow sensor uses Hall effect technology to give a variable frequency pulsed output proportional to the liquid flow rate. The sensor has a POM (Hostaform C) and stainless steel housing, and accepts hoses of either 6mm or 8mm inside diameter. Connection is via a 2 core, screened cable supplied connected to the unit.

Flow range	3l/hour to 100l/hour	Sensor to sensor variation	±5%
Output frequency	22Hz @ 10 litres/hour 133Hz @ 60 litres/hour	Power supply	4.5 to 24V (V _{CC})
Viscosity range	0.8 to 10 centistokes	Output	100mV to V _{CC}
Design pressure	10 Bar	Current consumption	20mA
Signal reproducibility	±1%	Temperature range	-25°C to +85°C

212431

Order Code	Price Each			
	1+	5+	10+	25+
178-923				

INTELLIGENT ONLINE BUYING SYSTEM PROVIDING

Complete cost control, reduced administration time, visibility of your spend, flexibility and personalised to your company's needs.

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Water and Air Flowmeters - 'Loflow'



- Gives accurate indication of low rates of fluid flow
- Easy wall or panel mounting

'Loflow' flowmeters use the principle of variable area flow measurement, utilising the movement of a float inside a calibrated tapered tube. The float is displaced upwards with increasing flow rate until the weight of the float balances the upward force of the fluid. The top of the float then indicates the flow rate on the calibrated scale.

Construction:	
Body	Grillon-TR55
Black body half/ball retainer	ABS 7020
Black panel	PVC
Max. working pressure	10 bar
Max. working temperature	60°C
Accuracy	±2%
Repeatability	±1%

Media	Inlet Port	Flow Rate	Float Material	Order Code
	BSPT Male	Litres/minute		
Water	3/4"BSPT	0.2-2	Acetal	541-266
Water	3/4"BSPT	1.5-10	Stainless Steel	541-278
Water	3/4"BSPT	2-22	Stainless Steel	541-280
Air	1/4" BSPT (male)	1.0-7.5	Acetal	731-092
Air	1/4" BSPT (male)	3-21	Stainless Steel	731-109
Air	3/4"BSPT	5-50	Acetal	731-110
Air	3/4"BSPT	20-135	Acetal	731-122
Air	3/4"BSPT	60-720	Stainless Steel	731-146

Note: These units must be used in the vertical plane

224716

Flow Range	Mfrs.		Price Each				
	(Litres/min)	List No.	Order Code	1+	5+	10+	25+
Water							
0.2-2		LF.2020	541-266				
1.5-10		LF.211	541-278				
2-22		LF.2220	541-280				
Air							
1.0-7.5		LF3007E	731-092				
3-21		LF3021E	731-109				
5-50		LF3050E	731-110				
20-135		LF3135E	731-122				
60-720		LF3720E	731-146				

Water Flow Meters - 'Easiflow'

2 to 100 l/min.



- Calibrated specifically for use with water
- Suitable for installation in any plane
- Flow rate indicated on viewing window
- Wide range of flow rates available, either indication only or with switching facility from either ac or dc supply

CALIBRATION SERVICES

'Easiflow' flowmeters use the principle of difference pressure to give a positive and repetitively accurate indication of flow rate on the calibrated scale.

Construction:			
Body	Polyester	Connections	1" BSP (female)
Viewing area	Borosilicate glass	Max. working pressure	10 bar
Cone	Acetyl	Temperature range	+5°C to +80°C
Spring	Stainless Steel	Viscosity range	10 to 200 centistokes
Seal	Nitrile	Accuracy	±5% f.s.d.
Dimensions (mm)	H (overall) = 196, Ø = 60	Repeatability	±1% f.s.d.

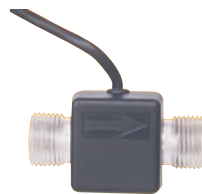
224717

Flow Range	Mfrs.		Price Each				
	(Litres/min)	List No.	Order Code	1+	5+	10+	25+
Flowmeters							
2 to 30		EFW.0302	541-308				
4 to 50		EFW.0502	731-160				
5 to 100		EFW.1002	541-310				

Flow Transducers

Compact, Pulse Output

1 - 25l/min.



'Dataflow Compact' is for monitoring low flows of liquids with an electronic output signal at low cost. Fluid impacts on a twin-vaned turbine which rotates at a speed proportional to the flow rate. The rotation is detected optically and converted to a pulse output signal suitable for display or control of flow rate, totalising or batch control.

Electrical connections, 3 wire	H = 29, W = 52 overall, D = 27
Red = +5V	Connections 3/8" BSP
Green = output signal	Cable L = 300
Blue = 0V	

Compact, Pulse Output - continued

1 - 25ℓ/min. - continued

- Pulse output signal for flows up to 25ℓ/min.
- Lightweight, robust and suitable for most liquids
- Operates in any plane
- Simple to install
- Negligible pressure drop
- Accepts reverse flow
- Low cost flow measurement

Construction		Shaft retainers	Grilamid - TR55
Body	Grilamid - TR55	Max. working pressure	20 bar
Rotor	18% PTFE filled nylon	Pressure drop (max.)	0.1 bar @ 15ℓ/min.
Shaft	Stainless Steel		

Calibration		Temperature range	+5°C to +70°C
'K' Factor	752 pulses/litre	Power supply	+5VDC
Accuracy	±2% typ.	Flow range	1 to 25ℓ/min.
Repeatability	±1%		

212177

Mftrs.	Order Code	1+	5+	10+	25+
List No.					
DFC.9000..	560-121				

4-20mA or 'Pulse' Output - 'Dataflow'

Flow Rates Up To 150ℓ/min.



- 4 to 20mA or pulse output types available
- Works in any plane
- Accepts reverse flow
- Simple to install
- For use with most liquids

H = 100, W = 42, L = 196
Connections: 1" BSP, parallel threads

'Dataflow' flow transducers are designed to operate with most liquids. The transducer is available with either 4 to 20mA output or pulse output.

The 4 to 20mA output type is factory calibrated to 4 to 100 litres/minute, but this can be easily user recalibrated using the zero and span adjusters on the unit.

The pulse output type is factory calibrated but is not user adjustable. It can be used in conjunction with a totaliser or batch counter.

Construction		Calibration	
Body	Polyester	560-108:	4mA - 0ℓ/min., 20A - 100ℓ/min.
Glass tube	Borasilicate	560-110:	'K' Factor, Water - 44.25 pulses/litre
Rotor and locator	Acetal		Oil (viscosity 30cSt) - 51.14 pulses/litre
Seals	Nitrile	Connections	560-108 560-110
Washers and shaft	Stainless Steel		1 +20mA 1 Signal +
Rotor tips	Stainless Steel		2 +24V 2 +24V
			3 No pin 3 Signal -
			4 0V, 0mA 4 0V GND

Max. working pressure	10bar oil/water	Temperature range	+5°C to +80°C oil +5°C to +60°C water
Max. flow rate	150ℓ/min.	Accuracy	±2%
Min. flow indication	2ℓ/min. (max. 150ℓ/min.)	Supply	24V dc

FOR SUITABLE 4 TO 20mA PROCESS INDICATOR, SEE ORDER CODE **118-6900** OR **993-3069**.

222139

Output	Mftrs. List No.	Order Code	1+	5+	10+
4 to 20mA	DFT.990	560-108			
Pulse	DFT.980	560-110			

Ultrasonic Flow Meter

UFB Series



H = 45, W = 69, D = 33.3mm

This innovative design of the UFB Flow Meter provides high accuracy, non-invasive and low cost flow measurement device. The unique measurement technique automatically compensates for viscosity and temperature variations.

The measurement of flow is by ultrasonic transit time in-line cell.



NEW

The flow path is designed to minimise pressure drop and, having no moving parts within, will not clog or jam.

The sensor will allow contaminants to pass through without affecting its performance. The sensor is supplied with pulse and analogue outputs which are selectable by connection wires.

- Non-invasive sensor technology
- Fully electronic with no moving parts
- Automatic viscosity and temperature compensation
- Pulse or analogue output - Selectable
- Low pressure drop
- LED indication of no liquid and of flow rate
- Flow tube internal diameter 10mm
- Connection thread 3/8" BSP

626526

Flow Rate	Mftrs.	Order Code	1+	5+	10+	+
Measurement Range	List No.					
0ℓ/min to 8ℓ/min	UF08B100	187-7555				
0ℓ/min to 8ℓ/min	UF25B100	187-7556				

Liquid Flow Sensor and Bubble Detector

LG01 Series



- Detection of low liquid flow in the ml-Range
- Totally non invasive
- Ultra fast response time of 100 ms
- 7V dc typical supply voltage (5V Min. - 12V Max.)

NEW

H (O/A) = 22mm
Body - Dia. = 8.9, L = 53.1mm

The LG01 Liquid Flow Switch enables detection of flow of liquid in the range of ml/min. The output signal is 5V when the flow rate is higher than the specified Flow Switch Limit and 0V below this limit or when air or bubbles are found inside the sensors flow channel instead of liquid.

Excellent chemical resistance and bio-compatibility are ensured: The flow path of the LG01 Liquid Flow Switch is formed by a simple, straight glass capillary.

Due to the measurement principle the LG01 flow switch characteristics is changing with the thermal properties of the liquid. For aqueous solutions the data above is a good approximation.

For hydrocarbon liquids such as oil, fuel, solvents and so on the Flow Switch Limit is increased. See Data Sheet for more details.

A Maximum Flow Rate of 250 ml/min and more is possible with hydrocarbon liquids for all LG01-2000Axxx models.

Flow Rate	Mftrs.	Order Code	1+	5+	10+
Max. / Flow Switch Limit	List No.				
50 ml/min / 4.5ml/min	LG01-2000A090	189-2814			
220 ml/min / 0.25ml/min	LG01-2000A005	189-2815			

Accessories

Connectivity Kit	LG01 CONNECTIVITY KIT	189-2816			
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Encoders - Incremental

Rotary Position Sensor

3382 Series - Surface Mount



Applications:

- Volume control on audio equipment
- Motion controllers
- Dishwasher control systems
- Automotive temperature range
- Surface mount
- Dustproof
- One million rotational cycles
- Thin profile

H = 2.11, W = 11, D = 12.04mm
Shaft Diameter = 4 mm

Mftrs.	Order Code	1+	10+	50+	100+	500+
List No.						
3382G-1-103G	SMD 171-7387					

EM14 Series - Rotary Optical Encoder with Switch



- HCMOS, CMOS and TTL compatible
- Compact package size
- High rotational cycle life
- Standard or high force push switch option
- Optional detent
- Splashproof shaft seal
- Recommended for human/machine interface applications (HMI)
- Cable/connector option
- Optional bracket

Voltage rating	5VDC
Maximum operating speed	120 rpm
Rotational life	1000000 Cycles (Non-Detent) 1000000 Cycles (Detent)
Operating temperature	-40°C to 70°C

Pulses Per Revolution	Detents	Switch Option	Mftrs List No.	Order Code
32	No Detent	No Switch	EM14A0D-C24-L032N	147-0246
8	32	Push Switch	EM14A1D-C24-L008S	147-0247
64	No Detent	Push Switch	EM14A0D-C24-L064S	147-0248
64	No Detent	No Switch	EM14A0D-C24-L064N	147-0249

488862

Mftrs List No.	Order Code	1+	5+	10+
EM14A0D-C24-L032N	147-0246			
EM14A1D-C24-L008S	147-0247			
EM14A0D-C24-L064S	147-0248			
EM14A0D-C24-L064N	147-0249			

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Rotary Encoders

EC20A Series



- Heavy torque and comfortable operation feel for encoder and potentiometer applications

Applications

- Automobile

Mfrs. List No.	Number of Detent	Pulse	Operating Force	Structure	Shaft Length	Life Cycles
EC20A1820401	18	18	40mN-m	Vertical	30mm	30000
EC20A1824401	18	18	40mN-m	Vertical	30mm	30000

NEW

659691

Mfrs. List No.	Order Code	1+	10+	25+	50+
EC20A1820401	206-5078				
With Push On Switch					
EC20A1824401	206-5079				

Rotary Encoders

EM20B Series



- 20mm size
- Magnetic metal shaft
- Highly reliable non-contact structure applicable to 31-point LED level indicator mounting

Applications

- Professional audio

Mfrs. List No.	Number of Detent	Pulse	Operating Force	Structure	Shaft Length	Life Cycles
EM20B4000000	0	40	7mN-m	Vertical	15.5mm	500000
EM20B4010000	40	40	8mN-m	Vertical	15.5mm	500000
EM20B4014A01	40	40	8N-m	Vertical	10mm	500000

NEW

659695

Mfrs. List No.	Order Code	1+	10+	25+	50+
EM20B4000000	206-5080				
EM20B4010000	206-5081				
With Push On Switch					
EM20B4014A01	206-5082				

Rotary Encoders

SRGA Series



- Absolute
- Hollow shaft
- Increased ease of use

Applications

- Home appliances
- Car AV equipment

Mfrs. List No.	Positions	Changeover Angle	Structure	Output
SRGAV80601	8	45	Vertical	Gray Code
SRGAVC0301	12	30	Vertical	Gray Code
SRGAVQ1100	24	15	Vertical	Gray Code
SRGAR10100	13	15	Vertical	Gray Code

NEW

659697

Mfrs. List No.	Order Code	1+	10+	25+	50+
SRGAV80601	206-5085				
SRGAVC0301	206-5086				
SRGAVQ1100	206-5087				
SRGAR10100	206-5084				

Ring Encoders

SRGP Series



Applications

- Personal audio
- Home appliances
- Car AV equipment

Mfrs. List No.	Number of Detent	Pulse	Width	Operating Force
SRGP300100	18	9	17.5mm	5mN-m
SRGP200200	20	10	17.5mm	7mN-m
SRGP400100	24	12	17.5mm	2mN-m
SRGP400200	24	12	17.5mm	3.5mN-m
SRGPWJ0200	32	16	32mm	6.5mN-m

NEW

659699

Mfrs. List No.	Order Code	1+	10+	25+	50+
SRGP300100	206-5091				
SRGP200200	206-5090				
SRGP400100	206-5092				
SRGP400200	206-5093				
SRGPWJ0200	206-5094				

Ultra Miniature, High Resolution Incremental Kit Encoders



- Three channel output (A & B output with index channel)
- Resolution options from 600 to 4096 cycles per revolution (CPR), up to 16384 counts with 4X decoding
- Cost effective
- -40 to 125°C operating temperature
- Ultra miniature size (Ø17mm)
- Maximum 1 MHz operating frequency
- Maximum 12000 RPM rotational speed
- Single 5V supply
- Integrated RS422 differential line driver
- Integrated bearing stage for easy mounting
- Bottom-up or top-down mounting options

CPR	Counts After X4 Decoding	Mfrs. List No.	Order Code
Bottom Mounting			
1024	4096	AEDA-3300-BA7	116-1068
Top Mounting			
3000	12000	AEDA-3300-TAM	116-1080
4096	16384	AEDA-3300-TAT	116-1083

Mfrs. List No.	1+	5+	10+	25+	50+
Bottom Mounting					
AEDA-3300-BA7			116-1068		
Top Mounting					
AEDA-3300-TAM			116-1080		
AEDA-3300-TAT			116-1083		

Quadrature Decoder/Counter Interface IC's



- Interfaces encoder to microprocessor
- 33 MHz clock operation
- Programmable count modes (1x, 2x or 4x)
- Single or dual axis support
- Index channel support
- High noise immunity
- Schmitt trigger inputs and digital noise filter
- 32-bit binary up/down counter
- Latched outputs
- 8-bit tristate interface

- 8, 16, 24 and 32-bit operating modes
- Quadrature decoder output signals up/down and count
- Cascade output signals, up/down and count
- Substantially reduced system software
- 5 V operation ($V_{DD} - V_{SS}$)
- TTL/CMOS compatible I/O
- Operating temperature: -40 to 100°C
- 20-pin PDIP

Mfrs.	1+	5+	10+	25+	50+
HCTL-2022			116-1110		

Quick Assembly Two and Three Channel Optical Encoder



- Two channel quadrature output with optional index pulse
- Quick and easy assembly
- No signal adjustment required
- Low cost
- Resolutions up to 512 counts per revolution
- Small size
- -40 to 100°C operating temperature
- TTL compatible
- Single 5V supply

Channel	CPR	Shaft Size	Mfrs. List No.	Order Code
HEDM55xx Series				
2	1000	8mm	HEDM-5500#B13	116-1163
HEDS5500 Series				
2	500	3mm	HEDS-5500#A02	116-1181
2	500	4mm	HEDS-5500#A11	116-1184
2	500	6mm	HEDS-5500#A12	116-1185
3	500	2mm	HEDS-5540#A01	116-1203
3	500	3mm	HEDS-5540#A02	116-1204

Mfrs. List No.	Order Code	1+	5+	10+	25+	50+
HEDM-5500#B13	116-1163					
HEDS-5500#A02	116-1181					
HEDS-5500#A11	116-1184					
HEDS-5500#A12	116-1185					
HEDS-5540#A01	116-1203					
HEDS-5540#A02	116-1204					

Encoders - Incremental - continued

Mid-Sized Housed Encoder



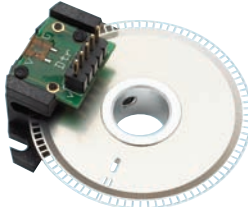
- Two channel quadrature output
- Quick and easy assembly
- Cost-effective
- Ideal for small motor systems
- -10 to 85°C operating temperature
- Hub available in either a set screw configuration or a press fit adhesive mount configuration
- Right angle connector available

Channel	CPR	Shaft Size	Mfrs. List No.	Order Code		
2		5mm	HEDR-5420-ES214	116-1169	442941	
Mfrs. List No.	Order Code	1+	5+	10+	25+	50+
HEDR-5420-ES214	116-1169					

Three Channel Optical Incremental Encoder



Module with Codewheel



- Two channel quadrature output with index pulse
- Resolution from 100 to 500 CPR (Counts Per Revolution)
- Low cost
- Easy to mount
- No signal adjustment required
- Small size
- -10 to 85°C operating temperature
- TTL compatible
- Single 5V supply

CPR	Shaft Size	Codewheel Rop	Mfrs. List No.	Order Code		
500	6.35mm	11.00mm	AEDB-9140-A06	116-1085	442943	
500	6mm	11.00mm	AEDB-9140-A12	116-1086		
500	8mm	11.00mm	AEDB-9140-A13	116-1087		
500	5mm	11.00mm	AEDB-9140-A14	116-1089		
Mfrs. List No.	Order Code	1+	5+	10+	25+	50+
AEDB-9140-A06	116-1085					
AEDB-9140-A12	116-1086					
AEDB-9140-A13	116-1087					
AEDB-9140-A14	116-1089					

Reflective Surface Mount Optical Encoder



- Reflective technology
- Surface mount small outline leadless package
- Single channel incremental output
- Two channel quadrature outputs for direction sensing
- TTL compatible output
- Single 5V supply
- -20 to 85°C absolute operating temperature

No. of Channels	LPI	Mfrs. List No.	Order Code			
2	75	AEDR-8300-1K2	116-1101	442950		
2	150	AEDR-8300-1P2	116-1102			
2	180	AEDR-8300-1Q2	116-1103			
Mfrs. List No.	Order Code	1+	5+	10+	25+	50+
AEDR-8300-1K2	116-1101					
AEDR-8300-1P2	116-1102					
AEDR-8300-1Q2	116-1103					

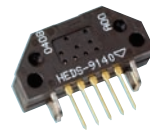
Reflective Surface Mount Optical Encoder



- Reflective technology
- Surface mount small outline leadless package
- Direct replacement of HEDR-8000 encoder
- Single channel incremental output
- Two channel quadrature outputs for direction sensing
- TTL compatible output
- Single 5V supply
- -20 to 85°C absolute operating temperature
- Lead free package

PCB Thickness	No. of Channels	LPI	Mfrs. List No.	Order Code		
1.5mm	2		AEDR-8000-1K2	116-1097	442951	
1.5mm	2	150	AEDR-8100-1P2	116-1099		
Mfrs. List No.	Order Code	1+	5+	10+	25+	50+
AEDR-8000-1K2	116-1097					
AEDR-8100-1P2	116-1099					

Three Channel Optical Incremental Encoder Module



- Two channel quadrature output with index pulse
- Resolution up to 1000 CPR (Counts per Revolution)
- Low cost, easy to mount
- No signal adjustment required
- Small size
- -40 to 100°C operating temperature
- TTL compatible
- Single 5V supply

no. of Channels	Mfrs. List No.	Order Code				
3	HEDS-9040#B00	116-1235	442953			
3	HEDS-9140#I00	116-1240				
Mfrs. List No.	Order Code	1+	5+	10+	25+	50+
HEDS-9040#B00	116-1235					
HEDS-9140#I00	116-1240					

Encoder Line Drivers



- Available on encoder kit housing (HEDM-5500 Series)
- Complementary outputs
- Industry standard line driver IC
- Single 5V supply
- Onboard bypass capacitor
- Operating temperature up to 70°C

No. of Channels	CPR	Shaft Diameter	Mfrs. List No.	Order Code		
2	1000	8mm	HEDL-5560#B13	116-1148	442958	
Mfrs. List No.	Order Code	1+	5+	10+	25+	50+
HEDL-5560#B13	116-1148					

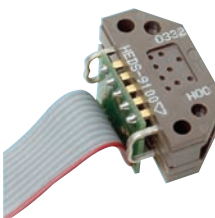
Two Channel Codewheel



- Cost effective
 - Resolutions from 100 to 1024 CPR
 - For use with HEDS-90xx/91xx Series two channel encoders
- | Shaft Diameter | Mfrs. List No. | Order Code |
|----------------|----------------|------------|
| 5mm | HEDS-5120#C14 | 116-1172 |
| 6.35mm | HEDS-5120#I06 | 116-1175 |
| 15.875mm | HEDS-6100#B10 | 116-1224 |
| 12.7mm | HEDS-6140#B09 | 116-1227 |

Mfrs. List No.	Best-Nr.	1+	5+	10+	25+	50+
HEDS-5120#C14	116-1172					
HEDS-5120#I06	116-1175					
HEDS-6100#B10	116-1224					
HEDS-6140#B09	116-1227					

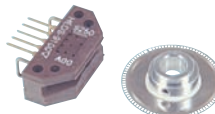
Two Channel High Resolution Optical Incremental Encoder Module



- High resolution: up to 1024 CPR
- Two channel quadrature output
- Low cost
- Easy to mount
- No signal adjustment required
- Small size
- -40 to 100°C operating temperature
- TTL compatible
- Single 5V supply

Codewheel ROP	No. of Channels	CPR	Mfrs. List No.	Order Code		
11.00mm	2	LPI	HEDS-9200#300	116-1241	442961	
Mfrs. List No.	Order Code	1+	5+	10+	25+	50+
HEDS-9200#300	116-1241					

Encoder Module



- High performance
- Low cost
- Modules designed to be tolerant to mounting misalignment
- Modules operate from a single 5V supply

The module consists of a lensed LED source and a detector IC enclosed in a small "C" shaped plastic package. The two channel module and code wheel gives two outputs in quadrature, and the three channel module and code wheel also gives an index output.

624196

Description	Resolution Mftrs.		Price Each			
	(PPR)	List No.	Best.-Nr.	1+	10+	50+
Encoder Modules						
2 Chn.	256	HEDS-9100#A00	165-4864	●		
2 Chn. - Flange Mount	500	HEDS-9730#A50	165-4865	●		
2 Chn.	2000	HEDS-9000#T00	165-4866	●		
3 Chn.	256	HEDS-9140#F00	165-4867	●		
3 Chn.	500	HEDS-9140#A00	165-4868	●		
3 Chn.	1024	HEDS-9040#J00	165-4869	●		
Code Wheels						
2 Chn., 1/4"	500	HEDS-5120#A06	165-4872	●		
2 Chn., 4mm	500	HEDS-5120#A11	165-4873	●		
2 Chn., 6mm	200	HEDS-5120#E12	165-4870	●		
3 Chn., 1/4"	500	HEDS-5140#A06	165-4876	●		
3 Chn., 1/4"	1024	HEDS-6140#J06	165-4878	●		
3 Chn., 4mm	500	HEDS-5140#A11	165-4877	●		
Accessories						
Assembly Tool		HEDS-8906	165-4879	●		

360/500 Pulses/Rev



H=41.1, W=30.0, D=18.3
 Mounting: Standard types - 2 screw M2.5 on 19.05 PCD or 3 screw M1.6 on 20.90 PCD
 Types with external mounting ears - Overall W=52.1 with 2 fixing holes for M2.5 screws on 46.0 PCD.

A series of two and three channel optical encoders incorporating an HEDS9100/9140 series encoder module and an HEDS5120/5140 series code wheel. The outputs of the two channel version are two square waves in quadrature. The three channel version gives one additional index output pulse per revolution.

The standard encoders (without mounting ears) are available for a 4mm or 1/4" dia shaft and can be mounted to a motor using either the two screw or three screw mounting options on the lid. The encoders with external mounting ears are designed for larger diameter motors and 1/4" dia shafts. The use of an alignment tool or aligning pins is recommended for 2 channel encoders and is essential for 3 channel encoders. Connecting leads (length 152mm) are available.

- High reliability
- Quick and easy assembly
- High resolution
- Single 5V supply

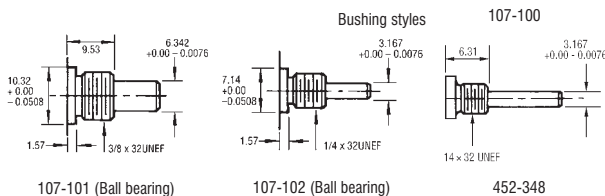
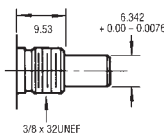
212435

Type	Mftrs. List No.	Order Code	Price Each		
			1+	10+	50+
Standard - 4mm Shaft Dia.					
3 ch., 500ppr	HEDS-5540#A11	165-4885	●		
Standard - 1/4" Shaft Dia.					
2 ch., 500ppr	HEDS-5500#A06	165-4880	●		
3 ch., 200 ppr	HEDS-5540#E06	165-4881	●		
3 ch., 500ppr	HEDS-5540#A06	165-4882	●		
External Mounting Ears - 1/4" Shaft Dia.					
2 ch., 500ppr	HEDS-5600#A06	165-4888	●		
2 ch., 360ppr	HEDS-5600#G06	165-4887	●		
3 ch., 500ppr	HEDS-5640#A06	165-4889	●		
2 ch., 200ppr	HEDS-5605#E06	165-4886	●		
Connecting Leads					
2 ch.	HEDS-8902	165-4890	●		
3 ch.	HEDS-8903	165-4891	●		

EN Series Rotary Optical Encoder



Body
 H=21.21,
 W=15.88,
 D=18.50,
 Spindle L=22.23



- Suitable for digital systems where both magnitude and direction of adjustment must be provided
- 2 bit gray code output produced, channel A leads channel B by 90° (clockwise)
- Ideal as a digital panel control or as position sensing devices in applications where long life, high resolution and precise linearity are critical.

Supply voltage	5V dc ±0.25V dc	Mechanical rotation	Continuous
Supply current	26mA max	Resolution	128 pulses per revolution
		(935-8242, 935-8277, 9358250)	

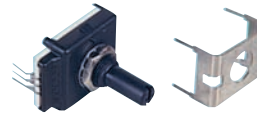
(935-8629)	256 pulses per revolution	3	Output A
Operating temperature	-40°C to +85°C	4	+Vcc
Connections	1 Ground	5	Output B
	2 NC		

Mftrs. List No.	ENA1J-B28-L00128L = 935-8242, ENS1J-B28-L00256L.935-8269	ENC1J-D28-L00128L.935-8250
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207180

Order Code	Price Each			
	1+	25+	50+	100+
935-8242	●			
935-8269	●			
935-8250	●			

EC Series Digital Contacting Encoder



Body D=27.6, W=22.2, H=7.4
 Shaft=19.0 (inc bush) x 6.32 dia,
 Bush=M9 x 0.75

- Low cost digital contacting encoders, long operating life and high operating temperature characteristics
- 2 bit gray code output is produced, channel A leads channel B by 90° (clockwise)
- Optional snap-on PCB mounting bracket

Contact rating	10mA @ 10V, or 0.1W	Maximum operating speed	120 rpm
Voltage rating	350V ac (or limited by power dissipation whichever <)	Rotational life	200000 revs
		Mechanical rotation	Continuous
		Insulation resistance	>
		Operating temperature	+1°C to +125°C

Cycles Per Revolution	Detents	Mftrs List No.	Order Code
6	24	ECWQJ-B24-AC0006	109-111
24	24	ECW1J-B24-AC0024L	120-0080

207187/406088

	Order Code	Price Each			
		1+	25+	50+	100+
Encoder, 6 cycles	109-111	●			
Encoder, 24 cycles	120-0080	●			
PCB mounting bracket	219-113	●			

Low Profile 11mm sq



Bush=M7 x 0.75

- Low profile, high precision audio type encoder
- PCB or chassis mounting with momentary switch

Mftrs. List No.	EC11B15242 = 119-1733
	EC11B15244 = 119-1734

Voltage rating	5V d.c.	Output signal	Channel A leads Channel B by 60° +/-30°
Maximum current	10mA		clockwise rotation
Rotational life	15000 cycles		

207244

	Order Code	Price Each				
		1+	10+	50+	100+	250+
Horizontal	119-1733	●				
Vertical	119-1734	●				

Rotary Encoders



EC11 Series



Flat Shaft



Dual Shaft



Serrated Shaft

- Compact and highly accurate sliding contact type encoder
- Incremental type
- Operating temperature -40 to 85°C
- Ratings: 10mA / 5 VDC

Encoders - Incremental - continued

Price Each

Mftrs. List No. Order Code 1+ 10+ 25+ 50+

Rotary Encoders - continued

EC11 Series - continued

Applications

- Controlling volume in car AV equipment
- Volume and menu selection in car navigation systems
- Various in-car components
- DVD players/recorders
- CD players, portable audio players and various AV equipment

Mftrs. List No.	Number of Detent	Operating Pulse Force	Structure	Shaft Style	Shaft Length	Life Cycles	Push-On Switch Travel
EC111							
EC1110120005	-	-	3 - 30mN-m Self-return switch	Flat	15mm	15000	-
EC111012010H	-	-	3 - 30mN-m Self-return switch	Flat	20mm	15000	0.5mm
EC1110120201	-	-	3 - 30mN-m Self-return switch	Flat	20mm	15000	1.5mm
EC11B							
EC11B15202AA	30	15	12mN-m Horizontal	Flat	20mm	15000	-
EC11B15242AE	30	15	12mN-m Horizontal	Flat	20mm	15000	0.5mm
EC11B15242AF	30	15	12mN-m Horizontal	Flat	20mm	15000	1.5mm
EC11E							
EC11E09204A4	18	9	10mN-m Vertical	Flat	20mm	15000	-
EC11E09244AQ	18	9	10mN-m Vertical	Flat	20mm	15000	1.5mm
EC11E09244BS	18	9	10mN-m Vertical	Flat	20mm	15000	0.5mm
EC11E082LB01	30	15	10mN-m Dual-Shaft	Flat/Slotted	25mm	15000	1.5mm
EC11E15204A3	30	15	10mN-m Vertical	Flat	20mm	15000	-
EC11E15244B2	30	15	10mN-m Vertical	Flat	20mm	15000	1.5mm
EC11E15244C0	30	15	10mN-m Vertical	Flat	20mm	15000	0.5
EC11E15244G1	30	15	10mN-m Vertical	Flat	20mm	15000	0.5mm
EC11E152T409	30	15	10mN-m Push lock	Serrated	25mm	15000	-
EC11E152U402	30	15	10mN-m Push lock	Serrated	26.4mm	15000	8mm
EC11E1530401	-	15	7mN-m Vertical	Flat	20mm	15000	-
EC11E1534408	-	15	7mN-m Vertical	Flat	20mm	15000	1.5mm
EC11E153440D	-	15	7mN-m Vertical	Flat	20mm	15000	0.5mm
EC11E1820402	36	18	10mN-m Vertical	Flat	20mm	15000	-
EC11E18244A5	36	18	10mN-m Vertical	Flat	20mm	15000	1.5mm
EC11E18244AU	36	18	10mN-m Vertical	Flat	20mm	15000	0.5mm
EC11E1830401	-	18	7mN-m Vertical	Flat	20mm	15000	-
EC11E1834403	-	18	7mN-m Vertical	Flat	20mm	15000	1.5mm
EC11E1834405	-	18	7mN-m Vertical	Flat	20mm	15000	0.5mm
EC11E183440C	-	18	7mN-m Vertical	Flat	20mm	15000	0.5mm
EC11EBB24C03	30	15	10mN-m Dual-Shaft	Flat/Slotted	25mm	15000	0.5mm
EC11EH124403	18	-	10mN-m ABC switch	Flat	20mm	30000	0.5mm
EC11EH124404	18	-	10mN-m ABC switch	Flat	20mm	30000	1.5mm
EC11EH224403	30	-	10mN-m ABC switch	Flat	20mm	30000	0.5mm
EC11EH224404	30	-	10mN-m ABC switch	Flat	20mm	30000	1.5mm
EC11J							
EC11J0920402	18	9	12mN-m Reflow	Flat	20mm	100000	-
EC11J0920602	18	9	12mN-m Reflow	Flat	20mm	500000	-
EC11J0920802	18	9	12mN-m Reflow	Flat	20mm	1000000	-
EC11J0924411	18	9	12mN-m Reflow	Flat	20mm	100000	0.5mm
EC11J0924602	18	9	12mN-m Reflow	Flat	20mm	500000	0.5mm
EC11J0924801	18	9	12mN-m Vertical	Flat	10mm	100000	1.5
EC11J0924802	18	9	12mN-m Reflow	Flat	20mm	1000000	0.5mm
EC11J0925403	18	9	12mN-m Reflow	Flat	20mm	100000	1.5mm
EC11J0925602	18	9	12mN-m Reflow	Flat	20mm	500000	1.5mm
EC11J0925802	18	9	12mN-m Reflow	Flat	20mm	1000000	1.5mm
EC11J1520402	30	15	12mN-m Reflow	Flat	20mm	100000	-
EC11J1520602	30	15	12mN-m Reflow	Flat	20mm	500000	-
EC11J1520801	30	15	12mN-m Reflow	Flat	20mm	1000000	-
EC11J1524413	30	15	12mN-m Reflow	Flat	20mm	500000	0.5mm
EC11J1524604	30	15	12mN-m Reflow	Flat	20mm	500000	0.5mm
EC11J1524801	30	15	12mN-m Vertical	Flat	10mm	100000	1.5
EC11J1524802	30	15	12mN-m Reflow	Flat	20mm	1000000	0.5mm
EC11J1525402	30	15	12mN-m Reflow	Flat	20mm	100000	1.5mm
EC11J1525602	30	15	12mN-m Reflow	Flat	20mm	500000	1.5mm
EC11J1525802	30	15	12mN-m Reflow	Flat	20mm	1000000	1.5mm
EC11K							
EC11K0920401	18	9	12mN-m Vertical	Flat	20mm	100000	-
EC11K0920601	18	9	12mN-m Vertical	Flat	20mm	500000	-
EC11K0920801	18	9	12mN-m Vertical	Flat	20mm	1000000	-
EC11K0924401	18	9	12mN-m Vertical	Flat	20mm	100000	0.5mm
EC11K0924601	18	9	12mN-m Vertical	Flat	20mm	500000	0.5mm
EC11K0924801	18	9	12mN-m Vertical	Flat	20mm	1000000	0.5mm
EC11K0925401	18	9	12mN-m Vertical	Flat	20mm	100000	1.5mm
EC11K0925601	18	9	12mN-m Vertical	Flat	20mm	500000	1.5mm
EC11K0925801	18	9	12mN-m Vertical	Flat	20mm	1000000	1.5mm
EC11K1520401	30	15	12mN-m Vertical	Flat	20mm	100000	-
EC11K1520601	30	15	12mN-m Vertical	Flat	20mm	500000	-
EC11K1520801	30	15	12mN-m Vertical	Flat	20mm	1000000	-
EC11K1524402	30	15	12mN-m Vertical	Flat	20mm	100000	0.5mm
EC11K1524601	30	15	12mN-m Vertical	Flat	20mm	500000	0.5mm
EC11K1524801	30	15	12mN-m Vertical	Flat	20mm	1000000	0.5mm
EC11K1525401	30	15	12mN-m Vertical	Flat	20mm	100000	1.5mm
EC11K1525601	30	15	12mN-m Vertical	Flat	20mm	500000	1.5mm
EC11K1525801	30	15	12mN-m Vertical	Flat	20mm	1000000	1.5mm

524167

Price Each

Mftrs. List No.	Order Code	1+	10+	25+	50+
EC111					
EC1110120005	206-5017	●			
EC111012010H	206-5018	●			
EC1110120201	206-5019	●			
EC11B					
EC11B15202AA	206-4977	●			
EC11B15242AE	206-4978	●			
EC11B15242AF	206-4979	●			

EC11E					
EC11E09204A4	206-4980	●			
EC11E09244AQ	206-4990	●			
EC11E09244BS	206-4985	●			
EC11E082LB01	206-5026	●			
EC11E15204A3	152-0804	●			
EC11E15244B2	206-4991	●			
EC11E15244C0	152-0806	●			
EC11E15244G1	206-4986	●			
EC11E152T409	206-5015	●			
EC11E152U402	206-5016	●			
EC11E1530401	206-4981	●			
EC11E1534408	206-4992	●			
EC11E153440D	206-4987	●			
EC11E1820402	206-4982	●			
EC11E18244A5	206-4993	●			
EC11E18244AU	206-4988	●			
EC11E1830401	206-4983	●			
EC11E1834403	152-0807	●			
EC11E183440C	206-4989	●			
EC11EBB24C03	206-5025	●			
EC11EH124403	206-5020	●			
EC11EH124404	206-5023	●			
EC11EH224403	206-5021	●			
EC11EH224404	206-5024	●			
EC11J					
EC11J0920402	206-5027	●			
EC11J0920602	206-5033	●			
EC11J0920802	206-5040	●			
EC11J0924411	206-5029	●			
EC11J0924602	206-5036	●			
EC11J0924801	165-6446	●			
EC11J0924802	206-5042	●			
EC11J0925403	206-5031	●			
EC11J0925602	206-5038	●			
EC11J0925802	206-5044	●			
EC11J1520402	206-5028	●			
EC11J1520602	206-5035	●			
EC11J1520801	165-6445	●			
EC11J1520803	206-5041	●			
EC11J1524413	206-5030	●			
EC11J1524604	206-5037	●			
EC11J1524801	165-6447	●			
EC11J1524802	206-5043	●			
EC11J1525402	206-5032	●			
EC11J1525602	206-5039	●			
EC11J1525802	206-5045	●			
EC11K					
EC11K0920401	206-4994	●			
EC11K0920601	206-5001	●			
EC11K0920801	206-5007	●			
EC11K0924401	206-4997	●			
EC11K0924601	206-5003	●			
EC11K0924801	206-5011	●			
EC11K0925401	206-4999	●			
EC11K0925601	206-5005	●			
EC11K0925801	206-5013	●			
EC11K1520401	206-4995	●			
EC11K1520601	206-5002	●			
EC11K1520801	206-5008	●			
EC11K1524402	206-4998	●			
EC11K1524601	206-5004	●			
EC11K1524801	206-5012	●			
EC11K1525401	206-5000	●			
EC11K1525601	206-5006	●			
EC11K1525801	206-5014	●			

Hollow Shaft Encoders

EC05E Series - 5mm

NEW

ALPS



A compact 12-pulse hollow shaft encoder adopting Alps DRUMCODE™ technology.

- Number of Detents 12
- Number of Pulses 12
- Detent Torque 1.6N-m
- Operating Life 100000 Cycles
- Operating Temperature -30°C to +85°C

654674

Mfrs. List No.	Order Code	1+	10+	25+	50+	100+
Horizontal						
EC05E1220202	206-4967					
EC05E1220203	206-4968					
Vertical						
EC05E1220401	206-4969					

Metal Shaft Encoders

EC09E Series - 9mm



A compact 9.5mm size and round shape contribute to save space.

Number of Detents	30
Number of Pulses	15
Detent Torque	8mN-m
Operating Life	15000 Cycles
Operating Temperature	-40°C to +85°C

654676

Shaft Length	Push-On Switch Travel	Order Code	1+	10+	25+	50+	100+
15mm	-	206-4970					
20mm	0.5mm	206-4971					
20mm	1.5mm	206-4973					

Hollow Shaft Encoders

EC10E Series - 10mm



A series of compact and long-life encoders with unique hollow shaft design.

Number of Detents	24
Number of Pulses	12
Detent Torque	5mN-m
Operating Life	100000 Cycles
Operating Temperature	-30°C to +85°C

654683

Mount Height	Mfrs. List No.	Order Code	1+	10+	25+	50+	100+
7mm	EC10E1220505	206-4974					
9mm	EC10E1220501	206-4975					
11mm	EC10E1220503	206-4976					

Rotary Encoders

EC12 Series



- Controls for image / sound devices, including DVD players, mini component stereos, CD players, portable audio players, monitors
- Controls for audio mixers and electronic instruments
- New type (EC12D) with push switch for volume control of car audio and navigation systems

Applications

- Controlling volume in car AV equipment
- Volume and menu selection in car navigation systems
- Various in-car components
- DVD players/recorders

- CD players, portable audio players and various AV equipment

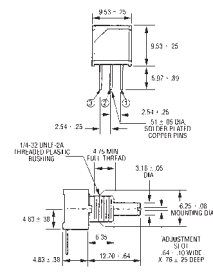
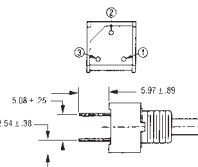
Mfrs. List No.	Number of Detent	Pulse	Operating Force	Structure	Shaft Style	Shaft Length	Life Cycles
EC12E1220301	12	12	3 - 20mN-m	Vertical	Hollow	8.5mm	30000
EC12E1220401	12	12	3 - 20mN-m	Vertical	Flat	20mm	30000
EC12E1220405	12	12	3 - 20mN-m	Vertical	Flat	25mm	30000
EC12E1220406	12	12	3 - 20mN-m	Vertical	Flat	20mm	30000
EC12E1220407	12	12	3 - 20mN-m	Vertical	Flat	15mm	30000
EC12E1220813	12	12	3 - 20mN-m	Vertical	Flat	25mm	30000
EC12E1224402	12	12	3 - 20mN-m	Vertical	Flat	8.5mm	30000
EC12E1240301	12	12	3mN-m	Vertical	Hollow	8.5mm	30000
EC12E1240405	12	12	3mN-m	Vertical	Flat	20mm	30000
EC12E1240406	12	12	3mN-m	Vertical	Flat	25mm	30000
EC12E24104A6	-	24	10mN-m	Vertical	Flat	20mm	30000
EC12E1220401	12	12	3 - 20mN-m	Vertical	Hollow	20mm	30000
EC12E1220405	12	12	3 - 20mN-m	Vertical	Hollow	25mm	30000
EC12E1220406	12	12	3 - 20mN-m	Vertical	Flat	20mm	30000
EC12E1220407	12	12	3 - 20mN-m	Vertical	Flat	15mm	30000
EC12E1220813	12	12	3 - 20mN-m	Vertical	Flat	25mm	30000
EC12E1224402	12	12	3 - 20mN-m	Vertical	Flat	8.5mm	30000
EC12E2420801	24	24	3 - 20mN-m	Vertical	Flat	25mm	30000
EC12E2420802	24	24	3 - 20mN-m	Vertical	Flat	20mm	30000
EC12E2420803	24	24	3 - 20mN-m	Vertical	Flat	30mm	30000
EC12E24242A2	24	24	3 - 20mN-m	Horizontal	Flat	20mm	30000
EC12E2430401	-	24	25mN-m	Vertical	Flat	25mm	30000
EC12E2430404	-	24	25mN-m	Vertical	Flat	20mm	30000
EC12E2430803	-	24	25mN-m	Vertical	Flat	25mm	15000

Mfrs. List No.	Order Code	1+	10+	25+	50+			
EC12E2430804	-	24	24	25mN-m	Vertical	Shaft Flat	20mm	15000
EC12E2440301	24	24	3mN-m	Vertical	Hollow	8.5mm	30000	
EC12E24404A6	24	24	3mN-m	Vertical	Flat	25mm	30000	
EC12E24404A8	24	24	3mN-m	Vertical	Flat	20mm	30000	
EC12E2460802	-	24	40mN-m	Vertical	Flat	30mm	15000	
With Push On Switch								
EC12D1524403	30	15	5mN-m	Vertical	Flat	17.5mm	30000	
EC12D1524406	30	15	5mN-m	Vertical	Flat	17.5mm	30000	
EC12D1564402	30	15	10mN-m	Vertical	Flat	17.5mm	30000	
EC12D1564404	30	15	10mN-m	Vertical	Flat	17.5mm	30000	

524167

Mfrs. List No.	Order Code	1+	10+	25+	50+
EC12E1220301	206-5050				
EC12E1220401	152-0809				
EC12E1220405	206-5049				
EC12E1220406	206-5048				
EC12E1220407	206-5047				
EC12E1220813	206-5066				
EC12E1224402	152-0810				
EC12E1240301	206-5053				
EC12E1240405	206-5051				
EC12E1240406	206-5052				
EC12E24104A6	206-5063				
EC12E1220401	152-0809				
EC12E1220405	206-5049				
EC12E1220406	206-5048				
EC12E1220407	206-5047				
EC12E1220813	206-5066				
EC12E1224402	152-0810				
EC12E2420801	206-5068				
EC12E2420802	206-5067				
EC12E2420803	206-5069				
EC12E24242A2	152-0811				
EC12E2430401	206-5065				
EC12E2430404	206-5064				
EC12E2430803	206-5072				
EC12E2430804	206-5070				
EC12E2440301	206-5062				
EC12E24404A6	206-5061				
EC12E24404A8	206-5059				
EC12E2460802	206-5073				
With Push On Switch					
EC12D1524403	206-5074				
EC12D1524406	206-5076				
EC12D1564402	206-5075				
EC12D1564404	206-5077				

3315 Series Conductive Plastic



Body H=9.53, W=9.53, D=4.83
Shaft=12.7 (inc bush) x 3.18
Bush=1/4-32 UNEF-2A

- Miniature package, long operating life for PCB or bush mounting
- On clockwise rotation of the shaft a 2 bit gray code output is produced where channel A leads channel B by 90°.

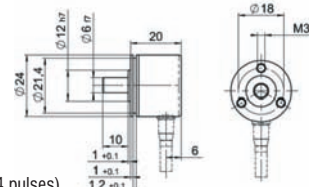
Contact rating	100mA @ 16Vd.c. or 0.1W	Mechanical rotation	Continuous
Dielectric strength	900V a.c.	Insulation resistance	>MΩ
Maximum operating speed	120 rpm	Operating temperature	-40°C to + 125°C
Rotational life	100000 cycles	Pulses per revolution	6

224004

Order Code	1+	25+	50+	100+
Encoder 6 cycles 3315C	935-4018			
Encoder 6 cycles 3315Y	935-4034			
Encoder 16 cycles 3315C	935-4026			
Encoder 16 cycles 3315Y	935-4042			

2400/2420 - Miniature incremental rotary encoder

24 mm flange



- very small design
- high performance but low cost (up to 1024 pulses)
- chromium-plated housing, IP64 housing

2400/2420 - Miniature incremental rotary encoder - continued

24 mm flange - continued

- robust cable entry with multiple clamping, high-flexibility cable
- Rated voltage: 5-24 V push-pull

Mechanical data:

Stainless Steel Shaft 4mm
 Connection: 2m high-flexible PVC wire radial
 Rotary speed: max. 12 000 min⁻¹
 Rotor Moment of Inertia: approx. 0.1 x 10⁻⁶ kgm²
 Starting Torque: <0.001 Nm
 Load Capacity of Shaft: radial: 10 N / axial: 20 N
 Weight: 0.06 kg
 Protection to EN 60529: IP 64 Housing
 Working temperature: -20° C ... +85° C / Operating temperature: -20° C ... +90° C
 Shock resistance to DIN-IEC 68-2-27: 1000 m/s², 6 ms / Vibration resistance to DIN-IEC 68-2-27: 100 m/s², 55 ... 2000 Hz

Electrical data:

Output Circuit
 Input voltage: 5 ... 24 V DC
 Power Consumption (No Load): max. 50 mA
 Permissible Load/Channel: max. 50 mA
 Pulse Frequency: max. 160 kHz
 Signal Level High: min. UB = -2.5 V
 Signal Level Low: max. 0.5 V
 Rise Time tr: max. 1 μs / Fall Time tf: max. 1 μs
 Short Circuit Proof Outputs: Yes
 Conforms to CE requirements acc. to EN 61000-6-1, EN 61000-6-4 and EN 61000-6-3

334405

Type	Imp./U.	Order Code	Price Each		
			1+	5+	10+
2400 (Shaft 4mm)					
05.2400.1122.0050	50	472-9481			
05.2400.1122.0100	100	472-9493			
05.2400.1122.0360	360	472-9500			
05.2400.1122.1024	1024	472-9535			

100/200 Pulses/Rev - E6CA2 Series

Solid 6mm Dia Shaft



- Subminiature
- Designed for plate mounting
- Bi-directional output
- Supplied with 0.5m connecting cable

Encoder: L = 31, Dia = 25,
 Shaft: L = 6, Dia = 4mm

Radial loading	1kg max	Operating voltage	5V
Axial loading	0.5kg max	Pulse response	20kHz
Current consumption	20mA max	Maximum speed	5000rpm
Output	Open collector - 6mA max		

624218

Type	Mftrs. List No.	Order Code	Price Each		
			1+	5+	10+
2 ch., 100ppr	E6A2CW3C-100	160-3029			
2 ch., 200ppr	E6A2CW3C-200	160-3030			

1000 Pulses/Rev - E6C Series

Solid 6mm Dia Shaft



- Heavy duty industrial use
- 3 channels for bi-directional output with zero index

Optical incremental rotary encoder with resolution of 1000 pulses per revolution.

The two outputs allow the direction of shaft rotation to be gauged and the zero index confirms a start reference point. The encoders are designed for plate mounting.

Encoder: L=94, Dia=50,
 Shaft: L=15, Dia=6, Cable L=2m

Radial loading	4kg	Operating voltage	4.75V dc - 10% to 27.6V dc +15%
Axial loading	3kg	Pulse response	30kHz
Current consumption	50mA max	Maximum speed	5000rpm
Output	80mA max open collector		

212437

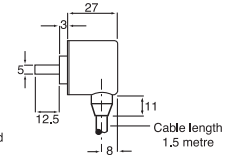
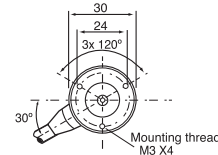
Type	Mftrs. List No.	Order Code	Price Each		
			1+	5+	10+
3 ch., 1000ppr	E6C2CWZ6C-1000	160-3032			
Flexible shaft coupling		160-3033			

IMPROVED BACK ORDER DELIVERY

Receive email updates with the exact status, due date and despatch information of all your back order items farnell.com

100 to 1000ppr with Opto-ASIC - RI32-0 Series HENGSTLER

Solid 5mm Dia. Shaft



- Self-test alarm system continuously monitors for disc contamination, disc breakage, over-temperature, under-voltage and excessive LED ageing
- Short circuit and overload protection
- Ingress protected to IP50

High quality 30mm diameter incremental miniature encoders. All have 2 channels and marker pulse outputs.

Supply voltage	5V dc or 10 to 30V dc
Max. pulse frequency	5V=300kHz, 10-30V=200kHz
Current consumption	30mA (24V dc), 40mA (5V dc)
Output voltage	5V input high ≥2.5V, low ≤0.5V 10 to 30V input high=supply -3V, low ≤2V
Alarm output	NPN open collector 5mA
Maximum output load	5V supply ±10mA, 10 to 30V supply ±30mA
Maximum shaft loading	Radial 10N, Axial 5N
Absolute max. speed	4000 rpm
Operating temperature	-10°C to 60°C
Storage temperature	-25°C to 85°C
Shock resistance	100g

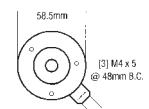
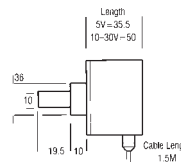
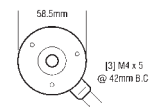
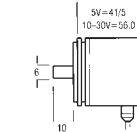
FOR SUITABLE FLEXIBLE COUPLINGS ORDER CODES 730-981 & 730-993

222178

Push-Pull 5V	Mftrs. List No.	Order Code	Price Each		
			1+	5+	10+
100ppr	RI32-0/100AR.14KB	615-936			
360ppr	RI32-0/360AR.14KB	615-948			
1000ppr	RI32-0/1000AR.14KB	615-950			
Push-Pull 10-30V					
360ppr	RI32-0/360ER.14KB	615-973			
1000ppr	RI32-0/1000ER.14KB	615-985			

1000 to 5000ppr with Opto-ASIC - RI58-0 Series HENGSTLER

Solid 6mm/10mm Dia. Shaft



- Short circuit and overload protection
- Maximum pulse frequency: TTL 300kHz, push pull 200kHz
- IP65 protection
- Set of 3 clamping eccentrics included with synchro flange version
- 2 channels, marker pulse and complimentary line driver outputs
- Self-test alarm continuously monitors for disc contamination, disc breakage, over temperature, under voltage, electrical overload and excessive LED ageing. It provides an open collector NPN output if any of these conditions occur
- Available with 5V TTL or 10 to 30V push pull outputs

A range of high quality 58mm diameter incremental encoders with solid 6mm diameter shafts.

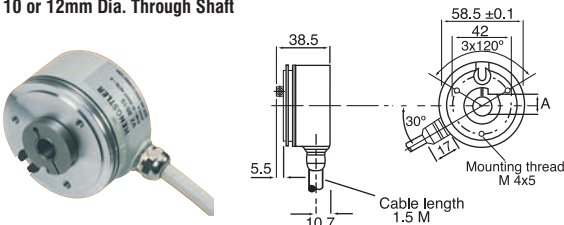
Supply voltage	5V dc TTL or 10 to 30V push pull
Current consumption	TTL - 40mA push pull 60mA (10V dc), 30mA (24V dc)
Output voltage	TTL high ≥2.5V, low ≤0.5V push pull high=supply -3V, low ≤2V
Alarm output	NPN open collector 5mA
Max. output load	±30mA
Max. loadings, 6mm shaft	Radial 110N, axial 60N
Absolute max. speed	10000rpm
Operating temperature	-10°C to +70°C
Storage temperature	-25°C to +85°C
Shock resistance	100g

222163

Supply	Mfrs. List No.	Order Code	1+	5+	10+
Solid 6mm Dia. Shaft, Synchro Flange					
2000 5V TTL	RI58-0/2000AS.41RB	615-882			
5000 5V TTL	RI58-0/5000AS.41RB	615-894			
Solid 10mm Dia. Shaft, Clamping Flange					
1000 5V TTL	R158-0/1000AK.42RB	723-4480			
5000 5V TTL	R158-0/5000AK.42RB	723-4508			
1000 10 - 30V push-pull	R158-0/1000EK.42IB	723-4510			

360 to 5000ppr with Opto-ASIC - RI58-D Series HENGSTLER

Hollow 10 or 12mm Dia. Through Shaft



A range of very slim 58mm diameter incremental encoders with hollow through shaft.

- Short circuit and overload protection
- Maximum pulse frequency 200KHz
- Ingress protected to **IP64**
- Available to accept 10 or 12mm diameter shafts
- 2 channels and marker pulse 10 to 30V push pull complimentary outputs
- Self test alarm system continuously monitors for error conditions and provides an open circuit NPN alarm output if these conditions occur
- Monitored conditions are disc contamination, disc breakage, over temperature, under voltage and excessive LED ageing

Supply voltage	10 to 30V	Absolute max. speed	6000 rpm
Current consumption	60mA (10V dc), 30mA (24V dc)	Operating temperature	-10°C to +70°C
Output voltage	high=supply - 3V dc low ≤ 2V dc	Storage temperature	-25°C to +85°C
Alarm output	NPN open collector 5mA	Shock resistance	100g
Max. output load	30mA/channel	Cable length	1.5m

212413

Mfrs. List No.	Order Code	1+	5+	10+
Hollow Shaft 10mm dia.				
360ppr RI58-D/360ED.32IB	615-997			
1000ppr RI58-D/1000ED.32IB	616-000			
Hollow Shaft 12mm dia.				
1000ppr RI58-D/1000ED.37IB	616-047			
5000ppr RI58-D/5000ED.37IB	616-060			

Encoders - Accessories

Measuring Wheel - 0.5m Circumference HENGSTLER

10mm Diameter Shaft



W=25, Circumference = 500

212378

- Aluminium measuring wheel has 10mm bore diameter, suitable for use with Hengstler RI58 (10mm dia. shaft) encoders or similar
- Suitable for measuring length of paper, cardboard, non-greasy metals, soft and hard plastics, undressed or surface treated wood
- Tread is 22mm wide white low-wear rubber with good grip

Mfrs. List No.	Order Code	1+	5+	10+
0.601.151	723-4478			

Measuring Wheels



- High quality
- Pimpled rubber coating
- Suitable for measuring a variety of materials
- Bore diameter 10mm

624220

Circumference	Mfrs. List No.	Order Code	1+	5+	10+	25+
200mm	9109-10	377-8253				
500mm	9102-10	377-8228				

Flexible Couplings



Plastic
L=20.5, Dia.=15

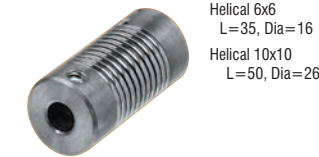
Helical
L=28, Dia.=19.2

Type	Plastic	Helical
Absolute max. speed	10000rpm	6000rpm
Torque max.	20N-cm	80N-cm
Max. angular misalignment	±2.5 degrees	±4 degrees
Max. shaft misalignment radial/axial	±0.3mm/±0.2mm	±0.25mm/±0.4mm
Material	Polyamide 6.6 glass-fibre reinforced RI32 Series (5mm shaft)	AlCuMgPb, chromed RI58-0 Series (6mm shaft)

212244

Material	Bore Diameter	Mfrs. Part No.	Order Code	1+	5+	10+
Plastic	55mm	3.520.034	730-981			
Plastic	56mm	3.520.003	730-993			
Helical	56mm	3.520.035	731-006			
Helical	66mm	0.070.653	731-018			
Diaphragm	66mm	3.520.081	731-031			

Flexible Couplings



Helical 6x6
L=35, Dia=16

Helical 10x10
L=50, Dia=26

Precision
L=25, Dia=25

	Helical 6x6	Helical 10x10	Precision
Maximum rpm	3000	3000	12000
Nominal torque	0.5Nm	1.5Nm	0.4Nm
Max radial mismatch	1mm	1.5mm	±0.4mm
Max. angle error	5.0°	5.0°	±2.5°
Max. axial mismatch	±1mm	±1mm	±0.4mm
Binding posts	M4	M5	M4
Max. starting torque	120Ncm	120Ncm	80Ncm
Maximum rpm	Nickel-faced spring steel, zinc diecast	Nickel-faced spring steel, zinc diecast	Flange: zinc diecast, Housing: polyamide 6.6
Weight	28g	120g	23g

234119

Type	Order Code	1+	5+	10+	25+	50+
Helical						
6x6	377-8277					
10x10	377-8265					
Precision						
6x10	377-8290					
10x10	377-8307					

Insert coupling



RPM value	12000rpm	Axial offset	±0.2 mm
Torque	0.2mN-m	Material	Plastic
Radial offset	±0.3 mm	Body	Plastic
Angular error	±2.5 degree	Hexagon Socket	Plastic

248963

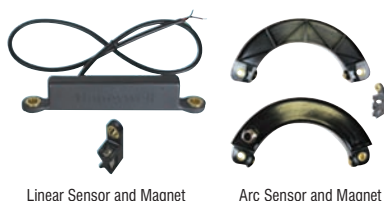
Mfrs. List No.	Order Code	1+	3+	5+
Voltage Coupling Ø1 = 6, Ø2 = 6	Z 121.D01	349-0701		

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Displacement Sensors

SMART Position Sensor 75mm Linear Configuration

Honeywell



The SMART Position Sensor is one of the most durable, adaptable, and lightweight position sensors available in the industry, enabling highly accurate motion control and improving operation efficiency and safety. Its simple, non-contact design eliminates mechanical failure mechanisms, reducing wear and tear, improving reliability

and durability, and minimizing downtime.

Why is the SMART Position Sensor smart? SMART means that this is a sensor that can essentially think for itself. SMART Position Sensors provide a self-diagnostics feature and data gathering for enhanced reliability and closed-loop feedback control.

They use a patented combination of an ASIC (Application-Specific Integrated Circuit) and an array of MR (magneto-resistive) sensors to accurately and reliably determine the position of a magnet attached to a moving object so that the object's position can be determined or controlled. The MR array measures the output of the MR sensors mounted along the magnet's direction of travel. The output and the MR sensor sequence determine the nearest pair of MR sensors to the center of the magnet location. The output of these two MR sensors is then used to determine the position of the magnet between them.

- Resolution of up to 16 bits provides enhanced accuracy
- Non-contacting technology can provide enhanced product life and durability with less downtime
- Combined patented MR sensor and ASIC technology provide enhanced differentiation and performance
- Air gap of up to 3 ±2.5 mm (0.118 ±0.098") between sensor and magnet expands application opportunities
- Self-diagnostics feature can reduce equipment downtime
- Small size, taking up less space than most competitive technologies, allows for use where space is at a premium
- IP67 and IP69K sealing allow use in a variety of harsh applications

610250

Supply Voltage	Mfrs. List No.	Order Code	1+	5+	10+	Price Each
Linear Sensor						
6V to 24V DC	SPS-L075-HALS	178-4725				
Arc Sensor - 100°						
6V to 24V DC	SPS-A100D-HAMS	NEW 189-4998				
18V to 40V DC	SPS-A100D-VAMS	NEW 189-4999				
Arc Sensor - 180°						
6V to 24V DC	SPS-A180D-HAMS	NEW 189-5001				
18V to 40V DC	SPS-A180D-VAMS	NEW 189-5002				

Position Sensors

Membrane - Self Adhesive



Rectilinear

Rotary

- Extremely flat - 0.5mm
- Adhesive film
- 1 Watt max. @ 25°C
- Greater than 1 million cycles life



Wiper 540860

Length (mm)	Width (mm)	Mfrs. List No.	Order Code	1+	10+	25+	50+	Price Each
Rectilinear								
65.86	20.32	SP-L-0050-ST	173-4690					
115.86	20.32	SP-L-0100-ST	173-4691					
215.86	20.32	SP-L-0200-ST	173-4692					
515.86	20.32	SP-L-0500-ST	173-4693					
Rotary								
56mm OD of Track SP-R-0046/353-103-ST				173-4694				
Accessories								
Wiper, M6 x 0.75 WIPER 1-3N			173-4695					

Position Sensors

Linear MagnetoPots



Rectilinear

Rotary

- Contactless Linear Sensor
- IP64 Debris Proof, Splash Proof
- Ideal for Hydraulic and Pneumatic Position Sensing
- Liquid Level Capability
- Life Cycle is >1 million
- Height: 3.50mm (0.138")
- Operating Temperature up to +85°C
- IP Rating of Active Area is IP64
- Crimpflex Solder Tab (ST)
- Requires MAGNET

The MagnetoPot is simple, yet elegant in its ability to track motion in a contactless manner. A magnet on the inside of a cylinder, or a magnet on the opposing side of a motion device will guide the built-in magnetics of the MagnetoPot for position location through a potentiometric output.

The MagnetoPot is a sealed potentiometer, in the membrane potentiometer tradition, yet it does not require a wiper/actuator to connect the collector and the resistor. Instead, the MagnetoPot is controlled by an outside magnet, which attracts the magnetic forces within the MagnetoPot to connect to the linear resistor and give linear potentiometer feedback. The wiper inside the sealed pot is magnetic or ferromagnetic, and will only perform if connected with an exterior magnet.

As opposed to a magnetically-based Reed Switch, which gives simply open or close signals, the MagnetoPot gives the full linear travel of a hydraulic or pneumatic cylinder. In liquid level applications, the MagnetoPot can attach to the outside of a liquid tank and give position of the magnet inside the float. No water ingress, no wearing of the part by environment, because the MagnetoPot is outside of the tank.

The MagnetoPot is made of polyester, fiberglass and kapton, depending on the specification required. It functions as a voltage divider, a resistor or rheostat, as desired by the end-user. By bringing the exterior magnet into a proximity necessary to connect with the internal magnetic attractors, the operator can obtain linear position sensing based on the location of the exterior magnet. As the exterior magnet moves, so does the electrical output of the MagnetoPot.

N.B. The MagnetoPot should not be mounted to a ferromagnetic surface.

608983

Active Length	Mfrs. List No.	Order Code	1+	5+	10+	25+	Price Each
Rectilinear							
25mm	MP1-L-0025-103-5%-ST	181-8274					
50mm	MP1-L-0050-103-5%-ST	181-8275					
100mm	MP1-L-0100-103-5%-ST	181-8276					
150mm	MP1-L-0150-103-5%-ST	181-8277					
300mm	MP1-L-0300-103-5%-ST	181-8278					
500mm	MP1-L-0500-103-5%-ST	181-8279					
Rotary							
Center of Active of Track							
45.57mm	MP1-R-0046-353-103-5%-ST	181-8280					

Rotary Position Sensor Hall Effect - SRH Series



- Single output
- Analogue voltage output
- Clockwise shaft rotation with increasing output
- "D" Section 6mm Stainless Steel shaft - 4.5mm A/F
- 200mm connecting cable
- 28mm body with crush proof flanges
- Sealed to IP68

H = 18.35, W = 48, Diameter = 28mm

The SRH series use a high performance, factory programmable 12 bit magnetic rotary sensor IC that includes integrated Hall elements and digital signal processing. The angular position information is provided by a two pole rare earth magnet integrated with the sensor shaft. The sensor provides an absolute analogue voltage signal by using a low-pass filter circuit. The SRH rotary sensor is designed to operate from a 5V dc regulated or a 9 - 30V dc unregulated supply, with a high stability circuit and EMC immunity to 100V/m.

613522

Measurement Range Angle	Mfrs. List No.	Order Code	1+	5+	10+	Price Each
360°	SRH280P/360/A1/1/D/68/P2	183-9691				
90°	SRH280P/90/A1/1/D/68/P2	183-9692				

Rotary Position Sensor Hall Effect - Dual Channel SRH Series



- Contactless - Hall effect technology
- Dual redundant outputs
- 5V dc or 9 - 30V dc supply (13.5-30V dc for 0-10V output version)
- Analog (0.1 - 4.9, 0.5 - 4.5, 0-10V dc) or Digital (PWM) outputs
- Measurement range from 0-20 to 0-360° in 1° increments
- 12 bit resolution (0.025%) over the angular range
- Extremely low signal noise - less than 1mV_{rms}

H = 18.35, W = 48, Diameter = 28mm

- Electrically interchangeable with potentiometers
- Operating temperature -40 to +140°C
- 6mm Stainless Steel "D" Section shaft, 4.5mm A/F
- Environmental protection to IP68
- Crush-proof mounting flange with steel inserts

These products are dual redundant output, contactless rotary position sensors with integrated 6-way connectors, using a factory programmable Hall effect sensor system. They provide reliable and accurate rotary position measurement in extreme industrial environments, such as specialist off-highway construction and agricultural vehicles, where shock, vibration and extreme temperatures can occur. The sensor design is housed in a moulded housing that has a fully integrated 6-way AMP 1.5 Superseal connector, allowing separate supply voltage and output signals on two channels. Environmental protection to IP68 (when fully mated). SRH220DR operates from either 5V dc regulated or 9-30V dc unregulated power supply and is available with analog 0.5-4.5V dc output signals. The sensor is factory programed with both the output signal direction set for Channel 1 clockwise and channel 2 anticlockwise. The sensor has a 12 bit resolution (0.025%) over the selected measuring range, and operates from -40 to +140 °C when powered at 5V dc.

613534

Measurement	Mftrs.	Order Code	1+	5+	10+
Range Angle	List No.				
360°	SRH220DR/360/360/A1/5/D/A	183-9694			
90°	SRH220DR/90/90/A1/5/D/A	183-9695			
Accessory					
Socket 6 Way	282090-1	150-472			

Rotary Position Sensor Hall Effect - NRH Series



H = 6.5, W = 48, Diameter = 28mm

- NO-CONTACT technology with external position magnet
- Unlimited mechanical lifetime - WEAR FREE
- Will operate from -40 to +140°C, with excursions to +170°C
- Withstands high pressure wash-downs (IP69K)
- Simple mounting and extremely low profile design
- Minimal weight
- Magnet radial offset up to ±2mm, air gap 2-7mm
- Extremely low signal noise - less than 1mV_{rms}

NEW

- Electrically interchangeable with potentiometers
- Standard output is dual channel
- Configurable output direction
- Measurement range from 20 to 360° in 1° increments
- 12 bit resolution (0.025%) over the angular range
- Independent linearity ±0.4%
- Analogue (0.5 - 4.5 or 0.1 - 4.9V dc) or PWM outputs
- 2.5 or 0.15mS input/output delay

Penny + Giles announces a new dual output, no-contact rotary position sensor with the slimmest low profile housing, which uses a factory programmable Hall effect sensor system. NRH280DP has a co-moulded fully encapsulated sensor system that can withstand high shock and vibration as well as operate up to 170°C, and endure high pressure wash-downs (IP69K). The sensor is activated by a separate magnet with a choice of two carrier designs. NRH280DP is designed for applications in extreme environments where space is limited. It also allows up to ±2mm radial offset, with a permissible gap of 2-7mm between the sensor and magnet. The transmissive properties between the magnet and sensor also allow operation through non-magnetic materials. The NRH280DP operates from 5Vdc (and 9-30Vdc) and is factory programmed to allow a wide range of configurations.

613536

Measurement	Mftrs.	Order Code	1+	5+	10+
Range Angle	List No.				
360°	NRH280DP/360/360/A1/5/B/P5	183-9696			
90°	NRH280DP/90/90/A1/5/B/P5	183-9697			

Hall-Effect Rotary Position Sensors



The RTY Series Hall-Effect Rotary Position Sensors provide angle monitoring in harsh transportation and industrial applications at a competitive cost. These products use a magnetically biased, Hall-effect integrated circuit (IC) to sense rotary movement of the actuator shaft over a set operating range. Rotation of the actuator shaft changes a magnet's position relative to the IC. The resulting flux density change is converted to a linear output. The IC, together with

conditioning and protection circuitry, and the permanent magnet, is sealed in an IP67-qualified rugged package for durability in most harsh environments.

- 15 M cycle product life
- Solid-state Hall-effect technology
- Rugged IP67-sealed package with integral connector
- Automotive-grade EMI/EMC testing, integrated reverse polarity, and short circuit
- Industry-standard AMP termination
- 32 mm mounting pitch
- European pinout styles
- Compact package

	Low Voltage	High Voltage
Supply Voltage	5V	10V to 30V
Supply Current	20 mA	32 mA
Output	Ratiometric	Non Ratiometric
Operating Temperature	-40°C to 125°C	
Response Time	4 ms	
Resolution	12 bit	

659103

Sensing Range Angle	Mftrs. List No.	Order Code	1+	10+	25+
Low Voltage					
60°	RTY060LVEAX	210-2279			
90°	RTY090LVEAX	210-2281			
120°	RTY120LVEAX	210-2283			
180°	RTY180LVEAX	210-2285			
360°	RTY360LVEAX	210-2288			
High Voltage					
60°	RTY060HVEAX	210-2280			
90°	RTY090HVEAX	210-2282			
120°	RTY120HVEAX	210-2284			
180°	RTY180HVEAX	210-2287			
360°	RTY360HVEAX	210-2289			

Miniature Industrial Transducer



- Linearity of better than 0.1%
- Dual wiper design on Myst R® plastic element
- Extruded wiper block guides
- Internal spring-loaded ball joint

- Anodised extruded aluminium housing
- Stainless steel shaft
- Fits into tight spaces, clamps easily to cylinders

Small diameter linear position sensor, rugged enough to withstand a hostile environment and easy to interface without additional amplifiers.

Independent linearity	> ±0.1%
Resistance per 25mm	1000Ω
Resistance tolerance	±20%
Operating temp. range	-40°C to +80°C
Starting force	29g
Resolution	Infinite
Shaft thread	4 - 40 UNC
Dimensions	Housing: L = electrical travel + 30.48, Ø = 9.53 Shaft: L = 19.05 (retracted)

224731

Measuring Range	Mftrs. List No.	Order Code	1+	10+	25+
25mm	06MTL0025A	708-8530			

Miniature Precision Linear Transducers 34L Series



- Rugged and accurate ideally suited for industrial applications
- High accuracy ±0.1%
- Essentially infinite resolution
- Long life
- Double ball joint shaft terminations

Independent linearity	>±0.1%
Operating temperature range	-55°C to 125°C
Total resistance	10KΩ
Resistance tolerance	±20%
Maximum Power Rating	0.05W/cm@70°C
Dimensions	366-6724 Housing: L = 182.8 Ball joint fixing centres = 251.6 366-6736 Housing: L = 304.8 Ball joint fixing centres = 373.6

233671

Measuring Range	Mftrs. List No.	Order Code	1+	10+	25+
100mm	34L 4D 103 W03263	366-6724			
200mm	34L 8D 103 W03263	366-6736			

Precision Linear Transducers 115L Series



- Rugged compact and accurate, for use in many industrial applications
- High accuracy +/- 0.05%
- Essentially infinite resolution
- Long life
- Not sensitive to temperature variations
- Moveable mounting brackets
- Ball joint can be ordered separately for greater flexibility

Independent linearity	>±0.1%
Operating temperature range	-55°C to 125°C
Total resistance	5KΩ
Resistance tolerance	±20%
Maximum Power Rating	0.05W/cm@70°C
Dimensions	Housing: L = measuring range + 75 Shaft: L = 25 (retracted)

233680

Measuring Range	Mftrs. List No.	Order Code	1+	10+	25+
130mm	115L 5,2E 502 W06017	366-6750			
225mm	115L 9E 502 W06017	366-6761			
350mm	115L 14E 502 W06017	366-6773			
750mm	115L 30E 502 W06017	366-6803			
Ball Joint (pair)	320 371	366-6815			

TROUBLESHOOTING TIPS

Chat online to one of our technical engineers at farnell.com

Tilt Sensors

Tilt Sensor



H=23, W=36.5,
Dia.=22mm

This compact tilt sensor is intended for use in systems such as portable heaters and HVAC equipment. The sensor acts as a safety cut-out to prevent operation when knocked out of a fully vertical position. The D7E-3 has an operating angle of 50° to 80°, minimising the risk of false triggering by small vibrations and knocks. It is self-resetting with a return angle of 25°. This allows the system to be re-positioned and restarted without further intervention. The sensor features 10mm pitch, 5mm quick connect terminals for ease of installation.

Contact Form		Operating Humidity	25 to 85% RH
Rating	5V dc, 0.1mA to 30V dc, 100mA	Operating Temperature	-25°C to 60°C
Contact Resistance	300mR	Insulation Resistance	100 MR Min.

418089

Mfrs.	List No.	Order Code	1+	5+	10+	+	+	Price Each
	D7E-3	100-7618						

Tilt Sensor

Sealed - STT Series

NEW

Penny+Giles



H = 17.3, W = 48, Diameter = 28mm

613530

- No moving parts
- High resolution ± 0.07°
- Absolute measurement
- Measuring range from ± 10° to ± 60°
- Less than 6.5mA supply current
- 200mm connecting cable
- Protection up to IP68 to 2m (for 24 hours duration)
- CE approved

Measurement	Mfrs.	List No.	Order Code	1+	5+	10+	Price Each
Range Angle							
±60°		STT280/60/P2	183-9693				

Non-Mercury



540-614
L=10.2, Dia.=4.7,
Leads L=12, Dia.=0.51,
Lead spacing=2.9



730-221
H=25.0, W=27.0, D=7.0,
Fixing centres=10.0 (Dia 3.3)
Cable L=300



732-825
L=30, W=20, D=7,
Cable L=300
Fixing slots=6x3.3,
Fixing centres=16.0

- Hermetically sealed tilt switches using non-toxic materials
- 540-614 is designed to meet a wide range of low level switching applications
- 730-221 will switch up to 10VA
- 732-825 has fixing slots for fine adjustment in alignment
- Suitable for safety and security systems, limit, position and level sensing

	540-614	730-221	732-825
Switching voltage	60V ac	240V ac	60V ac
Switching current	0.25A	0.5A	0.25A
Switching power	3VA	10VA	3VA
Contact resistance, (max)	30Ω	150Ω	30Ω
Max. differential angle	°	90°	16°
Max. 'break' angle above horizontal	10°	45°	10°
Max. 'make' angle below horizontal	10°	45°	10°
Operating temperature	-40°C to +150°C	-20°C to +70°C	-20°C to +70°C

212169

Mfrs.	List No.	Order Code	1+	25+	100+	250+	1K+	Price Each
	CW1300-1	540-614						
	MTA240	730-221						
	TSW30/60	732-825						

Tilt/Movement



L=10.2, Dia=4.7, Leads L=16.8,
Dia=0.46, Lead spacing=1.27

- Miniature mercury switch encapsulated in a nickel plated steel case for PCB mounting
- Senses tilt from horizontal, movement, impact etc.
- Mercury wetted contacts give low contact resistance throughout the life of the switch

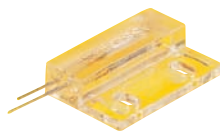
Switching current	200mA @ 240VAC	Operating modes	Max. 'break' 15° above horizontal
Switching voltage	240VAC, 168VDC		Max. 'make' 5° below horizontal
Switching power	10hm	Operating temperature	-37°C to +100°C

WARNING: THIS SWITCH SHOULD NOT BE OPENED AS IT CONTAINS MERCURY, A TOXIC SUBSTANCE

212441

Mfrs.	List No.	Order Code	1+	25+	100+	250+	1K+	Price Each
	CM13R-0	178-338						

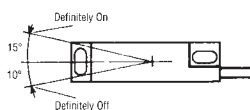
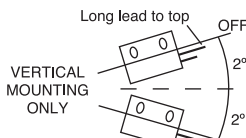
Surface Mounting



ASSEtech EUROPE

607-265: L=30, W=20, D=7, Pin L=20, Fixing slots=6x3.3. Fixing centres 16

176-794: L=47, W=12, D=11, Lead L=300, Fixing slots=6x3.2 Fixing centres=39x3



176-794 is fitted with 300mm 2-core PVC insulated cable.

607-265 has two 20mm wire leads and has transparent housing giving visual indication of switch position.

- Encapsulated mercury switches for surface mounting applications
- Fixing slots allow for fine adjustment in alignment

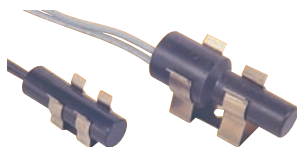
Switch Current	Switch Voltage	Switch Power	Contact Resistance	Order Code
1A max.	240V rms max.	100W max.	0.3Ω	176-794
0.25A max.	240V rms max.	10W max.	0.25Ω	607-265

WARNING: THESE SWITCHES SHOULD NOT BE OPENED AS THEY CONTAIN MERCURY, A TOXIC SUBSTANCE

212215

Mfrs.	List No.	Order Code	1+	25+	100+	250+	Price Each
	S1039	176-794					
	TSM4/240	607-265					

Insulated Steel



170-853
L=46, Dia=13.5,
Lead length=150

170-854
L=60.3, Dia=21.4,
Lead length=150

- Steel cased tilt switches insulated overall with PVC giving compact size and high structural strength
- Designed for horizontal mounting
- Fast switch action with no bounce
- High current switching capability for direct motor control
- Use for tilt sensing, level control, inertia or rotation sensing and in security applications

The mercury-to-mercury contacts close when the switch is tilted below horizontal. The switches have silicone rubber leads and are supplied with mounting clips.

Min Tilt from Horiz.	Rating	Order Code
15°	240V ac 13AA	170-853
15°	240V dc 8A	170-854

WARNING: THESE SWITCHES SHOULD NOT BE OPENED AS THEY CONTAIN MERCURY, A TOXIC SUBSTANCE

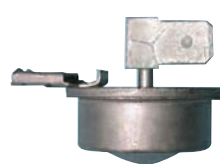
212442

Contact	Mfrs.	List No.	Order Code	1+	25+	100+	Price Each
13A		S1016	170-853				
19A		S1017	170-854				

Tip-Over Switches



607-241
Body dia.=28, H=29
Fixing centres 42, Dia.=4.2



170-888
Flange dia.=24, Body dia.=19.5
H=9.2, (22.1 overall)
W(overall incl. terminals)=31.8

Hermetically sealed mercury tip-over switches designed for a variety of level sensitive equipment. Switch contacts are closed when vertical as shown and open when tilted in any direction.

607-241: Switch in polypropylene housing, contacts are closed and open when tilted in any direction 35° from vertical. Fixing holes allow easy fitting. Fitted with silicon rubber coated tin/copper leads.

170-888: Nickel plated steel bodied switch has contacts which open at 25° to 45° from vertical. Connection by 6.35mm spade terminals.

Contact Rating	15A @ 50V dc, 15A @ 240V ac	15A @ 240V ac	Contact Resistance	Order Code
			1Ω typ.	170-888
			0.3Ω max.	607-241

WARNING: THESE SWITCHES SHOULD NOT BE OPENED AS THEY CONTAIN MERCURY, A TOXIC SUBSTANCE

212217

Mfrs.	Order Code	1+	25+	100+	250+
CM15-T5	170-888				
S1116	607-241				

Tip-Over Switch, Non-Mercury



- Hermetically sealed switch
- Switch contacts are closed when vertical as shown and open when tilted in any direction
- Non-mercury contacts

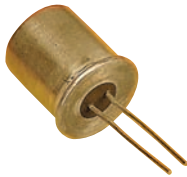
L=7.6, Body dia.=5.7mm,
Leads: L=8.6, Dia.=0.5

Switching voltage	60V ac	Contact resistance	5mΩ
Switching current	0.25A	Operating temperature	-37°C to +100°C
Switching capacity	3VA	Case material	Steel Tin Plated (case)
Operating angle	60°±10°		

212408

Mfrs.	Order Code	1+	50+	100+	250+
CW1260	309-4790				

Tip-Over/Jitter Switch



Miniature mercury switch with tin plated steel body. Contacts are closed in vertical position, opening when tipped over. Switch may also be used to sense movement or vibration.

Contacts 'must open' angle	45° from vertical
Contacts 'must close' angle	30° from vertical
Contacts rating	0.5A, 120V ac
Contacts resistance	3Ω

Flange dia.=9.5, Body dia.=8.2,
H=9.5, Pin L=11.8, Pin spacing=2.0

WARNING: THIS SWITCH SHOULD NOT BE OPENED AS IT CONTAINS MERCURY A TOXIC SUBSTANCE

212152

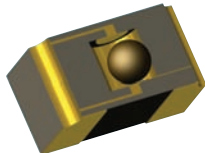
Mfrs.	Order Code	1+	25+	100+	250+
CM1421-0	723-745				

Motion Sensors

Micro Vibration Sensor

SENSOLUTE

Omnidirectional



H = 1.7, W = 2.85, D = 2.45mm

- Silent sphere motion
- SMD mount
- Gilded sphere and contact areas
- No mercury
- R_ON < 100 Ohm
- R_OFF > 30 Mega Ohm
- Max. +15V dc operation
- Response level approx. 50 mg
- Temperature range -20°C to +70°C

The micro vibration sensor is used for the detection of slight movements and vibrations by means of a mobile micro sphere.

With the aid of tool-specific evaluation electronics, the micro vibration sensor controls the operation of movement-sensitive tools. The micro vibration sensor is utilised for converting many systems to environmentally friendly devices by implementing wake-up and power-down logic to conserve battery power and bringing energy consumption to a minimum, pushing the availability of green technology and green electronics into new areas of design and application. The sensor is typically used for applications such as front and rear bicycle lights, bike computers, remote controls, electronic lock systems, transponders, mobile GPS systems, bluetooth-car-kits, wireless sensor networks, wireless PC mice and headsets, digital multimeters and tools provided with digital displays that are only switched on when in motion.

549289

Mfrs.	Order Code	1+	10+	25+	50+	100+
MVS0608.02	SMD 176-8152					

Movement - Miniature



L = 5, Dia = 5.5

This miniature sensor has been specifically designed for the detection of movement and vibration. The sensor is non position sensitive offering a similar level of sensitivity whatever its position and has been designed for use with analogue or digital circuitry.

The sensor reacts when disturbed by giving a fleeting change of state (ie NO to NC). The time taken to settle depends on the amount of energy absorbed by the device, the settled state will be random unless mounting attitude is chosen for a NC output.

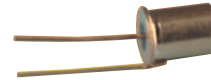
- Hermetically sealed non toxic metal cased switch with gold contacts
- Designed to meet a wide range of low level switching applications
- Suitable for security, limit, keyfob activation, position and level sensing
- Can also be used as a tilt switch
- Miniature size
- Non-Mercury content

Switching Voltage	24 Vac	Contact resistance	>10 Ω
Current Rating	0.02 A	Operating temperature	-37°C to 100°C
Switching Power	5 VA	Case Material	Steel - Gold Plated

249450

Mfrs.	Order Code	1+	5+	10+
MS24M	422-9046			

Shock / Linear Acceleration Switches



L = 6.8, Dia = 4.6

- Robust construction with sealed gold plated contacts
- Easy fitting and proven reliability
- Particularly suited for use in monitoring of centrifugal forces and controlling spin speeds

- Industrial and Medical centrifuge applications
- Electrical generating windmill applications
- Shock sensing in automotive and security applications etc

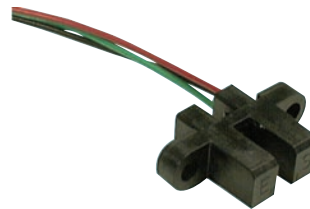
Contact	1NO	Operating temperature	-25°C to 85°C
Switching Voltage	24 Vac	Activation level	499-90582g to 4.9g
Current Rating	0.25A		499-906010g to 14.9g
Switching Power	5 VA		499-907115g to 19.9g
Contact resistance	10Ω		

249447

Activation Level	Mfrs. List No.	Order Code	1+	5+	10+
2g to 4.9g	ASLS2	422-9058			
10g to 14.9g	ASLS10	422-9060			
15g to 19.9g	ASLS15	422-9071			

SR16C-J6 Digital Vane Sensor

Honeywell



- Compact, robust package
- Mechanically interchangeable with standard optical style sensors
- Operated by a 'Ferrous Vane' interrupter for pulse counting or position sensing
- Current sinking (open collector) output
- 3.8V dc to 30V dc power supply
- Medium level magnetic switching to reduce stray field interference
- Internally sealed packages for moderate environment applications

- No mechanical contacts; eliminates product wear
- Non-contact position sensing

Package Style	Dual Tower Wire Exit
Supply Voltage	3.8 to 30VDC
Output Type	Sink
Termination Type	26 Gauge 7 Strand Lead Wire
Operating Temperature	-20 to 85°C
Output Voltage	0.4VDC
Vibration	10g/10Hz to 500Hz
Humidity	95% RH/40°C 100 h
Vane and Geartooth	Low Carbon Steel, High Permeability, Low Residual Induction
Output Current (Max.)	40mA
Supply Current (Max. @ 25°C)	10mA
Vane Thickness	1.14mm
Minimum Tooth Depth	6.35mm

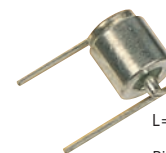
419622

Mfrs.	Order Code	1+	5+	10+	25+	+
SR16C-J6	108-2266					

Vibration/Motion Switches



540-626
L=9.5, Dia.=8.2, Leads L=11.2,
Dia.=1, Lead spacing=5



607-253
L=7.1, Dia.=4.6, Leads
L=7.5,
Dia.1, Lead spacing=6.3

Hermetically sealed switches which make contact when subject to vibration or motion.

540-626: A non-position sensitive switch whose contacts are open when at rest.

607-253: This switch is position sensitive and will be either open or closed depending on the centre electrode. Sensitivity can be varied by the position of the switch.

Contact Rating	0.75A @ 240V ac, 1A @ 110V ac	Temperature Range	-40°C to +260°C	Order	540-626
	0.1A @ V ac		-40°C to +260°C		607-253

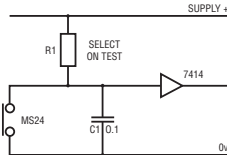
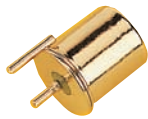
WARNING: THESE SWITCHES SHOULD NOT BE OPENED AS THEY CONTAIN MERCURY, A TOXIC SUBSTANCE

Vibration/Motion Switches - continued

Mfrs.	Order Code	1+	25+	100+	250+	1K+
CM4400-1.	540-626					
CM1800-1.	607-253					

212214

Vibration/Movement Switch - High Sensitivity Non-mercury



H=9.5, Dia=8.2, Leads L=4.5, Dia=1 Lead spacing=4.7

- Very high sensitivity detection of movement or vibration
- Non-position sensitive, offers a similar level of sensitivity whatever its position
- Long life and high reliability in a wide range of environments
- Ideal for anti-tamper and interference detection

A patented design non-mercury switch in hermetically sealed body with gold contacts. The contacts in their normal mode can be closed or open. When subjected to any small movement or vibration, the contacts will vibrate on and off repeatedly. The output may be damped if less sensitivity is required.

Applications: Movement detection - starting or running of motors, process equipment, detecting unusual levels of movement or vibration, detecting intrusion into control panels and security systems, anti-theft mobile systems in cars, laptop computers.

Switching voltage	24V ac	Contact resistance, initial	2Ω
Switching current	24mA	Operating temperature	-37°C to +100°C
Contact style	change of state	Case material	Steel, Gold Plated

212357

Mfrs.	Order Code	1+	25+	100+	250+	1K+
MS24	732-795					

Adjustable Sensitivity Module



- Module incorporates Assemtech MS24 high sensitivity non-mercury vibration motion switch
- Desensitising circuit allows response of sensor to be reduced
- Sensitivity is adjustable by trimmer ensuring no output below set level
- Omni-directional motion sensing
- Output is referenced to 0V and can drive a transistor or similar device
- Unit is fully encapsulated

H=20.3, W=38 (body), 60 (overall), D=32, Fixing centres=50.8 (Dia.=4.7), Cable L=300

Connections: Brown=5V, Green=0V, White=Output	Supply voltage 5V dc	Output current 24mA @ 5V dc
	Supply current 40mA max.	Operating temperature -10°C to +70°C

212395

Mfrs.	List No.	Order Code	1+	10+	25+	100+
MS24A/30.		723-0424				

Pyroelectric Infrared Sensor IRS-B Series - SMD

NEW



- Small and thin - 4.7 x 4.7 x 2.4mm
- High sensitivity
- Very high electromagnetic noise suppression
- Low profile lens contributes to very low overall profile

617570

Mfrs.	List No.	Order Code	1+	10+	25+	50+	100+
Dual - Long Distance	IRS-B210ST01	184-9539					
Quad - Micro-motion	IRS-B340ST02	184-9540					

Accessories

Fresnel Lens	IML-0650	184-9541					
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Infrared Sensor

Pyroelectric



Dual Quad

These SMD type pyroelectric infrared sensors exhibit high sensitivity and reliable performance made possible by the use of new ceramic material.

- High sensitivity and signal to noise ratio
- High resistance to temperature changes
- High immunity to external noise, vibration and RFI

Applications

- Security
- Lighting
- Household appliances

	207-4932	207-4933
Size (mm)	2.6 x 6.5 x 6.7	
Channels	Dual	Quad
Responsivity @ 500K, 1Hz	3.8mV _{p-p} (Typ)	3.8mV _{p-p} (Typ)
Supply voltage	2V DC to 15V DC	2V DC to 15V DC
Field of View	±50°	±50°
Optical filter	5µm long pass	5µm long pass
Operating Temperature	-40 to +70°C	-40 to +70°C

552984

Case Style	Mfrs. List No.	Order Code	1+	10+	25+	50+
Dual	IRS-A201ST01-R1	NEW 207-4932				
Quad	IRS-A334ST02-R1	NEW 207-4933				

Accessories - Fresnel Lens

3m to 5m - Wall Mount	IML-0642	177-7664				
5m to 7m - Wall Mount	IML-0658	177-7665				
6m to 7m - Ceiling Mount	IML-0669	177-7666				

Shock/Linear Acceleration Switch



984-541, 984-553: L=10.9, Dia=4.85, Lead Ø=0.5

730-210: L=6.8, Dia.=4.6 Leads L=11, Dia.=0.5

The switches are fitted with a spring loaded contact which closes when the switch detects shock or acceleration above its activation level. The contact will open again when acceleration decreases.

- Robust construction with sealed contacts
- Easy fitting and proven reliability
- Particularly suited for use in monitoring of centrifugal forces and controlling spin speeds
- Industrial and medical centrifuge applications
- Electrical generating windmill applications
- Power switching in automotive applications, etc.

Switching voltage	24V ac	Contact resistance	10Ω max.
Switching current	0.25A max.	Operating temperature	-20°C to +85°C

212282

Activation Level	Mfrs. List No.	Order Code	1+	25+	100+	250+
5g to 9.9g	ASLS5	730-210				

PIR-Motion Sensor AMN



- Very small dimensions: Ø10 x 13.5mm (Standard Type)
- Built-in amplifier for direct connection to µ-controller
- Two colours: black and white
- 4 detection types: standard, slight motion, spot, 10m
- Ambient temperature: -20°C to +60°C

Power Supply Voltage Vdd	3 - 6VDC
Output Voltage	Vdd - 0.5V
Output Current	100µA
Circuit Stability Time	7s (Typ.)
Detection Performance	Standard - 5m, 100° horizontal, 82° vertical Slight Motion - 2m, 91° horizontal, 91° vertical Spot - 5m, 38° horizontal, 22° vertical 10m Type - 10m, 110° horizontal, 93° vertical

475764

Detection	Mfrs. List No.	Order Code	1+	5+	10+
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White Lens					
Standard	AMN3112J	137-3711			
Slight Motion	AMN3212J	137-3713			
Spot	AMN3312J	137-3715			
10m Type	AMN3412J	137-3718			

Black Lens					
Standard	AMN3111J	137-3710			
Slight Motion	AMN3211J	137-3712			
Spot	AMN3311J	137-3714			
10m Type	AMN3411J	137-3716			

PIR-Motion Sensor EKMC

Panasonic
Ideas for life



- Simplified circuitry with fully integrated sensor design
- Low curvature lens for product designs
- Robust design prevents false detection
- Applications include commercial/residential equipment and home automation

NEW

	Standard	Long Distance
Sensing Distance	0m to 5m	0m to 12m
Horizontal Beam Angle	94°	102°
Vertical Beam Angle	82°	92°
Detection Zones	64	92
Current Consumption	170µA	
Mounting	T0-5	
Lens Material	Polyethylene	

659037

Colour	Mfrs. List No.	Order Code	1+	25+	50+
Standard					
White	EKMC1601111	209-5728			
Black	EKMC1601112	209-5729			
Pearl White	EKMC1601113	209-5730			
Long Distance					
White	EKMC1603111	209-5731			
Black	EKMC1603112	209-5732			
Pearl White	EKMC1603113	209-5733			

PIR-Motion Sensor EKMB

Panasonic
Ideas for life



- Simplified circuitry with fully integrated sensor design
- Low curvature lens for product designs
- Robust design prevents false detection
- Applications include security, wireless and mobile applications

NEW

	Standard	Long Distance	Mounting	Lens Material
Sensing Distance	0m to 5m	0m to 12m	T0-5	Polyethylene
Horizontal Beam Angle	94°	102°		
Vertical Beam Angle	82°	92°		
Detection Zones	64	92		

659040

Colour	Current Consumption	Mfrs. List No.	Order Code	1+	5+	10+
Standard						
White	1µA	EKMB1101111	209-5734			
Black	1µA	EKMB1101112	209-5735			
Pearl White	1µA	EKMB1101113	209-5736			
White	2µA	EKMB1201111	209-5738			
Black	2µA	EKMB1201112	209-5739			
Pearl White	2µA	EKMB1201113	209-5740			
White	6µA	EKMB1301111K	209-5741			
Black	6µA	EKMB1301112K	209-5742			
Pearl White	6µA	EKMB1301113K	209-5743			
Long Distance						
White	1µA	EKMB1103111	209-5744			
Black	1µA	EKMB1103112	209-5745			
Pearl White	1µA	EKMB1103113	209-5746			
White	2µA	EKMB1203111	209-5747			
Black	2µA	EKMB1203112	209-5748			
Pearl White	2µA	EKMB1203113	209-5751			
White	6µA	EKMB1303111K	209-5752			
Black	6µA	EKMB1303112K	209-5753			
Pearl White	6µA	EKMB1303113K	209-5754			

PIR-Motion Sensor EKMA

Panasonic
Ideas for life



- Low profile achieved with fitted lens and embedded sensing circuit
- Motion detection with 3mm diameter miniature flat lens
- Robust design against false starts

NEW

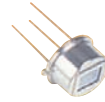
	PE Lens	Silicon Lens
Sensing Distance	0m to 5m	0m to 3m
Horizontal Beam Angle	94°	58°
Vertical Beam Angle	82°	34°
Detection Zones	64	4

659044

Current Consumption	Mfrs. List No.	Order Code	1+	5+	10+
Polyethylene Lens					
White 1µA	EKMA1101111	209-5755			
Black 1µA	EKMA1101112	209-5756			
White 2µA	EKMA1201111	209-5757			
Black 2µA	EKMA1201112	209-5758			
White 6µA	EKMA1301111	209-5759			
Black 6µA	EKMA1301112	209-5760			
Silicon Lens					
- 1µA	EKMA1102120	209-5761			
- 2µA	EKMA1202120	209-5763			
- 6µA	EKMA1302120	209-5764			

Pyroelectric Infra-Red Detector

muRata



- Movement sensor, for example in infra-red intruder alarms
- Sensor incorporates an optical filter to reflect white or visible light
- Improved sensitivity and reduced white noise
- Suitable Fresnel lens arrays also available

Dual element infra-red detectors housed in metal can package.

731-950: H=4.7, Dia=9.1

Detector

Sensitivity @ 500°K, 1Hz	4.3mVpp (typ.)	Supply voltage	2-15V dc
Sensitivity balance	10% max	Viewing angle	45°x45°
White noise level	200mVpp max	Element size	(2.0x1.0mm)x2
Source voltage	0.2-2.5V	Operating temperature	-40°C to +70°C

Mfrs. List No. IRA-E700St0=100-6209

212444

Order Code	1+	10+	25+	100+
Detector	100-6209			

Pyroelectric Infrared Sensor



Module



Fresnel Lens

- High sensitivity and excellent Signal to Noise ratio
- High stability, immunity to temperature changes
- Slight movement is detectable
- High immunity to external noise (Vibration, RFI etc.)

This pyroelectric infrared sensor exhibits high sensitivity and reliable performance made possible by ceramic technology and the hybrid IC techniques employed during fabrication. The Fresnel lens is used to decide the detection distance and the detection area (angle) of the sensor.

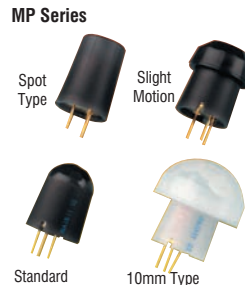
Supply Voltage	Total Resistance	White Noise	Detection Width (mm)	Operating Temperature	Description	Order Code
2 to 15V	47k to 200kΩ	200mVp-p Max.	4.7±0.1 6.6	-40 to 70°C -25 to 60°C	PIR Fresnel Lens	100-6207 100-6208

338804

Mfrs. List No.	Description	Order Code	1+	5+	10+
IRA-E712ST3	Module	100-6207			
IML-0636	Fresnel Lens	100-6208			

PIR-Motion Sensor MP Series

NAIS



- Extremely compact
- Built-in amplifier for direct connection to a micro-processor
- Dual lens colours available to match equipment
- 4 detection types

Power Supply Voltage Vdd 3 - 6VDC
Output Vdd. - 0.5V - 100µA
Circuit stability time 7s (Typ)

Detection Performance

Standard	5m - 100° Horizontal, 82° Vertical
Slight	2m - 91° Horizontal, 91° Vertical
Spot	5m - 38° Horizontal, 22° Vertical
10mm	10m - 110° Horizontal, 93° Vertical

624222

Detection	Mfrs. List No.	Order Code	1+	5+	10+
Standard					
Black	AMN11111	416-0253			
White	AMN11112	416-0265			
Slight Motion					
Black	AMN12111	416-0277			

PIR-Motion Sensor - continued

MP Series - continued

Detection	Mfrs.		Price Each		
	List No.	Order Code	1+	5+	10+
Spot Type					
Black	AMN13111	416-0290			
White	AMN13112	416-0307			
10mm Type					
Black	AMN14111	416-0319			
White	AMN14112	416-0320			

Stopped Motion Monitor - ROTASTOP3



Self-contained



- Self-contained, no moving parts
- Universal voltage, two wire operation
- Simple, low-cost installation
- No contact with moving parts

L=95, Dia.=M18 (overall)

The ROTASTOP SU1MZ is ideal for monitoring chain- or gear-driven machinery such as gearbox drives, screw conveyors etc. but is suitable for almost any application where stop-page detection is needed.

		Target	18mm dia. target for Maximum range
Supply	24 to 240V ac/dc		
Ambient temperature	-15°C to +60°C		
Operating speed	15 to 3600 ppm	Time delay	4 sec.
Protection	IP65	Start up delay	4 sec.
Output	Normally closed	Cable	2 core, PVC sheathed, 2m length
	When running		
Output rating	1.6mA min, 200mA max. (volt drop 8V)	Indication	LED indication of input plused and output energised
Operating distance	8mm ferrous metal	Enclosure	Moulded polycarbonate

212318

Mfrs.	Price Each	
List No.	Order Code	1+ 5+ 10+
SU1MZ(A)	705-9220	

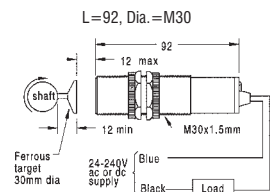
Underspeed Monitor - ROTASLIP



Self-contained



- Automatic calibration at 20% underspeed
- Microprocessor controlled
- Universal voltage, two wire operation
- No contact with moving parts
- ATEX Approved - Certification 2364X



The ROTASLIP self-contained underspeed monitor detects slowdown or stoppage of rotating machinery. It is ideal for monitoring the rotation of belt conveyors, grain elevators, fans, mixers or grinders and is suitable for many other industrial applications.

Note: The load must have the same voltage rating as supply being used.

		Target	20mm dia. target for maximum range
Supply	24 to 240V ac/dc		
Ambient temperature	-15°C to +50°C		
Operating speed	10 to 3600 ppm		
Protection	IP65		
Output	Normally closed at set speed		
Output rating	1.6mA min, 200mA max. (volt drop 8V)		
Operating distance	15 mm Max, detecting 20 mm dia, ferrous target		
Target	20mm dia. target for maximum range		
Start up delay	0 to 30 sec.		
Cable	2m, 2 core, PVC sheathed		
Accuracy	±/- 2% of set speed		
Indication	LED indication of input plused and output energised		
Enclosure	Moulded polyester		

212349

Mfrs.	Price Each	
List No.	Order Code	1+ 5+ 10+
PU1TZA-DM1201	445-0292	



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Hall Effect Vane Sensor



Hall effect vane sensors include a Hall effect transducer and a magnet, and are operated by passing a ferrous vane through the gap between the two.

Body - H = 10.9, W = 13.2, D = 19.1mm
Slot - W = 2.5, D = 7.4mm
Fixing centres = 14mm (dia. = 2.8mm)

- Rugged sealed housing
- Useful as limit switch by operating with single large vane
- Useful as tachometer sensor by operating with toothed wheels
- Wide temperature range
- Suitable in dusty or high ambient light environment where an optical sensor would be unsuitable
- Transient and reverse polarity protection

	Mfrs.	Price Each
Supply voltage	4.5 to 26.5V dc	50mA
Supply current	5 to 18mA	Temperature range
		-40°C to +150°C

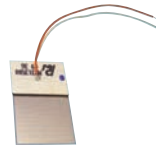
212443

Mfrs.	Price Each		
Termination	List No.	Order Code	1+ 10+ 25+ 100+
Leadwire	4AV16F.	178-877	

Ultrasonic Transducers

Ultrasonic Transducers

Piezoelectric Atomiser



- Piezoelectric ceramic element attached to a metal foil
- Fine and consistent particle size of between 7 and 10µm
- High atomizing efficiency
- Low power consumption
- High stability and durability

H = 1, W = 17.35, D = 29.2mm	Nozzle Size	Metal Material	Frequency Capacitance	Resonant Impedance	Resonant Freq.
	7 - 10 µm	Ni-Co Alloy	2450 pF	10 Ohm Typ.	135kHz

Applications

- Humidification in refrigerated food displays and storage
- Humidification in living environments and air conditioning plants
- Inhalation and disinfecting equipment
- Humidification in industrial process control for lubrication and coating
- Liquid dispensing systems

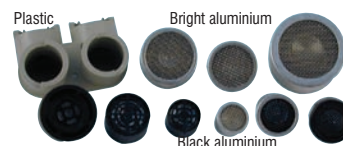
The ultrasonic vibration micro nozzle consists of a piezo ceramic attached to a metal foil, on which thousands of micro nozzles are formed. Similar to the inkjet printer principle, this transducer atomises fluids through this matrix of micro holes of around 7-10 µm. This style of transducer siphons small amounts of liquid to the metal foil, and then atomises it with the piezo ceramic. Unlike traditional atomizers, it does not need constant high levels of liquid on the surface of the transducer, and works at lower frequencies.

551755

Mfrs.	Price Each	
List No.	Order Code	1+ 25+ 100+
M2313500	177-4944	

Ultrasonic Transducer

Standard - Open Air Type



The Standard (S) Open Air type transducers consist of a piezo-ceramic disc bender mounted at the node of its fundamental resonant frequency, a quarter wavelength conical metal resonator bonded in the centre of the disc, acting as a rigid piston movement. This special construction provides high sensitivity and Sound Pressure Level (SPL), wider bandwidth, excellent temperature and humidity durability and stable electrical and mechanical characteristics. The S type transducers are suitable for continual driving circuits, such as Doppler motion detectors.

Applications

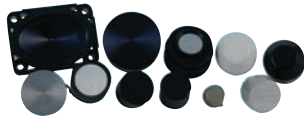
- Alarm systems
- Liquid level measurement
- Anti-collision devices
- Moving object detectors/counters
- Remote control devices
- Robotics

Centre Freq. (kHz)	SPL (dB)	Sensitivity (dB)	Drive Voltage Max. (rms)	Dimensions H x Dia. (mm)	Mfrs List No.	Order Code
25	112	112dB	20	12 x 16.2	250ST160	100-7326
25		-62dB	20	12 x 16.2	250SR160	100-7327
25	112	112dB	20	14.2 x 18.2	250ST180	100-7328
25		-62dB	20	14.2 x 18.2	250SR180	100-7329
32.8	115	115dB	20	9.6 x 16.2	328ST160	100-7330
32.8		-67dB	20	9.6 x 16.2	328SR160	100-7331
40	120	120dB	20	12 x 16.2	400ST160	100-7332
40		-65dB	20	12 x 16.2	400SR160	100-7333
40		-65dB	20	12 x 16.2	400SR16P	100-7338
40	115	115dB	20	12 x 16.2	400ST120	100-7339
40		-67dB	20	12 x 12.7	400SR120	100-7340
40	112	112dB	10	6.7 x 9.7	400ST100	100-7341
40		-70dB	10	6.7 x 9.7	400SR100	100-7342
40		-70dB	10	6.7 x 9.7	400SR10B	100-7344

415216

Case Type	Mftrs.		Price Each		
	List No.	Order Code	1+	25+	100+
Bright Aluminium	250ST160	100-7326			
Bright Aluminium	250SR160	100-7327			
Bright Aluminium	250ST180	100-7328			
Bright Aluminium	250SR180	100-7329			
Bright Aluminium	328ST160	100-7330			
Bright Aluminium	328SR160	100-7331			
Bright Aluminium	400ST160	100-7332			
Bright Aluminium	400SR160	100-7333			
Plastic	400SR16P	100-7338			
Bright Aluminium	400ST120	100-7339			
Bright Aluminium	400SR120	100-7340			
Bright Aluminium	400ST100	100-7341			
Bright Aluminium	400SR100	100-7342			
Black Aluminium	400SR10B	100-7344			

Ultrasonic Transducer Standard - Enclosed Air Type



The Standard Enclosed (E) Type Transducers can be used for outdoor installation, or, because of its special dust-proof construction, can be used in a dusty atmosphere. The transducers consist of a metal housing with integral diaphragm, which operates at resonance on the first harmonic overtone. The backs of the transducers are completely sealed with resin, protecting from exposure to the environment. Although they are of a watertight construction, it is not recommended that they be used underwater. Due to its free vibration and un-damping characteristics, the (E) type transducers are suitable for continual drive circuits, such as Doppler motion detectors.

Applications

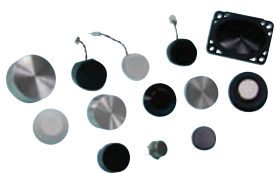
- Alarm systems
- Liquid level measurement
- Anti-collision devices
- Moving object detection/counters
- Remote control devices
- Robotics

Centre Freq. (kHz)	SPL (dB)	Sensitivity (dB)	Drive Voltage Max. (rms)	Dimensions H x Dia. (mm)	Mftrs List No.	Order Code
32.8	113	113dB	20	12 x 25	328ET250	100-7345
32.8		-67dB	20	12 x 25	328ER250	100-7346
40	115	115dB	15	12 x 18	400ET180	100-7347
40		-70dB	15	12 x 18	400ER180	100-7349
40	100	100dB	15	4.6 x 9.1	400ET080	100-7351
40		-80dB	15	4.6 x 9.1	400ER080	100-7352

415217

Case Type	Mftrs.		Price Each		
	List No.	Order Code	1+	25+	100+
Bright Aluminium	328ET250	100-7345			
Bright Aluminium	328ER250	100-7346			
Bright Aluminium	400ET180	100-7347			
Bright Aluminium	400ER180	100-7349			
Bright Aluminium	400ET080	100-7351			
Bright Aluminium	400ER080	100-7352			

Ultrasonic Transducer Pulse Transit



The Pulse/Tone Burst type transducers include two groups, open type (PT) and enclosed type (EP). Construction is similar to the standard air types, but an extra mechanical damper is added on the cone surface to minimise vibrations and hence reduce ringing. These types of transducer are specially designed for echo ranging systems with several transducers having asymmetric beam patterns designed specially to minimize unwanted reflections being picked up from the ground.

- Car reversing aids
- Alarm systems
- Liquid level measurement
- Anti-collision devices
- Moving object detection/counters
- Remote control devices
- Robotics

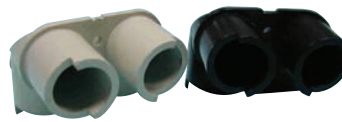
Centre Freq. (kHz)	SPL (dB)	Sensitivity (dB)	Drive Voltage Max. (rms)	Dimensions H x Dia. (mm)	Mftrs List No.	Order Code
40	98	-80dB	20	9.5 x 12.5	400EP125	177-4942
40	117	-65 dB	20	12 x 16.2	400PT160	100-7353
40	115	-68 dB	20	10 x 12.7	400PT120	100-7354
40	108	-75 dB	20	12 x 18	400EP18A	100-7355
40	103	-78 dB	20	9.1 x 14.1	400EP14D	100-7356
40	113	-72 dB	20	12 x 25	400EP250	100-7357

415218

Type	Mftrs.		Price Each		
	List No.	Order Code	1+	25+	100+
Bright aluminium	400EP125	177-4942			
Bright aluminium	400PT160	100-7353			
Bright aluminium	400PT120	100-7354			
Black aluminium	400EP18A	100-7355			
Black - Asymmetrical beam	400EP14D	100-7356			
Bright aluminium	400EP250	100-7357			

Ultrasonic Transducer

Mirror Bender



This dual sensor unit houses both transmitter and receiver in a resin housing with 45° acoustic delay mirrors. This delay path offsets the ringing of the transmitter, and theoretically this means that objects can be measured at very close distances.

The design combines high sensitivity and sound pressure level with excellent temperature and humidity durability.

Applications

- Remote control devices
- Robotics
- Intrusion Alarms
- Energy saving equipments

Centre Freq. (kHz)	SPL (dB)	Sensitivity (dB)	Drive Voltage Max. (rms)	Dimensions H x W x D. (mm)	Mftrs List No.	Order Code
50	113	-67 dB	20	32.65 x 30.5 x 31	500MB120	100-7360

415219

Type	Mftrs.		Price Each		
	List No.	Order Code	1+	25+	100+
Dual Transducer	500MB120	100-7360			

Ultrasonic Transducer

High Frequency - Narrow Beam



Applications

- Proximity detection
- Robotics
- Level control
- Short to long range measurement systems

These transceiver type transducers operate at higher frequencies than the standard air types and are constructed using a silicon rubber matching technique. Providing narrow beams with little or no side lobes, these transducers are ideal for use as proximity sensors. They have high sensitivity and sound pressure levels.

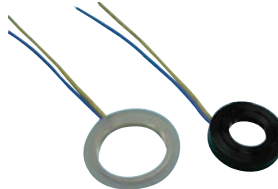
Centre Freq. (kHz)	Sensitivity (dB)	Drive Voltage Max. (rms)	Dimensions H x Dia. (mm)	Mftrs List No.	Order Code
235	-73 dB	50	15 x 13	235AC130	100-7362

415220

Type	Mftrs.		Price Each		
	List No.	Order Code	1+	25+	100+
Pins, 9.3mm x 1mm	235AC130	100-7362			

Ultrasonic Transducers

Piezoelectric Atomiser



The ultrasonic atomizing transducer uses a high Q hard type piezoelectric ceramic element and is ideal for atomizing liquids. A very fine mist, having a particle diameter of only a few microns, can be generated. The process also sterilizes water.

- Piezoelectric ceramic element clad with stainless steel for corrosion resistance
- Fine and consistent particle size of less than 3µm

- High atomizing efficiency >400 cc / hour
- High stability and durability

Applications

- Humidification in refrigerated food displays and displays
- Humidification in living environments and air conditioning plants
- Inhalation and disinfecting equipment
- Humidification in industrial process control for lubrication and coating
- Nebulisers

Operational Life (Hrs)	Atomising Quality (cc/hr)	Water Level (mm)	Input Power (W)	Resonant Freq. (MHz)	Dimensions H x W x D. (mm)	Mftrs List No.	Order Code
>6000	400	45	30	1.65	H = 5.5, Dia = 30.5	M165D25	100-7369

415223

Mftrs. List No.	Order Code		Price Each		
	1+	25+	100+		
M165D25	100-7369				

TROUBLESHOOTING TIPS

Chat online to one of our technical engineers at farnell.com

Ultrasonic Transducers - continued

Sonar Ranging Module Ultrasonic Development Kit



W = 27.5, D = 19mm

Dia. = 3,
L(body)8mm,
L(lead)
= 10mm



H=1.45, W=8.66, D=3.91mm

Ultrasonic ranging development module The SRM400 Development Kit is an ultrasonic sonar ranging module, designed specially to work with the Prowave PT or EP type transducers. This module provides a short learning curve for the development of car reversing systems, and other distance measurement systems, for design engineers who are not very familiar with analog circuits and/or the operation of ultrasonic transducers. The SRM400 module contains a module board, a 400EP14D enclosed transducer and a detailed electrical schematic.

Ultrasonic Sonar ranging IC This chip consists of an external tunable RC oscillator with a special feature of automatic frequency tracing, which compensates the resonant frequency shift of the transducer due to temperature changes. A fixed gain pre-amplifier can be tailored to compensate for varying transducer sensitivities. The 32 steps time controlled variable gain amplifier slope can be modified by adjusting the frequency of the system clock. The onboard comparator converts the analog signal of the returning echo to a TTL level digital signal for use with an external microprocessor.

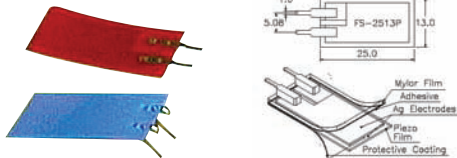
- Operating Voltage 6 - 10Vdc
- Broadband output up to 250kHz
- Built-in variable RC oscillator to match transducers with different frequencies
- High gain amplifier - time controlled 32 steps
- Integrated band pass filter to reduce external component count
- Bi-direction I/O pins to simplify control function when transmitting or receiving
- Adjustable system clock

415060

Mfrs.	List No.	Order Code	Price Each		
			1+	25+	100+
Module	SRM400	100-7370			
IC	PW0268	SMD 100-7371			
Crystal - 40 kHz	S4000	100-7372			

Piezoelectric Film Sensors

Motion / Vibration / Impact



The polymer film of polyvinylidene fluoride (PVF2) provides superior performance to many other piezo crystal or ceramic materials. The strain constant (g value) is 10 - 20 times larger than normal piezo ceramic and is therefore ideal for converting mechanical to electrical energy.

- High mechanical-electrical coefficient
- Low mechanical and acoustic impedance
- High resistance to moisture
- Pliant, flexible, tough and lightweight
- Self generated voltage, non-contact, rustless and free of sparking

Applications

- Vibration and motion sensors
- Coin and impact sensors
- Low weight accelerometer
- Pressure or force sensors
- Keyboards, keypads and touch panels
- Microphone and headset speakers

Voltage Sensitivity	Transverse Sensitivity	Resonant Frequency	Capacitance Sensitivity	Dimensions H x W . (mm)	Mfrs. List No.	Order Code
70mV/ms ⁻²	80	80Hz ±10	1500pF ±30%	13 x 25	FS-2513P	100-7374

415224

Mfrs.	List No.	Order Code	Price Each		
			1+	25+	100+
FS-2513P		100-7374			

Ultrasonic Sensor

Piezoelectric Ceramic - PIEZOTITE®



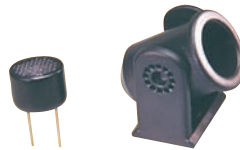
- Compact
- Light weight
- High sensitivity
- High reliability
- Nominal frequency 40 kHz
- Directivity 80°
- 2550 pF capacitance
- Temperature range -40 to +85°C
- Detectable range from 0.2m to 4m

Body - Dia. = 9.9, H = 7.1mm
Pins - Dia. = 0.64, L = 10mm

553089

Function	Mfrs. List No.	Order Code	Price Each		
			1+	10+	25+
Ultrasonic Transmitter	MA40S4S	177-7667			
Ultrasonic Receiver	MA40S4R	177-7668			

Ultrasonic Transducers



10mm Dia. Type
H=6.6, dia.=9.8
Leads L=8.5,
dia.=0.5
Lead spacing=4.8

10mm Housing
Bracket
H=19, W=12,
D=16
Mtg=4.5 dia.

10mm Dia. Open	
Sensitivity, transmitter	110dB
Sensitivity, receiver	-70dB
Resonant frequency	40±1kHz
Typical operating distance	5m
Direction angle	30°
Input voltage (max), transmitter	10V rms
Capacitance (typ.)	2000pF
Operating temperature	-20°C to +60°C

Ultrasonic transmitters and high sensitivity receivers designed for sending and receiving ultrasonic sound in the form of continuous or modulated waves through the air at 40kHz.

- Typical applications: remote control, proximity sensors, intruder alarms, motion detectors and data transmission
- Pair of housings are suitable for mounting 10mm dia. transducers. The housing enables the transducer to be aligned in a number of fixed positions relative to its mounting bracket, and is ideal for non-PCB applications

212433

10mm Dia. (Open)	Mfrs. List No.	Order Code	Price Each		
			1+	25+	100+
Transmitter	SQ-40-T-10B	213-214			
Receiver	SQ-40-R-10B	213-226			
Housings (pair)	QHP10	213-238			

Matching Transformers

Sonar Ranging Circuits



Order Code	177-4949	177-4947	177-4948
Mfrs. List No.	K4000002	K4000004	K4000005
Operating Frequency	40kHz	40kHz	125kHz
Variable Inductance (Min.)	5.3mH	6mH	1.5mH
Unloaded Q (Min.)			
Turns Ratio	1:10	1:10	1:20

H = 10, W = 8.3, D = 7.9mm

551792

Mfrs.	List No.	Order Code	Price Each		
			1+	10+	25+
K4000002		177-4949			
K4000004		177-4947			
K4000005		177-4948			

Magnetic Sensors

Hall-Effect Gear Tooth Sensor



- Senses ferrous metal targets
- Digital current sinking output (open collector)
- Better signal-to-noise ratio than variable reluctance sensors
- Excellent low speed performance
- Output amplitude not dependant on RPM
- Sensor electronically self adjusts to slight variations

- in runout and variation in temperature
- Fast operating speed - over 100 kHz
- EMI resitant
- Reverse polarity protection and transient protection (integrated into Hall IC)
- Wide continuous operating temperature range

Product Type	Hall Effect Gear Tooth Sensor
Supply Voltage	4.5 to 24VDC
Output Type	Sink
Termination Type	
Operating Temperature Range	-40 to 150°C
Output Voltage	0.4VDC Max.
Vane & Gear Tooth Target Material	Cold Rolled Steel, 1018 or Low in Carbon (Annealed)

GT Target RPM	10 RPM Min, 3600 RPM Max.
Switching Time Rise (10% to 90%)	15 µs Max.
Switching Time Fall (90% to 10%)	1.0 µs Max.
Operate Point	3.3° ±1.25°
Release Point	4.4° ±2.50°
Supply Current (Max. @ 25°C)	20mA
Output Current (Max.)	40mA
GT Target Min Tooth Height	5.06mm
GT Target Min Tooth Width	2.54mm
GT Target Min. Tooth Spacing	10.16mm
GT Target Thickness	6.35mm
GT Target Thickness	101.6mm
GT Airgap	1.02mm to 2.03mm
Leakage Current Max.	10 µA
Differential	8.4° ±3.70°

449158

Mfrs.	List No.	Order Code	Price Each			
			1+	10+	50+	100+
1GT101DC		122-5630				

Hall-Effect Gear Tooth Sensor Dual Differential



Product Type Hall Effect Gear Tooth Sensor
Supply Voltage 4.5 to 18VDC
Supply Current 13.6mA
Output Type Square Wave
Output High $\geq V_s$ 500mV
Output Low $\leq 0.5V$
Output Current (Max.) 20mA
Termination Type Axial Leaded - 555mm
Sensing air gap 0 to 2mm
Operating Temperature -40 to 150°C
Continuous

- Enhanced target resolution
- Dynamic offset self calibration
- Near zero speed
- EMI hardened
- Short circuit protection

- Reverse voltage protection
- Open collector output
- Low jitter output
- Wide continuous operating temperature range

505698

Mfrs.			Price Each			
List No.	Order Code	1+	10+	25+	50+	100+
SNDH-T4L-G01	156-6216					

Magnetic Speed Sensor High Temperature



High Temperature VRS (Variable Reluctance Speed) sensors are designed for use in applications where the sensor is exposed to temperatures up to 260 C [450 F]. Passive VRS Magnetic Speed sensors are simple, rugged devices that do not require an external voltage source for operation. A permanent magnet in the sensor establishes

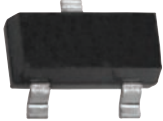
a fixed magnetic field. The approach and passing of a ferrous metal target near the sensor's pole piece (sensing area) changes the flux of the magnetic field, dynamically changing its strength. This change in magnetic field strength induces a current into a coil winding which is attached to the output terminals. The output signal of a VRS sensor is an ac voltage that varies in amplitude and wave frequency as the speed of the monitored device changes, and is usually expressed in peak to peak voltage (Vp-p). One complete waveform (cycle) occurs as each target passes the sensor's pole piece. If a standard gear were used as a target, this output signal would resemble a sine wave if viewed on an oscilloscope.

- Self-powered operation
- Direct conversion of actuator speed to output frequency
- Simple installation
- No moving parts
- Designed for use over a wide range of speeds
- Adaptable to a wide variety of configurations
- Housing diameter 6.4mm
- Stainless steel threaded housing
- 1220mm insulated 28 AWG leads
- -73°C to 230°C operating temperature range
- Output voltage 4.7 Vp-p to 125 Vp-p

526332

Mfrs.			Price Each		
List No.	Order Code	1+	5+	10+	
MA3055S10	154-1025				

Bipolar Hall-Effect Sensor Latching



SS361CT - H = 1.45, W = 2.9, D = 1.6mm



SS461C - H = 3, W = 4.1, D = 1.6mm
Leads = 14.61mm

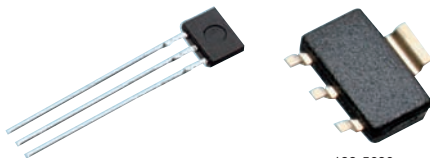
The SS361CT/SS461C latches are small, sensitive and versatile digital Hall-effect devices that are operated by the magnetic field from a permanent magnet or an electromagnet. They are designed to respond to alternating North and South poles. These bipolar sensor ICs have enhanced sensitivity which often allows for the use of less expensive magnets. They offer reverse polarity protection and deliver a stable output

over a wide temperature range. Operation from any dc supply voltage from 4 Vdc to 24 Vdc is acceptable.

605390

Case	Mfrs.		Price Each			
Style	List No.	Order Code	1+	100+	250+	500+
SOT-23	SS361CT	SMD 181-1310				
T0-92	SS461C	181-1311				

Linear Position Sensor



122-5624

122-5626

The SS49E and SS59ET series economical linear hall-effect sensors are small, versatile linear hall-effect devices what are operated by the magnetic field from a permanent magnet or an electro magnet. The linear sourcing output voltage is set by the supply voltage and varies in proportion to the strength of the magnetic field.

Honeywell

The integrated circuitry features low noise output, which makes it unnecessary to use external filtering. It also includes thin film resistors to provide increased temperature stability and accuracy. These linear hall sensors have an operating range of -40 to 100°C, appropriate for commercial, consumer and industrial environments.

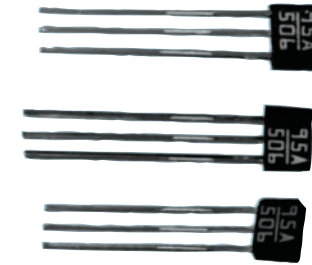
- Miniature construction
- Power consumption of 6 mA @ 5V dc for energy efficiency
- Low voltage operation down to 3V dc
- Single current sourcing output
- Linear output for circuit design flexibility
- Low noise output virtually eliminates the need for filtering
- Thin film resistors for a stable and accurate output
- Temperature range from -40 to 100°C
- Responds to either positive or negative gauss

Product Type Hall Effect Linear Position Sensor
Supply Voltage 3.0 to 6.5VDC
Output Type Source
Magnetic Actuation Type Analog
Sensitivity @ 25°C 1.0 mV/G min., 1.4mV/G typ., 1.75mV/G max.
Operating Temperature Range -40 to 100°C
Output Voltage 1.05V/Gauss min., 1.4mV/Gauss typ., 1.75mV Max.
Linearity (% of span) -0.007
Temperature Error (@ 25°C) 0.10 max./-0.10 min
Null Shift (%/°C)
Supply Current (max @ 25°C) 10mA
Response Time 3µs
Null (@ 0 Gauss, 25°C) 2.25 V dc min., 2.50V dc typ., 2.75 V dc max.
Supply Current (typ. @ 25°C) 6mA
Temperature Error ($\geq 25^\circ\text{C}$) 0.05 max., -0.15 min.
Sensitivity (%/°C) 0.185 max., -0.04 min.
Temperature Error ($\leq 25^\circ\text{C}$)
Sensitivity (%/°C)
Magnetic Range ± 650 Gauss min., ± 1000 Gauss typ.
Output Voltage Span 1.05 V dc to ($V_s - 1.05V$ dc) min.
0.95V dc to ($V_s - 0.95V$ dc) typ.
1.0 mA ($V_s 3.0 V$) min
1.5 mA ($V_s 3.0V$) typ.

449071

Connection	Mfrs.		Price Each				
Type	List No.	Order Code	1+	10+	25+	50+	100+
	SS49E	122-5624					
	SS59ET	SMD 122-5626					

Miniature Ratiometric Linear Hall-Effect Sensor Honeywell



The SS490 Series MRL (Miniature Ratiometric Linear) sensors have a ratiometric output voltage, set by the supply voltage. IKT takes in proportion to the strength of the magnetic field.

- Small size
- Low power consumption
- Single current sinking or current sourcing linear output
- Built in Thin-Film resistors, laser trimmed for precise sensitivity and temperature compensation
- Rail-to-rail operation provides more useable signal for higher accuracy

- Responds to either positive or negative gauss
- Quad hall sensing element for stable output

Product Type Hall Effect Linear Position Sensor
Supply Voltage 4.5 to 10.5VDC
Output Type Sink / Source
Magnetic Actuation Type Ratiometric
Operating Temperature Range -40 to 150°C
Output Voltage 0.2VDC to ($V_s - 0.2 V$ dc) typ.
400mV to ($V_s - 0.2 V$ dc) min.
-0.1 % typ., -1.5% max.
0.4 V dc to ($V_s - 0.4 V$ dc)
8.7mA @ 5 V dc
0.4 V dc
 $V_s - 0.4 V$ dc
Response Time 3µs
Output Current Typical Source 1.5 mA
Output Current Minimum Source ($V_s < 4.5 V$ dc) 1 mA
Output Current Minimum Sink ($V_s < 4.5 V$ dc) 0.6 mA
Output Current Minimum Sink ($V_s < 5 V$ dc) 1 mA
Output Voltage Span (typ.) 0.2 V dc to ($V_s - 0.2 V$ dc)
Response Time 3µs
Null (Output @ 0G) 2.50 V dc $\pm 0.075 V$ dc

	122-5627	147-0592
Sensitivity	3.125 mV ± 0.125 mV/G	3.125 mV ± 0.094 mV/G
Temperature Error (@ 25°C)	-0.06% Min., 0.06% Max.	-0.04% Min., 0.04% Max.
Null Shift (%/°C)	-0.01% Min., 0.05% Max.	-0.01% Min., 0.05% Max.
Magnetic Range (typ.)	-67 mT to 67mT (-670G to 670G)	-67 mT to 67mT (-670G to 670G)
Magnetic Range (min.)	-60 mT to 60 mT (-600G to 600G)	-60 mT to 60 mT (-600G to 600G)

449088

Mfrs.	List No.	Order Code	1+	10+	25+	50+	100+
	SS495A	122-5627					
	SS495A1	147-0592					

Digital Hall-Effect Position Sensor

Honeywell

Micropower Omnipolar



- Energy efficient
- Can operate from a supply voltage as low as 2.2V dc
- Push-pull output does not require external pull-up resistor
- Non-chopper stabilized design
- Subminiature SOT-23 package

The SL353 Series sensor ICs are small, versatile, digital Hall-effect devices operated by the magnetic field from a permanent magnet or an electromagnet. These sensitive devices are designed to meet a wide range of potential applications with low power requirements.

The SL353 Series responds to either a North or South pole, meaning that they do not require the magnet polarity to be identified, providing an easier installation and potentially reducing system cost.

These low-power sensing devices use BiCMOS (Bipolar Complementary Metal Oxide Semiconductor) technology and a timing circuit that turns the power on for only a short time it is off for the rest of the period (duty cycle) significantly reducing the average current consumption.

Both products can operate from a supply voltage as low as 2.2 V, promoting energy efficiency.

The push-pull output does not require a pull-up resistor and can operate with very low current levels, potentially helping to reduce cost and minimizing the total current consumption. The SL353 Series is available in two duty cycle configurations to accommodate a variety of application needs: SL353HT: High duty cycle (13% typ.) for applications requiring high switching speed and a lower current (0.33 mA typ.) than standard Hall-effect sensor ICs. SL353LT: Very low duty cycle (0.013% typ.), resulting in extended battery life in applications requiring extremely low current drain (1.8 μ A typ.) and not requiring a high switching speed.

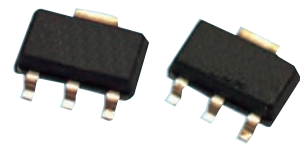
The SL353 Series has a typical operating point of ± 60 Gauss at 25°C

626549

Type	Mftrs.		Price Each				
	List No.	Order Code	1+	10+	50+	100+	250+
High Duty Cycle	SL353HT	SMD 187-7493					
Very Low Duty Cycle	SL353LT	SMD 187-7494					

Hall-Effect Digital Position Sensor

Honeywell



- Quad hall design virtually eliminates mechanical stress effects
- Temperature compensated magnetics
- Super high sensitivity available
- Symmetry of operate/release points about zero gauss (bipolar/latching)
- Low current consumption
- High output current capability

Package Style
Supply Voltage
Output Type
Operating Temperature Range
Output Voltage
Switching Time Rise (10% to 90%)
Switching Time Fall (90% to 10%)
Supply Current (max @ 25°C)
Output Current (Max.)
Operate Point @ 25°C
Release Point @ 25°C
Leakage Current Max.
Differential

122-5620
Surface Mount Device
3.8 to 30.0VDC
Sink
-40 to 150°C
0.4VDC Max.
1.5 μ s Max.
1.5 μ s Max.
7.5mA typ.
20mA
8.5 mT [85 G] typ.
5.5 mT [55 G] typ.
10 μ A
3.0 mT [30 G] Typ.

448290

Magnetic Actuation	Mftrs.		Price Each				
	List No.	Order Code	1+	10+	25+	50+	100+
Unipolar	SS541AT	SMD 122-5620					

Magnetic Speed / Position Sensor

Honeywell

Magnetoresistive



- Wide operating temperature range
- 2-wire operation means less wiring
- Enhanced sensitivity, ± 7 gauss typical
- Output pattern independent of gap between target and sensor

Applications

- Speed encoding using a multipole ring magnet
- Enhanced accuracy cam and crank position sensing
- Wheel speed sensing
- Window lift applications

H = 3, W = 4.06,
D = 1.57mm
Leads = 14.98mm

The VF401 is a 2-wire MR (magnetoresistive) bridge array in a miniature plastic package, designed for sensing fine pitch ring magnets.

The VF401 allows a greater air gap between the target and the sensor with reduced loss in sensor signal or accuracy. Patent number 6,297,628.

605399

Mftrs.			Price Each				
	List No.	Order Code	1+	15+	25+	50+	+
	VF401	181-1313					

Bipolar Latch - Dual Hall-Effect Sensor

Honeywell

Speed and Direction Outputs



H = 1.32, W = 4.39, D = 2.39mm

Potential Applications:

Transportation

- Power windows
- Power seats
- Power sliding doors
- Sunroofs
- Encoders for electronic steering systems

Industrial

- Motion control for pulleys and belts
- Door openers and sliding door controls
- Position and/or velocity detection
- Linear displacement sensing

The VF526DT Bipolar Latch, Dual Hall-effect Digital Position Sensor has two distinct Hall sensing elements precisely located 1.4 mm apart on a single integrated circuit chip. The elements are encapsulated in a thermoset molding material. The two active Hall latches provide speed and direction indication of a magnetic gradient (such as a rotating ring magnet) across the face of the package. The miniature device surface mounts on PC (Printed Circuit) boards and on flexible circuits. The VF526DT's built-in temperature compensation is designed to match the temperature coefficient of low-cost magnets, allowing for a reliable, yet cost-effective, sensor-magnet combination. A unique, regulator circuit provides extremely stable operation with supply voltages from 3.4V dc to 24V dc. It can directly interface with many electronic components without buffering or compensation circuitry.

605400

Case Style	Mftrs.		Price Each			
	List No.	Order Code	1+	25+	50+	100+
SOT-89B	VF526DT	181-1314				

Hall-Effect Linear Position Sensor

Honeywell



- Single current sinking or current sourcing linear output
- Improved temperature stability
- Standard mounting centers
- Laser trimmed thin film and thick film resistors minimize sensitivity variations and compensate for temperature variations

Package Style
Supply Voltage
Output Type
Magnetic Actuation Type
Operating Temperature Range
Linearity (% of span)
Supply Current (max @ 25°C)
Output Current (Max.)
Sensitivity @ 25°C
Temperature Error (@ 25°C)
Null Shift (%/°C)
Temperature Error (@ 25°C)
Sensitivity (%/°C)
Magnetic Range (min.)
Response Time
Output Voltage (0 G @ 25°C)

122-5622
Ceramic
6.6 to 12.6VDC
Sink / Source
Ratiometric
-40 to 125°C
-0.8% typ., -1.5% max.
30mA typ.
1mA
25 mV \pm 5 mV/G
-0.1% min., 0.1% max.
-0.055% min., 0.02% max.
-10 mT to 10 mT
[-100 G to 100 G]
3 μ s (typ.)
4.0VDC \pm 0.08V dc

448296

Mftrs.			Price Each				
	List No.	Order Code	1+	10+	50+	100+	200+
	SS94A1F	122-5622					

Magnetic Sensor

Honeywell

3-Axis Electronic Compass



HMC5843 and Evaluation Board

The **HMC5843 IC** offers a more inclusive product for design engineers who need more than an analog output magnetic sensor and who need to utilize an existing microprocessor for compass algorithms. The inclusion of the sensor conditioning electronics, 12-bit A/D and the I²C digital output, with Honeywell's high accuracy magnetic sensors in the new HMC5843, also eases implementation of a compassing function into consumer products. Used with a MEMS accelerometer, the whole system becomes capable of performing applications like electronic map orientation, vehicle dead reckoning, location-based services, and pedestrian navigation.

The **Evaluation Board** contains the HMC5843 IC mounted on a 0.8" x 0.8" plug-board with wide-DIP spaced (0.6") pins for solder less breadboard compatibility. The evaluation board also contains the two capacitors and I²C pullup resistors needed for typical function for the retrieval of the XYZ magnetic field information. Both single and dual supply configurations of the HMC5843 are supported.

The **Demonstration board** for the 3-axis Compass IC provides the HMC5843 plus serial bus conversion circuits to convert the I2C data to USB interfacing for personal computers. Includes a 6-foot USB cable, software, user manual & 5 samples of the HMC5843.

- 3 axis magnetic sensors and an ASIC in a single package
- I²C serial bus interface
- 12-bit analog-to-digital converter
- Offset and Set-Reset / De-gaussing Straps
- Adjustable Gain Settings
- Built in Self Test
- 4 x 4 x 1.3 mm QFN package
- 1.8V digital, 2.5V analog
- Sleep, standby & operating mode supported

605156

Mftrs.			Price Each				
	List No.	Order Code	1+	5+	25+	50+	100+
	HMC5843	178-4722					
	HMC5843-EVAL	178-4724					
	HMC5843-DEMO	178-4723					

Digital Hall Effects Sensors



- Negative temperature coefficient for temperature stability
- High current capability to 50mA
- Quad Hall design to eliminate mechanical stress
- Operating temperature -40°C to +150°C
- SS400 - T092E Package

SS400 Series

Description	Mag. Characteristic @ 25°C			Mfrs. List No.	Order Code
	Max. Op.	Min. Rel.	Min. Dif.		
Hall Effect	60	-60	15	SS411A	311-1465
Hall Effect	115	20	20	SS441A	311-1477
Hall Effect	50	85	-85	SS461A	311-1489
Hall Effect	180	-180	200	SS466A	311-1490
Hall Effect	180	75	25	SS443A	311-1507

212423/406092

Description	Package	Order Code	Price Each		
			1+	25+	100+
Hall Effect	T092E	311-1465			
Hall Effect	T092E	311-1477			
Hall Effect	T092E	311-1489			
Hall Effect	T092E	311-1490			
Hall Effect	T092E	311-1507			

Digital Hall-Effect Sensor

SS400 Series

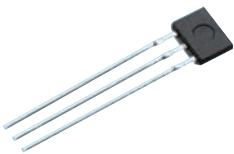


- T092E Package
- Negative temperature coefficient for temperature stability
- High current capacity
- Quad Hall design to eliminate mechanical stress
- Operating temperature range -40°C to +150°C

624235

Description	Mfrs. List No.	Order Code	Price Each		
			1+	25+	100+
Bi-Polar ±60 Gauss	SS411A	311-1465			
Unipolar 115 Gauss @ 25°C	SS441A	311-1477			
Latching Bi-polar ±115 Gauss	SS461A	311-1489			
Latching Bi-polar ±180 Gauss	SS466A	311-1490			
Unipolar 180 Gauss @ 25°C	SS443A	311-1507			

SS40A Bipolar Hall-Effect Sensor



- Miniature construction: 3.0x4.0mm plastic package
- Power consumption of only 5mA Max. @ 4.5V dc for energy efficiency
- Digital current sinking output
- Bipolar magnetics for ring magnet applications
- High output current capability (20mA)
- High speed - operates from 0 KHz to over 100 KHz

- Broad temperature range of -40 to 125°C
- Built-in reverse polarity protection

Package Style	Radial Lead IC	Leakage Current Max.	10 µA
Supply Voltage	4.5 to 24.0VDC	Output Current (Max.)	20mA
Output Type	Sink	Supply Current (Max. @ 25°C)	10mA
Magnetic Actuation Type	Bipolar	Supply Current (Typ. @ 25°C, 24V dc)	6.5mA
Operating Temperature	-40 to 125°C	Response Time	4 µs (Typ.)
Output Voltage	0.4VDC	Operate Point -40°C to 85°C	110G Max.
Operate Point @ 25°C	45 G Typ.	Release Point -40°C to 85°C	-110G Max.
Release Point @ 25°C	-45 G Typ.	Differential (Typ. @ 25°C)	90G

419647

Mfrs. List No.	Order Code	Price Each			
		1+	5+	10+	25+
SS40A	SMD108-2268				

SR13/15 Series Solid State Position Sensors



Snap-in: L=20, W=10.7, D=7.6
Flat Mount: L=20, W=4.3, D=7.6

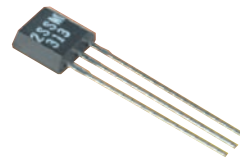
This range of snap-in and flat mount sensor packages incorporate Honeywell's proven SS400 series solid state sensors.

- 3.8 to 30V dc supply voltage
- Digital current sinking output
- Snap-in or flat mount packages
- Quad hall design eliminates stress effects
- Temperature compensated magnetics
- Bipolar, unipolar and latching magnetics
- High output capability, 50mA absolute maximum
- Operating temperature: -40°C to +150°C
- 24AWG radox lead wire

Honeywell

	Mfrs. List No.	Order Code	Price Each		
			1+	5+	10+
SR13C-A1 Unipolar Snap-in	SR13C-A1	389-0156			
SR13R-A1 Latching Snap-in	SR13R-A1	389-0170			
SR15C-A3 Unipolar Flat Pack	SR15C-A3	389-0181			

Magneto-Resistive Digital Sensor



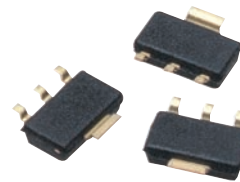
- Low gauss operation (typical op. 15 gauss)
- Digital current sinking
- Omni polar (N & S pole sensing)
- 0-100KHz
- Miniature package
- 3 pin in-line 0.1" centre
- Operating temperature -40°C to +125°C
- Supply voltage 6 to 24V dc

Magneto-resistive material integrated on silicone. Can achieve large sensing distances when used with conventional magnets.

212412

Mfrs. List No.	Order Code	Price Each		
		1+	10+	100+
2SS52M	311-1519			

SS552MT Surface Mount Sensor



SS552MT is a digital position sensor in an SOT-89 style surface-mount package with omnipolar magnetic action. The sensor has magnetoresistive material integrated on silicon and encapsulated in a plastic package. The integrated circuit provides a digital output in response to very low magnetic fields.

Package Style	Surface Mount	Output Voltage	0.4VDC
Supply Voltage	3.8 to 30.0VDC	Switching Time Rise (10 to 90%)	0.2µs Typ.; 1.5µs Max.
Output Type	Sink	Switching Time Fall (90 to 10%)	0.1µs Typ.; 1.5µs Max.
Magnetic Actuation Type	Omnipolar	Output Current (Max.)	20mA
Operating Temperature	-40 to 150°C	Supply Current (Typ. @ 25°C)	10mA

419608

Mfrs. List No.	Order Code	Price Each			
		1+	5+	10+	25+
SS552MT	SMD108-2265				

Magnetic Displacement Sensor

High Resolution



H = 1.37, W = 4.8, D = 3.91mm

Honeywell's APS00B High Resolution Magnetic Displacement Sensor is a miniature surface mount sensor for linear, angular, or rotary displacement designed for magnetic saturating field sensing. The APS00B creates an analog output voltage that varies with the direction of the magnetic flux passing over the sensor surface. It contains dual, saturated-mode Wheatstone bridges that generate quadrature (sine and cosine) signals to provide an extended range of angular measurements up to 180°. This sensor is a cost-effective and space-efficient solution for high-volume OEM designs. Potential applications include position sensing, rotary speed and angle detection, and non-contact precision location measurement systems. APS00B sensor uses Honeywell's Anisotropic Magnetoresistive (AMR) technology that provides advantages over Hall-effect-based magnetic sensors. They are designed to resolve better than a tenth of a degree or a tenth of a millimeter, to withstand large variations in magnet-to-sensor gaps, and to exhibit insensitivity to shocks and vibrations. These surface mount devices are mounted directly on the electrical traces on a PC (Printed Circuit) board. They are attached by an automatic solder reflow operation which requires no hole, so it may help reduce the cost of the PC board.

605393

Mfrs. List No.	Order Code	Price Each			
		1+	15+	25+	50+
APS00B	SMD181-1312				

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Proximity Switches - Magnetic

Reed Sensor

Ferromagnetic Metal Detection



Products for tomorrow...



H = 10, W = 32.4, D = 16.7mm

These reed proximity switches operate when in the presence of magnetically conductive material unlike standard sensors that require an actuating magnet. Only a simple piece of iron is required to operate this sensor, either from in front of the sensor or from above depending on the version. The connecting cable is round twin core 2 x 0.35 mm² (AWG 22), 500mm long.

Contact Form	Contact Form	
Contact resistance mR (max)	150	Switch carry current A (max) 1.75
Switch power W (max)	10	Breakdown voltage V dc 310
Switch voltage V dc (max)	200	Temperature, operating °C -20 to +85
Switching current A (max)	0.5	

417770

Sensing direction	Mfrs. List No.	Order Code	1+	10+	25+	50+
Front	MK02/0-1A66-500W	107-9473				
Above	MK02/1-1A71-500W	107-9474				

Mini Firecracker Reed Sensor

HAMLIN



L Barrel = 15.24mm
Ø = 5.10mm

- 2 part magnetically operated position sensor
- N/O contact
- Hermetically sealed
- 300mm cable

Typical Sensing Applications

- Security systems
- Position and limit sensing
- Linear actuators
- Level sensing

Contact	5540653	1N0	Breakdown voltage	170VDC
Power	3W	3W	Switching current	0.25A
Switching voltage	100V dc	100V dc	Carry current	0.5A
Type			Operating temperature	-40°C to +105°C
Sensor		Mfrs. List No.	Order Code	
Actuator		59020-1-S-02-A	554-0653	
		57020-000	554-1499	

341354

Type	Order Code	1+	5+	10+	25+	50+
Sensor	554-0653					
Actuator	554-1499					

Firecracker Reed Sensor

HAMLIN



L = 36mm
Ø = 6.22mm

- 2 part magnetically operated position sensor
- N/O, N/C and C/O contact options
- Hermetically sealed
- 300mm wires

Typical Sensing Applications

- Security systems
- Position, limit and Level
- Linear actuator

Contact	5540665	1N0	5540690	1NC	
Power	10W	10W	5W	5W	
Switching voltage	200V dc	200V dc	175V dc	175V dc	
Breakdown voltage	250VDC	250VDC	200VDC	200VDC	
Switching current	0.5A	0.5A	0.25A	0.25A	
Carry current	1.2A	1.2A	1.5A	1.5A	
Operating temperature	-40°C to +105°C	-40°C to +105°C	-40°C to +105°C	-40°C to +105°C	
Type	Mfrs. List No.	Order Code	Type	Mfrs. List No.	Order Code
Sensor	59025-1-S-02-A	554-0665	Actuator	57025-000	178-2630
Sensor	59025-4-S-02-A	554-0690			

341355

Type	Contacts	Order Code	1+	5+	10+	25+	50+
Sensor	1N0	554-0665					
Sensor	1NC	554-0690					
Actuator		178-2630					



TROUBLESHOOTING TIPS

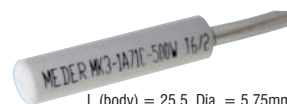
Chat online to one of our technical engineers at farnell.com

Reed Sensor

Magnet Detection



Products for tomorrow...



L (body) = 25.5, Dia. = 5.75mm

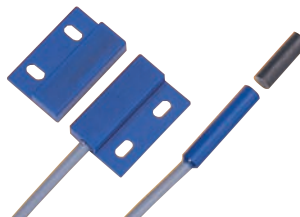
This sensor is a magnetically operated proximity switch housed in a cylindrical case with an interconnecting cable 500mm in length. The sensor is designed to be mounted on a fixed surface with the actuating magnet on the moving surface. Introduction or removal of the magnetic field determines the opening of the reed switch.

Contact Form	Contact Form	
Contact resistance mR (max)	150	Switch carry current A (max) 1.5
Switch power W (max)	10	Breakdown voltage V dc 200
Switch voltage V dc (max)	180	Temperature, operating °C -20 to +85°C
Switching current A (max)	0.5	

417773

Mfrs. List No.	Order Code	1+	10+	25+	50+
MK03-1A71B-500W	107-9476				

Reed, Plastic Housing



- Magnetic proximity switches with hermetically sealed contacts
- Suitable for systems, position sensing, level sensing, security, flow sensing, etc.
- Choice of normally open, normally closed or changeover contacts (Forms A, B or C)
- Rectangular or cylindrical polystyrene housing

Rectangular switch: 30x20x7, Fixing centres=16 (slots 6x3.3)
Rectangular actuator: 30x20x7, Fixing centres=16 (slots 6x3.3)
Cylindrical switch: L=28, Dia.=6, Cylindrical actuator: L=19, Dia.=6

- No maintenance required
- Rectangular version has two slotted fixing holes for easy fitting

Switch contacts operate when the magnet actuator moves in close proximity to the switch, 8mm min. for rectangular version and 5mm min. for cylindrical version.

Switching current	SPNO	5VA, SPCO, SPNC	20VA, SPCO
Switching voltage	0.5A max.	0.25A max.	1A max.
Switching capacity	240V ac max.	175V ac max.	150V dc max.
Operating temperature	10VA max.	5VA max.	20VA max.
	-20°C to 70°C	-20°C to 70°C	-20°C to 70°C

Changeover contacts=white-common, green-normally open, brown-normally closed

212213

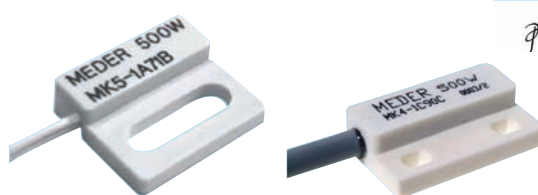
Switches	Mfrs. List No.	Order Code	1+	25+	100+	250+
Rectangular SPNO	PSA240/30	607-186				
Rectangular SPNC	PSB175/30	721-3440				
Rectangular SPCO	PSC175/30	607-198				
Rectangular SPCO, 20VA	PSC150/30	732-000				
Cylindrical SPNO	PRA/240/30	607-216				
Cylindrical SPCO	PRC/175/30	607-228				
Magnets						
Rectangular	PSM	607-204				
Cylindrical	PRM	607-230				

Reed Sensor

Magnet Detection



Products for tomorrow...



H = 5.9, W = 23, D = 19.4mm

H = 5.9, W = 23, D = 13.9mm

MK04 / MK05 sensors are magnetically operated Reed proximity switches designed for screw mounting. The sensor should be mounted on a fixed surface with the actuating magnet on the moving surface.

Introduction or removal of the magnetic field determines the closing and opening of the Reed Switch.

Contact Form	Contact Form	
Contact resistance mR (max)	150	Switch carry current A (max) 1.5
Switch power W (max)	10	Breakdown voltage V dc 200
Switch voltage V dc (max)	180	Temperature, operating °C -20 to +85°C
Switching current A (max)	0.5	

417779

Mfrs. List No.	Order Code	1+	10+	25+	50+
MK4-1A66B-500W	107-9477				
MK05-1A66B-500W	107-9478				

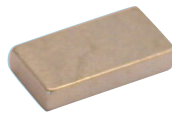
Sensor Magnets



Products for Tomorrow...



M4



NdFeB



Bar

AlNiCo bar magnets are suitable for the operation of most Reed Switches and should ideally be the moving part of the sensing application. The selection of the magnet and the sensitivity of the Reed Switch will determine the Pull-In and Drop-Out distances.

SmCo (samarium cobalt) and **NdFeB** (neodymium iron boron) magnets are made from rare earth materials and have especially good magnetic properties concerning stability and energy product.

Dimensions		Dimensions					
Order Code	H (mm)	W (mm)	D (mm)	Order Code	H (mm)	W (mm)	D (mm)
107-9492	5.9	23	13.9	107-9496	22	5	
Order Code	L (mm)	Dia. (mm)		107-9497	4	3	
107-9493	27	7.5		107-9498	4	5	
107-9494	12	3		107-9500	15	8	
107-9495	19	4		Order Code	H (mm)	W (mm)	D (mm)
				107-9501	5	10	1.9

417861

Mfrs.	List No.	Order Code	1+	10+	25+	50+
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AlNiCo500	
MAGNET M4	107-9492
ALNICO500 7.5X27MM	107-9493
ALNICO500 3X12MM	107-9494
ALNICO500 4X19MM	107-9495
ALNICO500 5X22MM	107-9496

SmCo	
SMCO5 3X4MM	107-9497
SMCO5 5X4MM	107-9498

NdFeB	
NDFEB 8X15MM	107-9500
NDFEB 10X5X1.9MM	107-9501

Proximity Switch



Contact Style	Switching Distance	Min.
Switching Capacity (Resistive)	Operating Temperature Range	to
Switching Voltage	Storage Temperature Range	-25 to 90°C
Switching Current	Case Material	Blue
Carry Current	Dimensions (WxHxD)	xx
Breakdown Voltage	Cable	2 x Round 0.14mm ² PVC covered grey and insulated brown/white

Contact Resistance mΩ Max. 449876

Mfrs.	List No.	Order Code	1+	50+	200+	1K+
Proximity Switch	MMPSA 240/100	117-3767				
Magnet	MMPSM	117-3768				

Reed, Plastic Housing

Miniature



Switch: 20 x 15 x 7
Actuator: 20 x 15 x 7
Fixing centres=10 (slots 6 x 3.3)

- Magnetic proximity switch with hermetically sealed contacts
 - Suitable for position, level sensing and security/anti-tamper
 - Contacts closed with magnet present
 - Slotted holes for easy fitting and alignment
 - Compact housing
 - Good protection in harsh environments up to IP65
- Applications**
- Process control systems
 - Intruder alarm, limit and proximity applications

Switch contact operates when the magnet actuator moves in close proximity to the switch, typically 5mm.

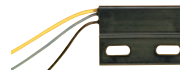
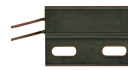
Contacts	(Form A)	Switching distance, min.	5mm
Switching voltage, max.	ac	Operating temperature	-20°C to 85°C
Switching current, max.		Case material	ABS
Switching capacity, resistive	VA	Cable length	1m, PVC insulated
Contact resistance, max.	mΩ		

212399

Mfrs.	List No.	Order Code	1+	50+	200+
	MMPSA 240/100	117-3767			
	MMPSM	117-3768			

Reed, Plastic Housing

Miniature



- Robust housing
- Nylon 6.6
- UL approved option
- Temperature range to 105°C
- Repeatability and reliability due to Reed Switch characteristics

Typical Sensing Applications

- Posting franking machines
- Door interlocks
- Hook switches
- Machinery interface
- Material handling

H = 19.5, W = 28.5, D = 6.4mm
Fixing Centres = 21mm, (PM102 magnet = 16mm. Slots 90° against body)

Switch Action	100-6783	100-6784	100-6785
SPST-NO - SPST	SPST-NO - SPST	SPST-1NO / 1NC - SPST	SPST-NO - SPST
Switching voltage	250VAC	100VAC	250VAC
Switching current	1.0A	0.3A	1.0A
Switching power	15W	3W	15W
Material	Nylon 6.6	Nylon 6.6	Nylon 6.6
Temperature Range	-30 to +105°C	-30 to +105°C	-30 to +105°C
Cable	2 x 24AWG PVC insulated	2 x 24AWG PVC insulated	2 x 24AWG PVC insulated

Type	Mfrs.	List No.	Order Code	1+	5+	10+
SPST NO	PS1011	100-6783				
SPST CO	PS1031	100-6784				
SPST NO (UL Recognised)	PS2011	100-6785				
Magnet	PM101	372-0913				
Magnet	PM102	372-0925				

Reed Sensor - Mini Flange Mount

HAMLIN



L = 23.01mm
W = 14.0mm
D = 5.99mm
Ctrs = 14.0mm

- 2 part magnetically operated position sensor
- N/O and N/C contact options
- Hermetically sealed
- 300mm wires

Typical Sensing Applications

- Security system switch
- Position and limit
- Linear actuator
- Door switch

Contact	5541141	5541177
Power	1N0	1NC
Switching voltage	10W	5W
Breakdown voltage	200V dc	175V dc
Switching current	250VDC	200VDC
Carry current	0.5A	0.25A
Operating temperature	1.2A	1.5A
	-40°C to +105°C	-40°C to +105°C

Type	Mfrs.	List No.	Order Code	Type	Mfrs.	List No.	Order Code
Sensor	59140-1-S-02-A	554-1141		Actuator	59140-000	178-2770	
Sensor	59140-4-S-02-A	554-1177					341398

Type	Contacts	Order Code	1+	5+	10+	25+	50+
Sensor	1N0	554-1141					
Sensor	1NC	554-1177					
Actuator		178-2770					

Reed Sensor - Flange Mount

HAMLIN



- 2 part magnetically operated position sensor
- N/O and N/C contact options
- Hermetically sealed
- 300mm wires exit from RH side

Typical Sensing Applications

- Security system switch
- Position and limit
- Linear actuator
- Door switch

L = 28.57mm D = 6.35mm
W = 19.05mm Ctrs = 15.88mm

Contact	5541189	5541219	Type	Mfrs.	List No.	Order Code
Power	1N0	1NC	Sensor	59145-1-S-02-A.	554-1189	
Switching voltage	10W	5W	Sensor	59145-4-S-02-A.	554-1219	
Breakdown voltage	200V dc	175V dc				
Switching current	250VDC	200VDC				
Carry current	0.5A	0.25A				
Operating temperature	1.2A	1.5A				
	-40°C to +105°C	-40°C to +105°C				

Proximity Switches - Magnetic - continued

Reed Sensor - Flange Mount - continued

341399

Type	Order Code	1+	5+	10+	25+	50+
Sensor	554-1189					
Sensor	554-1219					

Reed Sensor - High Temperature Flange Mount

HAMLIN



- 2 part magnetically operated position sensor
- N/O contacts
- Hermetically sealed
- 300mm high temperature wires

Typical Sensing Applications

- Security system switch
- Position and limit
- Linear actuator
- Door switch

L = 28.57mm
W = 19.05mm
D = 6.35mm
Ctrs = 15.88mm

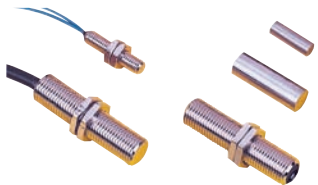
		554-1104	554-1116		
Contact		1NO	1NO		
Power		10W	10W		
Switching voltage		200V dc	300V dc		
Breakdown voltage		250VDC	450VDC		
Switching current		0.5A	0.5A		
Carry current		1.2A	1.5A		
Operating temperature		-40°C to +150°C	-40°C to +150°C		

		Mfrs. List No.	Order Code	Type	Mfrs. List No.	Order Code
Sensor	1NO	59135-1-S-02-A	554-1104	Actuator	57135-000	178-2691
Sensor	1NO	59135-2-T-02-A	554-1116			

341397

Type	Contacts	Order Code	1+	5+	10+	25+	50+
Sensor	1NO	554-1104					
Sensor	1NO	554-1116					
Actuator		178-2691					

Reed, Threaded Barrel



- 730-208: L=28, Ø=M6
 - 732-734: L=50, Ø=M12
 - 732-746: L=90, Ø=M18
 - 607-230: L=19, Ø=6
 - 732-771: L=40, Ø=12.5
 - 732-760: L=50, Ø=M12
- Cable L=300 (all types)

- Threaded barrel housings for easy fitting and adjustment
- High switching capacity - up to 60VA and 120VA
- Suitable for a wide range of position sensing applications

Barrel size	M6	M12	M18
Contacts	SPNO (form A)	SPNO (form A)	SPNO (form A)
Switching voltage, max.	470Vac	230Vac	1500Vac
Switching current, max.	0.5A	3A	3A
Switching capacity, resistive	10VA max.	60VA max.	120VA max.
Contact resistance, max.	150mΩ	80mΩ	80mΩ
Switching distance, min	5 mm	8 mm	15 mm
Operating temperature		-20°C to 85°C	
Case material	Brass, nickel plated		
Order Code	730-208	732-734	732-746

212356

		Price Each				
Switches	Mfrs. List No.	Order Code	1+	25+	100+	250+
M6 threaded	PTA470/30	730-208				
M12 threaded	PTA230/30	732-734				
M18 threaded	PTA1500/30	732-746				

		Magnets		
6mm dia	PRM	607-230		
M12 threaded	PTM12	732-760		
18mm dia.	PRNM	732-771		

Magnets - High Strength Discs

Miniature, Nickel Plated



- Disc magnets made from strongest permanent magnet material
- Exceptional magnetic strength from small size
- All magnets nickel plated to reduce the onset of corrosion when used under normal conditions
- Suitable for use at temperatures up to 120°C
- Ideal for proximity sensor triggering or biasing where space is a premium

Distance (mm) at which magnets measure 1000 gauss	M1219-1=4.1, M1219-2=2.2, M1219-3=1.8, M1219-4=1.2, M1219-5=0.6
Surface flux measurement (gauss)	M1219-1=1500, M1219-2=2500, M1219-3=3200, M1219-4=2500, M1219-5=3500
Magnet material	Neodymium Iron Boron
Grade/Energy density	Grade N30H, max. energy density 30 MGOe (M1219-4 Grade N35H, energy density 35 MGOe) 120°C max.
Operating temperature	120°C max.

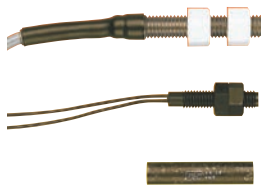
Note: M1219-4 has north-seeking pole identified with a dimple

Mfrs. List No.	M1219-1=723-0345, M1219-2=723-0357,	M1219-3=723-0369, M1219-4=723-0370,	M1219-5=723-0382
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212390/406096

		Price Each				
Size (mm)	Order Code	1+	25+	100+	250+	1K+
Dia.=3, W=1	723-0345					
Dia.=3, W=2	723-0357					
Dia.=4, W=3	723-0369					
Dia.=6, W=2	723-0370					
Dia.=10, W=5	723-0382					

Reed Threaded Barrel



- Threaded housing
 - Robust housing
 - Adjustable fit using supplied mounting nuts
 - Temperature range to 120°C
 - Stainless Steel or Nylon 6.6
 - Normally open
 - Repeatability and reliability due to Reed Switch characteristics
- 100-6786 L=65, Dia = M10
100-6787 L=38.2, Dia = M8
730-841 L=45, Dia = M10

Typical Sensing Applications

- Security device
- Interlocked systems
- Food cutting machines
- Valve positioning
- Material handling
- Conveyor systems

	100-6786	100-6787
Switching voltage	250VAC	250VAC
Switching current	1A	1A
Switching power	15W	15W
Material	Stainless Steel	Nylon 6.6
Temperature Range	-30°C to +120°C	-30°C to +105°C
Cable	1 x 16/0.2mm PVC insulated	1 x 16/0.2mm PVC insulated

233611

		Price Each			
Type	Mfrs. List No.	Order Code	1+	25+	100+
Sensor, Stainless Steel	PS-801	100-6786			
Sensor, Nylon 6.6	PS811	100-6787			
Magnet	FPM8	730-841			

Reed Sensor - M8 Plastic threaded barrel

HAMLIN



- 2 part magnetically operated position sensor
- N/O and N/C contact options
- Hermetically sealed
- 300mm wires

Typical Sensing Applications

- Security system switch
- Position and limit
- Linear actuator
- Industrial process control

L Barrel = 38.10mm, L Thread = 31.75mm, Ø = M8

		554-0859	554-0860	554-0884
Contact		1NO	1NO	1NC
Power		10W	10W	5W
Switching voltage		200V dc	300V dc	175V dc
Breakdown voltage		250VDC	450VDC	200VDC
Switching current		0.5A	0.5A	0.25A
Carry current		1.2A	1.5A	1.5A
Operating temperature		-40°C to +105°C	-20°C to +105°C	-40°C to +105°C

		Mfrs. List No.			Order Code		
Type	Mfrs. List No.	Order Code	Type	Mfrs. List No.	Order Code		
Sensor	59070-1-S-02-A	554-0859	Sensor	59070-4-S-02-A	554-0884		
Sensor	59070-2-T-02-A	554-0860					

341360

		Price Each					
Type	Contacts	Order Code	1+	5+	10+	25+	50+
Sensor	1NO	554-0859					
Sensor	1NO	554-0860					
Sensor	1NC	554-0884					

Reed Sensor Magnet Detection



The MK11 sensor is a magnetically operated Reed Sensor with screw thread enclosure supplied with a 500mm long interconnect cable. The sensor should be mounted on a fixed surface with the actuating magnet on the moving surface. Introduction or removal of the magnetic field determines the closing and opening of the Reed Switch.

L (overall) = 25, Thread = M5 x 0.5mm

Contact Form	150	Contact Form	1.5
Contact resistance mR (max)	10	Switch carry current A (max)	200
Switch power W (max)	180	Breakdown voltage V dc	-20 to +85°C
Switch voltage V dc (max)	0.5	Temperature, operating °C	
Switching current A (max)			

417800

Pull in Range	Mfrs. List No.	Order Code	Price Each			
			1+	10+	25+	50+
10 to 15mm	MK11-1A71B-500W	107-9483				

Reed Sensor - M8 Stainless steel threaded barrel



Typical Sensing Applications

- Security systems
- Position and limit
- Linear actuator
- Industrial process control
- 2 part magnetically operated position sensor
- N/C contacts
- Hermetically sealed
- 300mm double insulated cable

L Barrel = 36mm
L Thread = 27.5mm
Ø = M8

Contact	5540800
Power	1NC
Switching voltage	5W
Breakdown voltage	175V dc
Switching current	200VDC
Carry current	0.25A
Operating temperature	1.5A
	-40°C to +105°C

Type	Mfrs. List No.	Order Code	Type	Mfrs. List No.	Order Code
Sensor	59060-4-S-02-A	554-0800	Actuator	57060-000	554-1530

Price Each

Type	Contacts	Order Code	1+	5+	10+	25+	50+
Sensor	1NC	554-0800					
Actuator		554-1530					

Reed Threaded Barrel



L = 28, Dia = M6

- Brass - nickel plated body
- Threaded barrel housings for easy fitting and adjustment
- Robust sealed construction ideal for harsh environments
- High switching capacity - up to 60VA and 120VA
- Suitable for a wide range of position sensing applications

Contact	130 Vac	Contact resistance	150 mΩ
Switching Voltage	0.25A	Operating temperature	-25°C to 85°C
Current Rating	3 VA	Switching Distance	3 mm
Switching Power			

249448

Mfrs. List No.	Order Code	Price Each		
		1+	5+	10+
Switch PTC130/30	422-9083			
Magnet PRM	607-230			

Reed, Threaded Barrel



L=28mm; Dia. thread=M8; Head Hex=11mm A/F

- Threaded barrel housings for easy fitting and adjustment
- High switching capacity - up to 120VA
- Suitable for a wide range of position, proximity and limit sensing applications
- Low cost CTI version for easy fitting
- Contacts closed with magnet position
- Good protection in harsh environments up to IP65

Applications

- Process control systems
- Intruder alarm, limit and proximity applications

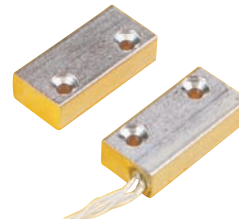


Barrel size	M8 (coarse)	Contact resistance, max.	200mΩ
Contacts	SPNO (form A)	Switching distance, min	10 mm
Switching voltage, max.	230Vac	Operating temperature	-20°C to 85°C
Switching current, max.	0.5A	Case material	Brass
Switching capacity, resistive	10VA max.		

212400

Mfrs. List No.	Order Code	Price Each		
		1+	50+	200+
CTI 302.	309-4820			
CTI302M	309-4832			

Reed, Metal Housing



Switch: 32x15x8
Actuator: 32x15x8
Fixing centres=20,
Fixing hole, 3.3 dia. csk

- Magnetic proximity switch with hermetically sealed contacts
- Suitable for position, level sensing and security/anti-tamper
- Contacts closed with magnet present
- Compact aluminium housing
- Good protection in harsh environments up to IP65

Applications:

- Process control systems
- Intruder alarm, limit and proximity applications

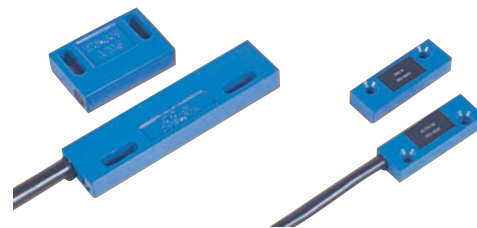
Switch contact operates when the magnet actuator moves in close proximity to the switch, typically 10mm.

Contacts	SPNO	Switching distance, min	10 mm
Switching voltage, max.	230Vac	Operating temperature	-20°C to 70°C
Switching current, max.	0.5A	Case material	Aluminium
Switching capacity, resistive	10VA	Cable length	280mm, PVC insulated
Contact resistance, max.	300mΩ		

212401

Mfrs. List No.	Order Code	Price Each		
		1+	50+	200+
CTC 012.	309-4868			
CTCM	309-4870			

Reed, Metal Housing



Standard

Standard switch: 79.5 x 19.3 x 9.8,
Standard actuator: 38.1 x 25.4 x 9.8,
Miniature switch: 38.3 x 12.7 x 7.7,
Miniature actuator: 38.3 x 12.7 x 7.7,

Miniature

Fixing centres=50 (slots 14 x 4.7)
Fixing centres=28 (slots 14 x 4.7)
Fixing centres=25 (hole dia 3.1)
Fixing centres=25 (hole dia 3.1)

- Magnetically operated reed proximity switches encapsulated in pressure die castings with a blue powder coated finish
- Solid construction gives protection in harsh environments, IP64 rating
- Suitable for many applications with resistive loads
- Intruder alarm and limit switch, micro-switch and proximity switch applications
- Normally open or changeover contacts available

Connection is by integral PVC cable, 0.5m for miniature and 0.7m length for standard switches.

Size	Contact Form (earthed*)	Max dc Contact Ratings			Order Code
		V	V.A.	A	
Miniature	SPNO	220	15	0.5	170-838
Miniature	SPO	175	3	0.25	170-839
Standard	SPNO*	250	100	3	170-842
Standard	SPO*	250	50	1.5	170-841

Order Code	Used with Order Code	Distance - face to face Min. (mm)	Max. (mm)
	170-839	5	13
170-843	170-842	13	22
	170-841	13	25

212445

Type	Switches	Order Code	Price Each		
			1+	10+	25+
Miniature	SPNO	170-838			
Miniature	SPO	170-839			
Standard	SPNO	170-842			
Standard	SPO	170-841			
Magnets					
Miniature		170-840			
Standard		170-843			

Proximity Switches - Magnetic - continued

Solid State - Long Range Sensing

55100 Series, Mini Flange Mount Hall Effect Sensor

HAMLIN



- Cost effective
- Magnetically operated position sensor
- 3 wire (voltage output)
- Reverse/over voltage protection
- Digital, latching or programmable analogue types available
- Built in temperature compensation

Description	Supply Voltage	Output High Voltage	Output Low Voltage	Output Current	Switching Speed	Order Code
Analogue	4.5 - 5.5VDC	4.65V dc	0.35V dc	1.0mA (max)	2 kHz	505-2592
Programmable						
High	3.8 - 24VDC	4.65V dc	0.35V dc	10mA (max)	10 kHz	505-2567
Medium	3.8 - 24VDC	4.65V dc	0.35V dc	10mA (max)	10 kHz	505-2580
Sensitivity						338048

Mfrs.	Price Each						
List No.	Order Code	1+	10+	25+	50+	100+	250+
55100 AP 02 A	505-2592						
55100 3H 02 A	505-2567						
55100 3M 02 A	505-2580						



Rectangular: H=16, W=10, D=28 (body) Magnets:
 M3.0: Dia.=20, H=6.5, Hole dia.=4.3
 M5.0: Dia.=31, H=15, Hole dia.=5.3

- Can be installed flush and non-flush in metal
- Long sensing ranges, even with small size sensors
- Can be used to detect magnets behind surfaces such as wood, plastic or non-ferrous metal
- High switching frequency
- Short circuit and reverse polarity protection
- Plastic rectangular housing similar to V3 style microswitch
- Prewired 2m cable connector
- LED status indication
- IP67 enclosure rating
- Suitable magnets available, centre drilled and countersunk

Sensing range, axial (using M4.0 magnet)
 In non-magnetisable material M8=60, M8=60, Rectangular=60
 Flush in magnetisable material M8=20, M8=55, Rectangular=20
 Operating voltage 10-30V dc
 Switching output normally open, 300mA max.
 Case material Rectangular: plastic
 Connection, plug-in Rectangular: M8 screw lock; M18: M12
 Magnet material Barium ferrite

222167

Proximity Switches		Mfrs. List No.	Order Code	Price Each		
Rectangular		MQ10-60APS-KUO	722-9537	1+	5+	10+
Magnets						
Dia.=20, H=6.5 (drilled)	M3.0	722-9550				
Dia.=31, H=15 (drilled)	7901786	722-9562				

55110 Series, LED Flange Mount Hall Effect Sensor

HAMLIN



- Cost effective
- Magnetically operated position sensor
- 3 wire (voltage output)
- Reverse/over voltage protection
- Digital or latching types available
- Built in temperature compensation
- Integral LED indicator

Description	Supply Voltage	Output High Voltage	Output Low Voltage	Output Current	Switching Speed (max)	Order Code
3 Wire	3.8 - 24VDC	VDD-2 @ 0.1mA	0.4V dc @ 10mA	10mA (max)	10 kHz	505-2609
High	3.8 - 24VDC	VDD-2 @ 0.1mA	0.4V dc @ 10mA	20mA (max)	10 kHz	505-2622
Medium	3.8 - 24VDC	VDD-2 @ 0.1mA	0.4V dc @ 10mA	20mA (max)	10 kHz	505-2622
Sensitivity						338047

Mfrs.	Price Each						
List No.	Order Code	1+	10+	25+	50+	100+	250+
55110 3H 02 A	505-2609						
55110 3M 02 A	505-2622						

Touch to Teach Sensors

Miniature magnetic position sensors

BERNSTEIN safe solutions



The BERNSTEIN range of teachable electronic magnetic sensors combines two programmable switching points and fully integrated electronics in an enclosure that boasts the smallest dimensions in its class.

NEW

- Fully integrated electronic solution
- Permanent protection rating
- No need to mount additional electronics
- Two freely programmable switching points
- Straightforward teach-in procedure
- Reduced installation and wiring requirements
- High switching accuracy

- Industries and Applications**
- Assembly and handling systems
 - Short-stroke cylinders
 - Block cylinders
 - Clamping element
 - Robotics
 - Grippers

651922

Mfrs.	Price Each					
List No.	Connection	Order Code	1+	5+	10+	25+
C - Slot - SMC Installation						
637.0281.109	Cable	190-8277				
637.0281.110	M8 Plug	190-8278				
C - Slot - FESTO Installation						
637.0281.144	Cable	190-8279				
637.0281.145	M8 Plug	190-8280				
T-Slot Installation						
637.0299.136	Cable	190-8281				
637.0299.143	M8 Plug	190-8282				

IMPROVED BACK ORDER DELIVERY



Receive email updates with the exact status, due date and despatch information of all your back order items farnell.com

Proximity Switches - Capacitive

Low Profile, dc - E2K-F

OMRON



H=10.1, W=50 (overall), 34 (face), D=20, Fixing centres=42 (3.5 dia.), Cable L=2m

- For detection of metallic or non-metallic objects
- Flat-pack construction allows a 10mm sensing range in a comparatively small space
- LED operation indicator fitted
- Protection to IP66

A plastic body capacitive proximity switch. The switch can be mounted directly onto a metal panel, though care should be taken with regard to surrounding metal, since the switch is of non-shielded construction and is side sensitive.

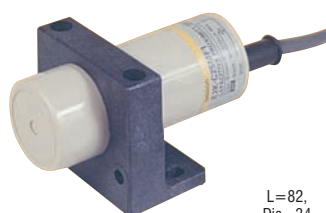
Sensing distance 10mm (max.)
 Operating voltage 10 to 30VDC dc, 10% ripple (max.)
 Output NPN
 Current consumption 10mA max. @ 24V dc
 Response frequency 100Hz
 Temperature range -10°C to +55°C

212192

Mfrs. List No.	Order Code	Price Each		
		1+	5+	10+
E2KF10MC1	160-3020			

34mm ac and dc - E2K-C Series

OMRON



L=82, Dia=34

- Detects metallic or non-metallic objects without contact
- Sensitivity is adjustable by built-in potentiometer
- Output indication via LED
- Protection IP66
- DC types have UL listing
- Supplied with mounting bracket

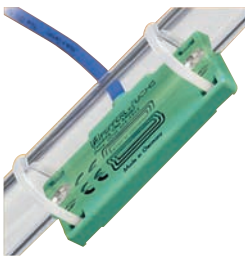
Note: When mounting with bracket, provide 20mm (min) between face of detecting head and bracket.

Sensing distance 3 to 25mm (adjustable)
 Output dc type
 Current consumption 1 to 2 mA (ac) 10 to 15mA (dc)
 Output mode Normally Open
 Response frequency 70Hz
 ac type 10Hz
 Temperature range -25°C to +70°C

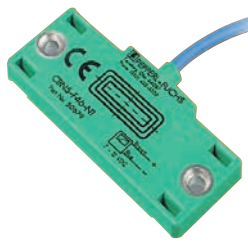
212447

Mfrs.	Price Each				
Voltage	List No.	Order Code	1+	5+	10+
10 to 40VDC/PNP	E2KC25MF1	160-3037			
90 to 250VAC/SCR	E2KC25MY1	160-3035			

Low Profile, DC - CBN Series



PEPPERL+FUCHS



Low Cost Level Solution

H=50, W=20 D=5

Supply Voltage 10 to 30Vdc
Connection 2m PVC cable
Operating Current 0 to 100mA

Switching Frequency 10Hz
Temperature range -25°C to 70°C

233748

Sensing		Mfrs.		Price Each			
Distance	Output	List No.	Order Code	1+	5+	10+	25+
5mm	NPN	CBN5-F46-E0	372-6113				
5mm	PNP	CBN5-F46-E2	372-6125				

M18 and M30 AC/DC - CJ Series

PEPPERL+FUCHS



- Cylindrical Embeddable Capacitance sensors 8 and 10 mm adjustable range
- Normally open NPN and PNP, and AC output options
- Connection type; 2m PVC cable
- Short circuit and Polarity reversal protected
- Housing material PBT and high grade steel

Thread M18 x 1, L=79

Outputs		Operating voltage	Operating current	Switching frequency	IP rating
PNP, NPN/NO	AC	10 to 30Vdc	0 to 300mA	100Hz	IP67
PNP, NPN/NO+NC	AC	10 to 60Vdc	0 to 200mA	1Hz	IP65
	AC	20 to 253Vac	5 to 200mA	10Hz	IP67

233750

Sensing		Mfrs.		Price Each			
Range	Output	List No.	Order Code	1+	5+	10+	25+
M18, Steel Body							
8mm	NPN/NO	CJ8-18GM-E0	372-6137				
8mm	PNP/NO	CJ8-18GM-E2	372-6149				
M30, Steel Body							
10mm	AC/NO	CJ10-30GM-WS	372-6198				
M30, Plastic Body							
10mm	AC/NC	CJ10-30GK-WO	372-6186				

Capacitive Proximity Sensors

Flush and Non-flush Mounting



- Fine adjustment via potentiometer
- 3-wire normally open PNP output options
- 4-wire changeover and complementary PNP output options
- LED output indicator
- Protection to IP67

TURCK
Industrial Automation

NEW

638591

Sensing Voltage		Mfrs.		Price Each			
Range	Range	List No.	Order Code	1+	5+	10+	25+
PNP - Cables							
5mm	10V to 30V	BC5-Q08-AP6X2/S250	190-8318				
5mm	10V to 65V	BC5-M18-AP4X	190-8322				
10mm	10V to 65V	BC10-M30-VP4X	190-8323				
PNP - Connectors							
5mm	10V to 30V	BC5-Q08-AP6X2-V1131/S250	190-8319				
20mm	10V to 65V	BC20-CP40-VP4X2-H1141	190-8321				
PNP - Terminals							
20mm	10V to 65V	BC20-CP40-VP4X2	190-8320				
20mm	10V to 65V	BC20-K40SR-VP4X2	190-8324				

Flat Pack, dc - EC55

Prewired



- Adjustable sensing range 5 to 25mm
- Units have both N.O. and N.C. switching with LED indication
- Choice of NPN or PNP output
- Sensors are sealed to IP67
- Easy-mounting using 2 M3.5 screws
- Ideal for use in material handling applications

CARLO GAVAZZI

3 YEARS WARRANTY

H=35, W=55, D=15, Fixing Centres=25 (Slot W=3.5)

Sensing distance 5 to 25mm
Operating voltage 10 - 40V dc
Switching current ≤200mA
Frequency of operation 100Hz

Operating temperature -25°C to +70°C
Housing material Grey polycarbonate
Cable material Grey PUR, 2m

222160

Mfrs.		Price Each	
List No.	Order Code	1+	5+
Prewired, NPN EC 55 25 NPAP	711-4941		
Prewired, PNP EC 55 25 PPAP	711-4953		

Capacitive Sensors - GlobalProx Range

Object and Level Sensors

BALLUFF

NEW



- 10V dc to 30V dc Operating voltage
- 75V dc Rated Insulation Voltage
- 100mA Maximum Output Current
- -25°C to +85°C Ambient Temperature Operating Range
- IP67 Protection as per IEC 60529
- Reverse Polarity Protected
- Short-circuit Protected
- PNP-NO Output
- PBT Housing and Sensing Face material
- 4-Pin, A-coded, M12 Connector

634432

Mfrs.		Price Each		
Size - Range	List No.	Order Code	1+	5+
Object Detection - Flush Mounting				
M12 x 1 - 1 to 4mm	BCS M12BBG2-PSC40D-S04K	190-3541		
M18 x 1 - 2 to 8mm	BCS M18BBI3-PSC80D-S04K	190-3542		
M30 x 1.5 - 2 to 15mm	BCS M30BBI2-PSC15D-S04K	190-3543		
Level Detection - Non-flush Mounting				
M12 x 1 - 1 to 8mm	BCS M12BBE2-PSC80H-S04K	190-3544		
M18 x 1 - 2 to 15mm	BCS M18BBG2-PSC15H-S04K	190-3545		
M30 x 1.5 - 1 to 25mm	BCS M30BBE2-PSC25H-S04K	190-3546		

M30 ac/dc, Extended Sensing - 'Tripleshield'

Prewired and M12 Plug-in

CARLO GAVAZZI



L=72.6 (non-flush), 60.6 (flush), Thread=M30

- Outstanding high immunity against ESD, interference and transients, exceeding all industry norm requirements
- Adjustable extended sensing distances to 25mm
- Elevated temperature range -25°C to +80°C
- DC types available NPN or PNP with NO/NC dual output
- AC types have SCR output with programmable NO/NC switching
- DC types have reverse polarity and short-circuit protection
- Senses most materials
- IP67 protection

M30 sensors in thermoplastic polyester housing, triple protected against environmental disturbances, fitted with 2m PUR cable or M12 connector.

Output functions

Sensing distance
Rated operating current (continuous)
Operating frequency

dc types (4-wire): NO/NC, wire selectable
ac types (2-wire): NO/NC, switch selectable
Flush=2 to 16mm, Non-flush=4 to 25mm
≤500mA (ac types), ≤200mA (dc types)
25Hz (ac types), 100Hz (dc types)

Operating voltage	Output type	Mounting style	Mfrs. List No.	Order Code	Mfrs. List No.	Order Code
10-40VDC	NPN	Non-flush	EC 30 25 NPAPL	711-3201		
10-40VDC	PNP	Non-flush	EC 30 25 PPAPL	711-3213	EC3025 PPAPL-1	721-3001
20-250VAC	Thyristor	Non-flush	EC 30 25 TBAPL	711-3249	EC3025 TBAPL-6	721-3025
10-40VDC	NPN	Flush	EC 30 16 NPAPL	711-3225		
10-40VDC	PNP	Flush	EC 30 16 PPAPL	711-3237		

222156

Mfrs.		Price Each		
Voltage	Output	Order Code	1+	5+
Prewired, Non-flush Mounting				
10 to 40VDC	NPN	711-3201		
10 to 40VDC	PNP	711-3213		
20 to 250VAC	Thyristor	711-3249		
Prewired, Flush Mounting				
10 to 40VDC	NPN	711-3225		
10 to 40VDC	PNP	711-3237		
20 to 250VAC	Thyristor	711-3250		
Plug-in, Non-flush Mounting				
10 to 40VDC	PNP	721-3001		
20 to 250VAC	Thyristor	721-3025		

TRUBLESHOOTING TIPS

Chat online to one of our technical engineers at farnell.com

Proximity Switches - Inductive - Pepperl + Fuchs

Prewired and Plug-in AC and DC



- 3 wire normally open NPN and PNP output options.
- 2 wire normally open AC output options
- Protection Degree **IP67**
- Yellow LED indicator
- Short circuit/overload protected
- Cable connector versions
- Sensing range 1.5 to 15mm

Temperature range -25° to 70°C

Type	Operating Voltage	Current (mA)	Response Frequency (Hz)
NBB 1.5	10 to 30Vdc	100	1500
NBB2	10 to 30Vdc	200	1500
NBB5	10 to 30Vdc	200	800
NBB10	10 to 30Vdc	200	20
NBN2	10 to 30Vdc	100	1500
NBN4	10 to 30Vdc	200	1200
NBB,NBN...WS	20 to 253Vac	5 to 200	20

Nomenclature		Nomenclature	
NJ	Inductive, Initiator	50	Housing length mm
NBB	Inductive, base line,embeddable	E0	NPN normally open
NBN	Inductive, base line,non-embeddable	E2	PNP normally open
1.5	Sensing range mm	WS	Normally open ac
8	Housing size (8mm diameter)	V1	M12 connector (cable version 2m PVC no reference) M8 connector 3 pin
GM	Metal thread	V3	

Sensing Distance mm	Mftrs. List No.	Order Code	1+	10+	25+	50+
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Prewired - 3 wire dc, 2 wire ac-embeddable and non embeddable

Embeddable						
1.5	NBB1,5-8GM50-E2	356-5166				
2	NBB2-12GM50-E0	356-5178				
2	NBB2-12GM50-E2	356-5180				
5	NBB5-18GM50-E0	356-5191				
5	NBB5-18GM50-E2	356-5208				

Non-Embeddable						
2	NBN2-8GM50-E0	356-5233				
4	NBN4-12GM50-E0	356-5257				
4	NBN4-12GM50-E2	356-5269				
8	NBN8-18GM50-E0	356-5270				

Embeddable, NO AC						
5	NBB5-18GM60-WS	356-5361				
5	NBB10-30GM50-WS	356-5373				

Plug-in - M8 and M12, 3 Wire dc, embeddable and non-embeddable

Embeddable + M8 Connector						
1.5	NBB1,5-8GM40-E0-V3	169-2790				
1.5	NBB1,5-8GM40-E2-V3	356-5427				

Non-Embeddable + M8 Connector						
2	NBN2-8GM40-E2-V3	356-5520				

Embeddable + M12 Connector						
1.5	NBB1,5-8GM40-E0-V1	356-5439				
1.5	NBB1,5-8GM40-E2-V1	356-5440				
2	NBB2-12GM50-E0-V1	532-710				
2	NBB2-12GM50-E2-V1	532-721				
5	NBB5-18GM50-E0-V1	356-5476				
5	NBB5-18GM50-E2-V1	532-745				

Non-Embeddable + M12 Connector						
4	NBN4-12GM50-E2-V1	356-5567				

Extended Range, Prewired and Plug-in 3 wire dc, Embeddable



- Yellow LED indicator
- Short circuit/overload protected
- Cable connector versions
- Sensing range 1.5 to 15mm
- 3 wire normally open NPN and PNP output options.
- Protection Degree **IP67**

Temperature range -25° to 70°C
Supply Voltage 10 to 30Vdc
Response Frequency ≥300Hz
Output rating 100mA

233701

Sensing Distance (mm)	Output	Thread	Mftrs. List No.	Order Code	1+	5+	10+	25+
Embeddable-Prewired								
4	NPN	M12	NBB4-12GM50-E0	372-5844				
4	PNP	M12	800734	372-5856				
8	NPN	M18	NBB8-18GM50-E0	372-5868				
8	PNP	M18	NBB8-18GM50-E2	372-5870				

Embeddable-Plug in,M12								
4	PNP	M12	NBB4-12GM50-E2-V1	372-5911				
8	NPN	M18	NBB8-18GM50-E0-V1	372-5923				
8	PNP	M18	NBB8-18GM50-E2-V1	372-5935				

2 Wire dc, prewired



Embeddable and Non Embeddable



Temperature range -25° to 70°C
Supply Voltage 6 to 60Vdc
Response Frequency 1000Hz (NBN8), 1500 Hz (NBB5), 2000Hz (NBB2, NBN4)
Output rating 4 to 100mA
Off state current 1mA

- Low Off-state current -2 wire Inductive sensors
- 2 wire dc NO output with yellow LED operation indicator
- Reverse polarity tolerant
- Fully shielded
- Protection Degree **IP67**

233702

Sensing Distance (mm)	Thread	Size	Mftrs. List No.	Order Code	1+	10+	25+	50+	100+
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2 Wired dc, Embeddable-Prewired, 2m									
2	M12	NBB2-12GM40-Z0	356-5312						
5	M18	NBB5-18GM40-Z0	356-5324						

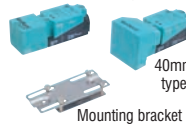
2 Wired dc, None-Embeddable-Prewired, 2m									
4	M12	NBN4-12GM40-Z0	372-5741						
		M18	NBN8-18GM40-Z0	356-5348					

5 Position Turrent Head Range



2-Wire ac and 3-Wire dc

15mm and 20mm types



Output Rating
Response frequency
Temperature range

ac: NO or NC, dc: NO
ac: 500mA, 45 to 65Hz (2-Wire thyristor)
dc: 200mA (3-Wire NPN or PNP transistor)
ac: 25Hz, dc: 300Hz
-25°C to +70°C

- Sensing head may be set in one of 5 positions mutually at right angles
- Main body of unit plugs into base and may therefore be replaced easily
- Key-way pin prevents connection of a DC unit into an AC base
- Connection via terminals within the base of the unit
- 15mm Types are flush mountable
- Confirm to **DIN43694, EN50025 and EN50037**
- All bases supplied with metric sleeves

624236

Sensing Distance	Operating Voltage	Mftrs. List No.	Order Code	1+	5+	10+
15mm	20 to 250V ac	NJ15+U1+W	176-021			
15mm	10 to 30V dc/PNP	NBB15+U1+E2	179-262			
20mm	20 to 250V ac	NJ20-U1-W	254-435			
20mm	10 to 30V dc/PNP	NBB20+U1+E2	179-264			
40mm	20 to 250V ac	NJ40+U1+W	176-023			
40mm	10 to 30V dc/PNP	NJ40+U1+E2	179-265			
Mounting Bracket		MH4-2057	176-025			

Miniature V3 Style Sensors



- 3 wire dc with yellow LED operation indicator
- Fully Shielded
- Miniature V3 style housing
- Prewired 100mm
- NPN or PNP normally open outputs
- Housing protected to IP67

Switching Frequency	Output Rating	Temperature Range	NBB2-V3-E0	NBB2-V3-E2	372-5753	372-5765
1000Hz	100mA	-25°C to 70°C				

233706

Prewired 3 wire dc, 2 wire ac-embeddable and non embeddable							
Sensing Distance (mm)	Voltage	Order Code	1+	5+	10+	25+	50+
Prewired							
2	10 to 30Vdc/NPN	372-5753					
2	10 to 30Vdc/PNP	372-5765					

Proximity Sensor Output Interface Terminals



- Miniature amplifier for NAMUR sensors (see Hazardous Area Equipment Section) and DC Sensors
- 20mm wide module for 35mm din rail mounting
- Lead break monitoring (L versions)
- Short circuit protected
- Yellow LED output indicator
- Self opening instrument terminals, conductor 2,5 mm²
- Provides 8Vdc to Namur sensor
- Relay output for DC Sensors

Supply Voltage 10 to 30Vdc
 Switching Frequency 1000Hz
 Output Rating NPN/PNP = 200mA, Relay = 2A
 Temperature Range -25°C to 70°C

233710

Prewired 3 wire dc, 2 wire ac-embeddable and non embeddable

Sensor Type	Voltage	Order Code	Price Each			
			1+	5+	10+	50+
Prewired						
Namur	10 to 30Vdc/NPN/NO	372-6022				
Namur(L)	10 to 30Vdc/PNP/NO	372-6060				

Proximity Switches - Inductive - Omron



Miniature, 3-Wire dc - TLW Series



- Side mounted LED indicates output on
- Reverse polarity protected
- Protection to IP67
- Prewired with 2m cable
- ABS body ideal for chemical plant and food processing applications

A miniature inductive proximity switch of flat construction and side sensing. Cable entry is perpendicular to the sensing direction.

160-3082 & 179-258 H=27, W=10, D=5.5 fitted with mtg bracket
 160-3081 & 177-886 H=30.5, W=18, D=10

Output Sensing distance	Normally Open 3mm, 5mm	Output rating	3mm 100mA 5mm 50mA at 12V dc, 100mA at 24V dc -25°C to +70°C
Operating voltage	10 to 30VDC, 10% ripple	Operating temperature	
Order Code		Order Code	
160-3082TLW3MC1		160-3081TLW5MC1	
179-258TL-W3MB1		177-886TLW5MB12MOMC	

212450

Sensing Distance	Output	Order Code	Price Each		
			1+	5+	10+
3mm	NPN	160-3082			
3mm	PNP	179-258			
5mm	NPN	160-3081			

High Performance

E2A Series



- Improved sensing range increasing reliability
- Long sensing range aiding mechanical protection
- IP67 for environmental protection
- Rugged construction and improved cable protection
- Clear, visible indicator of operation

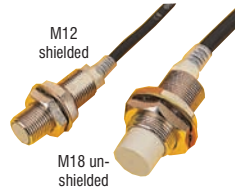
Control Output PNP or NPN Open collector, load current 200mA max.
 Operation mode NO for all types
 Power Supply 12 to 24VDC
 Enclosure rating IP67
 Response frequency M12 - 1kHz, M18 - 500Hz, M30 - 250Hz
 Temperature range -40°C to +70°C

Sensing Distance	Size	Thread Length	Overall Length	Output	Mfrs. List No.	Order Code
4mm	M12	34	50		E2AM12KS04WPB12M	160-3083
4mm	M12	34	50		E2AM12KS04WPC12M	160-3084
8mm	M18	39	59		E2AM18KS08WPC12M	160-3088
M12 Connector						
4mm	M12	34	48		E2AM12KS04M1B1	160-3086
4mm	M12	34	48		E2AM12KS04M1C1	160-3087
8mm	M18	39	53		E2AM18KS08M1B1	160-3089
15mm	M30	44	58		E2AM30KS15M1B1	160-3092

337918

Size	Sensing Distance	Output	Order Code	Price Each		
				1+	5+	10+
Pre-wired						
M12	4mm		160-3083			
M12	4mm		160-3084			
M18	8mm		160-3088			
M12 Connector						
M12	4mm		160-3086			
M12	4mm		160-3087			
M18	8mm		160-3089			
M30	15mm		160-3092			

Prewired Range - 3-Wire dc, 2-Wire ac and dc E2E Series



DIN inductive proximity switches for detection of metallic objects without physical contact at a distance dependent upon ferrous content within object. The indicated sensing distances are based upon ferrous material.

DC 3-wire types include NPN and PNP outputs and shielded or non-shielded construction. Non-shielded types offer longer sensing distances than shielded, but are side sensitive and hence may mutually interfere.

2-wire ac and dc types are particularly suitable for PLC connection, since they will take their supply directly from the PLC and their very low leakage current will not cause the PLC input to turn on when the proximity switches are in the off state.

- Choice of shielded or non-shielded construction
- Non-shielded types offer longer sensing distances
- All dc 3-wire types are protected against reverse polarity connection
- All dc 3-wire types offer overload/short-circuit protection
- 2-wire ac and dc types are particularly suitable for PLC connection
- All types feature LED operation indicator
- Standard length of wire is 30cm
- DC types are UL approved

Supply voltage	3-wire dc 12 to 24V dc		2-wire dc 12 to 24V dc		2-wire ac to V ac	
	Output	Output rating	Sealing	Response times dc	Operating temperature	
	Normally open, NPN or PNP	2-wire dc 100mA, 3-wire dc 200mA, 2-wire ac 200mA	IP67	1mm 0.1ms, 2mm 1ms, 5/10mm 5ms, ac: 5/10mm 0.10ms	-40°C to +85°C(3-wire dc and ac), -25°C to +70°C(2-wire dc)	
Sensing Distance	Thread Size	Thread Length	Overall Length	Output	Mfrs. List No.	Order Code

3-wire dc, shielded

1mm	M8	26	30	NPN	E2EX1R5E1	160-3038
1mm	M8	26	30	PNP	E2EX1R5F1	160-3045
2mm	M12	33	38	NPN	E2EX2E1	160-3039
5mm	M18	38	43	NPN	E2EX5E1	160-3040
5mm	M18	38	43	PNP	E2EX5F1	160-3044

3-wire dc, unshielded

5mm	M12	26	38	NPN	E2EX5ME1	160-3046
5mm	M12	26	38	PNP	E2EX5MF1	160-3049

2-wire dc, shielded

3mm	M12	33	38	—	E2E-X3D1	160-3051
7mm	M18	38	43	—	E2E-X7D1	160-3052

2-wire ac, shielded

5mm	M18	38	43	—	E2EX5Y1	160-3041
10mm	M30	43	48	—	E2EX10Y1	160-3042

212453

Size	Sensing Distance	Output	Order Code	Price Each		
				1+	5+	10+
3-wire dc, shielded						
M8	1mm	NPN	160-3038			
M8	1mm	PNP	160-3045			
M12	2mm	NPN	160-3039			
M18	5mm	NPN	160-3040			
M18	5mm	PNP	160-3044			
3-wire dc, unshielded						
M12	5mm	NPN	160-3046			
M12	5mm	PNP	160-3049			
2-wire dc, shielded						
M12	3mm	—	160-3051			
M18	7mm	—	160-3052			
2-wire ac, shielded						
M18	5mm	—	160-3041			
M30	10mm	—	160-3042			

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Proximity Switches - Inductive - Omron - continued

Square, 2 Wire ac - TL-YS



- Two-wire supply 90 to 250V ac
 - Reverse polarity protection
 - Red LED operation indicator
 - Screw terminal connections
- Sensing distance 15mm
 Supply voltage 90 to 250VAC
 Output rating (normally open) 500mA
 Sealing IP66
 Response frequency 20Hz
 Temperature range -25°C to +70°C

OMRON

H=40, W=40, D=114

212206

Price Each

Mfrs. List No.	Order Code	1+	5+	10+
TL-YS15-MY1	176-402			

Proximity Switches - Inductive - Telemecanique

Inductive Proximity Sensors

Schneider Electric



- Operating temperature: -25°C to +70°C
- Supply voltage range: 12V to 24V DC
- Output type: PNP
- Enclosure material: Nickel plated brass
- IP degree of protection: IP 67 double insulation conforming to 60529
- Approved to CSA and UL

NEW

639849

Mfrs. List No.	Order Code	1+	5+	10+
----------------	------------	----	----	-----

PNP - Cables				
0mm to 2.5mm	M8	XS108B3PAL2	197-4015	●
2.5mm to 4mm	M12	XS112B3PAL2	197-4017	●
4mm to 8mm	M18	XS118B3PAL2	197-4019	●
8mm to 15mm	M30	XS130B3PAL2	197-4021	●
0mm to 2.5mm	M8	XS508B1PAL2	197-4023	●
0mm to 2.5mm	M8	XS508BLPAL2	197-4025	●
0mm to 2.5mm	M12	XS512B1PAL2	197-4028	●
0mm to 2.5mm	M12	XS512BLPAL2	197-4030	●
4mm to 8mm	M18	XS518B1PAL2	197-4032	●
4mm to 8mm	M18	XS518BLPAL2	197-4034	●
8mm to 15mm	M30	XS530B1PAL2	197-4036	●
8mm to 15mm	M30	XS530BLPAL2	197-4039	●

PNP - Connectors				
0mm to 2.5mm	M8	XS108B3PAM8	197-4016	●
2.5mm to 4mm	M12	XS112B3PAM12	197-4018	●
4mm to 8mm	M18	XS118B3PAM12	197-4020	●
8mm to 15mm	M30	XS130B3PAM12	197-4022	●
0mm to 2.5mm	M8	XS508B1PAM8	197-4024	●
0mm to 2.5mm	M8	XS508BLPAM12	197-4027	●
0mm to 2.5mm	M12	XS512B1PAM12	197-4029	●
0mm to 2.5mm	M12	XS512BLPAM12	197-4031	●
4mm to 8mm	M18	XS518B1PAM12	197-4033	●
4mm to 8mm	M18	XS518BLPAM12	197-4035	●
8mm to 15mm	M30	XS530B1PAM12	197-4037	●
8mm to 15mm	M30	XS530BLPAM12	197-4041	●
22	M30	XS630B1MBL01U78	197-4042	●
8mm to 15mm		XS7C40DP210	197-4043	●
8mm to 15mm		XS7C40FP260	197-4044	●
8mm to 15mm		XS7C40MP230	197-4045	●
8mm to 15mm		XS7C40PC440	197-4046	●
15mm to 40mm		XS8C40FP260	197-4047	●
15mm to 40mm		XS8C40PC449	197-4048	●

Sensing Brackets				
M8	XSZB108	197-4049	●	
M12	XSZB112	197-4050	●	
M18	XSZB118	197-4052	●	
M30	XSZB130	197-4053	●	
XS-D	XSZBD10	197-4054	●	

Osiprox Pre-cabled Universal Proximity Switch - IP67 M8

Telemecanique



- Extended Sensing range
- 2X nominal sensing distance
- Flush mountable in metal
- Fast switching frequency

Nominal sensing distance 2.5mm
 Output PNP NO
 Contact rating 10 - 36VDC
 Switching Capacity 200mA
 Max. switching frequency 2500 Hz
 Operating temperature -25°C to 70°C
 Protection IPIP67

dia. = M8, L=50

246768

Mfrs. List No.	Order Code	1+	5+	10+
XS608B1PAL2	425-4697			

Osiprox Universal Proximity Switches - IP67 M12

Telemecanique



- Extended Sensing range
- 2X nominal sensing distance
- Flush mountable in metal
- Fast switching frequency

Nominal sensing distance 4mm
 Output PNP NO
 Contact rating 10 - 36VDC
 Switching Capacity 200mA
 Max. switching frequency 2500 Hz
 Operating temperature -25°C to 70°C
 Protection IPIP67

dia=M12, L=50

246769

Description	Mfrs. List No.	Order Code	1+	5+	10+
Metal Body					
Pre-cabled 3 wire dc	XS612B1PAL2	425-4715			
M12 Connector 3 wire dc	XS612B1PAM12	425-4727			

Osiprox Universal Proximity Switches - IP67 M18

Telemecanique



- Extended Sensing range
- 2X nominal sensing distance
- Flush mountable in metal
- Fast switching frequency

Nominal sensing distance 8mm
 Output PNP NO
 Contact rating 10 - 36VDC
 Switching Capacity 200mA
 Max. switching frequency 1 kHz
 Operating temperature -25°C to 70°C
 Protection IPIP67

dia. = M18, L=60

246770

Description	Mfrs. List No.	Order Code	1+	5+	10+
Metal Body					
Pre-cabled 3 wire dc	XS618B1PAL2	425-4739			
M18 Connector 3 wire dc	XS618B1PAM12	425-4740			
Pre-cabled 2 wire ac/dc	XS608B1PAL2	425-4790			
M18 Connector 2 wire ac/dc	XS618B1MAU20	425-4806			

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Osiprox
Universal Proximity Switches - IP67
M30



- Extended Sensing range
- 2X nominal sensing distance
- Flush mountable in metal
- Fast switching frequency

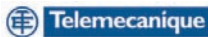
Nominal sensing distance 15mm
 Output PNP NO
 Contact rating 20 - 264V ac/dc
 Switching Capacity 200mA
 Max. switching frequency 500 Hz
 Operating temperature -25°C to 70°C
 Protection **IIP67**

dia. =30, L=60

246771

Description	Mfrs. List No.	Order Code	Price Each		
			1+	5+	10+
Metal Body					
Pre-cabled 3 wire dc	XS630B1PAL2	425-4752			
Pre-cabled 2 wire ac/dc	XS630B1MAL2	425-4818			

Extended Sensing, Prewired



Short Case, 3 Wire dc



530-293: Thread M8, L=33
 530-300: Thread M12, L=33
 530-311: Thread M18, L=33.5

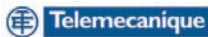
- 3-wire dc inductive proximity switches with extended sensing range
- Multi-direction LED operation indication
- Fully shielded
- Over-load and short-circuit protection

Output Normally Open, PNP Response frequency M8=350Hz
 Output rating 200mA M12=300Hz
 Supply voltage 12 to 24V dc M18=60Hz
 Voltage limits (incl. ripple) 10 to 38V dc Temperature range -25°C to +50°C
 Sealing **IP67**

212175

Size	Sensing Distance	Mfrs. List No.	Order Code	Price Each			
				1+	5+	10+	25+
M8	2mm	XS1N08PA349	530-293				
M12	3.2mm	XS1N12PA349	530-300				
M18	8mm	XS1N18PA349	530-311				

Extended Sensing, M8 and M12 Plug-In



3-Wire dc, Short Case



- 3-wire dc inductive proximity switches with extended sensing range
- Red LED operation indicators giving multi-direction visibility
- Fully shielded
- Over-load and short-circuit protection
- Metal body incorporates a metal 3-pin screw-lock M8 or 4-pin M12 plug-in connector

Output Normally Open, PNP Response frequency M8=350Hz
 Output rating 200mA M12=300Hz
 Supply voltage 12 to 24V dc M18=60Hz
 Voltage limits (incl. ripple) 10 to 38V dc Temperature range -25°C to +50°C
 Sealing **IP67**

222138

Sensing Distance	Thread Size Length mm	Plug Connection	Output	Mfrs. List No.	Order Code	Price Each			
						1+	5+	10+	25+
3.2mm	M12x45	M12	PNP	XS1N12PA349D	530-347				
8mm	M18x45	M18	PNP	XS1N18PA349D	530-359				

FOR SUITABLE M12 SENSOR CONNECTORS SEE **ORDER CODE 532-010**

Plug-in Connection Size	Sensing Distance	Output	Order Code	Price Each			
				1+	5+	10+	25+
M12	3.2mm	PNP	530-347				
M18	8mm	PNP	530-359				

Proximity Switches - Inductive - Balluff



Inductive Proximity Sensors

3 - Wire Connection



Housing material Nickel plated brass
 Rated operating voltage 24VDC
 Operating voltage range 12VDC to 30VDC dc
 Operating temperature range -25°C to 70°C

- Cylindrical housing sizes M8, M12 and M18
- Sensing distances available from 1.5mm to 8mm
- PVC cable connection
- Short circuit and polarity reversal protected
- LED output indicator
- Double insulated
- **IP67** sealing specification

Sensing range with steel square target size of face dia x 1mm thick

Size	Sense Dist.	Mfrs.	Order Code	Price Each		
				1+	5+	10+
NPN Output						
M8	1.5mm	BESM08MI-NSC15B-BV03	160-6702			
M12	2mm	BESM12MI-NSC20B-BV03	160-6704			
M18	5mm	BESM18MI-NSC50B-BV03	160-6706			
M8	2mm	BESM08MI-NSC20B-BV03	160-6708			
M12	4mm	BESM12MI-NSC40B-BV03	160-6710			
M18	8mm	BESM18MI-NSC80B-BV03	160-6713			
PNP Output						
M8	1.5mm	BESM08MI-PSC15B-BV03	160-6703			
M12	2mm	BESM12MI-PSC20B-BV03	160-6705			
M18	5mm	BESM18MI-PSC50B-BV03	160-6707			
M8	2mm	BESM08MI-PSC20B-BV03	160-6709			
M12	4mm	BESM12MI-PSC40B-BV03	160-6711			
M18	8mm	BESM18MI-PSC80B-BV03	160-6714			
M8	2mm	BESM08MH1-PSC20B-S04G	160-6715			
M12	4mm	BESM12MI-PSC40B-S04G	160-6716			
M18	8mm	BESM18MI-PSC80B-S04G	160-6717			

Stainless Steel Face Inductive Proximity Sensors

Extended Sensing Range



Inductive steel faced sensors with long sensing distances are used especially in harsh environments and applications too extreme for standard sensors. They are resistant to abrasive media and aggressive coolants and lubricants with the stainless steel face giving an extra protection and a longer life.

- Extended switching distances (up to x3)
- M12 connector
- Rugged stainless steel sensing face
- Pressure rated 60 / 80 bar
- LED for visual indication of output state
- 24V dc operating voltage
- Operating temperature from -25 to 70°C
- **IP67** rated for arduous environments

For suitable connector/cable see Order Code **160-6760**

Dia. (mm)	Sense Dist.	Output Type	Mfrs. Config. List No.	Order Code	Price Each		
					1+	5+	10+
M12	6mm	PNP 1NO	BES M12EG1-PSC60Z-S04G-S11	161-2829			
M18	10mm	PNP 1NO	BES M18EG1-PSC10Z-S04G-S11	161-2830			

HyperPROX

Extended Sensing Range



- Extended sensing range
- Cylindrical housing sizes M8, M12
- Short circuit and polarity reversal protected
- LED for visual indication of output state
- **High IP67** rating for arduous environments

Hyperprox inductive proximity sensors with up to 4 x standard sensing distance. No matter how reliable your existing sensor, it is unlikely to withstand collision with metal objects. Revolutionary new technology combined with extremely high component specification has allowed Balluff to develop this problem solving family of sensors to allow the sensor to be mounted further away from the danger area and thus avoid expensive breakdowns.

Size	Sense Dist.	Mfrs. List No.	Order Code	Price Each		
				1+	5+	10+
M8	4mm	BESM08MI-PSC40B-S49G	160-6774			
M12	8mm	BESM12MI-PSH80B-S04G	160-6775			
M12	10mm	BESM12MF1-PSC10F-S04G	160-6778			

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Proximity Switches - Inductive

proxistor.

Proximity Sensor

Inductive - V3 Style Miniature



- Precise mounting, easy to fit
- Similar housing to V3 microswitch
- Sealed to IP 65
- Designed to be flush mounted
- 2m, 3-wire connecting cable
- Sensing Distance assured from 0 - 1.6mm

Body - H = 16.5, W = 30, D = 10.5mm

Supply voltage	10 to 30VDC	Switching frequency	1000Hz max.
Output	Normally Open, 200mA max. load	Temperature range	-25°C to +70°C
Sensing distance	2mm	Protection	IP65

505004

Output		Mftrs.		Price Each		
Type	List No.	Order Code	1+	5+	10+	
PNP	IPO-002-VSF-LFmm	120-5165				
NPN	INO-002-VSF-LFmm	120-5166				

Proximity Switch Tester

proxistor.



- Suitable for testing 2 and 3 wire proximity switches, including inductive, photo-electric, capacitive and ultrasonic
- Ideally suited to 'point of use' testing
- Audio and visual indication
- Supplied and fitted with batteries, ready for use

H=104, W=60, D=29

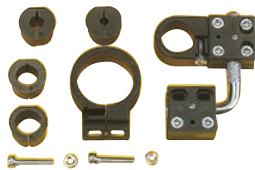
Indication of proximity switch function	NPN or PNP, normally closed or normally open, light-on or dark-on operation
Auto-on/off feature	Unit is powered only when a proximity switch is connected
Battery	DC = 2.9V (PP3)

212302

Mftrs.		Price Each		
List No.	Order Code	1+	5+	10+
MU2-DC	721-3803			

Sensor Mounting Bracket

THORPE PRODUCTS



- High quality, fully adjustable mounting bracket for all types of barrel sensors
- Constructed from Black Nylon 66, with stainless steel fasteners and a zinc plated knurled pin
- Supplied complete with a kit of parts to fit sensor diameters 4mm, 5mm, 12mm, 14mm, 18mm and 30mm
- Two M4x20mm zinc plated cap head screws are supplied for fixing the bracket in position

212417

Mftrs.		Price Each		
List No.	Order Code	1+	5+	10+
TP-30	311-5379			

Uprox® Inductive Sensors

3-Wire Connection

NEW



- Protection class IP68
- Magnetic field immune
- High switching distance
- High switching frequency
- 3-wire, NO contact, PNP output
- LED output indicator

Output Function Normally Open
Operating voltage range 10V to 30V

638590

Sensing		Mftrs.		Price Each			
Size	Range	List No.	Order Code	1+	5+	10+	25+
PNP - Cables							
M6	0mm to 2mm	BI2U-EH6,5-AP6X	190-8284				
M6	0mm to 6mm	NI6U-EH6,5-AP6X	190-8287				
M8	0mm to 2mm	BI2U-EG08-AP6X	190-8289				
M8	0mm to 6mm	NI6U-EG08-AP6X	190-8291				
M12	0mm to 4mm	BI4U-M12-AP6X	190-8293				
M12	0mm to 10mm	NI10U-M12-AP6X	190-8295				
M18	0mm to 8mm	BI8U-M18-AP6X	190-8298				
M18	0mm to 15mm	NI15U-M18-AP6X	190-8300				
M30	0mm to 15mm	BI15U-M30-AP6X	190-8302				

Size	Sensing Range	Mftrs. List No.	Order Code	Price Each			
				1+	5+	10+	25+
PNP - Cables							
M30	0mm to 30mm	NI30U-M30-AP6X	190-8305				
M8	0mm to 4mm	NI4U-Q8SE-AP6X	190-8307				
M8	0mm to 8mm	BI8U-Q08-AP6X	190-8309				
PNP - Connectors							
M6	0mm to 2mm	BI2U-EH6,5-AP6X-V1131	190-8286				
M6	0mm to 6mm	NI6U-EH6,5-AP6X-V1131	190-8288				
M8	0mm to 2mm	BI2U-EG08-AP6X-H1341	190-8290				
M8	0mm to 6mm	NI6U-EG08-AP6X-H1341	190-8292				
M12	0mm to 4mm	BI4U-M12-AP6X-H1141	190-8294				
M12	0mm to 10mm	NI10U-M12-AP6X-H1141	190-8296				
M18	0mm to 8mm	BI8U-M18-AP6X-H1141	190-8299				
M18	0mm to 15mm	NI15U-M18-AP6X-H1141	190-8301				
M30	0mm to 15mm	BI15U-M30-AP6X-H1141	190-8304				
M30	0mm to 30mm	NI30U-M30-AP6X-H1141	190-8306				
M8	0mm to 4mm	NI4U-Q8SE-AP6X-V1131	190-8308				
M8	0mm to 8mm	BI8U-Q08-AP6X-V1131	190-8310				
M8	0mm to 30mm	BI30U-CK40-AP6X2-H1141	190-8311				
M12	0mm to 50mm	NI50U-CK40-AP6X2-H1141	190-8312				
M12	0mm to 50mm	BI50U-Q80-AP6X2-H1141	190-8316				
M12	0mm to 75mm	NI75U-Q80-AP6X2-H1141	190-8317				
PNP - Terminals							
—	0mm to 30mm	BI30U-CP40-AP6X2	190-8313				
—	0mm to 50mm	NI50U-CP40-AP6X2	190-8314				

Proximity Switches - Ultrasonic

Compact, Switch Output

Adjustable Switch Point and Time Delay



- User adjustment of delay time
- User adjustment of range 100 to 500 mm
- Housing protected to IP67
- Small compact design
- Easy mounting options:- M4 thru-holes or M18 thread
- Switch status LED
- Detection of small poorly reflecting objects
- Detection unaffected by dust, waterdrops, strong sunlight etc.
- Distance measurement unaffected by target material
- Input protected against power reversal

Body H=46, W=18, D=30,
Overall W=40, Cable L=1.5m
Mounting: Thread=M18,
2x4.1 dia thru-holes, F.C=20

Versatile ultrasonic proximity switch in compact polyamide (glass fibre filled) case for object detection regardless of size, colour and target material.

Operating voltage V _s	12 to 24V
Scanning range	100 to 500mm
Switching point	Adjustable 100 to 500 mm
Time delay	Adjustable 0.2 to 7 secs
Resolution	±1.6 mm typ.
Detection sensitivity	100% @ V _s =24V, 80 to 90% @ V _s =15V
Carrier frequency	175kHz
Output	PNPopen collector 100mA, short-circuit proof
Operating temperature	-15°C to +60°C

212350

Output		Mftrs. List No.		Price Each			
		Order Code	1+	5+	10+	25+	
PNP	UPX500 PVPS 24	732-801					

Distance Sensors

Ultrasonic



- Cylindrical M30 versions with digital display
- High resolution for maximum precision
- Temperature compensation for accurate measurement in fluctuating temperatures
- Automatic switchover between current and voltage output for simple operation
- Teach-in for rapid commissioning
- Operating voltage of up to 30V with reverse polarity protection for application in various supply networks
- IP 65 Protection class

552160

Operating Range	Output Type	Mftrs. List No.	Order Code	Price Each		
				1+	5+	10+
Cylindrical M30						
200mm to 1300mm	PNP - Switching	MIC+130/D/TC	177-5722			
200mm to 1300mm	4-20 mA / 0-10V	MIC+130/IU/TC	177-5723			
350mm to 3400mm	PNP - Switching	MIC+340/D/TC	177-5724			
350mm to 3400mm	4-20 mA / 0-10V	MIC+340/IU/TC	177-5725			
600mm to 6000mm	PNP - Switching	MIC+600/D/TC	177-5726			
600mm to 6000mm	4-20 mA / 0-10V	MIC+600/IU/TC	177-5727			
SKS Type						
20mm to 150mm	PNP - Switching	SKS-15/D	177-5729			
ZWS Type						
20mm to 150mm	PNP - Switching	ZWS-15/CD/QS	177-5731			
20mm to 150mm	0-10V	ZWS-15/CU/QS	177-5732			
120mm to 700mm -	PNP - Switching	ZWS-70/CD/QS	177-5733			
120mm to 700mm -	4-20 mA	ZWS-70/CI/QS	177-5735			

Ultrasonic Adjustable Sensors

Cylindrical M12



- IP degree of protection: IP 65 conforming to IEC 60529
- Operating temperature: -20°C to +60°C
- Enclosure material: ULTEM

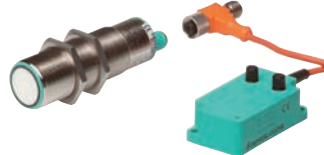


NEW

Sensing Range	Beam Divergence	Mftrs. List No.	Order Code	Price Each		
				1+	3+	5+
0.051m to 0.508m	6	XX518A3PAM12	197-4091			
0.051m to 0.991m	10	XX630A1KAM12	197-4092			
0.051m to 0.991m	10	XX630A1PCM12	197-4093			
0.203m to 8m	16	XX630A3PCM12	197-4094			
0.203m to 8m	16	XX930A3A2M12	197-4095			

M30, Switch Output

With 2 Teachable Switch Points



- Operating voltage: 20 to 30V dc
- Switch outputs: 200mA (PNP)
- LED indicators: Green=Power on, Red=Fault, Yellow=Switch condition
- Temperature range: -25°C to +70°C
- Response time: 480ms
- Hysteresis: ≤1% of operating distance
- Reproducibility: ≤1%

- One programmable switch output
- Nickel-plated brass IP65 housing
- Tamper-proof programming

The sensor switch points can be set by applying the supply voltage to the teach inputs or programming unit.

UB500, UB2000:L=94, Head dia.=M30, UB4000:L=109, Head dia.=40, Thread size M30x1.5

Sensing Range (mm)	Mftrs. List No.	Order Code	Price Each		
			1+	5+	10+
60 to 500	UB500-30GM-E5-V15	709-7931			
200 to 2000	UB2000-30GM-E5-V15	709-7943			
500 to 4000	UB4000-30GM-E2-V15	709-7955			
Programming Unit	UB PROG 2	709-7979			

M30, Analogue Output, Stainless Steel

4-20mA/0-10V, Temperature Compensated



The sensor has a four position insert to program the limit values of the analogue output and also to compensate for temperature drift.

UC300, UC500, UC2000:L=114, Head dia.=M30, Thread size M30x1.5

- User-defined analogue outputs (current or voltage)
- Stainless steel IP65 housing
- Temperature compensation

Operating voltage	Repeatability	Linearity	Response time	Current output	Voltage output	LED indicators			Power on	Object not detected/disturbance	Limit value 1	Limit value 2
						Dual-Green	Dual-Red	Yellow				
10 to 30VDC	0.1% of full scale	0.1% of full scale	35ms	4 to 20mA	0 to 10V							

Sensing Range (mm)	Mftrs. List No.	Order Code	Price Each		
			1+	5+	10+
15 to 300	UC300-30GM-IU-R2-V15	372-6241			
80 to 2000	UC2000-30GM-IU-R2-V15	709-8030			

Photoswitches - Optical - Balluff

Through Beam Slot Sensors

BGL Series - Anodized Aluminium



A robust alternative to fiber optic cables needing no separate amplifier. Installation is simple as they are ready aligned and need no bracket allowing a more accurate, less expensive and more robust installation than fiber optic cable. A full range of slot sizes ensure that virtually any sensing task can be handled. Also included is the laser range of through beam slot sensors with a smallest detection of 0.6µm and with NO/NC and sensitivity adjustment.

- Easy installation and setup
- High switching frequency of 1500Hz
- Adjustable sensitivity
- PNP output, switchable to Normally Open or Normally Closed
- Output short circuit and reverse polarity protected
- M8 3 Pin Connector
- Slim 10mm height profile
- 10 to 30V dc operating voltage
- Operating temperature from -10 to 60°C
- 30mm, 50mm, 80mm and 120mm slot options
- IP65 rated

For suitable connector/cable see Order Code 160-6720

Slot Width (mm)	Dimensions W x D (mm)	Sensor Type	Mftrs. List No.	Order Code	Price Each		
					1+	5+	10+
50	70 x 79	Red LED	BGL 50A-001-S 49	161-2837			
50	70 x 79	Laser	BGL 50A-003-S 49	161-2842			
80	100 x 79	Laser	BGL 80A-003-S 49	161-2843			
120	140 x 84	Laser	BGL 120A-003-S 49	161-2844			

Photoswitches - Optical - Sick

Compact - W9 Series



- Insensitive to high ambient light and adjacent sensor light sources
- PNP output
- Light/Dark switching
- Visible red LED and long range IR
- Sensitivity/Range adjustable
- M12 4 pin connector
- Compact plastic housing
- Output indicator LED
- Circuit protection

Sensing distance	Supply voltage	Output	Switching Mode	Switching Frequency	Operating Temperature	Price Each		
						1+	5+	10+
H=40 W=12 D=22	10 to 30VDC	PNP, 100mA	Light / Dark selectable	800 Hz or greater	-40°C to 60°C			

Sensing distance	Mftrs. List No.	Order Code	Price Each		
			1+	5+	10+
Diffused (BGS) - 250mm, Teach In	WT9-2P430	416-7764			

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Diffuse, Polarised Reflex

Miniature Prewired - W150 Series



- Miniature photoswitches with integral amplifier
- Sensitivity adjustment by potentiometer
- Light-on/dark-on operation selected by control wire
- UL Recognised
- IP67 protection
- Reflex type supplied with PL20A reflector
- Supplied with mounting bracket

H=28 (body), W=10, D=17, Cable L=2m

Sensing distance (max.) Diffuse = 200, Diffuse with background suppression=100, Polarised reflex=2m
 Supply voltage 10 - 30V dc
 Output PNP or NPN transistor
 Output current 100mA max.
 Switching frequency 1000 per sec.

212372

Output	Mfrs. List No.	Order Code	Price Each		
			1+	5+	10+
Diffuse					
PNP	WT150-P132	722-9392			
NPN	WT150-N132	722-9409			
Diffuse with Background Suppression					
PNP	WT150-P162	722-9410			
NPN	WT150-N162	722-9422			
Polarised Reflex					
PNP	WL150-P132	722-9434			
NPN	WL150-N132	722-9446			

Diffuse with Background Suppression, Polarised Reflex



PNP or Relay Output; Prewired - W250 Series



- Robust and compact plastic housing
- Choice of SPCO relay or PNP transistor output
- Detection distance setting with position indicator
- Diffused types have 150 - 500mm scanning range with background suppression
- Polarised reflex types suitable for detecting objects with glossy surfaces
- Light/dark switching selectable by control line (PNP types)
- Reflector supplied with reflex types
- IP67 protection
- UL Recognised
- Supplied with mounting bracket

H=60, W=20, D=43, Cable L=2m

Sensing distance Diffuse=150 to 500mm, Reflex=0.01 to 8m
 Output SPCO Relay open collector or SPCO Relay relay
 Output current PNP types=3A, Relay types=3A@ 240V ac/30V dc
 Supply voltage PNP types=12 to 240V dc, Relay types=12 to 240V dc12240V30V10
 Switching mode PNP types=light/dark switching (via control line)
 Relay types=light switching
 Switching frequency PNP types=33 per sec, Relay types=33 per sec700

212369

Output	Mfrs. List No.	Order Code	Price Each		
			1+	5+	10+
Diffuse with Background Suppression					
Relay	WT250-S162	722-9460			
Polarised Reflex					
PNP	WL250-P132	722-9471			
Relay	WL250-S132	722-9483			

Compact - W160 Series



- Plastic housing
- PNP output
- Light/Dark switching
- Polarised Reflex or Optical Proximity versions
- Visible red LED
- 2 metre 3 core cable or M8 4 pin connector versions
- Sensitivity/Range adjustable
- Output indicator LED
- Circuit protection
- P250 Reflector supplied with Reflex types
- Mounting bracket supplied
- UL Recognised and CSA approved

H=33 W=11 D=23

Sensing Distance Reflex: 0.01 to 6m using PL80A reflector
 Reflex: 0.005 to 4m using P250 reflector
 Diffused: 0 to 900mm
 Supply voltage 10 to 30VDC
 Output PNP, 100mA
 Switching Mode Light / Dark selectable
 Switching Frequency 1000 Hz
 Operating Temperature -25°C to 55°C

249408

Reflex	Mfrs. List No.	Order Code	Price Each		
			1+	5+	10+
Diffused					
PNP, Cable	WL160-F142	414-7716			
PNP, M8 Connector	WL160-F440	414-7728			
Reflex					
PNP, M8 Connector	WT160-F480	414-7741			

Polarised Reflex - W12 Series



Transparent Object Sensor



- Metal housing (Zinc diecast)
- Sensitivity control
- Insensitive to external light sources
- Switching outputs short circuit protected
- Polarised reflex sensing
- Light/Dark operation via control wire
- 5-pin M12 connection
- Supplied with 2 fixing clamps
- Adjustable mounting bracket available
- IP67 protection

H = 48.5, W = 15.9, D = 42mm

Sensing distance 1.5m
 Supply voltage 10 to 30V dc
 Output PNP / NPN
 Response time 330µs

624244

Description	Mfrs. List No.	Order Code	Price Each		
			1+	5+	10+
Sensor	WL12G-3B2531	169-7929			

Polarised Reflex - W36 Series



High performance and robust polarised reflex sensor suitable for use on conveyor systems and all automated machinery. Available for 10-30V dc supply with NPN/PNP transistor output or for 24-240V ac/dc supply with SPCO relay output. Adjustable mounting bracket and choice of reflectors available separately.

- Switch selectable time delays
- Sensitivity control
- PG11 cable gland
- Light/dark operation (switch selectable)
- Enclosure sealing to IP67
- Terminal chamber connection
- Test input and alarm output (transistor output type)

H=85 (excl. connector), W=36, D=72

Max. sensing distance 15m (with 730-440 reflector), 12mm (with 730439), 11mm (with 730-427)
 Supply voltage 10 to 30V dc (730-257), 24 to 240V ac/dc (730-269)
 Output PNP / NPN transistor (730-257), SPCO Relay 3A 250V ac (500VA)
 Power consumptions 40mA (730-257), 2VA (730-269)
 Time delays 0.02-1s (730-257) 0.5-12s (730-269)
 Response time 1.25ms (730-257), 20ms (730-269)
 Mfrs. List Nos. WL36-B230=730-257, WL36-R230=730-269, 2005806=730-270

222152

	Order Code	Price Each		
		1+	5+	10+
Photoswitch, transistor output	730-257			
Photoswitch, relay output	730-269			
Mounting bracket	730-270			

W260 Series



H=77.5, W=25, D=63,
 Reflector (overall)=60.9 x 50.9

- SPNO relay output
- Light/dark operation (switch selectable)
- Protection to IP66
- Mounting bracket and cable gland supplied
- Adjustable sensitivity
- UL Recognised and CSA approved
- Reflector supplied with reflex types
- Reflex types use polarised red light thereby eliminating risk of malfunction due to shiny surfaces
- Terminal chamber connection with 2-position cable entry gland
- Polarised reflex type available with or without time delays

Sensing distance Diffuse=2m
 Supply voltage 12-240V dc, 24-240V
 Output SPCO Relay 3A @ 240V AC / 30V DC
 Power consumption 2VA
 Response time 20ms
 Time delays (timer version) OFF-delay/ON-delay (switch selectable), delay adjustable 0.1-5s

212260

	Mfrs. List No.	Order Code	Price Each		
			1+	5+	10+
Diffuse	WT260-S280	723-4594			
Polarised reflex	WL260-S270	730-282			
Polarised reflex with timer	WL260-R270	730-294			

Slot Sensor

WF Series



- Solid aluminium housing
- Simple and accurate sensitivity adjustment
- Adjustment by 25-turn potentiometer
- Choice of PNP/NPN and light-on/dark on switching
- 4-pin M8 plug connection

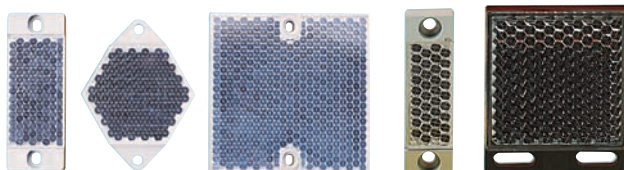
Body - H = 50, W = 12, D = 60mm
Slot - W = 15, D = 40mm

Light source: Infra-red LED
Supply voltage: 10- 30V dc
Switching output: PNP/NPN, Light/Dark switching
Response time: 1ms
Operating temperature range: -20°C to +60°C

624249

	Mfrs. List No.	Order Code	Price Each		
			1+	5+	10+
Slot width 15mm	WF15-40B410	723-4570			

Reflectors



730-427 Overall dims: H=82, W=30, D=7.2, Fixing centres=71 (Dia. 4.5)
730-439 H=78, W=60, D=8, Fixing centres=68 (Dia. 4.8)
730-440 H=84, W=84, D=8.5, Fixing centres=71 (Dia. 4.5)
722-9653 H=60, W=18,18, D=7.3, Fixing centres=50 (Dia. 4.6)
722-9665 H=60.9, W=50.9,50.9, D=8.5, Fixing centres=30 (Dia. 4.3)

High performance prismatic reflectors.

Mfrs. List No. PL30A = 730-427, PL20A = 722-9653, PL50A = 730-439, P250 = 722-9665, PL80A = 730-440, 212252

	Order Code	Price Each				
		1+	5+	10+	25+	50+
Rectangular, 82 x 30mm	730-427					
Hexagonal, 78 x 60mm	730-439					
Square, 84 x 84mm	730-440					
Rectangular, 60 x 18mm	722-9653					
Square, 61 x 51mm	722-9665					

Photoswitches - Optical - Omron

M18 Difuse and Reflex

E3F2 Series



- Light-on/Dark on operation - Wire selectable (dc types)
- Short circuit and reverse connection protection (dc types)
- Potentiometer sensitivity adjustment (300mm types)
- Reflector supplied reflex types
- LED output indication
- IP66 Protection
- UL Recognised

ac type - M18 x 80
dc type - M18 x 65

624246

Sensing Distance		Voltage	Output	Mfrs. List No.	Order Code	Price Each		
						1+	5+	10+
Diffuse								
100mm	12 to 30V dc	PNP	E3F2DS10B4N	160-3060				
300mm	12 to 30V dc	PNP	E3F2DS30B4	160-3056				
100mm	10 to 30V dc	NPN	E3F2DS10C4N	160-3059				
300mm	10 to 30V dc	NPN	E3F2DS30C4	160-3055				
Reflex - Includes Reflector								
2m	12 to 30V dc	NPN	E3F2R4C4 2M	160-3057				
2m	12 to 30V dc	PNP	E3F2R4B4 2M	160-3058				
Spare Reflector				E39R1	160-3054			

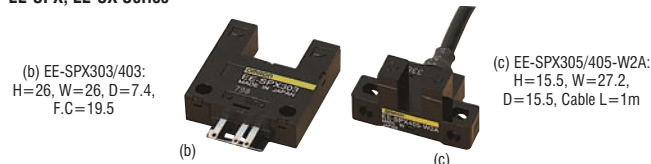


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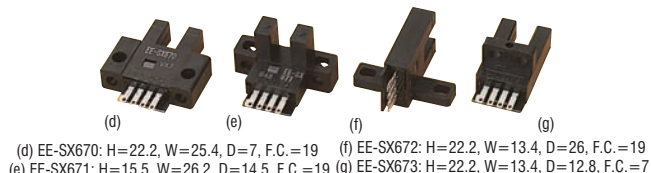
Subminiature - Through-beam (Slotted)

EE-SPX, EE-SX Series



(b) EE-SPX303/403: H=26, W=26, D=7.4, F.C.=19.5

(c) EE-SPX305/405-W2A: H=15.5, W=27.2, D=15.5, Cable L=1m



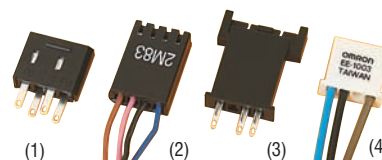
(d) EE-SX670: H=22.2, W=25.4, D=7, F.C.=19 (e) EE-SX671: H=15.5, W=26.2, D=14.5, F.C.=19 (f) EE-SX672: H=22.2, W=13.4, D=26, F.C.=19 (g) EE-SX673: H=22.2, W=13.4, D=12.8, F.C.=7

- Built-in amplifier circuitry allows direct switching of PLC and relay outputs
- Applications include robot control, cam timer switching, general position and object detection
- All slotted sensors have light-on indication
- Variety of slot widths, mounting and termination styles
- Mating connectors and connecting leads available

Slot Width	Output	Load	Supply Voltage	Connector Code	Mfrs. List No.	Order Code
5mm	Light - On/Off	100mA	5 - 24VDC	1 or 2	EE-SX671	162-7015
5mm	Light - On / Off	100mA	12 - 24VDC	1 or 2	EE-SX672	721-4030
Modulated light, prewired 1m leads						
5mm	Light - On	80mA	12 - 24VDC	N/A	EE-SPX405-W2A	721-4080 212306

Mfrs. List No.	Order Code	Price Each				
		1+	5+	10+	25+	100+
EE-SX671	162-7015					
EE-SX672	721-4030					
EE-SPX405-W2A	721-4080					

Connectors for EE Subminiature Photoswitches



Connectors and connecting leads for Omron EE subminiature photoswitches.

Connector Code	Lead Length	Mfrs. List No.	Order Code	Price Each		
				1+	10+	25+
1	—	EE-1001	721-4091			
2	1 mtr	EE-1006	721-4108			

'Mini' Side-view and Flat Packages - E3T



Diffuse, Separate



- Very small size saves installation space
- 'Pin-point' beam (1-2mm) ideal for detecting minute sensing objects
- Minimal influence of background or ambient shiny metal objects

Package	Side-view	Flat pack
H	14.6	20.8
W	7	12
D	9.5	3.7

Power supply: 12 to 24V dc ± 10% (ripple 10% max.)
Control output: NPN or PNP open collector, load current: 50mA max. at 24V dc
Operation mode: Diffuse = light-ON; Separate = dark-ON
Response time: 1ms max. for both operation and release
Operating temperature: -25°C to +55°C
Enclosure rating: IP67

222158

Sensing Distance		Style	Output	Mfrs. List No.	Order Code	Price Each		
						1+	5+	10+
Diffuse								
5 to 30mm	Flush	PNP	E3T-FD13	722-6445				
Separate								
1m		NPN	E3T-ST12	721-3797				
1m		PNP	E3T-ST14	722-6470				

Photoswitches - Optical - Omron - continued

Diffuse, Polarised Reflex



E3S-A Series



- LED indication of output and stability status
- Switch selectable Light-on/dark-on operation
- Small variation in sensitivity between sensors
- Quick adjustment of multiple sensors
- Quick alignment
- Close alignment of optical axis to mounting position
- Plastic housing providing IP67 protection
- Reflector supplied with reflex types

Reflex - H = 22.3, W = 12.4, D = 42.3mm
 Diffuse - H = 22.3, W = 12.4, D = 40mm
 Cable = 2m long
 Supply voltage 10 to 30V dc
 Control output 100mA max, 30V dc max
 Response time 0.5ms
 Operating temperature -25°C to +55°C

Type	Output	Mfrs. List No.	Order Code	Price Each		
				1+	5+	10+
Diffuse	PNP	E3SAD31	160-3065			
Polarised reflex	NPN	E3SAR11	160-3066			
Polarised reflex	PNP	E3SAR31	160-3067			

Diffuse and Separate



Horizontal Appearance - E3S Series



- LED indication of output and stability status
- Operation mode selectable by changing supply polarity
- Plastic body
- Supplied with stainless steel brackets
- Reflector supplied with reflex type
- IP65 protection
- UL Recognised

175-728 - H = 21, W = 15, D = 50mm
 160-3062 & 160-3436 - H = 19, W = 15, D = 50mm
 Cable = 2m long
 Sensing distance 0 to 3m
 Current consumption 40mA
 Supply voltage 10 to 30V dc
 Control output Open collector, 100mA max, 30V dc max
 Response time 1ms
 Operating temperature -25°C to +55°C

Output	Mfrs. List No.	Order Code	Price Each		
			1+	5+	10+
Separate Type					
		175-728			
NPN	E3S2E4	160-3062			
Separate Reflector	E39R1	160-3054			

Polarised Reflex



Long Range, Metal Housing - E3S-C Series



- Sensing up to 3m
- Robust metal housing
- Mutual interference protection
- Light-on/dark-on operation
- Selectable PNP/NPN output
- LED indication of output and stability status
- Supplied with stainless steel brackets
- Reflector supplied
- IP67 protection

H = 23, W = 20, D = 50mm
 Cable = 2m long
 Sensing distance 0 to 3m
 Current consumption 40mA
 Supply voltage 10 to 30V dc
 Control output Open collector, 100mA max, 30V dc max
 Response time 1ms
 Operating temperature range -25°C to +55°C

Type	Mfrs. List No.	Order Code	Price Each		
			1+	5+	10+
Horizontal Mounting	E3S-CR11	532-411			

Diffuse - High Precision Background Suppression



E3S-CL



- High definition sensor, easily adjusted to detect objects at a specific distance, disregarding the background or colour
- Switch selectable operation for NPN or PNP output and dark or light response
- Robust IP67 protected construction resists water, oil and detergent

H=43.7, W=15.4, D=40, Cable L=2m

Setting distance 50 to 500mm
 Detection distance 5 to 500mm
 Repeat accuracy:
 Perpendicular to optical axis 0.5mm max.
 In direction of optical axis 10mm max.
 Supply voltage 10 to 30V dc
 Control output 100mA (max.) @ 30VDC, NPN / PNP Selectable
 Response time 1ms max. for both operation and release
 Sensitivity adjustment Six turn, adjuster with indicator

Mfrs. List No. E3S-CL2=674-370

212224

Detection range	Order Code	Price Each		
		1+	5+	10+
5mm to 500mm	674-370			

Slot Sensor



E3S-GS Series



- Sensor detects marks on transparent, opaque or translucent targets with sensing range of 30mm
- Robust metal body, protected to IP67
- LED indication of output and stability status
- Adjustable sensitivity
- Operation mode is wire selectable
- Direct switching of NPN or PNP loads

H=52, W=20, L=80, Fixing centres=40 (Dia. 6.5), Slot W=30, D=45, Cable L=2m

Sensing distance 30mm
 Supply voltage 12 to 24VDC
 Current operation 40mA
 Output current (max.) NPN 80mA, PNP 100mA
 Response time (max.) 1ms
 Operating temperature -25°C to +55°C

212186

Output	Order Code	Price Each		
		1+	5+	10+
NPN	160-3017			
PNP	160-3018			

Diffuse, Polarised Reflex and Separate - E3JM Series



H=65, W=25, D=75

Note: Mounting bracket 179-874 allows these E3JM Series photoswitches to fit the same bracket mounting holes as obsolete E3A Series and OA5N photoswitches.

	Diffuse	Reflex
Sensing distance	700mm	4m
Supply voltage	20 to 240V ac, 50/60Hz ±10% or 12 to 240V dc ±10%	
Power consumption	2W (max.)	2W (max.)
Output		SPDT
Sensitivity	Adjustable	Fixed
Timer version	One-shot or on-delay or off-delay adjustable 0.1 to 5s	

212473

Type	Order Code	Price Each		
		1+	5+	10+
Diffuse	178-472			
Polarised reflex	178-473			
Polarised reflex with timer	178-474			
Spare reflector	160-3054			

Retroreflective Sensors



E3G-MR19 Series



- Sensing distance up to 10 m
- Operation stability monitor
- Relay output
- Mutual interference prevention function
- Voltage Supply 24VAC to 240VAC, 12VDC to 24VDC
- Power consumption 2W
- Output relay switching - Voltage (Max.) 250VAC, 30VAC
- Output relay switching - Current 3A
- Response time - 160-3438 30ms
- Response time - 160-3439 0 to 5s
- Temperature range -25°C to +55°C
- PBT case material
- IP67 protection
- Terminal block connection

H = 84.95, W = 29, D = 68mm

510541

Type	Mfrs. List No.	Order Code	Price Each		
			1+	5+	10+
Retroreflective	E3G-MR19G	160-3438			
Retroreflective - Timed	E3G-MR19TG	160-3439			
Spare Reflector	E39R1	160-3054			

Photoswitches - Optical - Pepperl + Fuchs

Diffused



- 3 wire DC
- Yellow LED indicator
- Short circuit/overload protected
- Cabled and M8 or M12 connector versions
- Protection Degree **IP67**
- Sensing range 50 to 500mm

L: M5=35, M18=70

Wiring NPN = Normally Open
PNP = Normally Open
NPN/PROG = Programmable open or closed
PNP/PROG = Programmable open or closed

Supply Voltage 10 to 30Vdc
Output Rating 100mA
Switching frequency 250Hz
Temperature range 0 to 55°C

Sensing Distance	Output	Thread Size	Mftrs. List No.	Order Code
Plug in, M8 Connection 3 pin				
50mm	PNP	M5	KT11-50/25/98A/103	372-5133
Plug in, M12 Connection 4 pin				
200mm	NPN/PROG	M18	OBT200-18GM60-E4-V1	372-5327
200mm	PNP/PROG	M18	OBT200-18GM60-E5-V1	372-5339

Order Code	Price Each			
	1+	5+	10+	25+
Plug in, M8 Connection 3 pin				
372-5133				
Plug in, M12 Connection 4 pin				
372-5327				
372-5339				

Photoswitches - Optical - Datasensor

M18 Tubular Optical Sensor

Type S15 - Cable Output



- Short length
 - Cable output
 - M18 x 1 threaded body
 - Pre-set sensitivity
 - **IP69K** Mechanical protection
 - **CE** Approval, **UL** Recognised
- Body - L = 40mm, Dia. = M18

Sensing Range	Output	Optic Function	Mftrs. List No.	Order Code
0.1 to 4cm	PNP	Retroreflex	S15-PA-2-A00-PK	177-4932
1 to 10cm	PNP	Short diffuse proximity	S15-PA-2-C10-PK	177-4933
1 to 35cm	PNP	Long diffuse proximity	S15-PA-2-C00-PK	177-4934
0.1 to 4cm	NPN	Retroreflex	S15-PA-2-A00-NK	177-4935
1 to 10cm	NPN	Short diffuse proximity	S15-PA-2-C10-NK	177-4936

Mftrs. List No.	Order Code	1+	5+	10+
S15-PA-2-A00-PK	177-4932			
S15-PA-2-C10-PK	177-4933			
S15-PA-2-C00-PK	177-4934			
S15-PA-2-A00-NK	177-4935			
S15-PA-2-C10-NK	177-4936			

Object Detector - M18 Tubular



The S51 Series offers a very cost-effective solution for object detection in all industrial automation applications

- NPN and PNP outputs
- Standard 3 wire connection configuration
- Selectable dark or light output

Supply voltage 10 to 30VDC
Output load 100mA
Response time 1ms
Temperature range -25°C to +70°C

Sensor Type	Output	Sensing Distance	Mftrs. List No.	Order Code
Axial, 2m cable				
Reflex	NPN	0.1 to 3m	S51-PA-2-A00-NK	416-4799
Reflex	PNP	0.1 to 3m	S51-PA-2-A00-PK	416-4805
Diffused Long Range	NPN	10 to 300mm	S51-PA-2-C01-NK	416-4830
Diffused Short Range	PNP	0 to 100mm	S51-PA-2-C10-PK	416-4866

Type	Output	Order Code	Price Each		
			1+	5+	10+
Axial Sensors, 2m Cable					
Reflex	NPN	416-4799			
Reflex	PNP	416-4805			
Diffused Long Range	NPN	416-4830			
Diffused Short Range	PNP	416-4866			

M18 Diffuse and Polarised Reflex - S5 Series

Prewired and M12 Plug-In



Thread=M18, Cable L=2m
731-470: L=55
731-481/731-493: L=65 (excl. cable sleeve)
Reflector supplied with reflex type

- Available AC and DC versions
- Red LED output indication
- M12 connector option (DC types only)
- DC versions have wire selectable NPN/PNP, light-on/dark-on output
- Long range version has sensitivity trimmer and green stability LED
- AC version is multi-voltage 15-264V ac with light-on output
- Plastic housing giving **IP67** protection

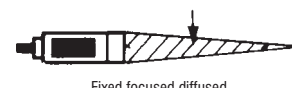
Photoswitches suitable for most direct sensing requirements in an industry standard M18 housing.

Sensing distance 80mm-3000mm
Diffuse=80mm, Diffuse adjustment=0-350mm,
Polarised reflex=3000mm
Operating temperature -1555
-15°C to +55°C

Power supply	DC versions		AC version
	10 to 30V dc	150mA	15 to 264V ac, 48 to 62Hz
Output	NPN/PNP selectable	NPN / PNP	Thyristor + bridge rectifier
Output current	150mA	100mA	100mA
Response time	1ms max.	1ms max.	20ms max.
Mftrs. List No.	S5-5C10-30 = 731-470, S5-5B3-30 = 721-2586, S5-5B3-32+REFLECTOR = 721-2616	S5-1C8-20 = 731-481,	S5-5C35-30 = 731-493, S5-5C35-32 = 721-2604,

Prewired Type	Output	Order Code	Price Each			
			1+	5+	10+	50+
Diffuse	NPN / PNP	731-470				
Diffuse	Thyristor	731-481				
Diffuse, adjustable	NPN / PNP	731-493				
Polarised reflex	NPN / PNP	721-2586				
Plug-In Type						
Diffuse, adjustable	NPN / PNP	721-2604				
Polarised reflex	NPN / PNP	721-2616				

M18 Fixed Focus - S5 Series



Thread=M18x70, Cable L=2m

- Available AC and DC versions
- Plastic housing giving **IP67** protection
- DC version has wire selectable NPN/PNP, light-on/dark-on output
- AC version is multi-voltage 15-264V ac with light-on output
- Red output LED indication

Modulated infra-red diffuse fixed focus sensors will detect objects up to the cut-off point 15mm from the sensor head, and will ignore objects in the background.

Sensing distance 15mm
Operating temperature -15°C to +55°C

Power supply	DC versions	
	10 to 30V dc	30mA Max.
Current consumption	30mA Max.	
Output	NPN/PNP selectable	
Output current	30mA max.	
Response time	1ms max.	
Mftrs. List No.	S5-5-D15-30 = 179-359,	

Voltage	Output	Order Code	Price Each		
			1+	5+	10+
10 to 30V dc	NPN / PNP Selectable	179-359			

M18 Diffuse and Polarised Reflex - 90° Viewing S5 Series



- Available AC or DC versions
- Red LED output indication
- Plastic housing giving **IP67** protection
- Viewing optics turned through 90°
- DC versions have wire selectable NPN/PNP, light-on/dark-on output
- AC version is multi-voltage 15-264V ac with light-on output
- Long range DC version has sensitivity trimmer and green stability LED

Thread=M18x80 Cable L=2m
Reflector supplied with reflex type
Sensing distance Diffuse = 80, Diffuse adjustable=0-300, Polarised reflex=1500
Operating temperature -15°C to +55°C

Photoswitches - Optical - Datasensor - continued

M18 Diffuse and Polarised Reflex - 90° Viewing - continued

S5 Series - continued

	DC versions	AC version
Power supply	10 to 30V dc	15 to 264V, ac 48 to 62Hz
Output	NPN/PNP selectable	Thyristor + bridge rectifier
Output current	150mA max.	100mA max.
Response time	1ms max.	20ms max.
Mfrs. List No.	S5-1-C8-25 = 179-357, S5-5B3-35 = 731-500	

212462

Type	Output	Order Code	Price Each			
			1+	5+	10+	50+
DiffuseS5-1-C8-25	Thyristor	179-357				
Polarised reflexS5-5B3-35	NPN / PNP	731-500				

S60 Series Optical Sensors



- Standard 50 x 50 x 15 compact housing
 - Complete range of optic functions, basic, advanced and laser class 1
 - Models with coaxial optics for polarised retroreflex contrast and luminescence sensors
 - Trimmer or touch to teach setting
 - M12 connection with PNP configuration
- Supply voltage 12 - 24 Vdc
Output load 100mA
Response time 100µs
Temperature range -25°C to +55°C

Sensor Type	Sensing Distance	Setting Type	Mfrs. List No.	Order Code
Reflex, Transparent	0 to 2m	Trimmer	S60-PA-5-T51-PP	410-1236

248812

Type	Order Code	Price Each		
		1+	5+	10+
Reflex, Transparent	410-1236			

Diffuse, Reflex and Polarised Reflex



S6 Series



H=50, W=18, D=50mm
Cable L=2m

- Multi-voltage supply 16 to 264V ac/dc
- Adjustable sensitivity
- Diffused 90cm and 200cm
- Reflex 0.1M to 6M
- Polarised reflex 0.1M to 5M with R2 reflector
- LED indication of output status
- Relay output version
- Compact ABS housing with min IP65 protection
- Light-on/Dark-on selectable
- Polarised reflex gives reliable detection of shiny objects
- Reflector included with reflex & polarised retroreflex versions

Compact photoelectric sensors suitable for most conveyor systems and automation machinery, available as reflex or diffused types using infra red light or as polarised reflex type using red light.

Sensing range	
Diffuse	900mm
Reflex	0.1 to 6m
Polarised reflex	0.1 to 5m
Supply voltage	15 to 264V ac/dc
Current consumption	35mA max.
Output	SPCO Relay 3A @ 275V AC / 30V DC Resistive
Response time	30ms max.
Operating temperature	-15°C to +55°C

Mfrs. List No. S6-1C90 = 213-263, S6-1A6 = 213-240, S6-1B5 = 213-251,

212472

Type	Order Code	Price Each		
		1+	5+	10+
Diffuse	213-263			
Reflex	213-240			
Polarised reflex	213-251			



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Complete cost control, reduced administration time, visibility of your spend, flexibility and personalised to your company's needs.
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Diffuse, Reflex

S2 Series



- Multi-voltage supply 16 to 264V ac/dc
- Time delay 0.6 to 16 seconds
- Relay output
- LED indication of output status
- Sensitivity trimmer standard on all models
- Dark / light selectable
- Rugged plastic housing with min IP66 protection
- Terminal block connection
- Bracket & R2 reflector included (with reflex)

H=58.5, W=26, D=92.5mm

Sensing Distance	Diffused 900mm, Reflex 5m
Supply Voltage	15 to 264 Vac
Current Consumption	4 VA
Output Rating	SPNO relay 1A @ 250 Vac, 2A @ 30 Vdc
Response Time	20ms max
Timing Functions	Normal, ON Delay, OFF Delay, ON/OFF Delay, One Shot Delay, Selectable by rotary switch
Delay with Timer Versions	Adjustable 0.1 to 16s
Temperature Range	-25°C to 55°C

249627

Type	Mfrs. List No.	Order Code	Price Each		
			1+	5+	10+
Diffuse	S2-1-C90	177-903			
Reflex	S2-1-A5	177-900			

Reflectors



- High efficiency models for long operating distances
- Microprism reflectors (R7R8) for laser sensors
- Work with infrared and visible red emission sensors
- Suitable for reflex or polarised reflex sensors

248823

	Order Code	Price Each		
		1+	5+	10+
Prismatic				
47 x 47mm	410-1285			
36 x 55mm	410-1297			
Miropism				
38 x 40mm	410-1303			
9.7 x 19mm	410-1315			

Slot Sensor - SR21

Microprocessor Based



H=90 (excl. connector),
W=20, D=26 (overall), Slot
W=2, D=50

- Fully automatic touch to teach setup
- Automatically selects red or green emission
- 721-2549 - For label edge & registration mark detection
- 177-4926 - For colour print register mark detection on transparent film
- LED indication of output status & stability
- Transistor output PNP or NPN (selectable on the cable)
- Dark/Light selectable through teach procedure
- Rugged metal housing with min IP65 protection
- Rotatable M8 connector

Slot sensing gap	2mm
Supply voltage	10 - 30V dc, reverse polarity protected
Setting	Auto set teach button
Output current	100mA with short circuit protection
Protection	IP65
Response time	80µs
Operating temperature	0 to 55°C
Light source	721-2549: Infra-red (label detection) 117-4926: Double red or Green (colour print detection)

212294

Emission	Mfrs. List No.	Order Code	Price Each		
			1+	5+	10+
Infra-red	SR21-IR	721-2549			
Red / Green	SR21-RG	117-4926			

Photoswitches - Optical - Seeka-Takex



Label Sensor



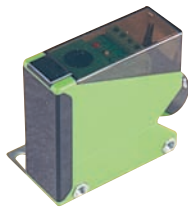
- Detects labels on backing paper or registration marks on translucent material
- Sensor detects difference between label/colour mark and background material
- Adjust using high/low power switch and fine tuning sensitivity potentiometer
- IP67 protection

H=32, W=18, D=75, Slot D=50, Cable L=3m			
Supply voltage	12 to 24V dc ±10%	Output indication	Output = red LED Stability = green LED 0.5ms max. Red LED (680nm)
Current consumption	22mA max.	Response speed	0.5ms max.
Operation mode	Light-on/Dark-on select- able	Light Source	Red LED (680nm)
Output	NPN or PNP open collec- tor, 100mA at 30V dc max. (selectable by wiring)	Temperature range	-25°C to +55°C
212249			
Mftrs.		Price Each	
List No.	Order Code	1+	5+ 10+
MCU2RTC	678-983		

Diffuse with Background Suppression

TAKEX

DL-S Series



H=68, W=26, D=80

Sensing distance	279-950: 0.2m to 1m, 279-961: 0.2m to 2m
Supply voltage	24 to 240V ac/dc
Current consumption (max.)	AC 30mA, DC 4W
Output	SPNO Relay 3A 250V ac (750VA) max. 3A 30V dc (90W) max.

Response time	20ms (max)
Light Source	Red LED (880nm)
Temperature range	-25°C to +55°C
Mftrs. List No.	DL-S100P=279-950, DL-S200P=279-961

- Reliable detection up to 1m or 2m with background suppression
- Mechanical adjustment system allows full power of device to be used across full sensing range
- Insensitive to dirt build-up
- Can be used in poor environmental conditions
- Polycarbonate housing protected to IP66
- Detects objects of any colour, material or shape against a similar background
- LED indicators for output and stability status
- Light-on/dark-on operation is switch selectable
- Connection by screw terminals under sealed cover

		Price Each	
Sensing Range	Order Code	1+	5+ 10+
200mm to 1m	279-950		
200mm to 2m	279-961		

Photoswitches - Optical - Telemecanique

Photo-electric Sensor XU Series

NEW

Schneider Electric



- Operating temperature: -25°C to +55°C
- Supply voltage range: 12V to 24V DC
- Output type: PNP
- IP degree of protection: IP 67 double insulation conforming to 60529
- Approved to CE, CSA and UL

Sensing Range	Mftrs. List No.	Order Code	1+	3+	5+	Price Each
Multimode PNP NO/NC, R/A						
0m to 20m	XUB0BPSWL2	197-4055				
0m to 20m	XUB0BPSWM12	197-4056				
Reflex, PNP, NO						
1m to 5m	XUB1BPANL2	197-4057				
1m to 5m	XUB1BPBNL2	197-4059				
5m to 15m	XUK1ARCNL2	197-4066				
5m to 15m	XUX1ARCNT16	197-4082				
Reflex, PNP, NO, R/A						
1m to 5m	XUB1BPAWL2	197-4058				
1m to 5m	XUB1BPBWL2	197-4060				
Sensitivity Adjustment Diffuse, PNP						
0.3m to 1m	XUK5APANM12	197-4067				
0.3m to 1m	XUM5APCNL2	197-4073				
0.3m to 1m	XUM5APCNM8	197-4074				
Polarised Reflex, PNP, R/A						
1m to 5m	XUB9BPANM12	197-4062				
1m to 5m	XUB9BPBWM12	197-4065				
Polarised Reflex, PNP						
1m to 5m	XUB9BPANM12	197-4061				
1m to 5m	XUB9BPBWM12	197-4064				
1m to 5m	XUK9APANM12	197-4068				
1m to 5m	XUM9APCNL2	197-4076				
1m to 5m	XUM9APCNM8	197-4077				
5m to 15m	XUX9ARCNT16	197-4083				

Sensing Range	Mftrs. List No.	Order Code	1+	3+	5+	Price Each
Pork, PNP, NO, 12-24V						
0mm to 50m	XUVR0605PANM8	197-4078				
0mm to 80m	XUVR0608PANM8	197-4079				
0mm to 120m	XUVR1212PANM8	197-4080				
0mm to 180m	XUVR1218PANM8	197-4081				
Through Beam, Transmitter						
5m to 15m	XUM2AKCNL2T	197-4069				
5m to 15m	XUM2AKCNM8T	197-4070				
Through Beam, Receiver						
5m to 15m	XUM2APCNL2R	197-4071				
5m to 15m	XUM2APCNM8R	197-4072				
Accessories - Brackets						
For XU Series	XUZA118	197-4084				
For XU Series	XUZA218	197-4085				
For XUM Series	XUZA50	197-4086				
For XUK Series	XUZA51	197-4088				
Accessories - Reflector						
Long sensing distance	XUZC2000	197-4090				
	XUZC100	197-4089				

Osiris

Universal Optical Proximity Switches - IP67 50 X 50 Housing format

Telemecanique



- Self teach multimode detection
- 4 modes of detection from the same sensor
- Diffuse mode range 1m
- Pol Reflex " reflector accessory 4m
- Background suppression mode 0.4m
- Thru-Beam "with accessory" 20m
- Programmable NO/NC switching
- Pre-cabled or plug-in connector
- Relay or solid state output

PNP	Dimensions	Connector	Body length
Relay	H = 50	W = 18	D = 50

Output	PNP	Relay
Supply voltage	10 - 36VDC	20 - 264V
Switching Capacity	100mA	3AmA
Max. switching frequency	250 Hz	30 Hz
Operating temperature	-15°C to 55°C	-15°C to 55°C
Protection	IP67	IP67

			Price Each	
Body Type	Connection	Mftrs. List No.	Order Code	1+ 5+ 10+
Plastic	Pre-cabled 2m	XUKOAKSAL2	425-5021	
Plastic	Connector	XUKOAKSAM12	425-5033	
Plastic	Pre-cabled (relay output)	XUKOARCTL2	428-5426	
Reflector accessory				
	Reflector 50 X 50	XUZC50	541-084	

Photoswitches - Optical - Sensopart

Laser Proximity Sensor Background Suppression

SENSOPART
www.sensopart.de



- Subminiature sensor for installation in tight spaces
- Bright, precise laser light spot for first-rate small-part detection and easy alignment
- Comfortable use via electronic teach key or control cable
- Robust, glass fibre reinforced plastic housing (IP67) with ecolab accreditation
- Permanent, cleaner-resistant laser marking
- 2-Wire, 2m Cable connection

Body - H = 21.1, W = 8, D = 14.6mm

Sensing Range - Output Type	Mftrs. List No.	Order Code	1+	5+	10+	Price Each
Laser Proximity Switches with Background Suppression						
- PNP / NO	FT10-RLH-PSK4	186-7741				
- NPN / NO	FT10-RLH-NSK4	186-7742				
Laser Proximity Switches with Background Suppression (Fixed Focus)						
- NPN / NO	FT10-B-RLF1-PSK4	186-7743				
- NPN / NO	FT10-B-RLF1-NSK4	186-7744				
- NPN / NO	FT10-B-RLF2-PSK4	186-7745				
- NPN / NO / NC	FT10-B-RLF2-NSK4	186-7746				
Accessories						
Reflector	R5L	186-7753				

Photoswitches - Optical - Sensorpart - continued

Laser Proximity Sensor Retro-reflective Light Barrier



- Subminiature sensor for installation in tight spaces
- Bright, precise laser light spot for first-rate small-part detection and easy alignment
- Comfortable use via electronic teach key or control cable
- Robust, glass fibre reinforced plastic housing (IP67) with ecolab accreditation
- Permanent, cleaner-resistant laser marking
- 2-Wire, 2m Cable connection

NEW

Body - H = 21.1, W = 8, D = 14.6mm

622968

Sensing Range - Output Type	Mfrs. List No.	Order Code	1+	5+	10+
Laser Proximity Switches with Background Suppression (Fixed Focus)					
- PNP NO / NC	FR10-RL-PSK4	186-7747			
- NPN NO / NC	FR10-RL-NSK4	186-7748			
Accessories					
Reflector	R5L	186-7753			

Laser Proximity Sensor Through-beam



- Subminiature sensor for installation in tight spaces
- Bright, precise laser light spot for first-rate small-part detection and easy alignment
- Comfortable use via electronic teach key or control cable
- Robust, glass fibre reinforced plastic housing (IP67) with ecolab accreditation
- Permanent, cleaner-resistant laser marking
- 2-Wire, 2m Cable connection

NEW

Body - H = 21.1, W = 8, D = 14.6mm

622972

Sensing Range - Output Type	Mfrs. List No.	Order Code	1+	5+	10+
Laser Through Beam Receiver					
- PNP NO / NC	FE10-RL-PSK4	186-7749			
- NPN NO / NC	FE10-RL-NSK4	186-7750			
Laser Through Beam Transmitter					
-	FS10-RL-K4	186-7752			
Accessories					
Reflector	R5L	186-7753			

Retro-reflective Laser Sensor FR 20 RLO Series

NEW



- Autocollimation principle (emitter/receiver beam on one axis)
- Scanning range 4000 mm
- High precision - very good detection of small parts (from 0.2 mm)
- Excellent detection of cylindrical objects
- High reproducibility, no matter if the target object cuts the light beam horizontally or vertically
- Small light spot over the whole detection range
- Objects can be detected at close range
- Laser protection class 1 according to DIN EN 60825-1: 2008-05

Body - H = 32, W = 12, D = 20mm

622424

This retro-reflective light barrier in a miniature casing has a homogenous small light spot over the whole detection range. Emitter and receiver beam run on one axis (autocollimation), therefore it is possible to detect objects even through small holes. This sensor opens up many new application possibilities as it recognizes objects at close range, does not require any protective measures thanks to laser protection class 1, and as it works very precisely. The setting is made by teach-in, either by push-button or by external teach. In combination with the function "dynamic teach-in", setting by external teach is also possible when the sensor is mounted in a place which is not easily accessible.

Output Type	Mfrs. List No.	Order Code	1+	3+	5+
M8 4-Pin Plug Connector					
PNP	FR20-RLO-PSM4	186-6365			
NPN	FR20-RLO-NSM4	186-6367			
2m Cable					
PNP	FR20-RLO-PSK4	186-6366			
NPN	FR20-RLO-NSK4	186-6368			

Colour Sensor

FT50 Series



- Colour scanning function
- Recognition of colours independent of sensing distance
- Reliable recognition of colours even for vibrating objects
- White light LED
- Dynamic teach-in and remote teach functions
- Triggering input
- 3 Colour channels
- 5 Tolerance levels
- Reflector operation possible
- 18 to 30V dc supply
- Connection via M12, 8-Pin Connector
- CE Approved

NEW

Body - H = 50, W = 17, D = 50mm

622297

Sensing Range	Mfrs. List No.	Order Code	1+	3+	5+
PNP - NO Output					
12mm to 32mm	FT50C-1-PSL8	186-6355			
15mm to 20mm	FT50C-2-PSL8	186-6356			
18mm to 22mm	FT50C-3-PSL8	186-6358			
Integrated RS485 Interface Output					
12mm to 32mm - PNP	FT50C-1-PS1-L8	186-6359			
15mm to 30mm - PNP	FT50C-2-PS1-L8	186-6360			
18mm to 22mm - PNP	FT50C-3-PS1-L8	186-6361			
12mm to 32mm - NPN	FT50C-1-NS1-L8	186-6362			
15mm to 30mm - NPN	FT50C-2-NS1-L8	186-6363			
18mm to 22mm - NPN	FT50C-3-NS1-L8	186-6364			

Distance Sensor

FT50 Series

NEW



- Large scanning distances and working ranges
- High repeatability
- High measuring rates
- LED Infrared light source
- 18 to 30V dc supply
- Connection via standard metric connector
- CE Approved, UL Recognised

Body - H = 93, W = 42, D = 95mm

622438

Sensing Range - Output Type	Mfrs. List No.	Order Code	1+	3+	5+
Proximity Switches with Background Suppression					
200mm to 6000mm - PNP	FT92-IL-PSL4	186-6371			
200mm to 6000mm - NPN	FT92-IL-NSL4	186-6372			
Distance Sensors with RS422 Analog Output					
0.5m to 10m	FT90-ILA-S2-Q12	186-6373			
500mm to 6000mm	FT91-ILA-S2-Q12	186-6374			
200mm to 6000mm	FT92-ILA-PSL5	186-6375			
Distance Sensors					
200mm to 6000mm - PNP	FT92-ILA-PSL5	186-6375			
200mm to 6000mm - NPN	FT92-ILA-NSL5	186-6376			

Photoswitches - Optical

Long Range - High Power Through beam



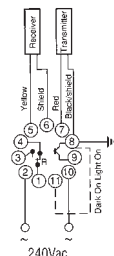
The transmitter and receiver are mounted remote from the amplifier unit which is normally installed with other electrical equipment. The amplifier is simply plugged into a standard 11 pin relay base.



Sensors: L=30, Dia=10, Cable L=5m
Amplifier: H=76.5, W=38, D=85 (overall)

- Infra-red transmitter/receiver combination with remote amplifier
- Operates up to 20 metres range when set to maximum sensitivity
- Alternatively can be used over a shorter range on high power
- Suitable for very dirty conditions such as car washes, lift doors, etc.
- Transmitter and receiver are sealed to IP67
- Amplifier features either relay or solid state output with optional on-delay and off-delay timer
- The sensors are supplied complete with mounting blocks

Sensors	
Sensing distance	0 to 20 metres
Light source	Modulated infra-red LED
Housing	Noryl sealed to IP67 with 5 metres of cable on each device
Temperature range	-40°C to +125°C



Amplifier	240VAC ±10%				
Operating voltage	2.8V _A				
Power consumption	Relay - SPDT, 8A/250V ac				
Outputs	NPN open collector 50mA/30V dc				
Functions	Delay on make 0 to 10s, delay on break 0 to 10s				
Indication	LED indication of beam on and separate indication of relay on				
Temperature range	Sensitivity adjustment by potentiometer				
	-20°C to +60°C				212158

Mfrs.	List No.	Order Code	1+	5+	10+	Price Each
Transmitter	IED12-FEC	279-973				
Receiver	SPT3A-FEC	279-985				
Amplifier	OEM203N-240A	279-997				

Self-Contained Photoelectric Sensors



- Available with PFA chemical resistant jacket
 - LED output indicator
 - Exceptional optical performance
 - Retroreflectors easily fits almost any mounting situation
- Operating voltage range 10V to 30V
Output type PNP



Size	Connection Option	Sensing Range	Mfrs. List No.	Order Code	1+	5+	10+	25+	Price Each
Diffuse Type									
M8	Cable	0mm to 30mm	Q12AB6FF30	190-8332					
M8	Connector	0mm to 30mm	Q12AB6FF30Q	190-8333					
M12	Cable	0mm to 450mm	QS18VP6D	190-8342					
M12	Connector	0mm to 450mm	QS18VP6DQ8	190-8343					
M12	Cable	0mm to 100mm	QS18VP6FF100	190-8344					
M12	Connector	0mm to 100mm	QS18VP6FF100Q8	190-8345					
M12	Cable	0m to 1m	QS30D	190-8353					
M12	Connector	0m to 1m	QS30DQ	190-8354					
Retroreflective Type									
M8	Cable	0m to 1m	Q12RB6LP	190-8330					
M8	Connector	0m to 1m	Q12RB6LPQ	190-8331					
M12	Cable	0m to 3.5m	QS18VP6LP	190-8338					
M12	Connector	0m to 3.5m	QS18VP6LPQ8	190-8341					
M12	Cable	0m to 8m	QS30LP	190-8350					
M12	Connector	8m	QS20LPQ	190-8351					
Tx Type									
M8	Cable	0m to 2m	Q126E	190-8325					
M8	Connector	0m to 2m	Q126EQ	190-8326					
M12	Cable	0m to 20m	QS186E	190-8334					
M12	Connector	0m to 20m	QS186EQ8	190-8335					
M12	Cable	0m to 60m	QS30E	190-8346					
M12	Connector	0m to 60m	QS30EQ	190-8347					
Rx Type									
M8	Cable	0m to 2m	Q12RB6R	190-8328					
M8	Connector	0m to 2m	Q12RB6RQ	190-8329					
M12	Cable	0m to 20m	QS18VP6R	190-8336					
M12	Connector	0m to 20m	QS18VP6RQ8	190-8337					
M12	Cable	0m to 60m	QS30R	190-8348					
M12	Connector	0m to 60m	QS30RQ	190-8349					

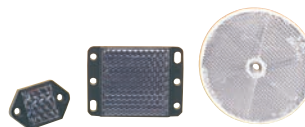
M18 Retro Reflective and Through Beam PA18 Series



- Miniature sensor range
- Sensitivity adjustment by potentiometer
- Modulated, infrared light 850 nm
- Supply voltage: 10 to 30 VDC
- Output: 100 mA, NPN or PNP, N.O + N.C.
- Degree of protection IP67, IP69K
- LED indication for output, stability and power ON
- Protection: reverse polarity, short circuit and transients
- Cable and plug versions
- Excellent EMC performance

Sensing Distance	Output	Connection	Mfrs. List No.	Order Code	1+	5+	10+	Price Each
Retro Reflective								
0mm to 6.5mm	PNP	Cable	PA18CAR65PASA	194-7836				
0mm to 6.5mm	PNP		PA18CAR65PAM1SA	194-7838				
Through Beam - Emitters								
0m to 20m		Cable	PA18CAT20	194-7839				
0m to 20m			PA18CAT20M1	194-7840				
Through Beam - Receivers								
0m to 20m	PNP	Cable	PA18CAT20PASA	194-7841				
0m to 20m	PNP		PA18CAT20PAM1SA	194-7842				

Reflectors



Overall dims:
541-072: H=29, W=45, D=9,
Fixing centres=33 (Dia. 4.5)
541-084: H=69, W=55, D=8,
Fixing centres=60x35 (Dia. 4)
541-096: Dia.=84, H=10, Fixing hole dia.=8

Reflectors for use with retroreflective (reflex) photoswitches. The 24mmx21mm and 50mm square reflectors are 'high reflection' types suitable for short sensing distances. The 80mm dia. reflector is for normal use, that is, typically at distances greater than 10% of the nominal sensing distance of the photoswitch.

Reflective Area	Mfrs. List No.	Order Code	1+	10+	25+	Price Each
24mm x 21mm	XUZC24	541-072				
50mm square	XUZC50	541-084				
80mm dia.	XUZC80	541-096				

Fibre Optic Photoswitches

Miniature - WLL160



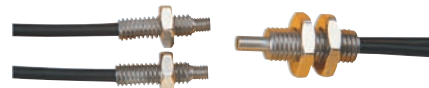
- Adjustable sensitivity
- Alarm output (forewarning of failure)
- Light/dark operation (switch selectable)
- UL Recognised and CSA approved
- Sealing to IP66
- OFF time delay (100ms switch selectable)
- Controls protected by hinged plastic cover
- Connection by either 2m integral cable or M8 screw-lock connector

H=38.5 (incl. mounting bracket)
W=12, L=59 (excl. connector)

Supply voltage	10 - 30VDC	OFF time delay	100ms
Output	PNP	Operating temperature	-25°C to +55°C
Response time	350µs		

Output	Mfrs. List No.	Order Code	1+	5+	10+	Price Each
PNP	WLL160-F122	722-9677				
PNP	WLL160-F420	730-397				
			WLL160-F420		730-397	

Fibre Leads for WLL160 Amplifiers



Thread=M4x0.7, L=15

Thread=M6x0.75, L=20

Diffuse and through-beam fibre leads for use with Sick WLL160 amplifiers and similar. The leads have threaded sensing heads fitted and can be cut to length with the guillotine supplied.

Fibre length	2m (may be shortened)	Operating temperature	-40°C to +70°C
Bending radius	25mm		

Mfrs List No.	Order Code	1+	5+	10+	Price Each
Diffused	LL3-DB01	730-403			
Separate	LL3-TB01	730-415			

Fibre Optic Amplifier



212-260 Thread=M6x1



212-271 Threads=M4x0.7

Fibre Optic Photoswitches - continued

Fibre Optic Amplifier - continued



Fibre Optic Leads

Fibre optic leads to plug into fibre optic amplifier above. The diffused type is for direct detection of an object, and the separate (through-beam) type is for light barrier operation. The leads can be cut to the required length with the tool supplied.

L = 80, Thread = M18,
Cable L = 2m

Fibre Optic Amplifier Unit

- Sensor for small object detection or when access is difficult using conventional sensor
- Adjustable sensitivity
- Proximity detection (OF18) fibre 22mm
- Through beam detection (OF19) 85cm
- Accepts any 2.2mm diameter fibre optic cable
- LED indication of output status & stability
- Transistor output PNP or NPN (selectable on the cable)
- Dark/Light (selectable on cable)
- Rugged ABS housing with min. IP67 protection

Supply voltage	10 to 30V dc, reverse polarity protected	Temperature range	-15°C to +55°C
Output current	150mA max. with short circuit protection	Light source	Visible red LED
Setting	Trimmer	Connection	2m cable
Response time	1ms max.		
Sensing distance	13mm (diffused), 50mm (separate)	Fibre length	1m
Mfrs. List No.	S5-5-E1-30=179-361, S5-1-E1-20=179-362, OF18=212-260, OF19=212-271		212479

		Price Each			
Supply	Output	Order Code	1+	5+	10+
Amplifier Units					
10 to 30V dc	NPN or PNP	179-361			
Fibre Optic Leads					
Diffused		212-260			
Separate		212-271			

Fine Tuning E3-DA-S Series



E3X-DA-S Series
H = 32, W = 70, D = 10mm
L (Cable) = 2m

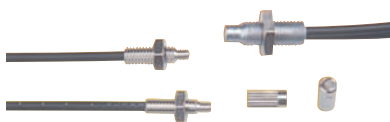
- High precision sensing with manual and auto tuning (teach function)
- Suitable for high precision positioning using fine sensitivity adjustment function
- Manual tuning allows threshold adjustments while sensed objects are moving
- Automatic sensitivity compensation function
- Offers longest sensing distance
- 16 bit resolution
- Mutual interference prevention
- 8-level incident and 13-level threshold indication

Supply voltage	12 to 24VDC ±10%
Light source	Red LED (680nm)
Current consumption	75mA
Output load	50mA max., NPN or PNP versions
Response time	1ms max.
Sensitivity setting	Teaching method
Fine sensitivity adjustment	Automatic or manual fine threshold adjustment
Time function (timer models)	Off-delay timer set to 40ms
Sensing distance	150mm with E32-DC200, 400mm with E32-TC200

212385

		Mfrs.	Price Each			
Type	Output	List No.	Order Code	1+	5+	10+
E3X-DA-S Series						
General purpose	NPN	E3XDA11S	160-3434			
General purpose	PNP	E3XDA41S	160-3435			

Fibre Leads



160-3021, 160-3023: Thread=M6x0.75 L=9, Dia.=4
160-3022 Threads=M4x0.7

- Lens attachment greatly increases sensing distance (typically from 200mm to 1500mm using E32-TC200)
- Extra flexible fibre is as flexible as electric wiring, allows neater wiring

Sensing distance (min.) - Standard fibre	
E3S-X3 Amplifier	Diffused 50mm, Separate 120mm
E3X-A Amplifier	Diffused 75mm, Separate 200mm
E3X-NT/NM Amplifier	Diffused 100mm, Separate 270mm
Sensing distance (min.) - Extra flexible fibre	
E3X-A Amplifier	Diffused 45mm, Separate 140mm
E3X-NT Amplifier	Diffused 65mm, Separate 200mm
E3X-NM Amplifier	Diffused 60mm, Separate 180mm
Fibre length	2m cuttable to length, (dia. 2.2)
Permissible bending radius	Standard = 25mm, Extra flexible = 1mm
Temperature range	-40°C to +70°C

212205

Standard	Mfrs.	Order Code	Price Each		
	List No.		1+	5+	10+
Diffused	E32DC200	160-3021			
Separate	E32TC200	160-3022			
Lens attachment	E39F1	160-3023			

Fibre Leads - Alternative Sensor Heads



Thread=M3x0.5, L=11; Flexible tube=0.9 dia,
L=90; Optical fibre L=2m, Dia.=1.0

160-3026

Side view heads L=30, Dia.=6 (diffuse), 3 (separate)



160-3028



722-9239

Fixed focus head H=20, W=20, D=5, F.C.=6.5, Optical fibre L=2m, Dia.=2.2

Fibre leads for use with Omron fibre optic amplifiers and similar.

All fibres are 2m long and may be cut to required length with tool supplied.

Sensing distance (with E3X-A amplifier)	E32-DC200E = 18mm, E32-TC200E = 50mm, E32-T14L = 120mm, E32-L25 = 3.3mm
Optical fibre	Black polyethylene, 25mm bending radius
Operating temperature	-40°C to +70°C

212364

		Price Each		
Mfrs List No.	Order Code	1+	5+	10+
Small Object Sensing (M3)				
Diffuse	E32DC200E	160-3026		
Side View, Long Distance				
Separate	E32T14L	160-3028		

Fibre Leads



279-699 Thread=M6x1.0, L=15

279-705 Thread=M4x0.7, L=15

Range of fibre leads for use with SEEKA-Takex® amplifiers and similar. All fibres are supplied 2 metres long and can be cut to length using the miniature guillotine supplied.

Sensing distance when used with:-	F1 Amplifier	F2 Amplifier	F10 Amplifier
279-699 (standard fibre - diffuse)	40mm	35mm	90mm
279-705 (standard fibre - separate)	100mm	80mm	230mm
Minimum bending radius (fibre)	279-699 & 279-705 = 15mm		
Minimum object resolution (best case)	279-699 = 0.03mm, 279705 = 1.0mm		
Temperature range	-30°C to +70°C		
Fibre length	2 metres cuttable to length		

Mfrs. List No. FR5BC = 279-699, FT5BC = 279-705

212251

		Price Each		
Order Code	1+	5+	10+	
Standard fibre - diffuse	279-699			
Standard fibre - separate	279-705			

Contrast Scanners

Contrast Sensor

Type S8 - RGB Mini



- Compact dimensions
- 10 kHz switching frequency
- Highly focused spots - 3 x 1mm²
- Very high resolution
- Operating distance up to 9mm
- 12 to 30V dc supply
- CE Approved, UL Recognised

Body - H = 42, W = 14, D = 25mm

The compact S8 sensor offers a very high detection performance. The LED emissions guarantee excellent resolution for detecting transparent objects. The combination of a 2 kHz frequency and an ALARM output for dirty lenses, offer great reliability and therefore plant productivity.

550850

		Price Each			
Mfrs.	List No.	Order Code	1+	5+	10+
	S8-PR-5-W03-PP	177-4928			

Contrast Sensors

Microprocessor Based with LED Emission



- Fully automatic touch to teach setup
- Red/Green or White LED emission
- 10 to 30V dc supply with reverse protection
- Operating distance 6 to 12mm
- Response time 50µs max.
- Sealed to IP67
- Reference standard EN 60947-5-2
- Certifications CE, EX II3D

Body - H = 58, W = 81.2, D = 31mm

The TLU series microprocessor based setting can be either Teach-in or Remote by cable with the possibility of rapid memorising and recall of 4 different formats.

The LED emission can be red/green with automatic selection, or white offering the possibility of operating on all contrasts, also amongst same-coloured objects and backgrounds, presenting different surface treatments or workings.

Emission	Spot	Connection	Output	Mftrs. List No.	Order Code
Red /Green	Vertical	4-Pin Plug	NPN	TLU-011	177-4922
Red /Green	Vertical	4-Pin Plug	PNP	TLU-115	177-4923
White	Circular	4-Pin Plug	PNP	TLU-515C	177-4925

550796

Mftrs. List No.	Order Code	1+	5+	10+	Price Each
TLU-011	177-4922				
TLU-115	177-4923				
TLU-515C	177-4925				

KT5G



KT5G: H (body)=53, W=30, D (body)=80

- Solid state light source (green LED)
- Dark-on/Light-on selectable
- Insensitive to stray light
- Diecast metal housing with IP67 protection
- Plug connection is rotatable by 90°
- Light output is direction selectable (interchange lens with threaded cap)
- Adjustable switching threshold and can distinguish up to 30 grey scale steps from black to white
- Has high speed operation up to 10KHz

Supply voltage	KT5G	Connection	M12 4 Way Plug
Scanning distance	10 - 30V dc	Output	PNP
Light spot	7 - 13mm	Switching frequency	10 KHz
Light source	1.2 x 4.2 mm	Light/dark switching	Switch selectable
	LED, green	Order Code	723-4557

222169

Mftrs. List No.	Order Code	1+	5+	10+	Price Each
KT5G-2P1111	723-4557				

Contrast Sensor

Type TL50 - RGB with Plastic Housing



Body - H = 53, W = 80.1, D = 31mm

The TL50 contrast sensor has optimised optics. The RGB LED emission with automatic colour selection and very fine resolution allow the detection of the weakest contrast of colours or grayscale between mark and background, or between different objects or surfaces.

Typical applications can be seen in packaging machinery for food, cosmetic or pharmaceutical goods, for the detection of print registration marks, labels or other references on plastic films or packages even on transparent material.

- High resolution
- RGB LED emission
- Automatic colour selection
- Very fast switching frequency
- Low response time
- Easy sensor setting by means of two pushbuttons
- IP 67 sealing
- 10 to 30V dc supply
- Sturdy plastic housing with standard dimensions and fixing holes

550851

Mftrs. List No.	Order Code	1+	5+	10+	Price Each
TL50-W-815	177-4929				

INTELLIGENT ONLINE BUYING SYSTEM PROVIDING

Complete cost control, reduced administration time, visibility of your spend, flexibility and personalised to your company's needs.

farnell.com/ibuy

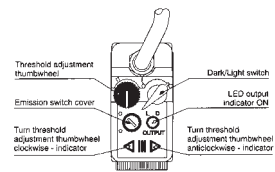


Contrast Sensor

TL80 Analog



H=63, W=30, D=87
Shielded cable L=3m



Control Panel

Connections:
White=NPN/PNP output Brown=10 to 30V dc
Grey=analogue output Blue=0V

- 10 to 30V dc supply
- Selectable NPN/PNP output
- Dark-on/light-on switching selection
- Simple contrast threshold adjustment
- Selectable red/green LED light source
- Output status indicator LED
- Industry standard IP67 metal housing
- 3 metre cable length

High performance contrast scanner for all print registration and positioning applications.

Sensing range	9mm ±2mm	Response time	50µs
Supply voltage	10V to 30V dc	Switch frequency	10kHz
Current consumption	80mA max.	Temperature range	-10°C to +55°C
Output	NPN / PNP Selectable		

212232

Mftrs. List No.	Order Code	1+	5+	10+	Price Each
TL80-011	731-584				

Sensor Connectors

Interface Hub

Sensors I / O



This group of products include devices to enable expansion and connection of sensors and sensor information to networks for information sharing.

DeviceNet Fieldbus Modules - Enable expanded communications down to the lowest level to provide improved process optimization and preventive maintenance. They serve as an in / out module for connecting to a DeviceNet network.

Profibus Network Interface - Serves as a decentral input and output module for connecting to a Profibus-DP network. It may be used for this purpose in an industrial environment corresponding to Class A of the EMC Law.

Passive Interface Modules - Light plastic boxes used for organised and decentralised wiring of peripherals.

Analogue Sensor Hubs - The Hubs take conventional sensor input signals and pass them over the I/O link interface.

515879

Device Type	Mftrs. WaysList No.	Order Code	1+	5+	10+	Price Each
DeviceNet	8 BNI DNT-104-000-Z004	177-5709				
- Configurable	8 BNI DNT-302-000-Z005	177-5710				
Profibus	8 BNI PBS-104-000-Z001	177-5711				
Profibus - Configurable	8 BNI PBS-302-000-Z001	177-5712				
Profibus - Link Module	8 BNI PBS-502-000-Z001	177-5715				
Passive Interface	8 BPI 8M4A5P-2K-00-KPXLO-050	177-5713				
Passive Interface	4 BPI 4M4A5P-2K-00-KPXB0-050	177-5714				
Analogue 4-20 mA	8 BNI IOL-709-000-K006	177-5717				
Analogue 0-10V dc	8 BNI IOL-710-000-K006	177-5718				
Analogue -	8 BNI IOL-102-000-K006	177-5719				
Analogue - M8, 3 Pin	8 BNI IOL-102-000-K019	177-5720				
Analogue - M8, 4 Pin	8 BNI IOL-104-000-K021	177-5721				

M8 Connector System



- Single end terminated cable assemblies
- Straight or right angle cable entry
- Overmoulded construction offers IP67 protection
- Panel mount products for solder termination
- 5m cable length
- PVC sheath

No. Of Ways	Cable Entry	Mftrs. List No.	Order Code
Male - Single End Terminated			
3	Straight	1838286-3	141-3681
4	Straight	1838288-3	141-3682
3	Right Angle	1838290-3	141-3683
Female - Single End Terminated			
3	Straight	1838282-3	141-3677
4	Straight	1838284-3	141-3678
3	Right Angle	1838296-3	141-3679
4	Right Angle	1838298-3	141-3680

Sensor Connectors - continued

M8 Connector System - continued

No. Of Ways	Cable Entry	Mfrs. List No.	Order Code
3	N/A	1838838-1	141-3704
4	N/A	1838838-2	141-3705
Female Solder Panel Mount Terminals			
3	N/A	1838839-1	141-3701
4	N/A	1838839-2	141-3702

476139

Mfrs. List No.	Order Code	1+	10+	25+	50+	100+
Male - Single End Terminated						
1838286-3	141-3681					
1838288-3	141-3682					
1838290-3	141-3683					
Female - Single End Terminated						
1838282-3	141-3677					
1838284-3	141-3678					
1838296-3	141-3679					
1838298-3	141-3680					
Male Solder Panel Mount Terminals						
1838838-1	141-3704					
1838838-2	141-3705					
Female Solder Panel Mount Terminals						
1838839-1	141-3701					
1838839-2	141-3702					

M12 Connector System



- Single end terminated cable assemblies
- Straight or right angle cable entry with LED indication option
- Overmoulded construction offers IP67 protection

No. Of Ways	Cable Entry	Mfrs. List No.	Order Code
Male - Single End Terminated			
4	Straight	1838238-3	141-3693
5	Straight	1838240-3	141-3694
Female - Single End Terminated			
4	Straight	1838244-3	141-3687
5	Straight	1838246-3	141-3688
3	Right Angle	1838254-3	141-3689
4	Right Angle	1838256-3	141-3690
5	Right Angle	1838258-3	141-3691
Female with LED Indication			
4	Right Angle	1838266-3	141-3700

476146

Mfrs. List No.	Order Code	1+	10+	25+	50+	100+
Male - Single End Terminated						
1838238-3	141-3693					
1838240-3	141-3694					
Female - Single End Terminated						
1838244-3	141-3687					
1838246-3	141-3688					
1838254-3	141-3689					
1838256-3	141-3690					
1838258-3	141-3691					
Female with LED Indication						
1838266-3	141-3700					

M12 Connector System



- Field Serviceable products allow on site rewiring
- Panel mount products for solder termination

No. Of Ways	Mfrs. List No.	Order Code
M16 Thread, Double D Cutout, Hexagonal Front Flange Male Solder Terminals		
4	1838893-2	141-3710
5	1838893-3	141-3711
Field Serviceable Connectors		
Male Metal		

No. Of Ways	Mfrs. List No.	Order Code
4	1838275-2	141-3717
5	1838275-3	141-3718
Female Metal		
4	1838274-2	141-3713
5	1838274-3	141-3714

476147

Mfrs. List No.	Order Code	1+	10+	25+	50+	100+
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Male Solder Terminals						
1838893-2	141-3710					
1838893-3	141-3711					

Female Solder Terminals						
1838891-2	141-3707					
1838891-3	141-3708					

Metal Male Field Serviceable Connectors						
1838275-2	141-3717					
1838275-3	141-3718					

Metal Female Field Serviceable Connectors						
1838274-2	141-3713					
1838274-3	141-3714					

Proximity Switch Tester



- Suitable for testing 2 and 3 wire proximity switches, including inductive, photo-electric, capacitive and ultrasonic
- Ideally suited to 'point of use' testing
- Audio and visual indication
- Supplied and fitted with batteries, ready for use

H=104, W=60, D=29

Indication of proximity switch function NPN or PNP, normally closed or normally open, light-on or dark-on operation
 Auto-on/off feature Unit is powered only when a proximity switch is connected
 Battery DC = 2.9V (PP3)

212302

Mfrs. List No.	Order Code	1+	5+	10+
MU2-DC	721-3803			

Nano-change 3 & 4 pole, Female Connectors



Nano-change (M8) straight

Nano-change (M8) 90°

231312

Description	Mfrs. List No.	Order Code	1+	5+	10+
Nano-change (M8) straight					
2m-PVC-3pole	403000E03M020	160-6718			
2m-PUR-3pole	403000P03M020	160-6719			
5m-PVC-3pole	403000E03M050	160-6720			
5m-PUR-3pole	403000P02M050	160-6721			
2m-PVC-4pole	404000E02M020	160-6722			
5m-PVC-4pole	404000E03M050	160-6723			
5m-PUR-4pole	404000P03M050	160-6725			
Nano-change (M8) 90°					
2m-PVC-3pole	403001E03M020	160-6726			
2m-PVC-3pole	403001P03M020	160-6727			
5m-PVC-3pole	403001E03M050	160-6728			
5m-PUR-3pole	403001P03M050	160-6729			
2m-PVC-4pole	404001E03M020	160-6730			
5m-PVC-4pole	404001E03M050	160-6731			

Receptacles - M8 & M12 Threaded



Male

Female

M8 Nano change straight field wireable connectors

M12 Micro change straight field wireable connectors

Panel mount M8 Nano change M8 mounting thread Panel mount M12 Micro change M14 mounting thread

231313

Description	Mfrs.		Price Each		
	List No.	Order Code	1+	5+	10+
M8 Nano change straight field wireable connectors					
Socket - 3 Way	N03FA03124	160-6732			
Socket - 4 Way	N04FA03124	160-6733			
Plug - 3 Way	N03MA03124	160-6734			
Plug - 4 Way	N04MA03124	160-6735			
M12 Micro change straight field wireable connectors					
Socket - 4 Way, PG7	8A4000-315	160-6737			
Socket - 4 Way, PG9	8A4000-325	160-6738			
Socket - 5 Way, PG7	8A5000-315	160-6739			
Socket - 5 Way, PG9	8A5000-325	160-6740			
Plug - 4 Way, PG7	8A4006-315	160-6741			
Plug - 4 Way, PG9	8A4006-325	160-6742			
Plug - 5 Way, PG7	8A5006-315	160-6743			
Plug - 5 Way, PG9	8A5006-325	160-6744			
Panel Mount M8 Micro change M8 mounting thread					
Socket - 3 Way	4R3F30E02C3003	160-6745			
Panel Mount M12 Micro change M14 mounting thread					
Socket - 4 Way	8R4E30E03C3003	160-6746			
Socket - 5 Way	8R5E30E03C3003	160-6747			
Plug - 4 Way	8R4E36E03C3003	160-6749			
Plug - 5 Way	8R5E36E03C3003	160-6751			
4 Pole - M12					
Socket - PG7	120071-0035	NEW 189-8915			
Socket - PG9	120071-0036	NEW 189-8916			
90° Socket - PG7	120071-0037	NEW 189-8918			
Plug - PG7	120071-0038	NEW 189-8919			
Plug - PG9	120071-0039	NEW 189-8920			
5 Pole - M12					
Socket - PG7	120071-0041	NEW 189-8921			
Socket - PG9	120071-0043	NEW 189-8922			
Plug - PG7	120071-0045	NEW 189-8923			
Plug - PG9	120071-0047	NEW 189-8924			

Sensor Leads



Brad

NEW

● Wide range of industrial sensor leads from leading manufacturer

● Straight and angled options available
● Leads can be free wire or double ended

659188

Straight - Single Ended	Mfrs.		Price Each		
	No. of Ways	Length	List No.	Order Code	1+ 5+ 10+
Male - M8					
3	1m	120027-0364	189-8842		
3	1m	120027-1079	189-8845		
3	2m	120086-8228	189-8843		
3	2m	120027-0911	189-8846		
3	5m	120027-0105	189-8844		
3	5m	120086-0474	189-8847		
3	10m	120086-8307	208-0775		
4	1m	120086-8161	189-8854		
4	1m	120086-8372	189-8857		
4	2m	120086-8368	189-8855		
4	2m	120086-8373	189-8858		
4	5m	120027-0376	189-8856		
4	5m	120086-8375	189-8859		
Male - M12					
3	1m	120065-8565	189-8873		
3	1m	120006-1853	189-8878		
3	2m	120006-0240	189-8874		
3	2m	120006-0257	189-8879		
3	3m	120006-2017	189-8876		
3	3m	120006-0260	189-8880		
3	5m	120006-0241	189-8877		
3	5m	120006-0261	189-8881		
4	1m	120006-0559	189-8882		
4	1m	120006-1633	189-8886		
4	2m	120006-0560	189-8883		
4	2m	120006-0570	189-8888		
4	2m	120079-8006	189-8946		
4	2m	120079-0263	208-0736		
4	3m	120006-0561	189-8884		
4	3m	120006-0571	189-8889		
4	5m	120006-0562	189-8885		
4	5m	120006-0047	189-8890		

Straight - Single Ended	Mfrs.		Price Each		
	No. of Ways	Length	List No.	Order Code	1+ 5+ 10+
Male - M12					
4	5m	120079-8003	189-8945		
5	2m	120006-0667	208-0807		
5	5m	120006-1345	208-0808		
5	5m	120006-0682	208-0809		
8	2m	120079-5026	208-0741		
8	2m	120065-0968	208-0814		
12	2m	120083-5015	208-0752		
Male - PG13.5					
4	0.3m	130013-0938	208-0859		
6	0.5m	130013-0956	208-0864		
Male - Size A					
3	0.9m	130006-0529	208-0875		
3	1.8m	130006-0534	208-0876		
3	3.6m	130006-0542	208-0877		
Female - M8					
3	2m	403000E03M020	160-6718		
3	2m	403000P03M020	160-6719		
3	2m	120027-0066	189-8832		
3	5m	403000E03M050	160-6720		
3	5m	403000P02M050	160-6721		
3	5m	403001E03M050	160-6728		
3	5m	403001P03M050	160-6729		
3	10m	120086-8003	208-0772		
4	2m	404000E02M020	160-6722		
4	2m	404001E03M020	160-6730		
4	2m	120086-8156	208-0780		
4	5m	404000E03M050	160-6723		
4	5m	404001E03M050	160-6731		
4	10m	120027-0131	208-0779		
4	10m	120086-8158	208-0781		
Female - M12					
3	2m	803000E03M020	160-6756		
3	2m	120065-8175	208-0858		
3	5m	803000E03M050	160-6757		
3	10m	120006-0003	208-0787		
4	2m	804000E03M020	160-6758		
4	2m	804000P03M020	160-6759		
4	2m	120065-8178	208-0819		
4	5m	804000E03M050	160-6760		
4	5m	804000P03M050	160-6762		
4	5m	120065-8244	208-0820		
4	10m	120006-0016	208-0793		
4	10m	120065-1782	208-0794		
4	10m	120065-8264	208-0821		
5	2m	120079-5110	208-0739		
5	2m	120006-0634	208-0803		
5	5m	120065-1792	208-0804		
5	10m	120006-0649	208-0805		
8	2m	120079-5023	208-0740		
8	2m	120065-0951	208-0810		
8	5m	120065-0953	208-0811		
8	10m	120065-0957	208-0812		
12	2m	120083-5010	208-0750		
12	5m	120083-5027	208-0751		
Female - M23					
12	10m	120094-5022	208-0847		
19	10m	120094-5003	208-0851		
Female - Size A					
3	0.9m	130006-0217	208-0869		
3	1.8m	130006-0221	208-0870		
3	3.6m	130006-0232	208-0871		
3	6.1m	130006-0241	208-0872		
4	1.8m	130006-0728	208-0878		
4	3.6m	130006-0737	208-0879		
5	1.8m	130006-1163	208-0881		
5	3.6m	130006-1171	208-0882		
14	5m	130008-9002	208-0865		
14	10m	130006-8064	208-0866		
Female - Size C					
19	10m	130008-0306	208-0884		
Angled - Single Ended		Mfrs.		Price Each	
No. of Ways	Length	List No.	Order Code	1+	5+ 10+
Male - M12					
3	2m	120006-0273	208-0789		
3	2m	120006-0288	208-0790		
4	2m	120006-1975	208-0798		
4	2m	120006-0592	208-0799		
4	5m	120079-8004	208-0737		

Sensor Connectors - continued

Sensor Leads - continued

Angled - Single Ended		Mftrs.	Price Each			
No. of Ways	Length	List No.	Order Code	1+	5+	10+
Male - M12						
4	5m	120079-8005	208-0738			
4	5m	120067-5016	208-0800			
4	10m	120067-5017	208-0802			
Female - M8						
3	2m	120027-0115	208-0776			
3	5m	120086-8089	189-8841			
3	5m	120086-0464	208-0777			
3	10m	120027-0093	208-0773			
3	10m	120086-8062	208-0774			
3	10m	120027-0949	208-0778			
4	2m	120027-0152	189-8852			
4	2m	120086-8382	208-0784			
4	5m	120027-0153	189-8853			
4	5m	120086-8081	208-0782			
Female - M12						
3	2m	803001E03M020	160-6763			
3	2m	803001P03M020	160-6764			
3	2m	120067-5067	208-0791			
3	5m	803001E03M050	160-6765			
3	5m	803001P03M050	160-6766			
3	10m	120006-0013	208-0788			
3	10m	120067-5061	208-0792			
3	10m	120067-8006	208-0818			
4	2m	804001E03M020	160-6767			
4	2m	804001P03M020	160-6768			
4	5m	804001E03M050	160-6769			
4	5m	804001P03M050	160-6770			
4	10m	120006-0023	208-0796			
4	10m	120065-1787	208-0797			
5	10m	120006-0664	208-0806			
Female - M16						
14	5m	130023-0054	208-0855			
14	10m	130023-0063	208-0856			
14	10m	130023-0068	208-0857			
Female - M23						
12	10m	120094-0125	208-0848			
19	5m	120094-5027	208-0852			
19	10m	120094-0044	208-0853			
19	20m	120094-5017	208-0854			
Female - Size A						
3	1.8m	130006-0426	208-0873			
4	1.8m	130006-0902	208-0880			
5	1.8m	130006-1349	208-0883			
Female - Size C						
19	5m	130008-0315	208-0885			

Sensor Connectors



Brad

NEW

- Wide range of industrial connectors leads from leading manufacturer
- Range includes field attachable and panel mount versions
- For a wide range of applications

659315

Standard		Mftrs.	Price Each			
No. of Ways	List No.	Order Code	1+	10+	25+	
Male - M8						
3	N03MA03124	160-6734				
3	120091-0006	189-8831				
4	N04MA03124	160-6735				
4	120150-0038	189-8822				
4	120091-0012	189-8824				
Male - M12						
4	8A4006-315	160-6741				
4	8A4006-325	160-6742				
4	120085-0003	189-8947				
4	120085-0005	208-0744				
4	120070-0144	208-0827				
5	8A5006-315	160-6743				
5	8A5006-325	160-6744				

Standard		Mftrs.	Price Each			
No. of Ways	List No.	Order Code	1+	10+	25+	
Male - M12						
5	120071-0047	189-8924				
5	120085-0004	189-8948				
5	120084-0031	208-0766				
8	120084-0032	208-0768				
12	120084-5091	208-0770				
Male - 90° M12						
5	120085-0008	208-0749				
Male - PG13.5						
14	130015-0188	208-0868				
Female - M8						
3	N03FA03124	160-6732				
3	120091-0003	189-8830				
4	N04FA03124	160-6733				
4	120091-0009	189-8823				
Female - M12						
4	8A4000-315	160-6737				
4	8A4000-325	160-6738				
4	120085-0011	208-0742				
4	120085-0013	208-0743				
5	8A5000-315	160-6739				
5	8A5000-325	160-6740				
5	120071-0041	189-8921				
5	120085-0012	208-0745				
8	120084-0033	208-0767				
12	120084-5092	208-0769				
Female - 90° M12						
4	8A4001-315	160-6772				
4	120085-0006	208-0748				
5	120085-0016	208-0747				
5	120071-0044	208-0826				
Female - PG13.5						
14	130015-0240	208-0867				

Panel Mount		Mftrs.	Price Each			
No. of Ways	List No.	Order Code	1+	5+	10+	

Male - M12						
4	8R4E36E03C3003	160-6749				
4	120084-5108	208-0756				
4	120070-0167	208-0828				
4	120070-4002	208-0832				
5	8R5E36E03C3003	160-6751				
5	120084-5109	208-0757				
5	120025-0007	208-0761				
5	120070-0235	208-0833				
8	120084-5096	208-0763				
12	120084-5015	208-0765				
Male - Size A						
2	130013-0076	208-0895				
3	130013-0202	208-0899				
3	130013-0229	208-0900				
4	130013-0353	208-0903				
5	130013-0493	208-0861				
5	130013-0515	208-0907				
6	130013-0593	208-0909				
Male - Size B						
8	130014-0078	208-0912				
Male - Size C						
9	130015-0137	208-0921				
10	130015-0044	208-0914				
19	130015-0112	208-0919				
Female - M8						
3	4R3F30E02C3003	160-6745				
Female - M12						
4	8R4E30E03C3003	160-6746				
4	120084-5154	208-0753				
4	120084-5103	208-0754				
4	120084-5107	208-0755				
4	120011-0239	208-0831				
5	8R5E30E03C3003	160-6747				
5	120084-5113	208-0759				
5	120070-0229	208-0829				
5	120011-0238	208-0834				
8	120084-5095	208-0762				
8	120070-0263	208-0830				
12	120084-5013	208-0764				

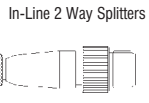
Panel Mount	Mfrs.	Price Each			
No. of Ways	List No.	Order Code	1+	5+	10+
Female - Size A					
2	130013-0060	208-0894			
3	130013-0135	208-0896			
3	130013-0148	208-0897			
3	130013-0314	208-0902			
4	130013-0300	208-0901			
4	130013-0442	208-0906			
6	130013-0567	208-0908			
Female - Size B					
7	130014-0037	208-0910			
8	130014-0061	208-0911			
Male - Size C					
9	130015-0117	208-0920			
10	130015-0024	208-0913			
12	130015-0054	208-0915			
19	130015-0098	208-0917			
19	130015-0102	208-0918			

Field Attachable	Mfrs.	Price Each			
No. of Ways	List No.	Order Code	1+	10+	25+
Male - Size C					
3	130017-0008	208-0923			
3	130017-0011	208-0924			
4	130017-0018	208-0926			
4	130017-0020	208-0927			
5	130017-0026	208-0931			
5	130017-0029	208-0932			
Female - Size C					
3	130017-0004	208-0922			
4	130017-0015	208-0925			
5	130017-0023	208-0929			

Adaptors and In-Line Splitters



Brad



M8 Female to M12 Male Adaptor
231315

No. of Poles	Mfrs.	Price Each			
List No.	Order Code	1+	5+	10+	
M8 Female to M12 Male Adaptor					
3 Way	483030	160-6752			
Bulkhead Size A Male to Female					
4 Way	NEW 130013-0076	208-0895			
In-line 2 Way Splitters					
M12 - 4 Way	81590	160-6754			
M12 - 4 Way	NEW 120009-0100	208-0824			
M12 - 5 Way	885A30	160-6755			
2 Way PVC Cable Splitters - M12 Male to 2 x Female, 4-Pole					
600mm Long	NEW 120068-5027	189-8904			
1m Long	NEW 120009-0087	189-8906			
2m Long	NEW 120068-5028	189-8907			
10m Long	NEW 120068-5006	189-8908			
5m Long	NEW 120068-8015	189-8909			
2 Way PUR Cable Splitters - M12 Male to 2 x Female, 4-Pole					
600mm Long	NEW 120068-8019	189-8910			
1m Long	NEW 120068-8020	189-8911			
2m Long	NEW 120009-0092	189-8912			
3m Long	NEW 120009-0093	189-8913			
5m Long	NEW 120068-8021	189-8914			

M12 with Flying Leads Micro-change Connectors



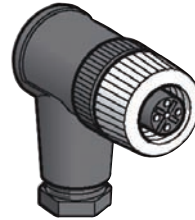
624265

Description	Mfrs.	Price Each			
List No.	Order Code	1+	5+	10+	
Micro-change - Straight					
2m-PVC-3pole	803000E03M020	160-6756			
5m-PVC-3pole	803000E03M050	160-6757			
2m-PVC-4pole	804000E03M020	160-6758			
2m-PVC-4pole	804000P03M020	160-6759			
5m-PUR-4pole	804000E03M050	160-6760			
5m-PUR-4pole	804000P03M050	160-6762			
Micro-change - 90°					
2m-PUR-3pole	803001P03M020	160-6764			
5m-PUR-3pole	803001E03M050	160-6765			
5m-PUR-3pole	803001P03M050	160-6766			
2m-PVC-4pole	804001E03M020	160-6767			
2m-PVC-4pole	804001P03M020	160-6768			
5m-PUR-4pole	804001E03M050	160-6769			
5m-PUR-4pole	804001P03M050	160-6770			

Connector Cabling Accessories

NEW

Schneider Electric



- For use with OsiSense XU sensors
- Cable connector fixing: Screw on
- IP degree of protection: **IP 67**
- Operating temperature: Connectors -40°C to +85°C and leads -35°C to +90°C
- Enclosure material: Plastic

Operating temperature -40°C to +85°C
IP degree of protection IP 67

639852

No. of Ways	Mfrs.	Price Each			
List No.	Order Code	1+	5+	10+	
Sensor Connector Sockets - M12 Thread Size					
4	XZCC12FCM40B	197-4096			
5	XZCC12FCM50B	197-4097			
4	XZCC12FDM40B	197-4100			
5	XZCC12FDM50B	197-4101			
4	XZCC12FDP40B	197-4102			
4	XZCC43FCP40B	197-4108			

Sensor Connector Plugs					
4	XZCC12FCP40B	197-4098			
4	XZCC12MCM40B	197-4103			
5	XZCC12MCM50B	197-4104			
4	XZCC12MDM40B	197-4106			
5	XZCC12MDM50B	197-4107			

Sensor Leads					
3	XZCP0566L10	197-4109			
3	XZCP0566L2	197-4110			
3	XZCP0566L5	197-4111			
3	XZCP0666L10	197-4112			
3	XZCP0666L2	197-4113			
3	XZCP0666L5	197-4114			
4	XZCP0941L10	197-4115			
4	XZCP0941L2	197-4116			
4	XZCP0941L5	197-4118			
4	XZCP1041L10	197-4119			
4	XZCP1041L2	197-4120			
4	XZCP1041L5	197-4121			
4	XZCP1141L10	197-4122			
4	XZCP1141L2	197-4123			
4	XZCP1141L5	197-4124			
5	XZCP1164L5	197-4125			
4	XZCP1241L10	197-4126			
4	XZCP1241L2	197-4127			
4	XZCP1241L5	197-4128			
5	XZCP1264L5	197-4131			
3	XZCP1340L10	197-4132			
3	XZCP1340L2	197-4133			
3	XZCP1340L5	197-4134			
3	XZCP1865L5	197-4135			
3	XZCP1965L5	197-4136			

Junction Boxes



Brad
NEW

- Provides a reliable and easy solution for connecting industrial controllers to sensors/actuators
- Large range of connectivity options

Sensor Connectors - continued

Junction Boxes - continued


No. of I/O per		Mfrs.		Price Each			
Ports	Port	Connection	List No.	Order Code	1+	5+	10+
M8							
4	Dual	5m Cable	120054-0034	189-8927	●		
4	Dual	10m Cable	120054-0010	189-8928	●		
4	Single	5m Cable	120113-0006	189-8925	●		
4	Single	10m Cable	120113-0007	189-8926	●		
4	Single	M16 Connector	120113-0023	208-0836	●		
6	Dual	5m Cable	120054-0043	189-8933	●		
6	Dual	10m Cable	120054-0008	189-8934	●		
6	Single	5m Cable	120113-0011	189-8931	●		
6	Single	10m Cable	120054-0026	189-8932	●		
8	Dual	5m Cable	120113-0017	189-8937	●		
8	Dual	10m Cable	120054-0009	189-8938	●		
8	Single	5m Cable	120113-0014	189-8935	●		
8	Single	10m Cable	120113-0015	189-8936	●		
8	Single	M16 Connector	120113-0029	208-0838	●		
10	Dual	5m Cable	120054-0045	189-8940	●		
10	Dual	10m Cable	120054-0003	189-8941	●		
10	Single	5m Cable	120113-0002	189-8939	●		
10	Single	5m Cable	120113-0050	208-0835	●		
10	Single	M16 Connector	120113-0020	208-0839	●		
M12							
4	Dual	Field Wireable	120119-0004	208-0841	●		
4	Dual	M23 Connector	120119-0006	208-0842	●		
4	Dual	5m Cable	120119-0007	208-0843	●		
4	Single	5m Cable	120119-0001	208-0840	●		
6	Dual	Field Wireable	120119-0012	208-0844	●		
8	Dual	5m Cable	120119-0023	189-8944	●		
8	Dual	M23 Connector	120055-0925	208-0845	●		
8	Dual	5m Cable	120114-8027	208-0846	●		
8	Single	5m Cable	BTY800P-FBP-050	160-6771	●		
8	Single	5m Cable	120119-0016	189-8943	●		

Nominal Primary Current	Peak Current Range	Turns Ratio	Current Output	Offset Current	Mfrs. List No.
50A	90A	1000	50mA	±0.20mA	CSNP661 (-002)
100A	150A	1000	100mA	±0.20mA	CSNF161
10A	10A	1000	100mA	±0.20mA	CSNF661

Mfrs. List Nos:	CSNP661 = 723-4752	CSNF161 = 723-4788	CSNP661-002 = 723-4764	CSNF661 = 118-7544
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Nominal/Peak Current DC	Order Code	1+	5+	10+	25+	100+
50A/90A	723-4752					
50A/90A with bus-bar	723-4764					
100A/150A	723-4788					
150A/150A	118-7544					

CSLA2CD Linear Current Sensor Honeywell



- Linear output
- AC or DC current sensing
- Through-hole design
- Fast response time
- Output voltage isolation from input
- Minimum energy dissipation
- Maximum current limited only by conductor size
- Adjustable performance and built-in temperature compensation assures reliable operation
- Accurate, low cost sensing
- Operating temperature range -25 to 85°C
- PBT polyester housing

Sensor Type	Open Loop Linear PCB Bottom Mount	Supply Current (Max. @ 25°C)	20mA
Package Style	5.4 to 13.2VDC	Offset Voltage	Vcc/2 ± 2%
Supply Voltage	0 to 72A	Offset Shift	± 0.02
Sensed Current Range	Voltage	Response Time	3µs
Output Type	-25 to 85°C	Mounting	PCB on 3 Pins
Operating Temperature	32.7mV N ±3.0 @ 8V dc	Pinout Style	3 Pin
Sensitivity			

Mfrs. List No.	Order Code	1+	5+	10+	25+	+
CSLA2CD	108-2269	●				

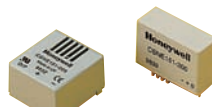
Electromechanical

32

Sensors & Transducers

Current Transducers

Multirange - 25/12/8/6/5A Honeywell



- Fast response current sensing using Hall effect technology
- Multiple ranges in compact PCB mounting packages
- AC, DC and impulse current measurement
- Improved measurement accuracy at lower currents
- 25A sensor in small-footprint housings
- UL Recognised and CSA approved

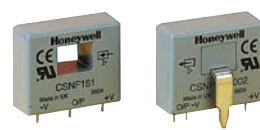
723-4727 & 118-7543: H=16.8, W=26, D=28
 723-4739: H=20.3, W=31.8, D=12.7

Multiple primary connection pins permit a range of currents to be measured, giving a nominal output current that can be used to derive a voltage output.

Mfrs. List No.	CSNE151-005	CSNE151-100	CSNE151
Supply voltage (±5%)	±15V dc	±15V dc	±15V dc
Turns ratio	1-2-3-4-5 : 1000	1-2-3-4 : 1000	1000
Nom. primary current	25/12/8/6/5A	25/12/8/6A	25/12/8/6A
Peak current measurement	36A	90A	36A
Output current	25mA	25mA	25mA
Accuracy	±0.5%	±0.5%	±0.5%
Linearity	± 0.2%	± 0.2%	±0.2%
Response time	<1µS	<0.2ns	<1µs

Mfrs. List No.	Order Code	1+	5+	10+	25+	100+
CSNE151-005	723-4727					
CSNE151-100	723-4739					
CSNE151	118-7543	●				

0 to 50A, 0 to 100A Honeywell




- Closed loop current sensors using Hall effect technology
- AC, DC and impulse current measurement
- Fast response time
- Range of measurement ranges up to 150A peak in small PCB mounted housing
- 50A/90A transducer available with bus-bar for use where the primary current is required on the PCB
- UL Recognised and CSA approved

Supply voltage	±12 to ±5V (±5%)	Accuracy	±0.5% of nom. current @ 25°C
Linearity	± 0.1%	Operating temperature	-40°C to +85°C
Response time	<0.5ns		29.836.514.513.525

Current Transducer SPC multicom

Hall Effect TQL Series - Closed Loop NEW




- Highly reliable Closed Loop Hall Effect device
- Compact and light weight
- Fast response time
- Excellent linearity of the output voltage over a wide input range
- Excellent frequency response (> 150 kHz)
- Low power consumption (9 mA nominal)
- Supply voltage range ±12 to ±15V
- Capable of measuring both DC and AC, both pulsed and mixed
- High isolation voltage between the measuring circuit and the current-carrying conductor (AC2.5KV)
- Extended operating temperature range
- Flame-Retardant plastic case and silicone encapsulant

Nominal Input Current	Secondary Current	Mfrs. List No.	Order Code	1+	5+	10+	50+
±100A ac/dc	Closed Loop	TQL100A	189-8950	●			

Current Transducer SPC multicom

Hall Effect TMA Series - Open Loop NEW



- Highly reliable Hall Effect device
- Compact and light weight
- Fast response time
- Excellent linearity of the output voltage over a wide input range
- Excellent frequency response (>50 kHz)
- Low power consumption (12 mA nominal)
- Capable of measuring both DC and AC, both pulsed and mixed
- High isolation voltage between the measuring circuit and the current-carrying conductor (AC2.5KV)
- Extended operating temperature range
- Nominal output voltage 4V
- Flame-Retardant plastic case and silicone encapsulate

Nominal Input Current	Mfrs. List No.	Order Code	1+	5+	10+	25+	50+
±50A ac/dc	TMA50A	189-8953	●				
±100A ac/dc	TMA100A	189-8955	●				
±200A ac/dc	TMA200A	189-8952	●				
±400A ac/dc	TMA400A	189-8951	●				

Current Transducer

Hall Effect TH Series - Open Loop



Body - H = 19.7,
W = 19, D = 15.4mm

- Highly reliable Hall Effect device
- Compact and light weight
- Fast response time
- Excellent linearity of the output voltage over a wide input range
- Excellent frequency response (> 50 kHz)
- Low power consumption (12 mA nominal)
- Supply voltage $\pm 15V$
- Nominal output voltage 4V
- Capable of measuring both DC and AC, both pulsed and mixed
- High isolation voltage between the measuring circuit and the current-carrying conductor (AC2.5KV)
- Extended operating temperature range
- Flame-Retardant plastic case and silicone encapsulate



NEW

632297

Nominal Input Current	Mfrs. List No.	Order Code	1+	5+	10+	25+	50+
± 3 A ac/dc	TH3A	189-8956					
± 5 A ac/dc	TH5A	189-8957					
± 10 A ac/dc	TH10A	189-8958					
± 15 A ac/dc	TH15A	189-8959					
± 20 A ac/dc	TH20A	189-8960					
± 30 A ac/dc	TH30A	189-8961					

0-8A to 0-25A, LTS Series



- Development Kit contains three transducers with PCB mounts
- Unique ASIC design
- Improved linearity
- Excellent accuracy
- Extended measuring range
- Unipolar supply
- Voltage output

Output voltage $\pm V_{PN}$ 2.5V \pm 0.625V Thermal drift if gain TC_{EG} Typically $< 50ppm$

212409

Nominal Peak/Power Current Range	Supply	Mfrs. List No.	Order Code	1+	5+	10+
6A/19.2A	+5V	LTS 6-NP	214-6860			
			LTS 15-NP PRESENTATION KIT	161-7407		
15/45A	+5V	LTS 15-NP	161-7409			
			LTS 25-NP KIT	161-7408		
25/80A	+5V	LTS 25-NP	161-7410			

0-3A to 0-15A, HX P/SP2Series



- Galvanic isolation between primary and secondary circuit
- Hall effect measuring principle
- Isolation voltage 3000V
- Low power consumption
- Extended measuring range ($3 \times I_{PN}$)
- Single Supply from +12V to +15V
- Material according to UL94-V0

H = 20, W = 19, D = 15.4mm

Output voltage $\pm 0.625V @ \pm I_{PN}, R_L = 2k\Omega$
Output impedance $\leq 50 \Omega$
Supply voltage +12 to +15V
Current consumption $\leq 15mA$

249454

Current	Mfrs. List No.	Order Code	1+	5+	10+	25+
3	± 9 A HX 03-P/SP2	161-7419				
5	± 15 A HX 05-P/SP2	161-7420				
10	± 30 A HX 10-P/SP2	161-7421				
15	± 45 A HX 15-P/SP2	161-7422				
25A	± 75 A HX 25-P/SP2	NEW 214-6841				
50A	± 150 A HX 50-P/SP2	NEW 214-6842				

0-5A to 0-10A, HX NP Series



- Galvanic isolation between primary and secondary circuit
- Hall effect measuring principle
- 2 isolated primary windings
- Isolation voltage 3000V
- Low power consumption
- Extended measuring range ($3 \times I_{PN}$)
- Power Supply from $\pm 12V$ to $\pm 15V$
- Material according to UL94-V0

H = 20, W = 19, D = 15.4mm

249454

Primary Current, I_{PN} Series	Parallel	Primary Current, Measuring Range Series	Parallel	Mfrs. List No.	Order Code
$\pm 5A$	$\pm 10A$	$\pm 15A$	$\pm 30A$	HX 05-NP	161-7425
$\pm 10A$	$\pm 20A$	$\pm 30A$	$\pm 60A$	HX 10-NP	161-7426

Output voltage $\pm 4V @ \pm I_{PN}, R_L = 10k\Omega$
Output impedance $> 50 \Omega$
Supply voltage $\pm 15V$
Current consumption $> \pm 20mA$

249552

Current Range	Order Code	1+	5+	10+	25+	50+
5/15A	161-7425					
10/30A	161-7426					

5A to 50A, Low Currents HXS Series



H = 10, W = 16.5, D = 18.5mm



5 YEARS WARRANTY

These transducers have been specifically designed for the measurement of a wide range of current types including dc, ac, pulsed, and mixed. The devices have a galvanic isolation between the primary (high power) circuit and the secondary (electronic) circuit. For the complete HXS range, the fastening & connection of the secondary is by means of four 0.5 x 0.25mm pins.

The HXS 10-NP/SP3 has the option of selecting Serial or Parallel primary connections by utilising the four 1.3mm fastening & connection pins.

The HXS 20 range has 8 x 1.3mm primary & connection pins that enable the selection of 1, 2 or 4 primary turns.

- Hall effect measuring principle
- Multi-range current transducer
- Galvanic isolation between primary and secondary
- Isolation test voltage 2.5KV
- Fixed offset and gain
- Only occupies 3.05 cm³ on PCB

Order Code	Primary Current	Parallel
913-5588	Serial 10A Nom. 30A Max.	20A Nom. 60A Max.
913-5596	1	2
913-5618	20A Nom. 60A Max.	10A Nom. 30A Max.
913-5626	20A Nom. 60A Max. 50A Nom. 150A Max.	10A Nom. 30A Max. 25A Nom. 75A Max.
		4 5A Nom. 15A Max. 5A Nom. 15A Max. 12.5A Nom. 37.5A Max.

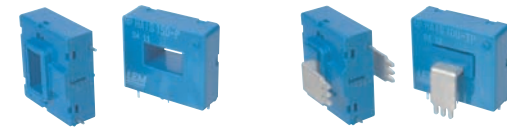
Analogue output voltage @ I_p
Analogue output voltage @ $I_p = 0$
Internal Reference - Output voltage, V_{REF}
Output impedance, R_{out}
Supply voltage, V_c
Current consumption, I_c
Operating temperature range

$V_{REF} \pm (0.625V \times I_{(Max.)} / I_{(Min.)})$
 $V_{REF} \pm 0.0125V$
 $2.5V \pm 0.025$
 $< 10 \Omega$
 $+5V \pm 5\%$
 $22mA @ V_c = 5V$
 -40 to $85^\circ C$

403270

Mfrs. List No.	Order Code	1+	5+	10+	25+
HXS 10-NP/SP3	913-5588				
HXS 20-NP	913-5596				
HXS 20-NP/SP2	913-5618				
HXS 50-NP	913-5626				

50A - 400A Rating, 150A - 600A Measuring Ranges HAIS Series



P Models - H = 29, W = 33,
D = 14mm

TP Models - H = 29, W = 33,
D = 25.9mm

- Galvanic isolation between primary and secondary circuit
- Hall effect measuring principle
- Isolation voltage 2500V
- Low power consumption
- Fixed offset and gain
- Single +5V Power Supply

Primary Current I_{PN}	Primary Current Measuring Range	Mfrs. List No.	Order Code
50A	$\pm 150A$	HAIS 50-P	161-7433
100A	$\pm 150A$	HAIS 100-TP	161-7429
100A	$\pm 300A$	HAIS 100-P	161-7428
100A	$\pm 300A$	HAIS 100-TP	161-7429
150A	$\pm 450A$	HAIS 150-P	161-7430
200A	$\pm 600A$	HAIS 200-P	161-7431
400A	$\pm 600A$	HAIS 400-P	161-7432

Analogue output voltage @ I_p
Analogue output voltage @ $I_p = 0$
Internal Reference - Output voltage, V_{REF}
Output impedance, R_{out}
Supply voltage, V_c
Current consumption, I_c
Operating temperature range

$V_{REF} \pm (0.625V \times I_{(Max.)} / I_{(Min.)})$
 $V_{REF} \pm 0.0125V$
 $2.5V \pm 0.025$
 $< 10 \Omega$
 $+5V \pm 5\%$
 $22mA @ V_c = 5V$
 -40 to $85^\circ C$

50A - 400A Rating, 150A - 600A Measuring Ranges - continued

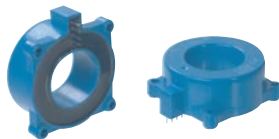
HAIS Series - continued

Mfrs.	Price Each				
List No.	Order Code	1+	5+	10+	25+
HAIS - TP Versions					
HAIS 50-TP	161-7434				
HAIS 100-TP	161-7429				
HAIS - T Versions					
HAIS 50-P	161-7433				
HAIS 100-P	161-7428				
HAIS 150-P	161-7430				
HAIS 200-P	161-7431				
HAIS 400-P	161-7432				

403271

200A - 800A Rating, 300A - 1200A Measuring Ranges

HTFS Series



H = 16.5, W (Dia.) = 40, D = 46mm

- Galvanic isolation between primary and secondary circuit
- Hall effect measuring principle
- Isolation voltage 2500V
- Low power consumption
- Ratiometric offset
- Single +5V power supply
- Fixing to PCB by either solder pins or 4 x M3 nuts and screws
- 22mm diameter aperture for primary conductor

Primary Current	Primary Current Measuring Range	Mfrs. Type
I_{pn}		
200A	± 300A	HTFS 200-P
400A	± 600A	HTFS 400-P
800A	± 1200A	HTFS 800-P

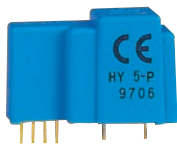
Analogue output voltage @ I_p
 Analogue output voltage @ $I_p = 0$
 Internal Reference - Output voltage, V_{REF}
 Output impedance, R_{out}
 Supply voltage, V_c
 Current consumption, I_c
 Operating temperature range

$V_{REF} \pm (0.625V \times I_{(Max.)} / I_{(Min.)})$
 $V_{REF} \pm 0.0125V$
 $2.5V \pm 0.025$
 $<10 \Omega$
 $+5V \pm 5\%$
 $22mA @ V_c = 5V$
 -40 to $105^\circ C$

403272

Mfrs.	Price Each				
List No.	Order Code	1+	5+	10+	25+
HTFS - P Models with M3 Screw fixing to PCB					
HTFS 200-P	913-5715				
HTFS 400-P	913-5731				
HTFS 800-P	913-5758				
HTFS - P/SP2 Models with Solder Pin fixing to PCB					
HTFS 200-P/SP2	913-5723				
HTFS 400-P/SP2	913-5740				
HTFS 800-P/SP2	913-5766				

0-5A to 0-25A, HY...P Series



H=21, W=35, D=12

- In-line PCB pinouts
- Potted construction for maximum protection
- Minimum footprint design
- Wide choice of current ratings

Pin arrangement
 1 = +15V, 2 = -15V, 3 = V_{OUT}
 4 = 0V, 5 = I_p IN, 6 = I_p OUT

Nominal primary current	0-5A, 0-10A, 0-15A, 0-20A, 0-25A	Power supply	±15V
Measuring range	3 nominal primary current	Output voltage	±4V
Accuracy	±1%		
HY5-P	5A	15V	4V
HY10-P	10A	15V	4V

212291

Primary Current	Mfrs.	Price Each				
List No.	Order Code	1+	5+	10+	25+	50+
5A	HY 5-P	161-7399				
10A	HY 10-P	161-7401				
15A	HY 15-P	161-7402				
20A	HY 20-P	161-7403				

0-50A, LAS Series



- Cost Effective
- Utilises New ETA Technology
- High Performance
- PCB Mounting
- Tolerant of high levels of EMI
- Unipolar Voltage Supply
- Wide Frequency Bandwidth
- Extended Measuring Range
- Small Footprint
- Low Power Consumption

H = 21, W = 33.9, D = 11.53mm

Primary Nominal RMS Current	LAS 50-TP	LAS 50-TP/SP1
Power Supply	0 to 50 A	0 to 50 A
Output Voltage	5 V	5V
Accuracy	$2.5 \pm 0.625V$	$V_{ref} \pm 0.625V$
	± 0.5%	± 0.5%

234892

Mfrs.	Price Each					
List No.	Order Code	1+	5+	10+	25+	50+
LAS 50-TP	161-7417					
LAS 50-TP/SP1	161-7418					

0-50A, 0-125A, Current Output



161-7405	161-7406	161-7404
H=27.6, W=36.5, D=14.4, Hole=7x12.7	H=33.6, W=48.4, D=21.4, Hole=11x17/13	H=15.1, W=15.24, D=29.2mm
50A	50A	125A
70A	100A	200A
±15V	±15V	±15V
50mA	25mA	125mA
±0.65%	±0.9%	±0.6%

Primary Current	Mfrs. List No.	Order Code	1+	5+	10+	25+
50A	LA 55-P	161-7405				
50A	LA 55-P/SP1	NEW 214-6846				
125A	LA 125-P	161-7406				
Pcb Mount						
25A	LA 25-NP	161-7404				

0-100A, LA 100-P/SP13 Series



- Closed loop (compensated) current transducer using hall effect technology
- PCB mounted
- Insulated plastic case to UL94-V0
- Excellent accuracy
- Very good linearity
- No insertion losses
- Wide frequency bandwidth

Primary nominal r.m.s. current	100 A	Current consumption	10 mA @ ±15V + I_s
Secondary nominal r.m.s. current <td>100 mA</td> <td>Operating temperature</td> <td>-25°C to 70°C</td>	100 mA	Operating temperature	-25°C to 70°C
Supply voltage	±12 to ±15V		

249553

Current	Mfrs. List No.	Order Code	1+	5+	10+	25+
0 to 150A	LA 100-P	NEW 214-6843				
0 to 160A	LA 100-P/SP13	161-7427				

100A, HTB Series



NEW

- Galvanic isolation between primary and secondary circuit
- Hall effect measuring principle
- Isolation voltage 2500V
- Low power consumption
- High immunity to external interference
- Used in industrial applications

L = 39mm, W = 14mm and D = 34mm	Supply voltage range	± 12V to ± 15V	Accuracy	1 %
Current consumption	15mA	Response time		3µs
Operating temperature range	-20°C to +80°C			

639462

Primary current	Primary current	Mfrs. List No.	Order Code	1+	5+	10+
I_{pn}	Measuring range	HTB100-TP	196-1158			
±100A	±300A					

CAS Series

NEW



- Galvanic isolation between primary and secondary circuit
- Compact design for PCB mounting
- LTS compatible footprint
- Low power consumption
- Very low temperature coefficient of offset
- Used in industrial applications
- Meets requirements of **IEC 61010-1**
- Approved to **UL 508** and **EN 50178**

5 YEARS WARRANTY

L = 21.9mm, W = 13.4mm and D = 16mm

Supply voltage range	4.75V to 5.25V	Accuracy	± 0.8%
Current consumption	15mA	Response time	0.3µs
Operating temperature range	-40°C to +85°C		

639463

Primary current	Primary current	Mfrs.	Price Each			
I _{PN}	Measuring range	List No.	Order Code	1+	5+	10+
6A	20A	CAS 6-NP	214-6819			
15A	51A	CAS 15-NP	196-1161			
25A	85A	CAS 25-NP	196-1162			

0-50A to 0-400A, HAL Series



- Base-mounted package
- Wide selection of current ratings available
- Instantaneous analogue voltage output
- Compact design
- Low power consumption from auxiliary power supply
- Potted construction for maximum protection
- Output connector facility for ease of connection

H = 41, W = 41.27, D = 24.57mm

Current Rating	Measuring Range	Power Supply	Output Voltage	Mfrs. List No.	Order Code
50A	0A to ± 150A	±15V	±4V	HAL 50-S	161-7411
100A	0A to ± 300A	±15V	±4V	HAL 100-S	161-7413
200A	0A to ± 600A	±15V	±4V	HAL 200-S	161-7414
400A	0A to ± 1000A	±15V	±4V	HAL 400-S	161-7415

230495

Current Rating	Order Code	Price Each				
		1+	5+	10+	25+	50+
50A	161-7411					
100A	161-7413					
200A	161-7414					
400A	161-7415					

Current Transducer DC and AC Primary Input



H = 7, W = 90, D = 25mm

These transducers are designed for the measurement of DC and distorted AC waveform current. They have galvanic isolation between the primary (High power) and secondary (Electronic circuit) circuits. There is a choice of 3 output types, 0 - 5V, 0 - 10V and 4 to 20mA.

5 YEARS WARRANTY

- Large aperture for cable up to 32mm Dia.
- High isolation between primary and secondary circuits
- Easy to mount
- Eliminates insertion loss

Load Resistance	≥ 10 KΩ	Measurement Bandwidth	DC and 20 to 6kHz
Supply Voltage	to	Operating Temperature	-40 to 70°C
Current Consumption	30mA	Protection	IP20
Accuracy	<±1%	Flammability Rating	UL94V-0

418017

Primary Current	Mfrs. List No.	Order Code	Price Each		
			1+	10+	25+
5 - 0VDC analogue output signal					
200A dc/ac (rms)	DHR 200 C5	100-2690			
500A dc/ac (rms)	DHR 500 C5	100-2700			
1000A dc/ac (rms)	DHR 1000 C5	100-2707			
10 - analogue output signal					
100 A dc/ac (rms)	DHR 100 C10	100-2688			
200A dc/ac (rms)	DHR 200 C10	100-2691			
300A dc/ac (rms)	DHR 300 C10	100-2694			
400A dc/ac (rms)	DHR 400 C10	100-2698			
500A dc/ac (rms)	DHR 500 C10	100-2701			
600A dc/ac (rms)	DHR 600 C10	100-2705			
1000A dc/ac (rms)	DHR 1000 C10	100-2708			
4 - 20 mA dc analogue output signal					
100 A dc/ac (rms)	DHR 100 C420	100-2689			
200A dc/ac (rms)	DHR 200 C420	100-2692			
300A dc/ac (rms)	DHR 300 C420	100-2695			
400A dc/ac (rms)	DHR 400 C420	100-2699			
500A dc/ac (rms)	DHR 500 C420	100-2702			
600A dc/ac (rms)	DHR 600 C420	100-2706			
1000A dc/ac (rms)	DHR 1000 C420	100-2709			

Voltage Transducer



A PCB mounting voltage transducer based on the Hall effect. The unit provides galvanic isolation between primary and secondary circuits. To enable a voltage to be measured a current proportional to the measured voltage must be collected through an external resistor, selected by the user, in series with the primary circuit of the unit.

H = 15.1, W = 26, D = 29.2mm

- Suitable for the electronic measurement of voltages associated with DC, AC and impulse circuits
- Provides galvanic isolation between primary and secondary circuits
- Applications:- AC and DC voltage sensing, including power supplies, UPS, instrumentation, metering and relay systems

Supply voltage	± 15V (±5%)	Overall accuracy @ 25°C	± 0.6% of I _N
Input current I _N	10mA (nom.)	Isolation	2.5kV rms
Analogue output current	25mA (nom.)	Linearity	0.2%
Turns ratio	2500 : 1000	Operating temperature	0°C to +70°C

230500

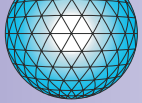
Mfrs. List No.	Order Code	Price Each				
		1+	5+	10+	25+	50+
LV 25-P	161-7416					

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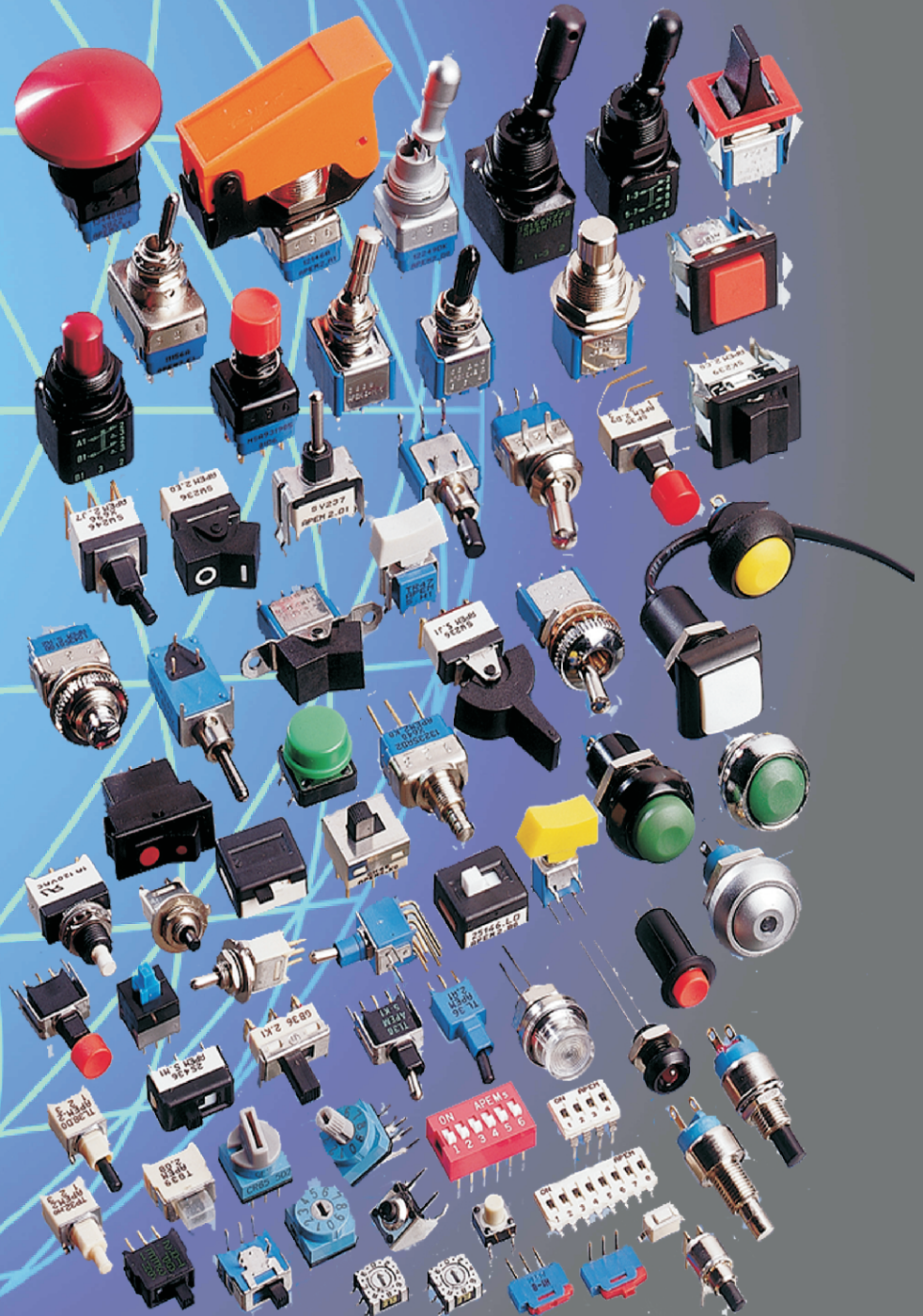
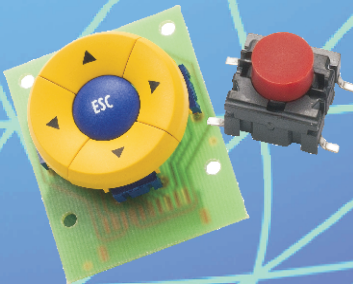
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