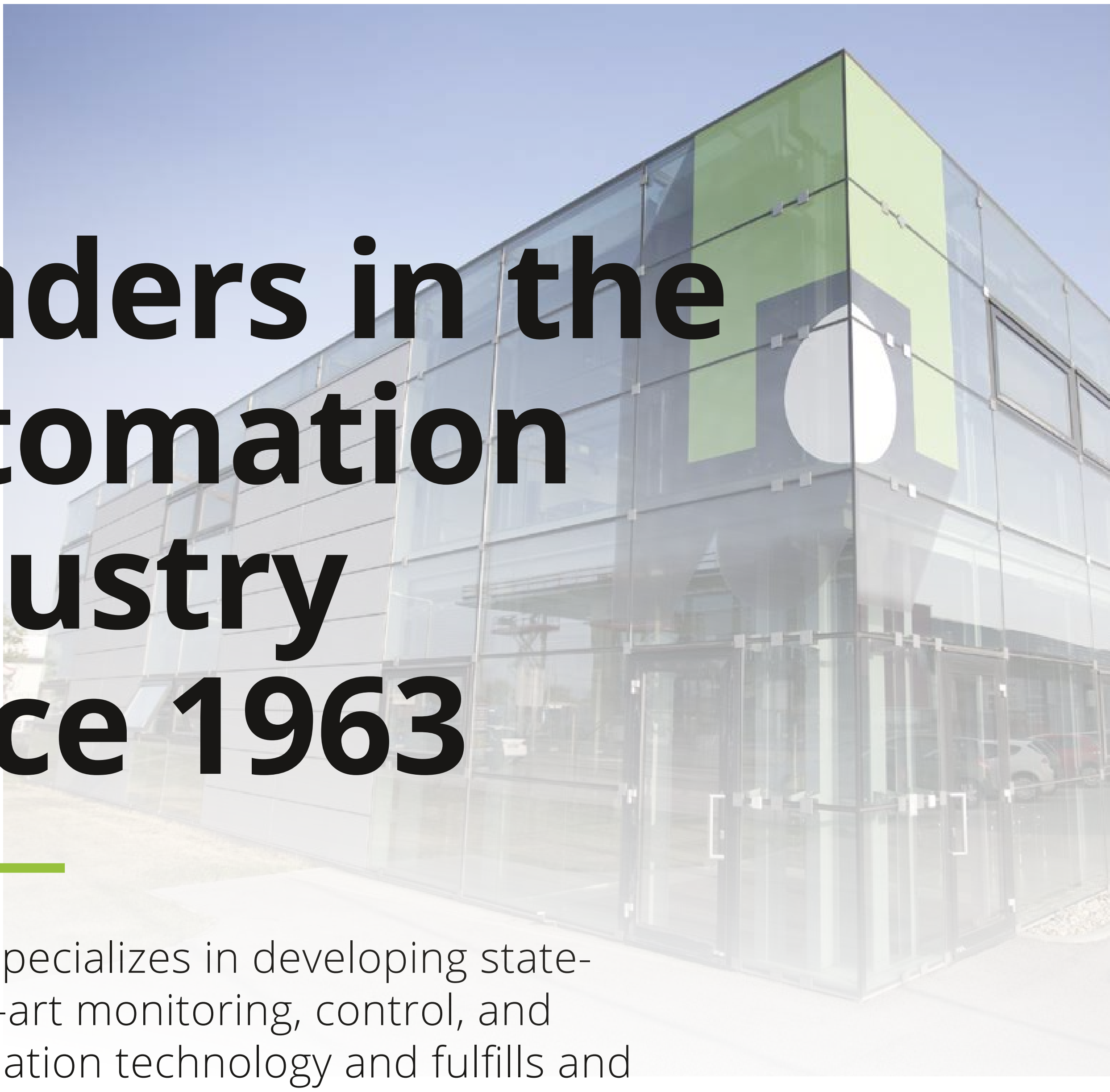
NORTH AMERICA

Product Catalog 2022



Leaders in the automation industry since 1963

TELE specializes in developing state-of-the-art monitoring, control, and automation technology and fulfills and exceeds local sourcing needs of OEMs, resellers, and distributors.

TELE is a family-owned technology company headquartered in Austria that is passionate about hiring the best to develop and manufacture control and monitoring solutions for both; the energy and the industrial sector.

FOUNDED IN 1963, TELE Haase continues to be a market leader for time and monitoring relays and has been developing customized solutions and components for the industrial and energy sectors for more than five decades.

TELE PRODUCTS are used globally and located in control cabinets, industrial plants, and transformer stations, as well as in the wind, water, and solar energy power plants.

IN THE COMING YEARS, TELE's technology integrates seamlessly into the industrial landscape by learning to communicate and deliver data across different interfaces and places where that information is needed. In doing so, we pave the way for the factory of the future and, even better, enable industries to be more efficient, green and worker friendly.

Serving North America

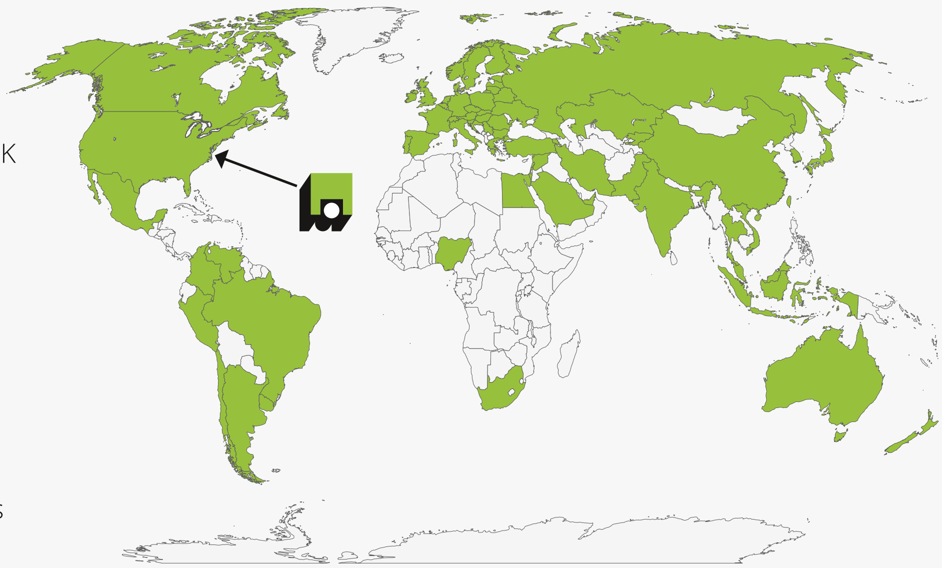
Our products are designed to protect, monitor, and automate systems for a wide range of industries. TELE relays might be small, but they master an immense variety of applications.

United States, Canada & Mexico

Since 2018, **TELE CONTROLS INC.** has been located out of Arlington, Virginia, fulfilling and exceeding the local sourcing needs of OEMs (original equipment manufacturers) to resellers and distributors throughout North America. TELE Controls has provided excellent on-demand project support in addition to personal sales assistance.

At a glance

- Headquartered in Vienna, Austria
- Offices in the USA and UK
- Production in Austria since 1963
- 55+ years of experience
- Global sales network serving 50+ countries
- Reliable and "green" automation components



We Are Automation

With nearly 60 years of experience in the development and production of control and monitoring components, we are proud of sharing this know-how with our customers.

In America and the world over

Be it in Arlington (USA), Vienna (Austria), or anywhere else in the world – TELE stands for top quality, sustainability, and exceptional customer service – both for TELE devices and for jointly developed products (EMS).

TELE customers can rely on an experienced, flexible, and reliable partner for the innovative development of ideas and their manufacturing.

How can you benefit from TELE?

- Short development and lead times
- Proven modular components
- Ability to integrate into the customer‘s system
- Scalable in price and performance
- In-house development and production with optimized batch sizes

Our Business Areas

With solid engineering know-how, TELE develops and produces smart technology for a better world. We try out ideas and break new ground on our way to “the company of the future”.

Automation components

According to our customers’ needs, we develop and produce technical solutions for a wide variety of controlling and monitoring tasks, such as timing and monitoring relays, grid and system protection, power electronics and industrial IoT. TELE products are being used all over the world in control cabinets, plant and machinery, renewable energy sector or facility management.

EMS Contract Manufacturing

At TELE Haase you will find our conveniently located Electronic Manufacturing Services (EMS), which can flexibly adapt to your requirements with a personal touch and Austrian quality. We support you in ideation, electronic development , prototyping to serial production and delivery.

Factory Hub Vienna

With the Factory Hub we offer space for new ideas and concepts of young founders and support startups with our extensive production know-how in the implementation of prototypes and small series along with out in-house coworking space.

Organisation Playground

TELE implemented a new organization structure in 2012 and invites people to join our experiences. Based on the idea of “New Work” we operate without traditional hierarchies and make democratic decisions. This promotes individual responsibility andagility, and puts us in a position to offer operational excellence at all levels in the future.

Product Portfolio

Time Delay Relays

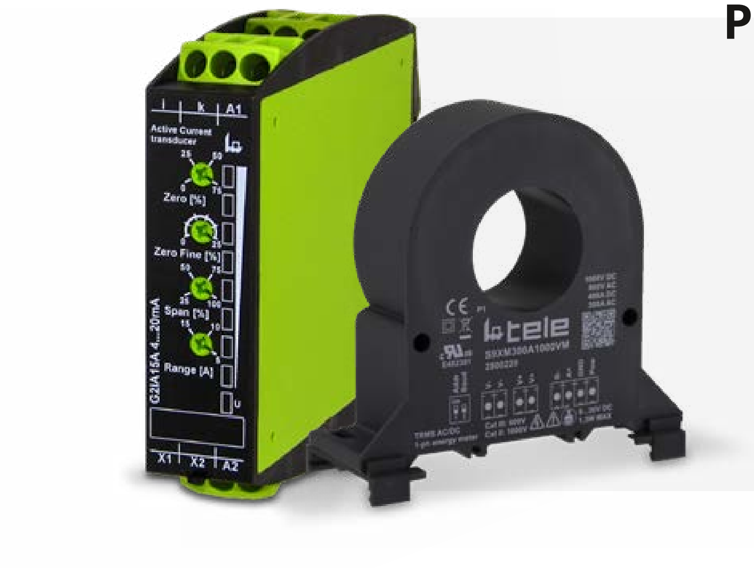
[page 10]

- Single function timers
- ON and OFF delay
- Multi-function timers
- Timer modules for industrial switching relays
- Star-delta (wye-delta) timers
- Digital timers
- Staircase timers
- Impulse encoders
- Alternating function timers
- Pump / Load alternators

Monitoring Relays

[page 20]

- Phase failure / loss
- Phase sequence
- Phase imbalance / Asymmetry
- Voltage up to 900 V AC
- Current up to 100 A AC/DC direct or higher via external CTs
- Effective frequency from 40–70 Hz
- Temperature via PTC, NTC or PT100
- Conductive liquid level



Power Meters

[page 30]

- 1~ power meter up to 50A and 1000V with ModBusRTU interface
- 1~ power meter up to 300A and 1000V with ModBusRTU interface
- Real power monitor up to 11 kW/15 hp direct or higher via external CTs
- Power factor monitor up to 11 kW/15 hp direct or higher via external CTs

Accessories

[page 38]

- TR power modules
- DIN-Rail mounting plates
- Sealable front covers
- Conductive probes
- USB to RS485 converters

Switching Relays

[page 41]

- RM/RA, miniature “ice cube” relays
- RT, industrial relays
- RP, PCB relays
- STKR, PLC coupling relays
- Sockets and modules

Power Supplies

[page 43]

- Industrial power supplies
- Compact power supplies

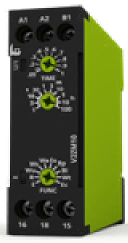
Thyristor Stacks

[page 44]

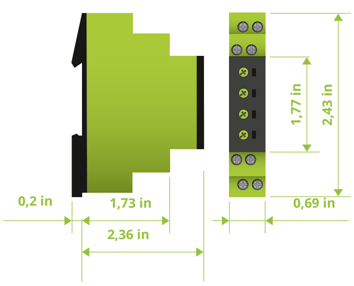
- Thyristor stacks, 1- & 3-phase SCRs
- Semiconductor fuses
- Fuse holders

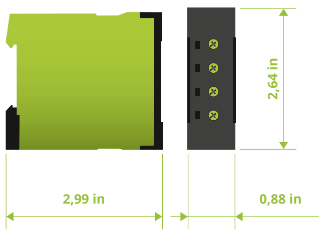
Product Series

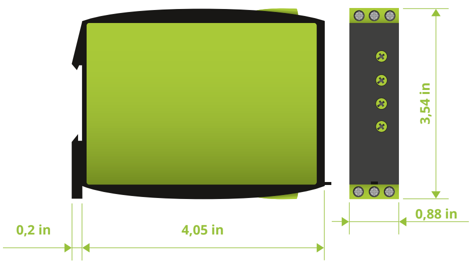
Designed to fulfill your needs:
Meet our ENYA, VEO and GAMMA Series!


	ENYA **TIME DELAY AND MONITORING RELAYS**	VEO **TIME DELAY AND MONITORING RELAYS**	GAMMA **TIME DELAY RELAYS, MONITORING RELAYS AND POWER MONITORS**
DESIGN FEATURES	Economical design 0.7 in (17.5 mm) or 1.4 in (35 mm) IEC style footprint DIN rail mount Screw terminals	Compact industrial design 0.9 in (22.5 mm) or 1.8 in (45 mm) IEC style footprint DIN rail mount Screw terminals or push-in terminals Flexible marking plate Ultra-low profile	Advanced industrial design 0.9 in (22.5 mm) or 1.8 in (45mm) IEC style footprint DIN rail mount Screw terminals Marking area
	W×H×D 0.69 / 1.38×2.43×2.56 in (17.5 / 35×87×65 mm)	W×H×D 0.88 / 1.76×2.64×2.99 in (22.5 / 45×67×76 mm)	W×H×D 0.88 / 1.76×3.54×4.25 in (22.5 / 45×90×108 mm)
FUNCTIONALITY	Timing and monitoring relays Single and multifunction versions Control/ trigger input fully adjustable LED status indication	Timing and monitoring relays Single and multifunction versions Control/ trigger input Fully adjustable LED status indication	Timing and monitoring relays Power monitors, transducers Control/ trigger input Single and multifunction versions Fully adjustable LED status indication or LCD screen
TECHNICAL FEATURES	Outputs SPDT, SPNO, SPNC or DPDT Power supply range 12-240 V AC/DC	Outputs SPDT, SPNO, SPNC, 3PNO or DPDT analog out 0…20mA, 4…20mA, 0…10V and bipolar Power supply range 12-240 V AC/DC	Outputs SPDT, SPNO, SPNC or DPDT analog out, 4…20 mA and 0…10V Power supply range 24-240V AC/DC or 12 to 5000V AC or 24VDC via TR" and TR3 power modules
	Accuracy ≤5% Energy consumption 0.8 – 1.3 W Operating temperature -13 to +131 °F (-25 to +55 °C)	Accuracy ≤2.5% Energy consumption 0.35 – 0.60 W Operating temperature -13 to +131 °F (-25 to +55 °C)	Accuracy ≤3% Energy consumption 1.0 – 1.5 W Operating temperature -13 to +131 °F (-25 to +55 °C)
	Overvoltage category III / 4 kV	Overvoltage category III / 4 kV	Overvoltage category III / 4 kV or 6 kV
	CE, EAC, UL, CSA, UKCA	CE, EAC, UL, CSA, UKCA	CE, EAC, UL, CSA, UKCA
	EN 61812-1, EN 60947	EN 61812-1, EN 60947	EN 61812-1, EN 60947, EN 50178







FOR THE ENTIRE PRODUCT RANGE PLEASE VISIT **www.tele-controls.com**

Products Impacting The Market

Our most unique innovations:

E1ZMLA10 24-240V AC/DC

Why decide between a pump alternator and timer when you can have both in one device? Control voltages of 24-240V AC/DC and make your life easier.

See page 14

TIMER MODULE COM3T

Transform your regular switching relay into a multifunctional super time delay relay and contactor.

See page 41

V4IA100A 24-240V AC/DC

The unit has an integrated current transducer that works from 0-100A AC and DC. With the flexibility of selecting from one of six integrated analog outputs.

See page 36

G4BM480V12ADTL20

This REAL power monitor doesn't require software skills for set-up and monitoring. Simplifying the way power monitoring should be executed.

See page 31

Function Overview
Time Delay Relays

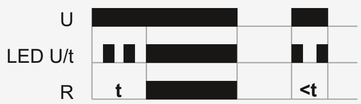
Our Functions In Detail:

U	Supply voltage
LED	LED status indication
LED U	LED status indication supply voltage
LED R	Led status indication relay output

LED U/t	LED status indication for supply voltage and timing of function
R	Relay output
T	Thyristor output

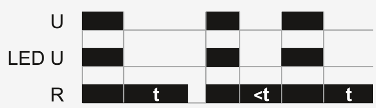
S	Control/ Trigger input
Y	Star-/ Wye-time
Δ	Delta time
t	Set time

E ON DELAY



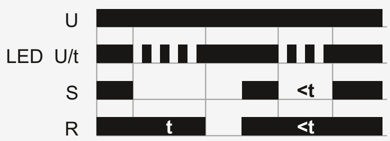
When the supply voltage U is applied, the set interval t begins. After the interval t has expired the output relay R switches into on-position. This status remains until the supply voltage is interrupted. If the supply voltage is interrupted before the expiry of the set interval, the interval t already expired is erased and is restarted when the supply voltage is next applied.

A OFF DELAY WITHOUT AUXILIARY VOLTAGE



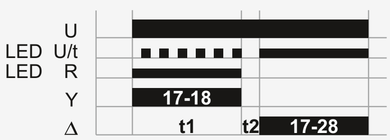
When the supply voltage U is supplied, the output relay R swiches into on-position. If the supply voltage is interrupted, the set interval t begins. After the set interval t has expired the output relay R switches into off-position. If the supply voltage is reconnected before the interval t has expired the interval already is erased and is restarted with the next cycle.

R OFF DELAY



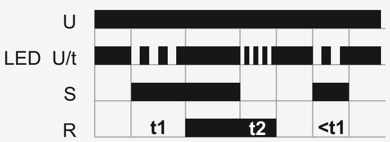
The supply voltage U must be constantly applied to the device. When the control contact S is closed, the output relay R switches into on-position. If the control contact is opened, the set interval t begins. After the interval t has expired the output relay switches into off-position. If the control contact is closed again before the set interval has expired, the interval already expired is erased and is restarted.

S STAR-DELTA START-UP (WYE DELTA)



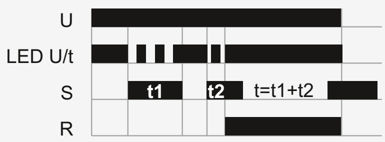
When the supply voltage U is applied, the star-contact switches into on-position and the set star-time t1 begins. After the interval t1 has expired the star-contact switches into off-position and the set transit-time t2 begins. After the interval t2 has expired the delta-contact switches into on-position. To restart the function the supply voltage must be interrupted and reapplied.

ER ON DELAY AND OFF DELAY WITH CONTROL CONTACT



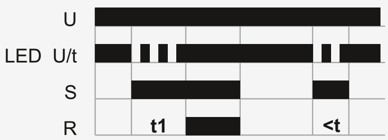
The supply voltage U must be constantly applied to the device. When the control contact S is closed, the set interval t1 begins. After the interval t1 has expired, the output relay R switches into on-position. If the control contact is opened, the set interval t2 begins. After the interval t2 has expired, the output relay Switches into off-position. If the control contact is opened before the interval t1 has expired, the interval already expired is erased and is restarted with the next cycle.

Ec ADDITIVE ON DELAY



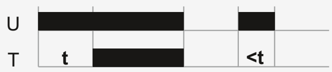
When the supply voltage U is applied, the release for the interval starts. When the control contact S is closed, the set interval t begins. If the control contact S is opened during the set interval t, the interval stops, and the already expired interval is stored. During the lapse of time the control contact can be opened or closed as often as required. If the sum of the periods, in which the control contact S is closed reaches the set interval t the output relay R switches into on-position. The interval is stopped and a further activation of the control contact S remains without effect. By interrupting the supply voltage, the device will be reset. A possibly expired time t is deleted.

Es ON DELAY WITH CONTROL INPUT



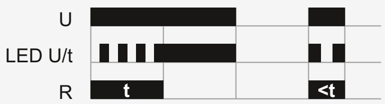
The supply voltage U must be constantly applied to the device. When the control contact S is closed, the set interval t begins. After the interval t has expired the output relay R switches into on-position. This status remains until the control contact is opened again. If the control contact is opened before the interval t has expired , the interval already expired is erased and is restarted with the next cycle.

ET ON DELAY TWO WIRE CONNECTED



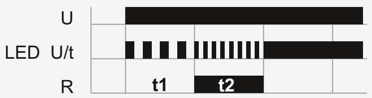
When the supply voltage U is applied, the set interval t begins. After the interval has expired the thyristor switches on. This status remains until the supply voltage is interrupted. If the supply voltage is interrupted before the expiry of the interval, the interval already expired is erased and is restarted when the supply voltage is next applied.

Wu SINGLE SHOT LEADING EDGE VOLTAGE CONTROLLED



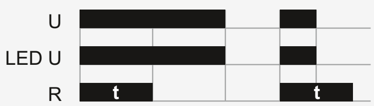
When the supply voltage U is applied, the output relay R switches into on-position and the set interval t begins. After the interval t has expired the output relay switches into off-position. This status remains until the supply voltage is interrupted. If the supply voltage is interrupted before the interval t has expired, the output relay switches into off-position. The interval already is erased and is restarted when the supply voltage is next applied.

EWu ON DELAY SINGLE SHOT LEADING EDGE WITH CONTROL CONTACT



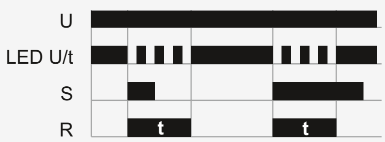
When the supply voltage U is applied, the set interval t1 begins. After the interval t1 has expired, the output relay R switches into on-position and the set interval t2 begins. After the interval t2 has expired, the output relay switches into off-position. If the supply voltage is interrupted before the interval t1+t2 has expired, the interval already expired is erased and is restarted when the supply voltage is next applied.

nWu MAINTAINED SINGLE SHOT LEADING EDGE



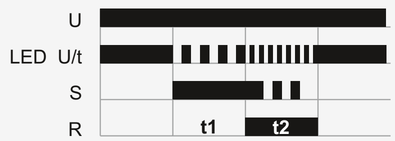
When the supply voltage U is applied, the output relay R switches into on-position and the set interval t begins. After the interval t has expired the output relay switches into off-position. This status remains until the supply voltage is interrupted. If the supply voltage is reconnected before the interval t has expired, the unit continues to perform the actual single shot.

Ws SINGLE SHOT LEADING EDGE WITH CONTROL INPUT



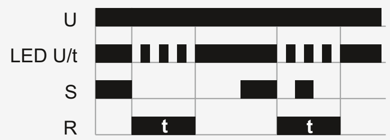
The supply voltage U must be constantly applied to the device. When the control contact S is closed, the output relay R switches into on-position and the set interval t begins. After the interval t has expired the output relay switches into off-position. During the interval, the control contact can be operated any number of times. A further cycle can only be started when the cycle run has been completed.

EWs ON DELAY SINGLE SHOT LEADING EDGE WITH CONTROL CONTACT



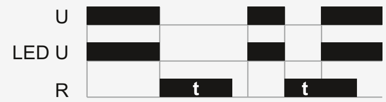
The supply voltage U must be constantly applied to the device. When the control contact S is closed, the set interval t1 begins. After the interval t1 has expired, the output relay R switches into on-position and the set interval t2 begins. After the interval t2 has expired, the output relay switches into offposition. During the interval, the control contact can be operated any number of times. A further cycle can only be started when the cycle run has been completed.

Wa SINGLE SHOT TRAILING EDGE WITH CONTROL INPUT



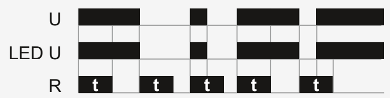
The supply voltage U must be constantly applied to the device. Closing the control contact S has no influence on the condition of the output R. When the control contact is opened, the output relay switches into on-position and the set interval t begins. After the set interval has expired, the ouput relay switches into off-position. During the interval, the control contact can be operated any number of times. A further cycle can only be started when the cycle run has been completed.

nWa MAINTAINED SINGLE SHOT TRAILING EDGE



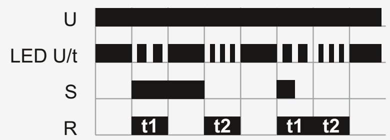
When the supply voltage U is supplied, the output relay R remains into off-position. As soon as the supply voltage is interrupted the output relay switches into on-position and the set interval t begins. After the set interval t has expired the output relay switches into off-position. When the supply voltage is reconnected before the interval t has expired, the unit continues to perform the actual single shot.

nWuWa MAINTAINED SINGLE SHOT LEADING AND TRAILING EDGE



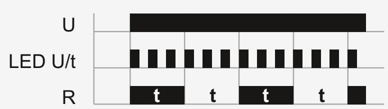
When the supply voltage U is applied, the output relay R switches into on-position and the set interval t begins. After the interval t has expired the output relay switches into off-position. As soon as the supply voltage is interrupted the output relay switches into on-position again and the set interval t begins. After the set interval t has expired the output relay switches into off-position. If the supply voltage is interrupted (nWu) or reconnected (nWa) before the interval t has expired the unit continues to perform the actual single shot

WsWa SINGLE SHOT LEADING AND SINGLE SHOT TRAILING EDGE WITH CONTROL CONTACT



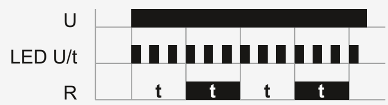
The supply voltage U must be constantly applied to the device. When the control contact S is closed, the output relay R switches into on-position and the set interval t1 begins. After the interval t1 has expired, the output relay R switches into off-position. If the control contact is opened, the output relay again switches into on-position and the set interval t2 begins. After the interval t2 has expired the output relay switches into off-position. During the interval, the control contact can be operated any number of times.

Bi FLASHER PULSE FIRST



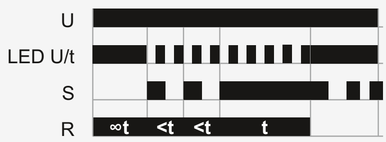
When the supply voltage U is applied, the output relay R switches into on-position and the set interval t begins. After the interval t has expired, the output relay R switches into off-position and the set interval t begins again. The output relay is triggered at a ratio of 1:1 until the supply voltage is interrupted.

Bp FLASHER PAUSE FIRST



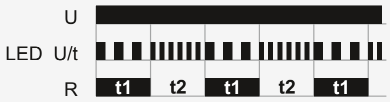
When the supply voltage U is applied, the set interval t begins. After the interval t has expired, the output relay R switches into on-position and the set interval t begins again. After the interval t has expired, the output relay switches into off-position. The output relay is triggered at a ratio of 1:1 until the supply voltage is interrupted.

Wt PULSE SEQUENCE MONITORING



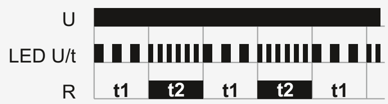
When the supply voltage U is applied, the set interval t1 begins and the output relay R switches into on-position. After the interval t1 has expired, the set interval t2 begins. So that the output relay R remains in on-position, the control contact S must be closed and opened again within the set interval t2. If this does not happen, the output relay R switches into off-position and all further pulses at the control contact are ignored. To restart the function the supply voltage must be interrupted and reapplied.

Ii ASYMMETRIC FLASHER PULSE FIRST



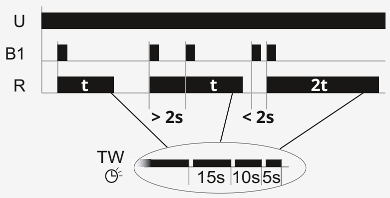
When the supply voltage U is applied, the output relay R switches into on-position and the set interval t1 begins. After the interval t1 has expired, the output relay switches into off-position and the set interval t2 begins. After the interval t2 has expired, the output relay switches into on-position. The output relay is triggered at the ratio of t1:t2 until the supply voltage is interrupted.

Ip ASYMMETRIC FLASHER PAUSE FIRST



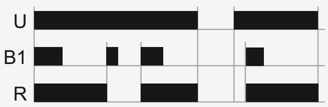
When the supply voltage U is applied, the set interval t1 begins. After the interval t1 has expired, the output relay R switches into on-position and the set interval t2 begins. After the interval t2 has expired, the output relay switches into off-position. The output relay is triggered at the ratio of t1:t2 until the supply voltage is interrupted.

T, TW FUNCTION AUTOMATIC TIMER WITH (TW) OR WITHOUT (T) SWITCH-OFF WARNING



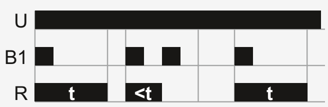
After the pushbutton (control input) has been pressed, the output relay R closes and the set interval t begins. If the pushbutton is pressed again before the interval has expired, the interval begins again (restart function complies with EN 60669-2-3). Rapid, multiple pressing of the pushbutton (pumping) adds 2, 3 or more time intervals to extend the time up to 60 min. Prolonged pressure on the button (>2 s) aborts the interval running and switches the relay off (energy saving function). In the TW mode the device provides a switch-off warning (in accordance with DIN 180-158-2) by generating short pulses (flashing) at 30s, 15s and 5s prior to switch-off.

P, PN IMPULSE SWITCH MODE



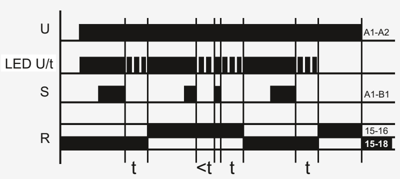
In this mode, every keypress of the pushbutton (control input) toggles the output relay R (flip-flop). In function P, the output relay remains in off-position, whenever the supply voltage is applied. In function PN, the output relay switches into on-position after applying the supply voltage U, if the output relay was in on-position last before power failure. In both functions the output relay switches into on-position, if a short voltage impulse (<2s) is applied to the additional control input (central ON). A longer voltage impulse (>2s) opens the output relay (central OFF).

P (R) IMPULSE SWITCH MODE WITH OFF DELAY



In this mode, every keypress toggles the output relay R (flip-flop). After the pushbutton (control input) has been pressed, the output relay closes and the set interval t begins. After the interval has expired the output relay switches into off-position. If the pushbutton is pressed again before the interval has expired, the interval will be canceled and the output relay switches into off-position.

LA LOAD ALTERNATOR – PUMP CHANGER



In this mode, every falling edge toggles the output relay R (flip-flop) from L1 to L2 or L2 to L1 whatever position is defined by the previous status. On Power-Up the relay R stays in off condition until the first falling edge is detected on S Terminal B1. To ensure a safe and optimal function, please turn both timing controllers on the front to the most left position (CCW), which equals 50 msec. In this operation mode, a minimum delay/de-bump time of 50 msec is applied from the falling edge of the control input until relay R is changing its state. Is a longer delay time as 50 msec is set, a short pulse on the „S“ input resets the times. The timer is restarted with the next falling edge signal on „S“ input again. If you wish to apply longer delay times, set the according time selectors to the required values or contact your application engineer.

E1ZMLA10

Our 3-in-1 pump alternating relay offers the highest performance in the industry's most compact and space-saving DIN-Rail enclosure style.

WHY TELE'S ALTERNATING RELAY? It controls two loads simultaneously and upgrades the regular alternating function by an integrated ON (E) and OFF (R) delay functionality. The selector switch allows the user to lock in one sequence while the relay works with a wide range control voltage of 24 – 240V AC/DC.

Our **E1ZMLA** is often used in special applications where optimization of load usage is required by balancing the runtime of two loads. Identical loads are used for the same task – one or more standby units are available in case the first load fails. However, an idle load might deteriorate due to lack of use and thereby lose its safety margin. Alternating relays prevent this by assuring that multiple loads get equal run time. In addition, there are situations where a need arises to have multiple loads on at the same time for additional capacity if one load cannot keep up with demand.

This alternating functionality "LA" is initiated by a control switch, such as a float switch, manual switch, timing relay, pressure switch or other isolated contact. Each time the initiating switch is opened, the output relay contacts will change state, thus alternating the two loads. Two LED indicators show the status of the output relay, control voltage and timing function.

Advantages

- 3-in-1 duplex control of two loads
- Integrated OFF and ON delay
- Load alternator w/selector switch to lock loads manually
- Control voltage 24 – 240V AC/DC
- 8A@250VAC SPDT output
- Low profile selector switch
- 2 LEDs for relay status, timing and operating voltage indication
- cULus, UKCA, CE, EAC, RoHs
- Rugged design for industrial applications
- Improved inventory maintenance

TYPE DESIGNATION	FUNCTIONALITY	DIMENSIONS (W × H × D)	PART NO.
E1ZMLA10 24-240 V AC/DC	Load alternator (LA), ON (E) and OFF (R) delay	0.69×2.43×2.56 in (17.5×87×65 mm)	110218

TYPE DESIGNATION	E1ZM10 12-240V	E1ZM10 24-240V	E1ZMQ10 ★ TOP SELLER ★	E1ZMW10	E3ZM20
ORDER INFORMATION					
Part No. single package	110100	110200	110202	-	111100
Part No. packaging unit (10 pcs)	110100A	110200A	110202A	110206A	-
FUNCTIONALITY	multifunction		4-function	multifunction	multifunction
E ON delay	■	■	■	■	■
R OFF delay	■	■	■	■	■
Es ON delay with control contact	■	■			■
Wu Single shot leading edge, voltage-controlled	■	■		■	■
Ws Single shot leading edge with control contact	■	■	■	■	■
Wa Single shot trailing edge with control contact	■	■		■	■
Bp Flasher pause first	■	■			■
Wt Pulse repetition analysis			■	■	
WsWa Single shot leading and trailing edge with control contact				■	
POWER SUPPLY CIRCUIT					
Supply voltage	12 – 240 V AC/DC	24 – 240 V AC/DC	24 – 240 V AC/DC	24 – 240 V AC/DC	12 – 240 V AC/DC
Frequency	48 – 63 Hz				
TIME CIRCUITS					
Time ranges	7				
Setting range	0.05 s – 100 h				
INPUT CIRCUIT					
Trigger input	■	■	■	■	■
OUTPUT CIRCUIT					
Contacts	SPDT	SPDT	SPDT	SPDT	DPDT
Switching capacity	2000 VA (8 A / 250 V AC)				
DESIGN					
Dimensions (W × H × D)	0.69 × 2.43 × 2.56 in (17.5 × 87 × 65 mm)				1.38 × 2.43 × 2.56 in (35 × 87 × 65 mm)
Certificates	CE, cULus, EAC, UKCA				

TYPE DESIGNATION	E1Z1E10	E1Z1R10	E1Z1ER10	E1ZI10	E3ZI20	E3ZS20
ORDER INFORMATION						
Part. No. single package	-	-	-	110101	111101	111300
Part No. package 10 pcs.	110204 A	110205 A	110208A	-	-	-
FUNCTIONALITY	ON delay	OFF delay	ON/OFF delay	asymmetric flasher	asymmetric flasher	star-delta
E ON delay	■					
R OFF delay		■				
ER ON delay + OFF delay with control contact			■		■	
EWu ON delay single shot leading edge, voltage-controlled					■	
Ws Single shot leading edge with testkey						
EWs ON delay single shot leading edge with control contact					■	
Ip Asymmetric flasher pause first				■	■	
Ii Asymmetric flasher pulse first				■	■	
Wt Pulse repetition analysis					■	
WsWa Single shot leading and trailing edge with control contact					■	
S Star-delta start-up (wye-delta)						■
POWER SUPPLY CIRCUIT						
Supply voltage	24 – 240V AC/DC			12 – 240V AC/DC	12 – 240V AC/DC	12 – 240V AC/DC
Frequency range	48 – 63 Hz					
TIME CIRCUITS						
Time ranges	7	7	7	7	7	4
Setting range	0.05 s – 100 h		1 s – 100h	1 s – 100 h	1 s – 100 h	0.5 s – 3 min
INPUT CIRCUIT						
Trigger input		■	■	■	■	
OUTPUT CIRCUIT						
Contacts	SPDT	SPDT	SPDT	SPDT	DPDT	DPDT
Switching capacity	2000 VA (8 A / 250 V AC)			2000 VA (8 A / 250 V AC)	2000 VA (8 A / 250 V AC)	2000 VA (8 A / 250 V AC)
DESIGN						
Dimensions (W × H × D)	0.69 × 2.43 × 2.56 in (17.5 × 87 × 65 mm)				1.38 × 2.43 × 2.56 in (35 × 87 × 65 mm)	
Certificates	CE, cULus, EAC, UKCA					

TYPE DESIGNATION	V2ZM10	V2ZQ10	V2ZI10	V2ZE10	V2ZR10	V2ZA10	V2ZS20
ORDER INFORMATION							
Part No.	125100	125150	125200	125110	125120	125500	125300
Part No. packaging unit (10 pcs)	125100 A	125150 A	-	125110 A	125120 A	-	-
FUNCTIONALITY	multifunction	4-function	flasher	ON delay	OFF delay	5-function	star-delta
E ON delay	■	■		■		■	
R OFF delay	■	■			■		
A OFF delay without auxiliary voltage						■	
Es ON delay with control contact	■						
Wu Single shot leading edge, voltage-controlled	■	■					
nWu Maintained single shot leading edge						■	
Ws Single shot leading edge with control contact	■						
Wa Single shot trailing edge with control contact	■						
nWa Maintained single shot trailing edge						■	
nWuWa Maintained single shot leading and trailing edge						■	
Bi Flasher pulse first	■						
Bp Flasher pause first	■	■					
Wt Pulse repetition analysis	■						
Ec Additive ON delay	■						
Ii Asymmetric flasher pulse first			■				
Ip Asymmetric flasher pause first			■				
S Star-delta start-up (wye-delta)							■
SUPPLY CIRCUIT							
Supply voltage	12 – 240 V AC/DC	24 – 240 V AC/DC	12 – 240 V AC/DC	12 – 240 V AC/DC	12 – 240 V AC/DC	24 – 240 V AC/DC	12 – 240 V AC/DC
Frequency range	48 – 63 Hz						
TIME CIRCUITS							
Time ranges	10					4	
Setting range	0.05 s – 100 h					0.1 s – 3 min	0.05 s – 3 min
INPUT CIRCUIT							
Trigger input	■	■	■		■		
OUTPUT CIRCUIT							
Contacts	SPDT	SPDT	SPDT	SPDT	SPDT	SPDT	SPDT
Switching capacity	2000 VA (8 A / 250 V AC)		1250 VA (5 A / 250 V AC)	1250 VA (5 A / 250 V AC)		1250 VA (5 A / 250 V AC)	750 VA (3 A / 250 V AC)
DESIGN							
Dimensions (W × H × D)	0.88 × 2.64 × 2.99 in (22.5 × 67 × 76 mm)						
Certificates	CE, cULus, EAC, UKCA						

TYPE DESIGNATION	G2ZM20	G2ZMF11	G2ZI20	G2ZIF20	G2ZA20 10MIN ★ TOP SELLER ★
ORDER INFORMATION					
Part No.	120401	120103	120501	120201	120600*
FUNCTIONALITY	multifunction	multifunction	2-time multifunction	2-time multifunction	True Off Delay Timer
E ON delay	■	■			■
R OFF delay	■	■			
ER ON delay and OFF delay with control contact			■	■	
Es ON delay with control contact	■	■			
Wu Single shot leading edge, voltage-controlled	■	■			
Ws Single shot leading edge with control contact	■	■			
Wa Single shot trailing edge with control contact	■	■			
EWu ON delay single shot leading edge, voltage-controlled			■	■	
EWs ON delay single shot leading edge with control contact			■	■	
WsWa Single shot leading and trailing edge with control contact			■	■	
Bi Flasher pulse first	■	■			
Bp Flasher pause first	■	■			
Ii Asymmetric flasher pulse first			■	■	
Ip Asymmetric flasher pause first			■	■	
A True off delay, No Aux Voltage					■
POWER SUPPLY CIRCUIT					
Supply voltage	12 - 240V AC/DC	24 - 240V AC/DC	12 - 240V AC/DC	24 - 240V AC/DC	24 - 240V AC/DC
Frequency range	48 – 63 Hz				
TIME CIRCUITS					
Time ranges	7	16	7	10	4
Setting range	0.05 s – 100 h	0.05 s – 30 d	0.05 s – 100 h	0.05 s – 10 h	0.1 s – 10 min
INPUT CIRCUIT					
Trigger input	■	■	■	■	
Remote potentiometer input		■		■	
OUTPUT CIRCUIT					
Contacts	DPDT	2x SPDT	DPDT	DPDT	DPDT
Switching capacity	1250 VA (5 A / 250 V AC)				
DESIGN					
Dimensions (W × H × D)	0.88 × 3.54 × 4.25 in (22.5 × 90 × 108 mm)				
Certificates	CE, cULus, EAC, UKCA				

***G2ZA20 10MIN TRUE OFF DELAY -** Additional Functions **nWa**, **nWu** & **nWuWa** on pages 11-12.

Timing relays for various applications

Safe switch-off

E1ZM10 24-240 To prevent fire hazard, the stove in a dormitory shared kitchen must switch off safely after a defined period of time. The switch needs to perform even if the central pushbutton has been illegally blocked.

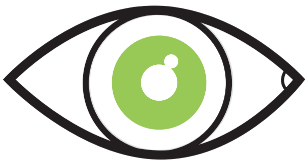
Anti-flutter protection

V2ZQ10 In pools of a wastewater treatment plant the use of the timing relay with Function E (switch-on delay) delays reading of the switch contact until the next usable measurement, and thereby prevents "flutter switching".

Monitoring of a cold store door

G2ZMF11 As soon as the control contact (Y1-Y2) is interrupted by opening the cold store door the cooling is switched off directly and the set time t starts to run. If the cold store door remains open for longer than the selected time, the delayed contact deactivates and an acoustic signal is triggered. This prevents the door from remaining open for too long or being improperly closed.

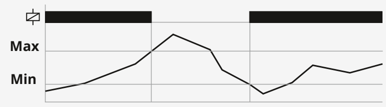
please scan QR code to see more timing relay applications



Function Overview
Monitoring Relays

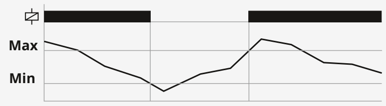
	Relay coil with one winding	**U**	Supply voltage	**May**	Maximum
PTC	Positive temperature coefficient	**R**	Relay output	**Rel**	Relay
L	Wire connection to phases	**Min**	Minimum		

O OVER



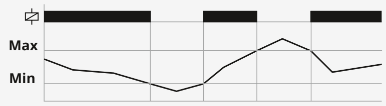
If the measured value exceeds the adjusted MAX threshold, the output relay switches into off-position. The output relay switches into on-position again, as soon as the measured value falls below the adjusted MIN threshold.

U UNDER



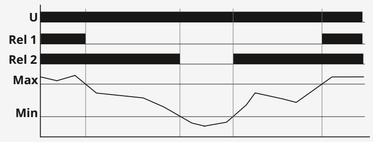
If the measured value falls below the adjusted MIN threshold, the output relay switches into off-position. The output relay switches into on-position again, as soon as the measured value exceeds the adjusted MAX threshold.

W WINDOW



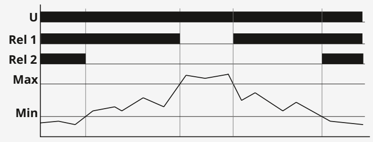
If the measured value falls below the adjusted MIN threshold, the output relay switches into off-position. The output relay switches into on-position again, as soon as the measured value exceeds the adjusted MIN threshold. If the measured value exceeds the adjusted MAX threshold, the output relay switches into off-position. The output relay switches into on-position again, as soon as the measured value falls below the adjusted MAX threshold.

2MIN MINIMUM MONITORING



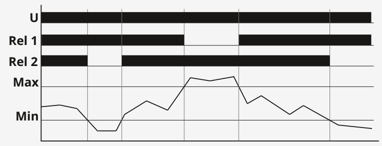
If the measured value falls below the adjusted MAX threshold, the output relay Rel1 switches into off-position. If the measured value falls below the adjusted MIN threshold, the output relay Rel2 switches into off-position. The output relays Rel1 and Rel2 switch into on-position again, as soon as the measured value exceeds the according adjusted threshold (MAX or MIN).

2MAX MAXIMUM MONITORING



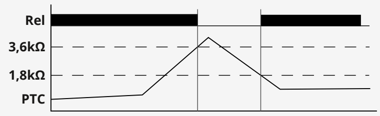
If the measured value exceeds the adjusted MIN threshold, the output relay Rel2 switches into off-position. If the measured value exceeds the adjusted MAX threshold, the output relay Rel1 switches into off-position. The output relays Rel1 and Rel2 switch into on-position again, as soon as the measured value falls below the according adjusted threshold (MAX or MIN).

MM MINIMUM AND MAXIMUM MONITORING (MIN/MAX)



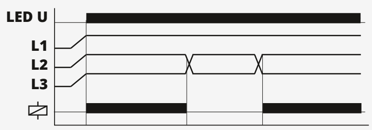
If the measured value falls below the adjusted MIN threshold, the output relay Rel2 switches into off-position. The output relay Rel2 switches into on-position again, as soon as the measured value exceeds the adjusted MIN threshold. If the measured value exceeds the adjusted MAX threshold, the output relay Rel1 switches into off-position. The output relay Rel1 switches into on-position again, as soon as the measured value exceeds the adjusted MIN threshold.

TEMP TEMPERATURE MONITORING



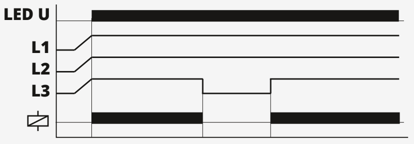
If the supply voltage U is applied and the cumulative resistance of the PTC-circuit is less than 3.6 kΩ (standard temperature of the motor), the output relay R switches into on-position. When the cumulative resistance of the PTC-circuit exceeds 3.6 kΩ, the output relay switches into off-position. The output relay switches into on-position again after the cumulative resistance falls below 1.6 kΩ.

SEQ PHASE SEQUENCE MONITORING



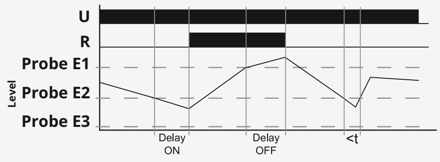
When all phases are connected in the correct sequence and the measured asymmetry is less than the fixed value, the output relay switches into on-position (yellow LED illuminated). When the phase sequence changes, the output relay switches into off-position (yellow LED not illuminated). It is recommended to connect the neutral wire of the monitoring relay once loads in the system use neutral connection.

PHASE FAILURE MONITORING



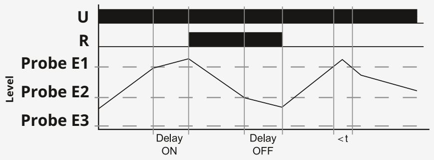
As soon as one of the three phases fails, the output relay R switches into off-position (yellow LED not illuminated). For reliable phase loss detection, the asymmetric function should be enabled. It is recommended to connect the neutral wire of the monitoring relay once loads in the system use neutral connection.

PUMP UP



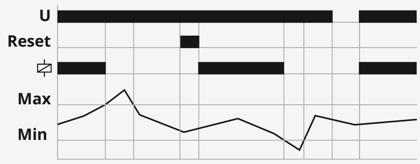
Connection of the probe rods E1, E2 and E3. When the air-fluid level falls below the minimum probe E2 the set interval of tripping delay begins. After the expiration of the interval, the output relay R switches into on-position. When the air-fluid level again rises above the maximum probe E1, the set interval of turn-off delay begins. After the expiration of the interval the output relay switches into off-position.

PUMP DOWN



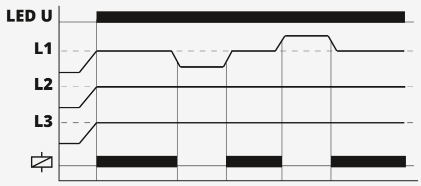
Connection of the probe rods E1, E2 and E3. When the maximum probe E1 gets moistened the set interval of tripping delay begins. After the expiration of the interval the output relay R switches into on-position. When the airfluid level falls below the minimum probe E2, the set interval of turn-off delay begins. After the expiration of the interval, the output relay switches into off-position.

LATCH (ERROR MEMORY)



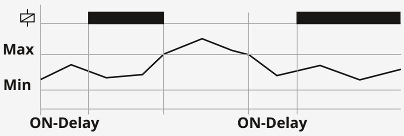
If the device detects a fault, the output relay only switches on again when the fault latch has been reset. The fault latch can be reset by means of an internal or external reset button or by interrupting the supply voltage.

ASYM ASYMMETRY/BALANCE MONITORING



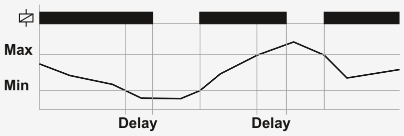
If the asymmetry of the phase-to-phase voltages exceeds the value set at the ASYM-regulator, the output relay switches into off-position. If the neutral wire is connected to the device, the asymmetry of the phase voltages referred to the neutral wire (Y-voltage) is monitored also. In that case both values of the asymmetry are evaluated and if one of the values exceeds the value set at the ASYM-regulator, the output relay switches into off-position.

ON DELAY



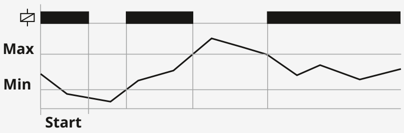
The output relay switches on if the monitored value is within the selected range during the defined time period.

DELAY



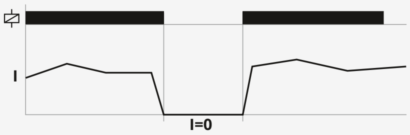
If the monitored value leaves the selected range, the output relay only switches into off-position following expiry of the trip delay.

START START-UP SUPPRESSION



The output relay switches on when the supply voltage is applied. Changes to measured variables have no impact on the setting of the output relay during start up suppression.

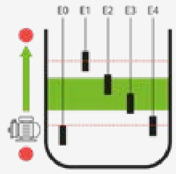
I = 0 RECOGNITION OF DISCONNECTED CONSUMERS



When the current flow between terminals i and k is interrupted the output relay switches into off-position. When the current flow is restored, the measuring cycle is restarted with the set interval of the start-up supression.

FUNCTION 1

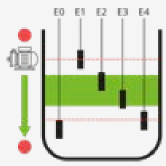
PUMP UP WITH MIN-/MAX- ALARM
(2uA) 1 container, 4 probes, 1 pump



Level control between probes E2 and E3 by pumping up. The probes E1 and E4 serve as overflow- respectively dry runnin alarm and may be used to control alarm devices, valves or additional pumps.

FUNCTION 2

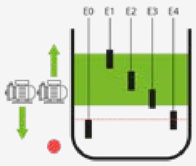
PUMP DOWN WITH MIN-/MAX- ALARM
(2dA) 1 container, 4 probes, 1 pump



Level control between probes E2 and E3 by pumping down. The probes E1 and E4 serve as overflow – respectively dry running alarm and may be used to control alarm devices, valves or additional pumps.

FUNCTION 3

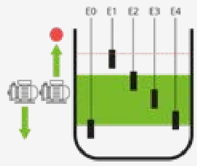
PUMP UP AND DOWN (bidirectional) WITH MINIMUM ALARM (3b-)
1 container, 4 probes, 2 pumps



The level is controlled by pumping in and out around the level of probe E3. One example of the minimum alarm via probe E4 is used in dry-running warnings.

FUNCTION 4

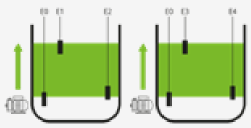
PUMP UP AND DOWN (bidirectional) WITH MAXIMUM ALARM (3b+)
1 container, 4 probes, 2 pumps



The level is maintained by pumping in and out around the level of probe E2. A maximum alarm via probe E1 warns of liquid overflow. Functions 3 and 4 can be changed during full operation.

FUNCTION 5

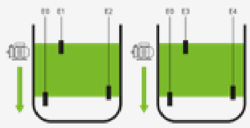
TWO INDEPENDENT CONTAINERS – PUMP UP (2u2)
1-2 container, 1-2 probes each , 1 pump each



Pump up between probes E1-E2 respectively E3-E4 (alternatively control around one probe). This feature allows level control in two separate containers with only one device. It is also possible to control cascades.

FUNCTION 6

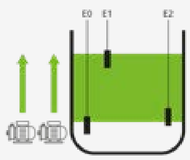
TWO INDEPENDENT CONTAINERS – PUMP DOWN (2d2)
1-2 container, 1-2 probes each , 1 pump each



Pump down between probes E1-E2 respectively E3-E4 (alternatively control around one probe). This feature allows level control in two separate containers with only one device. It is also possible to control cascades.

FUNCTION 7

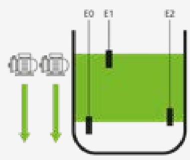
PUMP UP WITH INTEGRATED PUMP CHANGE
(2uc) 1 container, 2 probes, 2 pumps



Pump up between the control probes E1 and E2. The V4LM acts as an intelligent pump changer (for even use) with pump monitoring (feedback inputs E3 & E4). If a pump fails, the remaining pump is permanently prioritized and an alarm is issued, for maximum availability and uninterrupted operation through full redundancy.

FUNCTION 8

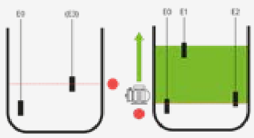
PUMP DOWN WITH INTEGRATED PUMP CHANGE
(2dc) 1 container, 2 probes, 2 pumps



Pump down between the control probes E1 and E2. The V4LM acts as an intelligent pump changer (for even use) with pump monitoring (feedback inputs E3 & E4).
If a pump fails, the remaining pump is permanently prioritized and an alarm is issued, for maximum availability and uninterrupted operation through full redundancy.

FUNCTION 9

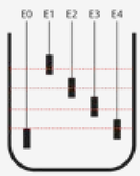
WELL CONTROL (3w-) WITH WELL AND DRY ALARM
1 well, 1 high tank, 3 probes, 1 pump



The function serves to ensure the water supply by means of a high tank and a well (pump up into the high tank from the well). Alarm functions: well alarm and dry alarm (high tank and well without water). The pump is protected against dry running in case the well (or feeding container) is below sufficient liquid levels.

FUNCTION 10

CODE OUTPUT FOR PLC CONNECTION
(4ce) 1 container, 4 probes



The 3 output relays are used to output the probe states by means of coding. Up to 4 level levels can be evaluated for one container.By connecting to an external controller, individual application conditions can be taken into account. Simple connection without external control unit can also protect up to four containers, with one probe each against overflow or dry running, and trigger a collective alarm.

FOR TECHNICAL SPECIFICATIONS please refer to page 29

Monitoring relays have a wide range of uses

Panel condition monitoring

TELE'S E1PF480Y/277VSY01 protects electrical components inside a panel by continuously checking phase loss, phase (un)balance, and phase rotation. Insufficient power supply or dirty voltage quality triggers the integrated alarm relay. The monitor activates the backup power or starts your fault response chain. TELE can also cover tripping delay functions.

No flooding in the underground car park

TELE LEVEL MONITOR V4LM continuously controls a potential increase of the water level in garage facilities. Once the connected sensors come into contact with ingressing water, the relay immediately activates pumps to drain the liquid and sends acoustic and optical warning signals.

V-belt monitoring

THE POWER FACTOR METER G2CM400VL10AL20 quickly recognizes whether a V-belt has broken or if it has become loose. A tripping delay ensures that no fault messages or acoustic or optical warning signals are sent to the control system in the event of small deviations.

please scan QR code to see more monitoring relay applications

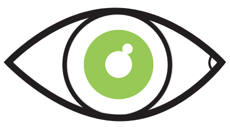
TYPE DESIGNATION	E1PF480Y/277VSY01 ★ TOP SELLER ★	E1PF480Y/277VSY10	E1YM480/277VS10	E1UM230V01	E1IM10AACL10
ORDER INFORMATION					
Part No.	1340306	1340305	1340409	1340101	1340200
FUNCTIONALITY	phase monitor	phase monitor	3-phase voltage monitor	1-phase voltage monitor	1-phase current monitor
Phase failure, Loss	■	■			
SEQ ... Phase sequence	■	■	■		
ASYM ... Asymmetry, Balance	■	■			
O ... Over					■
U ... Under			■	■	■
W ... Window			■	■	■
SWITCHING THRESHOLD					
Maximum			75 to 110% of U_N	80 to 120% of U_N	10 to 100% of I_N
Minimum			65 to 100% of U_N	75 to 115% of U_N	5 to 95% of I_N
Asymmetry	5 to 25%, OFF	5 to 25%, OFF	-	-	-
MEASURING CIRCUIT					
Measuring variable	3~ voltage AC sinus	3~ voltage AC sinus	3~ voltage AC sinus	1~ voltage AC/DC sinus	1~ current AC sinus
Measuring input	U_N= 480/277V AC	U_N= 480/277V AC	U_N= 480/277V AC	24V AC/DC and 230V AC	10A AC
SUPPLY CIRCUIT					
Supply voltage	-10% to +10% of U_N 432V to 528+V AC	-10% to +10% of U_N 432V to 528V AC	-35% to +10% of U_N 312V to 528V AC	-25% to +20% of U_N 18 to 29V AC/DC; 173 to 276V AC	-15% to +15% of 230V AC 195V to 265V AC
Frequency range	48 – 63Hz	48 – 63Hz	48 – 63Hz	48 – 63Hz or DC	48 – 63Hz
TIME CIRCUITS					
Tripping delay (DELAY)	fixed, approx. 100ms	0.1 – 20s	0.1 – 10s	-	0,1 – 10s
OUTPUT CIRCUIT					
Contact	SPDT	SPDT	SPDT	SPDT	SPDT
Switching capacity	1250VA (5A / 250V AC)	1250VA (5A / 250V AC)	1250VA (5A / 250V AC)	1250VA (5A / 250V AC)	1250VA (5A / 250V AC)
DESIGN					
Dimensions (W×H×D)	0.69×2.43×2.56 in (17.5×87×65 mm)				
Certificates	CE, cULus, EAC, UKCA				

TYPE DESIGNATION	G2PF400VS02	G2PF230VS02	G2PF115VS02	G2PM400VSY20	G2PM230VSY20	G2PM115VSY20
ORDER INFORMATION						
Part No.	2390000	2390001	2390002	2390505	2390512	2390506
FUNCTIONALITY	phase monitor			3 -phase voltage monitor		
U ... Under				■	■	■
W ... Window				■	■	■
SEQ ... Phase sequence	■	■	■	■	■	■
Phase failure	■	■	■	■	■	■
ASYM ... Asymmetry	■	■	■	■	■	■
SWITCHING THRESHOLD						
Maximum	-			-20 to +30% of U_N		
Minimum	-			-30 to +20% of U_N		
Asymmetry	fixed, typ. 30%			5 to 25%, OFF		
MEASURING CIRCUIT						
Measuring variable	3(N)~ voltage AC sinus			3(N)~ voltage AC sinus		
Measuring input	U_N= 400/230V AC	U_N= 230/132V AC	U_N= 115/66V AC	U_N= 400/230V AC	U_N= 230/132V AC	U_N= 115/66V AC
Frequency range	48–63Hz			48–63Hz		
SUPPLY CIRCUIT						
Supply voltage	= U_N			24 to 240V AC/DC		
TIME CIRCUITS						
Start-up suppression time (START)	fixed, max. 500ms			-		
Tripping delay (DELAY)	fixed, max. 350ms			0.1 – 10s		
OUTPUT CIRCUIT						
Contacts	DPDT			DPDT		
Switching capacity	1250VA (5A / 250V AC)					
DESIGN						
Dimensions (W×H×D)	0.88×3.54×4.25 in (22.5×90×108 mm)					
Certificates	CE, cULus, EAC, UKCA					

TYPE DESIGNATION	G2UM300VL20	G2IM5AL20	G2IM10AL20	G2JM5AL20
ORDER INFORMATION				
Part No.	2390304	2390411	2390410	2390801
FUNCTIONALITY	1-phase voltage monitor	1-phase current monitor	1-phase current monitor	3-phase current monitor
O ... Over	■	■	■	■
U ... Under	■	■	■	■
W ... Window	■	■	■	■
SEQ ... Phase sequence				
Phase failure				
ASYM ... Asymmetry				
+LATCH ... Error memory	■	■	■	■
SWITCHING THRESHOLD				
Maximum	10 to 100% of U_N	10 to 100% of I_N	10 to 100% of I_N	10 to 100% of I_N
Minimum	5 to 95% of U_N	5 to 95% of I_N	5 to 95% of I_N	5 to 95% of I_N
Asymmetry	-	-	-	-
MEASURING CIRCUIT				
Measuring variable	voltage AC/DC AC sinus	current AC/DC AC sinus	current AC/DC AC sinus	current AC AC sinus
Measuring input	30 / 60 / 300V AC/DC	20mA / 1A / 5A AC/DC or CT	100mA / 1A / 10A AC/DC or CT	5A AC or CT
Frequency range	16,6 – 400Hz or DC	16,6 – 400Hz or DC		16,6 – 400Hz
SUPPLY CIRCUIT				
Supply voltage	24 to 240V AC/DC	24 to 240V AC/DC	24 to 240V AC/DC	24 to 240V AC/DC
TIME CIRCUITS				
ON delay	-	-	-	-
Start-up supression time (START)	0 – 10s	0 – 10s	0 – 10s	0 – 10s
Tripping delay (DELAY)	0.1 – 10s	0.1 – 10s	0.1 – 10s	0.1 – 10s
OUTPUT CIRCUIT				
Number of switch contacts	DPDT	DPDT	DPDT	DPDT
Switching capacity	1250VA (5A / 250V AC)			
DESIGN				
Dimensions (W×H×D)	0.88×3.54×4.25in (22.5×90×108mm)			
Certificates	CE, cULus, EAC, UKCA			

TYPE DESIGNATION	G2PM690VSY20	G2PU690VS20 ★ TOP SELLER ★	G2TFKN02	G2LM20
ORDER INFORMATION				
Part No.	2390517	2390507	2390110	2390201 (24 V AC) 2390202 (110 V AC) 2390200 (230 V AC)
FUNCTIONALITY	3- phase voltage monitor	3-phase loss monitor	temperature monitoring (PTC)	level monitor for conductive liquids
U ... Under	■	■		
W ... Window	■			
SEQ ... Phase sequence	■	■		
Phase failure	■	■		
ASYM ... Asymmetry	■	■		
Temperature monitoring (PTC)			■	
Short circuit monitoring (PTC)			■	
Zero-voltage latch (PTC)			■	
Test function (PTC)			■	
Pump up				■
Pump down				■
SWITCHING THRESHOLD				
Maximum	55 to 115% of U_N	-	≥ 3.6 kΩ (switch-off resistance)	-
Minimum	50 to 110% of U_N	180 to 690 V AC	≤ 1.6 kΩ (switch-on resistance)	-
Asymmetry	5 to 25%, OFF	fixed, 25%	-	-
MEASURING CIRCUIT				
Measuring variable	3~ voltage AC sinus	3~ voltage AC sinus	temperature	liquid level via conductive probes
Measuring input	3~ 208-690 V AC	180-690 V AC	-	0.25 to 100 kΩ
SUPPLY CIRCUIT				
Supply voltage	= measuring voltage 177 V to 794 V AC	= measuring voltage 177 V to 794 V AC	24 to 240 V AC/DC	24 V AC 110 V AC 230 V AC
Frequency range	20-70 Hz	20-70 Hz	-	-
TIME CIRCUITS				
Start-up suppression time (START)	-	-	-	-
Tripping delay (DELAY)	0.1 – 10 s	0.1 – 10 s	-	0.5 – 10 s
OFF delay	-	-	-	0.5 – 10 s
OUTPUT CIRCUIT				
Contacts	DPDT	DPDT	DPDT	DPDT
Switching capacity	1250 VA (5 A / 250 V AC)			
DESIGN				
Dimensions (W × H × D)	0.88 × 3.54 × 4.25 in (22.5 × 90 × 108 mm)			
Certificates	CE, cULus, EAC, UKCA			

Please find probes matching E3LM-, G2LM-, V4LM-series on page 35 (chapter: Add-ons).



TYPE DESIGNATION	V2TF01	V2IM10AL10	V4IM100AL20	V4IM35AL20	V4LM4S30
			★ TOP SELLER ★	★ TOP SELLER ★	
ORDER INFORMATION					
Part No. screw terminal	2100100	2100400	2104400 (100A)	2104402 (35A)	2104500
FUNCTIONALITY	temperature monitor	1-phase current monitor	1-phase current monitor	1-phase current monitor	liquid level monitor
O ... Over		■	■		10 functions selectable via rotary switch – for function overview pls. refer to page 21
U ... Under		■	■	■	
W ... Window		■	■	■	
2MAX ... Maximum monitoring			■	■	
MM ... Min. and max. monitoring			■	■	
+LATCH ... Error memory			■	■	
Temperature monitoring (PTC)	■			■	
Short circuit monitoring (PTC)	■				
SWITCHING THRESHOLD					
Maximum	≥ 3.6 kΩ (switch-off resistance)	10 to 100% of I_N	10 to 100% of I_N	10 to 100% of I_N	sensitivity: 10 kΩ - 500 kΩ Vsense: 20, 40, 60, 80, 100%
Minimum	≤ 1.6 kΩ (switch-on resistance)	5 to 95% of I_N	5 to 95% of I_N	5 to 95% of I_N	sensitivity: 250 Ω – 12.5 kΩ Vsense: 20, 40, 60, 80, 100%
MEASURING CIRCUIT					
Measuring variable	temperature	1~ current AC/DC AC sinus	1~ current AC/DC AC sinus	1~ current AC/DC AC sinus	level via conductive probes
Measuring input	PTC	10A AC/DC	100A AC/DC	35A AC/DC	low (L): 250Ω – 12.5kΩ high (H): 10kΩ - 500kΩ
SUPPLY CIRCUIT					
Supply voltage	24 – 240V AC/DC -15% to +10%	AC: 110 - 240V; DC: 24 - 240V AC: -15% to +15% DC: -30% to +30%	24 - 240V AC/DC AC: -15% to +10% DC: -30% to +30%	24 - 240V AC/DC AC: -15% to +10% DC: -30% to +30%	24-240V AC/DC AC: -10% to +10% DC: -25% to +25%
Frequency range	16.6 to 400Hz or DC	16.6 to 400Hz or DC	16.6 to 400Hz or DC	16.6 to 400Hz or DC	16.6 to 400Hz or DC
TIME CIRCUITS					
ON delay	approx. 50ms	approx. 300ms	approx. 300ms	approx. 300ms	-
Start-up surpression time (START)	-	-	0 – 10s	0 – 10s	-
Tripping delay (DELAY)	-	0.1 – 10s	0.1 – 10s	0.1 – 10s	-
Delay (measuring filter)	-	-	-	-	1-10s
OUTPUT CIRCUIT					
Contact	SPNO	SPDT	2×SPDT	2x SPDT	3×SPNO
Switching capacity	2000VA (8A / 250V AC)	2000VA (8A / 250V AC)	2000VA (8A / 250V AC)	2000VA (8A / 250V AC)	1250VA (5A / 250V AC)
DESIGN					
Dimensions (W×H×D)	0.88×2.64×2.99in (22.5×67×76mm)		1.76×2.64×2.99in (45×67×76mm)		
Certificates	CE, cULus, EAC, UKCA				

Please find probes matching E3LM-, G2LM-, V4LM-series on page 35 (chapter: Add-ons).



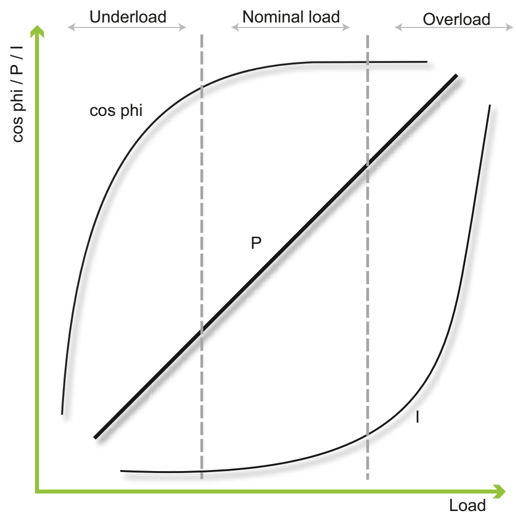

TYPE DESIGNATION	V2PF480Y/277VSY01	V2PM400Y/230VS10	V2UM230V10	V4PF480Y/277VSYTK02
ORDER INFORMATION				
Part No. screw terminal	2100000	2100500	2100300	2104200
Part No. packaging unit (10 pcs)	2100000A	-	-	-
FUNCTIONALITY	phase monitor	3- phase voltage monitor	1- phase voltage monitor	phase and temperature monitor
Phase failure, Loss	■	■		■
SEQ ... Phase sequence	■	■		■
ASYM ... Asymmetry, Balance	■			■
U ... Under		■	■	
W ... Window		■	■	
Temperature monitoring (PTC)				■
SWITCHING THRESHOLD				
Maximum	-	75 to 130% of U_N	80 to 115% of U_N	-
Minimum	-	70 to 125% of U_N	75 to 110% of U_N	-
Asymmetry	5 to 25%, OFF	-	-	5 to 25%, OFF
MEASURING CIRCUIT				
Measuring variable	3~ voltage A s	3~ voltage AC sinus	1~ voltage AC/DC AC sinus	3~ voltage AC sinus temperature
Measuring input	U_N= 480/277V AC	U_N= 400/230V AC	U_N= 24V AC/DC or 230V AC	U_N= 480/277V AC
SUPPLY CIRCUIT				
Supply voltage	-10% to +10% of U_N 432/250V to 528/305V AC	-35% to +35% of U_N 260/250V to 540/310V AC	-30% to +30% of U_N 17V to 31V AC/DC; 161V to 299V AC	-10% to +10% of U_N 432/250V to 528/305V AC
Frequency range	48 – 63 Hz	16.6 – 400 Hz	16.6 – 400 Hz or DC	48 – 63 Hz
TIME CIRCUITS				
ON delay	approx. 400 ms	approx. 200 ms	approx. 300 ms	approx. 500 ms
Tripping delay (DELAY)	< 250 ms	0.1 – 10 s	0.1 – 10 s	approx. 250 ms
OUTPUT CIRCUIT				
Contact	SPDT	SPDT	SPDT	DPDT
Switching capacity	2000VA (8A / 250V AC)	2000VA (8A / 250V AC)	2000VA (8A / 250V AC)	2000VA (8A / 250V AC)
DESIGN				
Dimensions (W×H×D)	0.88×2.64×2.99 in (22.5×67×76 mm)			1.76×2.64×2.99 in (45×67×76 mm)
Certificates	CE, cULus, EAC, UKCA			

Power Monitors

TELE power monitoring systems offer significant advantages, particularly in situations in which monitoring tasks are usually carried out by sensors and load monitoring relays.

Benefits at a glance:

- No problems due to contamination or measurement value drift of the sensors
- No maintenance and cleaning costs
- Easy to use, even in charged air or volatile substances
- Savings in terms of cabling
- No use of explosion-proof barriers necessary
- Reduction of error sources
- Easy retrofitting



CURRENT MONITORING RELAYS

Pure current measurements in the supply to motors can only be used in an extremely restricted capacity to monitor loads. This is due to three essential factors:

01 In alternating current circuits, the measured current is apparent current. This total current comprises the sum of reactive and active current components. However, when generating mechanical power it is the active current that is exclusively decisive. The reactive current merely causes losses and does not contribute to the shaft power delivered.

02 In an underload range the current does not reduce in a linear manner with the load but instead remains relatively high due to the necessary magnetisation current. Therefore, no relevant correlation exists between current and load.

03 The current is dependent on the supply voltage. An undervoltage condition with a constant load can result in an increased current draw. To prevent such cases monitoring of the pure active current is insufficient.

This means that pure current monitoring is applicable only for extreme operating conditions, such as a drive blockage, because the current rises dramatically in such cases.

POWER MONITORING SYSTEMS WITH POWER FACTOR MEASUREMENT (COS φ)

The power factor cos φ is the cosine of the phase shift angle between the current drawn and the voltage applied. For electrical motors this is dependent on the loading and theoretically equals 1 in an ideal case. However, due to induction it effectively lies within a range of 0.85 to 0.95 with a nominal load.

In an underload range, the cos φ monitor is extremely significant because the proportion of losses increases sharply at lower loads and results in a cos φ of up to <0.5 in an idle state. This is not applicable around the zero point and in an overload range because load changes cause only small changes of the phase shift angle φ.

POWER MONITORING SYSTEMS WITH EFFECTIVE POWER MEASUREMENTS

The effective power measurement facilitates obtaining the most precise feedback regarding the state of an electrical motor because the effective power is proportional to the shaft power. A direct correlation exists between the effective power supplied and the motor loading (torque at constant rotational speed) across the entire working range.

TELE solutions offer:

- Functional safety
- Voltage drop protection
- Over voltage protection
- Monitoring of voltage quality
- Frequency drop protection
- Frequency rise protection
- Detection of off-grid operation

Applications:

- Machinery tools
- Conveyor systems
- Screening machinery
- Bridge and portal cranes
- Centrifugal and piston pumps

Power monitors are being used for various applications

Monitoring of a waste incineration screw conveyor

G4BM480V12ADTL20 The screw conveyor in a waste incineration plant is monitored for overload. If the screw gets blocked or if pieces in the conveyor are too heavy, overload is detected by the effective power of the drive motor and the conveyor system is switched off.

Sensorless pump monitoring

G4CM690V16ATL20 Waste water facility pumps need monitoring of three operating conditions: dry running, mislaid input filter or missing intake and lower density through heating of the medium. Safe operation of machinery and systems is ensured by constantly monitoring the power factor of the drive motor.

Monitoring of a facility's ventilation system

G2CM400V10AL20 The correct functioning of an exhaust fan is monitored with the function "under" (underload monitoring). When the exhaust duct is clogged, the power factor worsens. The device reads this metric. In addition, high starting current need to be bridged for a short time and must not lead to a shutdown.

TYPE DESIGNATION	G2CM400V10AL20	G4CM690V16ATL20	G2BM480V12AFL10	G4BM480V12ADTL20
ORDER INFORMATION				
Part No.	2390602	2394600	2390700	2394706
FUNCTIONALITY	power factor cos φ in 1- or 3-phase mains	power factor cos φ in 1- or 3-phase mains	true power monitoring in 1- or 3-phase mains	true power monitoring in 1- or 3-phase mains
O ... Overload monitoring	■		■	■
U ... Underload monitoring	■		■	■
W ... Window	■			■
2MIN ... Minimum monitoring		■		■
2MAX ... Maximum monitoring		■		■
MIN/MAX ... Minimum- and maximum monitoring		■		■
+LATCH ... Error memory	■	■	■	■
I = 0 DETECTION ... Recognition of disconnected consumers		■	■	■
Temp ... Temperature monitoring of the motor winding		■		■
SWITCHING THRESHOLD				
Threshold P / P1	cos φ Max: 0.2 – 1.0	cos φ 1: 0,3 – 1 (inductive) 1 – 0,3 (capacitive)	5 to 120% of P_N	2.5kW: 120W to 2.5W 10kW: 480W to 10kW
Threshold P2	cos φ Min: 0.1 – 0.99	cos φ 1: 0,3 – 1 (inductive) 1 – 0,3 (capacitive)	-	2.5kW: 120W to 2.5W 10kW: 480W to 10kW
MEASURING CIRCUIT				
Measuring variable	power factor (cos φ), 1- or 3-phase loads AC sinus	power factor (cos φ), 1- or 3-phase loads AC sinus	true power, 1- or 3-phase loads AC sinus	true power, 1- or 3-phase loads AC sinus
Measuring range	0.1 to 1	0.3 to 1	0.75kW • 1.5kW • 3kW • 6kW 1hp • 2hp • 4hp • 8hp	2.5kW • 10kW 3.4 hp • 13.6hp
Measuring input voltage	40 to 415V AC (1-ph) 40/23 to 415/240V AC (3-ph)	85 to 690V AC (1-ph) 85 to 690/400V AC (3-ph)	0 to 480V AC (1-ph) 0 to 480/277V AC (3-ph)	0 to 480V AC (1-ph) 0 to 480/277V AC (3-ph)
Overload capacity voltage	500V AC (1-ph) 500/289V AC (3-ph)	796V AC (1-ph) 796/460V AC (3-ph)	550V AC (1-ph) 550/318V AC (3-ph)	550V AC (1-ph) 550/318V AC (3-ph)
Measuring input current	0.5 to 10A	1 to 8A (4.8kW) 2 to 16A (19.6kW)	0 to 6A (1.5kW) 0 to 12A (6kW)	0.15 to 6A (2.5kW) 0.3 to 12A (10kW)
Overload capacity current	11A permanent	20A permanent	12A permanent	12A permanent
SUPPLY CIRCUIT				
Supply voltage	selectable via power module TR2	selectable via power module TR3	selectable via power module TR2	24 – 240V AC/DC
TIME CIRCUITS				
Start-up surpression time (START)	1 – 100s	3 – 180s	0.1 – 2s	0 – 100s
Tripping delay (DELAY)	0.1 – 40s	1 – 50s	0.1 – 2s	0.1 – 50s
INPUT CIRCUIT				
Trigger input	-	Y1-Y2 (latch)	Y1-Y2 (latch)	Y1-Y2 (latch)
OUTPUT CIRCUIT				
Contacts	DPDT	2x SPDT	SPDT	2x SPDT
Switching capacity	1250VA (5A / 250V AC)			
DESIGN				
Dimensions (W×H×D)	0.88×3.54×4.25 in (22.5×90×108 mm)	1.76×3.54×4.25 in (45×90×108 mm)	0.88×3.54×4.25 in (22.5×90×108 mm)	1.76×3.54×4.25 in (45×90×108 mm)
Certificates	CE, cULus, EAC, UKCA			

TELE Meters

The new, compact power metering modules with ModBus RTU interface, for highly accurate, flexible and reliable measurements.

TELE carries a range of communication-capable sensing devices with ModBus RTU interface with the focus on electric energy applications and monitoring of key electrical values in industrial plants.

The modules may look like regular current transformers but they reliably measure current / voltage / power / energy and various other electrical values in single-phase networks. These values are provided to any kind of control unit, datalogger or PLC unit via the established industrial standard ModBus RTU.

The fast measurement cycles and data transmission gives the plant operator a clear view of the condition of his installation. This accurate process data enables specialists and engineers to adapt maintenance intervals accordingly, and help to avoid costly unscheduled downtimes.

SERIAL CONVERTER USB-RS485 (ISOLATED UP TO 5KV)

USB

The S-USB485 is a serial converter and galvanically isolated up to 5 kV, based on chip USB FTDI. Windows validated drivers download automatically when your PC is online. This device connects safely to any ModBus devices on RS485.

TELE SENS compact energy metering modules with Modbus RTU for various applications

Smart energy metering for ventilation systems

S9XM300A1000VM demonstrates its strengths for instance with ventilation systems in state-of-the-art facility management. Modern transducers need to be integrated into existing energy circuits in a sustainable and almost contactless way. Instead of a simple measuring device for conduction or energy, the requirement these days is to derive data from a measuring circuit and send them digitally to control units or SCADA systems for evaluation.

Quick and easily available information about operating conditions like e.g. energy flow, efficiency and fault states help detect potential wear and tear, blockages and may prevent costly engine failures, repair works and operational interruptions.

Digitally measuring wind-powered electrical generators

S6XM50A1000VM Wind turbines are regularly confronted with variable frequencies at alternating current and require measuring instruments that are precisely designed for this purpose.

Being one of the smallest single-phase power meters on the market TELE's S6XM50A1000VM is designed for use in rugged environments. Its integrated RS485 interface allows the S6XM50A1000VM to be connected to any ModBus device such as PCs, HMI, PLC, WLAN, modems and Wi-Fi access routers. A safely isolated data stream at the ModBus RTU interface delivers reliably values for power, current, voltage and energy (non-volatile meter memory).

V4IA100A 24-240V

Our unique and multifunctional current transducer challenges the status quo in the transducer world.

The 6 integrated analog outputs and the HALL sensor allow the direct conversion of up to 100A AC and DC to a mA or V signal.

The V4IA100A safely isolates and transmits your important process data. It can be mounted conveniently on a DIN-Rail. Also available with relay outputs.

Advantages

- Integrated current sensor for AC and DC
- Scalable input range 25 or 50 or 75 or 100A
- Galvanically isolated input/output
- Bidirectional current detection for DC
- Supply Voltage 24 – 240V AC/DC
- Adjustable Analog Outputs
- Low profile selector switches
- 4 LEDs for supply voltage, output status
- cULus, UKCA, CE, EAC, RoHs

Select from:

- ✔ 0..20mA
- ✔ 4..20mA
- ✔ 0..10V
- ✔ 12mA ± 8mA
- ✔ 10 ± 10mA
- ✔ 5V ± 5V

TYPE DESIGNATION	FUNCTIONALITY	DIMENSIONS (W × H × D)	PART NO.
V4IA100A 24-240V AC/DC	Current Transducer with Analog Outputs	1.77×2.64×2.99 in (45×67×76 mm)	2104420

				
TYPE DESIGNATION	**S6XM50A1000V** ★ TOP SELLER ★	**S9XM300A1000VM**	**S9IA300AM**	**S-USB485**
ORDER INFORMATION				
Part No.	2800200	2800220	2800030	498513
FUNCTIONALITY	power meter 1-ph	power meter 1-ph	current transducer 1-ph	USB to RS485 converter
INTERFACE				
ModBus RTU	■	■	■	■
Analog out 0-10V			■	
USB				■
INPUTS				
Current AC	50 A	300 A	300 A	-
Current DC	50 A	400 A	300 A	-
Voltage AC	800 V	800 V	-	-
Voltage DC	1000 V	1000 V	-	-
Frequency	DC and 1 – 400 Hz	DC and 1 – 400 Hz	DC and 20 – 2000 Hz	-
VALUES				
Irms	■	■	■	
Idc	■	■	■	
Vrms	■	■		
Vdc	■	■		
Ah on Irms			■	
Power/reactive/apparent power	■	■		
CosPhi	■	■		
Active energy bidirectional	■	■		
Ipeak	■	■		
Vpeak	■	■		
Frequency	■	■		
Min. values	■	■		
Max. values	■	■		
THD	■	■		
SUPPLY CIRCUIT				
Supply voltage	9 – 30 V DC	9 – 30 V DC	9 – 30 V DC	9 – 30 V DC
DESIGN				
Dimensions (W × H × D)	46.1 × 63 × 26.4 mm (1.8 × 2.48 × 1 in)	89,1 × 99.3 × 28.5 mm (3.5 × 3.9 × 1.12 in)		-
Compliance	EN601000-6-4/2006+A1 2011 EN64000-6-2/2005 EN61010-1/2010			
Certificates	CE	CE, cULus	CE, cULus	CE

Add-Ons

In addition to our core products we are glad to be offering the green extra:

Complementary Products

- DIN-rail mounting plates: MP [page 38]
- Power modules for GAMMA series [page 39]
- Probes: SK [page 39]
- Front covers for GAMMA series [page 39]

Switching Relays
Relay Bases
Accessories

- Multifunctional timer module series: COMBI [page 40]
- Miniature ice cube relays series: RA and RM [page 41]
- PCB/Slim ice cube relays series: RP [page 41]
- 8-/11-pin ice cube relays series: RT [page 41]
- Slim interface relays series: STKR [page 41]
- Accessories, Relay Bases, Modules [page 42]

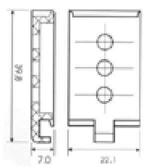
DC Power Supplies

- Industrial series: NDR [page 43]
- Industrial series: HDR [page 43]

Thyristor Control Units

- Fuse and fuse holders [page 43]
- Thyristor control series: GTF [page 44]
- Thyristor switch (SSR) series: GTS [page 44]

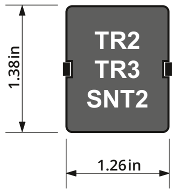
Mounting Plates MP easily attach any DIN-rail device to every kind of surface, panel and backplate



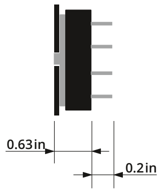
MP

TYPE DESIGNATION	FITS	ATTACHMENT	DIMENSIONS (W × H × D)	PART NO.
MP-Universal	ENYA, GAMMA, VEO	Ø 0.16 in (4 mm)	0.87×1.57×0.28 in (22.1×39.8×7.0 mm)	075574

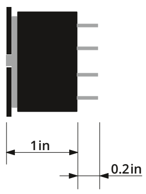
TR2, TR3, SNT Series power modules for transforming the supply voltage to the internal operating voltage of GAMMA relays



Design A



Design B



TYPE DESIGNATION	SUPPLY VOLTAGE	TOLERANCE	POWER INPUT P_{IN}	POWER OUTPUT P_{OUT}	DESIGN	PART NO.
SNT2 - 24V DC	24V DC	20.4 – 26.4V	2VA	0.5VA	A	282050
TR2 - 24V AC	24V AC	20.2 – 26.4V	2VA	0.5VA	A	282110
TR3 - 24V AC	24V AC	20.4 – 26.4V	4VA	1.5VA	B	285010
TR2 - 110V AC	110V AC	94 – 121V	2VA	0.5VA	A	282113
TR3 - 110V AC	110V AC	94 – 121V	4VA	1.5VA	B	285013
TR2 - 127V AC	127V AC	108 – 140V	2VA	0.5VA	A	282114
TR2 - 230V AC	230V AC	195 – 264V	2VA	0.5VA	A	282120
TR3 - 230V AC	230V AC	184 – 264V	4VA	1.5VA	B	285025
TR2 - 400V AC	400V AC	340 – 456V	2VA	0.5VA	A	282117
TR3 - 400V AC	400V AC	323 – 456V	4VA	1.5VA	B	285017
TR3 - 440V AC	440V AC	374 – 484V	4VA	1.5VA	B	285019
TR3 - 500V AC	500V AC*	425 – 550V	4VA	1.5VA	B	285026

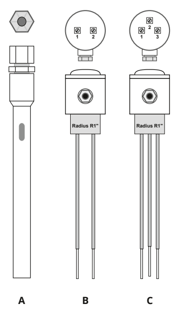
* may only be used with types G4PM and G4BM!

TR2 - 42V AC

TR3 - 400V AC

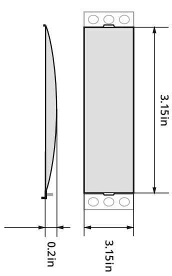
Remove protective cover before use.

Probes - SK Series for monitoring of conductive liquids with E3LM-, G2LM-, V4LM- SERIES



TYPE DESIGNATION	MAX. VOLTAGE	MAX. TEMPERA-TURE	NUMBER OF ELECTRODES	LENGTH	DESIGN	PART NO.
SK1	24V AC	140 °F (60 °C)	1	5.5 in (140 mm)	A	190107
SK2		194 °F (90 °C)	2	19.7 in (500 mm)	B	190108
SK3-500		194 °F (90 °C)	3	19.7 in (500 mm)	C	190109
SK3-1000		194 °F (90 °C)	3	39.4 in (1000 mm)	C	190110

Front Cover FA-G2 for GAMMA monitoring relays, width 8.9 in (22.5 mm)



TYPE DESIGNATION	DESCRIPTION	DIMENSIONS (W × H × D)	PART NO.
FA-G2	sealable front cover for protecting GAMMA devices against unintended or unauthorized changes in setup parameters	8.9 × 3.1 × 0.2 in (22.5 × 80 × 5 mm)	070160

2 IN1 ELECTRONIC MULTIFUNCTION TIMER

★ TOP SELLER ★

RT

+

COM3T

+

Socket

→

RT + COM3T + Socket

The 2 in1 electronic multifunction timer combined with 3PH power contactor is the perfect solution for directly switching small motors, fans, pumps, , lamp loads or electric heaters up to 10A@230V. Thanks to the compact size and versatility it reduces space, wiring costs and the amount of components. This is why this unit is the ideal replacement for standard plug-in contactors.

COMBI Series multifunction timer module for industrial relays (RT) with socket type ES9 and PF-113BEM (ES12)

TYPE DESIGNATION	FUNCTIONS	TIME RANGES	SUPPLY VOLTAGE	NUMBER OF SWITCHING CONTACTS	DIMENSIONS (W × H × D)	CERTIFICATES	PART NO.
COM3T	8 E, R, Ws, Wa, Wu, Es, Bp, Bi	8 (0.05 s – 10 d)	24 – 240 V AC/DC	DPDT or 3PDT (according to industrial relay)	1.4×0.5×1.9 in (35×12×47 mm)	CE, cULus	237010

Relay Bases for switching relays

<table>
<tr><th>MODEL</th><th>MODULES USABLE</th><th>TYPE OF CONNECTION</th><th>FOR RELAYS</th><th colspan="2">RATED VOLTAGE</th><th>PACKAGING UNIT</th><th>PART NO.</th></tr>
<tr><td>PYF14BE (ES 15/4N)</td><td rowspan="9">yes
(pls. s. table below)</td><td rowspan="2">screw terminal</td><td rowspan="4">RA, RM</td><td rowspan="13">300 V</td><td rowspan="13">AC</td><td rowspan="5">10</td><td>180134</td></tr>
<tr><td>PYF14BE3 (ES 15/4S)</td><td>180145</td></tr>
<tr><td>PYF14BE3CC (ES 15/4G)</td><td>push-in terminal</td><td>180148</td></tr>
<tr><td>CST-B14F2-L (ES 15/4B)</td><td rowspan="3">screw terminal</td><td>180146</td></tr>
<tr><td>RSS214</td><td>RM</td><td>180050</td></tr>
<tr><td>PI50BE/3R (ES 50/3)</td><td rowspan="4">RP</td><td rowspan="3">20</td><td>180150</td></tr>
<tr><td>PI50BE/3CC (ES 50/3G)</td><td>push-in terminal</td><td>180149</td></tr>
<tr><td>PI50BE (ES 50)</td><td rowspan="6">screw terminal</td><td>180137</td></tr>
<tr><td>PSS8/3</td><td rowspan="4">10</td><td>180056</td></tr>
<tr><td>PF083BE (ES8)</td><td>no</td><td rowspan="2">RT 8-pin</td><td>180139</td></tr>
<tr><td>ES 9</td><td rowspan="2">yes
(pls. s. table below)</td><td>180041</td></tr>
<tr><td>PF113BEM (ES12)</td><td rowspan="2">RT 11-pin</td><td>180136</td></tr>
<tr><td>PF113BE (R11X)</td><td>no</td><td>1 or 10*</td><td>180155</td></tr>
</table>

* For KAPPA series also available as single packaging unit.

Socket PYF14BE (ES15/4N)

Socket PI50BE(ES50)

Socket PYF14BE3CC (ES15/4G)

Socket PF113BE (R11X)

STKR Series + Accessories slim interface relays

STKR + PB-B SKR

TYPE DESIGNATION	RATED VOLTAGE		RATED CURRENT	RELAY VOLTAGE	CONTACTS	PACK. UNIT	PART NO.
STKR 524	24V	AC/DC	6A	24V DC	SPDT	10 pcs	180504
STKR 024	24V	DC		24V DC	SPDT		180503
STKR 615	115V	AC/DC		24V DC	SPDT		180506
STKR 730	230V	AC		60V DC	SPDT		180505

ACCESSORIES	FUNCTION	RATED CURRENT	DETAILS	CONTACTS	PACK. UNIT	PART NO.
PB-B SKR	jumper link	-	blue	20	10 pcs	180535
PB-R SKR		-	red			180536
RM699V-3011-85-1024	replacement relay for STKR	6A	24V DC	SPDT	20 pcs	100660
RM699V-3011-85-1060			60V DC	SPDT		100661

RA, RM Series miniature ice cube relays

RA

RM

TYPE DESIGNATION	RATED VOLTAGE		RATED CURRENT	LED	CONTACTS	PACKAGING UNIT	PART NO.
RA 524L-N	24V	AC	12A	■	DPDT	10 pcs	100623LD-N
RA 615L-N	115V			■			100621LD-N
RA 730L-N	230V			■			100624LD-N
RA 012L-N	12V	DC		■			100625LD-N
RA 024L-N	24V			■			100622LD-N
RM 512L-N	12V	AC	7A	■	4PDT		100612LD-N
RM 524L-N	24V			■			100613LD-N
RM 548L-N	48V			■			100614LD-N
RM 615L-N	115V			■			100618LD-N
RM 730L-N	230V			■			100619LD-N
RM 012L-N	12V	DC		■			100601LD-N
RM 024L-N	24V			■			100603LD-N
RM 048L-N	48V			■			100602LD-N
RM 060L-N	60V			■			100616LD-N
RM110L-N	110V			■			100617LD-N
RM 220L-N	220V			■			100620LD-N

* RA and RM relays with gold plating and integrated suppression diode available upon request.

RP Series PCB/slim ice cube relays

RP

TYPE DESIGNATION	RATED VOLTAGE		RATED CURRENT	CONTACTS	PACKAGING UNIT	PART NO.
RP 012-2	12V	DC	8A	DPDT	20 pcs	100420
RP 024-2	24V					100416
RP 524-2	24V	AC				100417
RP 615-2	115V					100421
RP 730-2	230V					100418

RT Series 8- and 11-pin ice cube relays

RT

TYPE DESIGNATION	RATED VOLTAGE		RATED CURRENT	LED	CONTACTS	PACKAGING UNIT	PART NO.
RT 1.2.012L	12V	AC	10A	■	DPDT	10 pcs	100508LD
RT 1.2.024L	24V			■			100507LD
RT 1.2.110L	110V			■			100505LD
RT 1.2.230L	230V			■			100502LD
RT 2.2.012L	12V	DC		■			100517LD
RT 2.2.024L	24V			■			100516LD
RT 1.3.024L	24V	AC		■	3PDT	10 pcs	100526LD
RT 1.3.048L	48V			■			100524LD
RT 1.3.110L	110V			■			100522LD
RT 1.3.230L	230V			■			100521LD
RT 2.3.012L	12V	DC		■			100536LD
RT 2.3.024L	24V			■			100535LD
RT 2.3.048L	48V			■			100533LD
RT 2.3.060L	60V			■			100532LD
RT 2.3.110	110V						100531
RT 2.3.220	220V						100530

* RT relays with gold plating and integrated suppression diode available upon request.

Modules and Accessories for switching relays

MODEL	TYPE DESCRIPTION	FOR SOCKETS SERIES	FOR SWITCHING RELAYS SERIES	RATED VOLTAGE	PACKAGING UNIT	PART NO
M21N	diode	PYF, CST, PI	RA, RM, RP	6 – 230V DC (+A1)	20	180261
M41R	LED (red) + diode	PYF, CST, PI	RA, RM, RP	6 – 24V DC (+A1)		180263
EM 12	LED (green) + diode	RSS214, PSS8	RA, RM, RP	6 – 24V DC (+A1)	10	180309
EM 03	RC-link	RSS214, PSS8	RA, RM, RP	110 – 230V AC		180300
TYPE41 (TVL1)	LED + diode	PF113BEM, ES9	RT	6 – 24V DC (+A1)	20	180232
TYPE21 (TVD1)	retaining clip (metal)	PF113BEM, ES9	RT	6 – 230V DC (+A1)		180230
HB/RM-RA	retaining clip (plastic)	PYF, CST, RSS214	RA, RM		25	180032
HB/ES15	retaining clip (metal)	PYF, CST	RA, RM		10	180153
HB/RT	retaining clip (plastic)	PF, ES9	RT			180043
HB/RP 16	retaining clip (plastic)	PI50	RP		20	180029
HB/PSS	retaining clip (plastic)	PSS8/3	RP		10	180060
BS/PSS	front cover (label field)	PSS8/3	RP			180057

M41R

EM 12

EM 03


HB

Fuse Holders (capsule fuse) by Wöhner

MODEL	RATED CURRENT (IEC)	POLES	FUSE SIZE	PART NO.
Fuse holder 1-P 10x38	32 A	1-Poles	0.4×1.5 in (10×38 mm)	490976
Fuse holder 3-P 10x38	32 A	3-Poles	0.4×1.5 in (10×38 mm)	490977
Fuse holder 1-P 14x51	50 A	1-Poles	0.6×2 in (14×51 mm)	490978
Fuse holder 3-P 14x51	50 A	3-Poles	0.6×2 in (14×51 mm)	490979
Fuse holder 1-P 22x58	100 A	1-Poles	0.9×2.3 in (22×58 mm)	490987
Fuse holder 3-P 22x58	100 A	3-Poles	0.9×2.3 in (22×58 mm)	490988

Switching Power Supplies industrial housing for switch cabinet and plant construction by MeanWell

TYPE	INPUT VOLTAGE	DIMENSIONS (W × H × D)	OUTPUT VOLTAGE	OUTPUT CURRENT	OUTPUT POWER	PART NO.
NDR-120-24	90-264 V AC	1.6×4.9×4.5 in (40×125.2×113.5 mm)	24 V DC (adj. 24-28 V DC)	5.00 A	120 W	491601
NDR-240-24		2.5×4.9×4.5 in (63×125.2×113.5 mm)		10.0 A	240 W	491610
NDR-480-24		3.4×4.9×4.5 in (85.5×125.2×113.5 mm)		20.0 A	480 W	491619

- **Output voltage 24 V DC**
- **Output power 75–480W**
- **Overload and short circuit protection**

Switching Power Supplies compact housing for building and plant engineering by MeanWell

TYPE	INPUT VOLTAGE	DIMENSIONS (W × H × D)	OUTPUT VOLTAGE	OUTPUT CURRENT	OUTPUT POWER	PART NO.
HDR-15-24	85-264 V AC	0.7×3.5×21.4 in (17.5×90×54.5 mm)	24 V DC (adj. 21.6-29 V DC)	0.63 A	15 W	491701
HDR-30-24		1.4×3.5×21.4 in (35.0×90×54.5 mm)		1.50 A	30 W	491702
HDR-60-24		2.0×3.5×21.4 in (52.5×90×54.5 mm)		2.50 A	60 W	491703
HDR-100-24		2.8×3.5×21.4 in (70.0×90×54.5 mm)		3.83 A	100 W	491704

- **Output voltage 24 V DC**
- **Output power 15–92W**
- **Overload and short circuit protection**

GTF Series digital thyristor control unit (compact design, digitally configurable) by Gefran

MODEL	AUXILIARY VOLTAGE	NOMINAL VOLTAGE	NOMINAL CURRENT	FAN	INTERNAL FUSE	OPERATING MODE	DIMENSIONS (W × H × D)	PART NO
GTF-25-480-0-0-0-0 1-P-M	24V AC/DC	480V AC *	25A			phase clipping control (other operating modes configurable)	2.4×5.4×5.6 in (60×136.5×143mm)	493100
GTF-40-480-0-0-0-0 1-P-M			40A				2.4×5.4×5.6 in (60×136.5×143mm)	493105
GTF-50-480-0-0-0-0 1-P-M			50A				3.1×5.4×5.6 in (80×136.5×143mm)	493108
GTF-60-480-0-0-0-0 1-P-M			60A				3.1×5.4×5.6 in (80×136.5×143mm)	493111
GTF-75-480-0-0-0-0 1-P-M			75A				5×5.4×5.6 in (127×136.5×143mm)	493121
GTF-90-480-0-0-0-0 1-P-M			90A				5×5.4×5.6 in (127×136.5×143mm)	493131
GTF-120-480-0-0-0-0 1-P-M			120A	■			5×5.9×5.6 in (127×150.5×143mm)	493141
GTF-150-480-0-0-1-0 1-P-M			150A	■	■		4.3×11.9×6.7 in (108.3×302×170.4mm)	493152
GTF-200-480-0-0-1-0 1-P-M			200A	■	■			493161
GTF-250-480-0-0-1-0 1-P-M			250A	■	■			493171
Configuration cable + software								493090

* other nominal voltages upon request

GTF

GTS

Fuse holder

GTS Series Gefran thyristor switch (compact design, operating mode zero point switch) by Gefran

TYPE DESIGNATION	NOMINAL VOLTAGE	NOMINAL CURRENT	CONTROL INPUT	FAN	DIMENSIONS (W × H × D)	PART NO.
GTS-15/48-D-0	480V AC *	15A	6 – 32V DC		0.9×3.9×4.2 in (24×100×107 mm)	493010
GTS-25/48-D-0		25A			0.9×3.9×4.2 in (24×100×107 mm)	493005
GTS-40/48-D-0		40A			1.4×3.9×5.6 in (35×100×142 mm)	493003
GTS-50/48-D-0		50A			2.4×3.9×5.6 in (60×100×142 mm)	493001
GTS-60/48-D-0		60A			3.1×3.9×5.6 in (80×100×142 mm)	493020
GTS-75/48-D-0		75A			5×3.9×5.6 in (127×100×142 mm)	493021
GTS-90/48-D-0		90A			5×3.9×5.6 in (127×100×142 mm)	493022
GTS-120/48-D-0 VEN92		120A		■	5×3.9×5.6 in (127×100×142 mm)	493023

* other nominal voltages upon request

Semiconductor Fuses (capsule fuse) by Wöhner

TYPE DESIGNATION	NOMINAL CURRENT	NOMINAL CURRENT THYRISTOR CONTROL	FUSE SIZE	PART NO.
HL-Fuse 5A	10A	5A	0.4×1.5 in (10×38 mm)	490971
HL-Fuse 15A	25A	15A	0.4×1.5 in (10×38 mm)	490975
HL-Fuse 25A	30A	25A	0.4×1.5 in (10×38 mm)	490972
HL-Fuse 35A	40A	35A	1.6×2 in (41×51 mm)	490973
HL-Fuse 50A	63A	50A	0.9×2.3 in (22×58 mm)	490974
HL-Fuse 50A GTF	50A	50A	0.9×2.3 in (22×58 mm)	490986

PRODUCT SERIES		WIDTH		MEASURED VALUE		FUNCTION		ADDITIONAL FUNCTION		RELAY OUTPUT	SUPPLY VOLTAGE
E	ENYA	**1**	0.69in / 17.5mm	**Z**	time	**M**	multifunction	**F**	remote potentiometer	delayed	12-240V AC/DC
V	VEO	**2**	0.88in / 22.5mm			**Q**	quattro (4 funct.)	**WI**	impulse switch mode	**10** SPDT	24–240V AC/DC
G	GAMMA	**3**	1.38in / 35.0mm			**E**	ON delay	**LA**	load alternator	**20** DPDT	230V AC
K	KAPPA	**4**	1.76in / 45.0mm			**R**	OFF delay			instantaneous	24V DC
						I	flasher			**01** SPDT	and others
						S	star-delta (wye-delta) OFF delay without			**02** DPDT delayed and instantaneous	
						A	auxiliary voltage			**11** 2x SPDT	

E	1	Z	M	–	10	12-240V AC/DC

Example product code time delay relay

E	1	Z	M	–	10	12-240V AC/DC

E1ZM10 12-240VAC/DC

ENYA series, in a 0.69 in wide housing, multifunctional timer with a SPDT relay output and a supply voltage of 12-240 V AC/DC.

PRODUCT SERIES		WIDTH		MEASURED VALUE		FUNCTION		NOMINAL VALUE	ADDITIONAL FUNCTION		RELAY OUTPUT	SUPPLY VOLTAGE
E	ENYA	**1**	0.69in /	**U**	voltage 1~	**U**	under	**115V**	**L**	latch	delayed	12-240V AC/DC
V	VEO		17.5mm	**P**	voltage 3~Δ	**O**	over	**230V**	**D**	digital	**10** SPDT	24–240V AC/DC
G	GAMMA	**2**	0.88in /	**Y**	voltage 3~Y	**W**	window	**400V**	**T**	thermistor	**20** DPDT	230V AC
K	KAPPA		22.5mm	**I**	current 1~	**F**	error	**480V**	**Y**	asymmetry	instantaneous	24V DC
		3	1.38in /	**J**	current 3~	**M**	multifunction	**690V**	**S**	phase sequence	**01** SPDT	and others
			35.0mm	**F**	frequency	**A**	analog output	**5A**	**F**	quick action release	**02** DPDT	
		4	1.76in /	**T**	temperature			**10A**				
			45.0mm	**L**	liquid level			**480V 12A**	**T**	test function		
				B	real power			**400V 12A**	**K**	short circuit monitoring		
				C	power factor cos φ			**PT100**				
								etc	**N**	zero voltage safe		

G	2	P	U	690V	S	20 DPDT

Example product code monitoring relay

G	2	P	U	690V	S	20 DPDT

G2PU690VS20

Gamma series, in a 0.88 in wide housing, measures 3-ph voltage, under voltage detection for a nominal voltage of 690 V, includes phase sequence monitoring and DPDT output

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Edition 1/2022
Part No. 091105

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