Circuit breaker testing
Accessories

Contents

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Item	Description	TM1800	TM1700	TM1600	EGIL	Art. No.
Cables						
Analogue Input XLR/Banana	XLR female / 4 mm safety plugs, 1 m (3.3 ft). For customized analog transducer connection	X	X	X	X	GA-00040
Cable Analogue XLR/open ends	XLR female / open ends, 1 m (3.3 ft)	X	X	X	X	GA-00041
Extension cable Analogue Input	For analog input, XLR3 female / XLR3 male Analog cable EGIL/TM, 7.5 m (24.6 ft)	X	X	X	X	GA-00042
Transducer cable, XLR / IP / TS	NOVOTECHNIC IP/TS, 1 m (3.3 ft)	X	X	X	X	GA-00044
Transducer cable, XLR / TLH / LWH	NOVOTECHNIC TLH/LWH, 0.5 m (1.6 ft)	X	X	X	X	GA-00049
Transducer cable XLR / LWG	NOVOTECHNIC LWG/M12, 0.5 m (1.6 ft)	X	X	X	X	GA-00050

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Item	Description	TM1800	TM1700	TM1600	EGIL	Art. No.
Cable Current clamp						
	For current clamp, BNC / XLR3, 0.3 m (1 ft)	X	X	X	X	GA-00140
Cable, extension EGIL Timing MAIN	Extension cable for time measurement of main contacts, XLR5 female / XLR5 male					
	10 m (32.8 ft)				X	GA-00150
	5 m (16.4 ft)				X	GA-00155
Cable, EGIL Timing	Timing 5 m (16.4 ft) XLR5 / 4 mm banana incl. clamps				X	GA-00160
Cable, EGIL Timing AUX	AUX1&2, timing 2 m (6.5 ft) XLR5 / 4 mm banana excl. clamps				X	GA-00170
Cable, EGIL Voltage sense	SDRM Voltage sense cable incl. clamps, 2 m (6.5 ft)				X	GA-00175
Cable set, Timing TM1800 AUX TM1700 AUX TM1600 MAIN TM1600 AUX	The cable sets consist of 8 cables with clamps and 4 mm stackable safety plugs. For timing of CB contacts.					
	5 m (16.4 ft)	X	X	X		GA-00231
	10 m (32.8 ft)	X	X	X		GA-00241
	15 m (49.2 ft)	X	X	X		GA-00251
	20 m (65.6 ft)	X	X	X		GA-00261
	25 m (82 ft)	X	X	X		GA-00271
	40 m (131 ft)	X	X	X		GA-00281

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Item	Description	TM1800	TM1700	TM1600	EGIL	Art. No.
SCA600/Coax. Cable						
		X	X	X		GA-00750
Extension cable Analogue input						
	XLR female/XLR male 1 m (3.3 ft)	X	X	X	X	GA-00760
Cable reel	20 m (65.5 ft), 4 mm stackable safety plugs					
	Black	X	X	X	X	GA-00840
	Red	X	X	X	X	GA-00842
	Yellow	X	X	X	X	GA-00844
	Green	X	X	X	X	GA-00845
	Blue	X	X	X	X	GA-00846
Cable Timing MAIN	Timing M/R XLR3 male / banana, 5 m (16.4 ft), Length of the split portion (retractable sock), 2.4 m (8 ft) to 3.8 m (12 ft)	X	X			GA-00850
Extension cable Timing MAIN	For Timing M/R modules, XLR3 male / XLR3 female, 10 m (32.8 ft)	X	X			GA-00851
Adapter for Doble digital transducer	For Doble transd. (Use with GA-00895)	X	X			GA-00867

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Item	Description	TM1800	TM1700	TM1600	EGIL	Art. No.
Adapter for Siemens digital transducer						
	For Siemens digital transducer	X	X			GA-00868
Adapter for Vanguard digital transducer						
	For Vanguard transd. (Use with GA-00895)	X	X			GA-00869
Cable Timing AUX	*Including:* 4 Adapter for terminal block 4 Cable lug adapter 1 Cable, 5 m, (16.4 ft)	X	X			GA-00870
Digital transducercable	For customized digital transducer connection RS422, SUB-D15 / open ends, 10 m (33 ft)	X	X			GA-00885
Digital transducer extension cable	RS422, SUB-D15 / SUB-D15, 10 m (33 ft)	X	X			GA-00888
Cable Digital TP1 and Rotary EIL	NOVOTECH Digital TP1 and Rotary Baumer EIL transducer cable, D-SUB 15 / M12					
	20 m (66 ft)	X	X			GA-00887
	10 m (33 ft)	X	X			GA-00889

Item	Description	TM1800	TM1700	TM1600	EGIL	Art. No.
Adapter for Elcon digital transducer	For using Leine & Linde 530 digital transducer, 10 m (33 ft)	X	X			GA-00890
Baumer digital cable	For using Baumer BDH16.05A3600-LO-B, digital transducer, 10 m (33 ft)	X	X			GA-00895
Heidenhein digital cable	Digital transducer cable, Heidenhein, 10 m (33 ft)	X	X			GA-00900
Ethernet cable, network	Cable for connection to network/LAN, RJ45	X	X			GA-00970
TM1700/1800 DCM extension cable	1 DCM extension cable, DIN 6, 10 m (33 ft) Old type	X	X			GA-00998
	1 DCM extension cable, DIN 7, 10 m (33 ft) Actual type. See "TM1700/1800 DCM Extension cable" on page 9	X	X			GA-00999
Open analog cable	For customized analog transducer connection,1 m (3.3 ft)	X	X	X	X	GA-01000
Extension cable Analogue Input	For analog input, XLR3 female / XLR3 male Analog cable EGIL/TM, 10 m (33 ft)	X	X	X	X	GA-01005
Cable for AnaDig 10	Optional Cable for AnaDig 100, 1 m (3 ft)	X	X			GA-01008
Cable kit Control	Control kit for three phases *Including:* 5 Test clip 5 Adapter for terminal block 5 Cable lug adapter 5 5 m (16 ft) 2 0.25 m (10") 2 Jumper 1 Plastic box	X	X			GA-90002

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Item	Description	TM1800	TM1700	TM1600	EGIL	Art. No.
HV Timing cable kit	**x 5**					
	For Timing M/R modules, XLR3 male / XLR3 female					
	5 Cable,10 m (32.8 ft) GA-00851	X	X			GA-90005
Connection kit for Control cables"						
	Including:					
	5 Test clip					
	5 Adapter for terminal block					
	5 Cable lug adapter					
	1 Plastic box	X	X	X	X	GA-90010

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Item	Description				TM1800	TM1700	TM1600	EGIL	Art. No.
DCM – DualGround									
DCM	DCM TM1700 DualGround Timing								
	3- channels *Including:*								
	1 DCM Upgrade cable kit	CG-19180				X			BL-59190
	6-channels *Including:*								
	2 DCM Upgrade cable kit	CG-19180				X			BL-59192
TM1700/1800 DCM Upgrade cable kit	Cables for 3 channels addition DualGround upgrade from 3 to 6 channels Length of the 2-cable portion, 1.5 m (5 ft) *Including:*								
	3 DCM cable, 12 m (39 ft)								
	6 Clamp				X	X			CG-19180
TM1700/1800 DCM Extension cable kit	DualGround cable, DIN 7, extension for 3 channels 10 m (33 ft) (3 x GA-00999)				X	X			CG-19181
DCM - TM1800	Module for TM1800								
	DCM Module 3 DCM cables, 12 m (39 ft) DCM to Timing M/R cable 6 Timing clamps Accessory bag	GA-12900 KD-03040 GD-31040			X				CG-19190
	DCM Module 6 DCM cables, 12 m (39 ft) DCM to Timing M/R cable 12 Timing clamps Accessory bag	GA-12900 KD-03040 GD-31040			X				CG-19192
DCM Span extension cable	Cable to extend the span in the TM1700/1800 DCM BNC / BNC, 2 m (6.6 ft)				X	X			GA-00720
DCM Cable link	DCM to Timing M/R				X				GA-12900

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Item	Description	TM1800	TM1700	TM1600	EGIL	Art. No.
Software						
CABA Win						
	For TM1700/1800, incl. Ethernet cross-over cable	X	X			CG-8000X
	For TM1600, incl. fiberoptics and USB interface			X		BL-8203X
	For EGIL, incl. USB cable				X	BL-8206X
	Upgrade to R04D	X	X	X	X	CG-8010X
	Upgrade to R05, including Test Plan Editor (TPE)	X	X	X	X	CG-8040X

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Item	Description	TM1800	TM1700	TM1600	EGIL	Art. No.
Application kits						
First trip kit						
	For single operating mechanism, 1 + 3 clamps	X	X			BL-90700
	For three operating mechanisms, 3 + 3 clamps	X	X			BL-90710
Synchro Switch Relay kit	Synchronized Switching Relay test kit incl. accessories, software and cables (delivered in transport case)					
	SSR kit for TM 1700/1800	X	X			CG-91200
	SSR for TM1600 (incl. VD401)			X		BL-91200
Transducer calibration kit						
	Plate XB-39022 not included	X	X	X	X	XB-39095
Vibration kit	The Vibration kit extends TM1800/TM1700/TM1600 and CABA Win with the equipment and software required for recording and analyzing vibration signals at a circuit breaker. The kit includes the signal conditioning unit SCA606, the software CABA Win Vibration and one vibration channel. The vibration solution can be extended up to 6 channels.	X	X	X		BL-13090

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Item	Description	TM1800	TM1700	TM1600	EGIL	Art. No.
Vibration channel	Additional vibration channel to be used together with the Vibration kit. Each Vibration channel includes accelerometer, accelerometer adapter, cables to SCA606 and cables to TM1800/TM1700/TM1600*.	X	X	X		XB-32010

Item	Description	TM1800	TM1700	TM1600	EGIL	Art. No.
Static and dynamic resistance measurement						
SDRM201 *EGIL*						
GB-03430	**Included acessories:** SDRM Cable GB-03430 SDRM multi cable extension GA-12815 Voltage sense GA-00175 Voltage sense extension cable GA-00150 Current cable (red) GA-12820 Current cable (black) GA-12830 Clamps (2 pcs) KD-03040 Ground cable, 2.5 mm², 10 m (33 ft) GA-00208 Charger HC-04210 Accessory bag GD-31040 Case GD-00222				X	CG-90250
SDRM202	**Included accessories** SDRM Cable for TM1700/1800 GB-03411 SDRM multi cable extension, 7.5 m (24.6 ft) GA-12815 Current cable, red, 2pcs, 3 m (9.8 ft) GA-12820 Current cable, black 2 pcs, 0.5 m (1.6 ft) GA-12830 Ground cable, 2.5 mm² 10 m (33 ft) GA-00208 Charger HC-04210 Accessory bag GD-31040 Case GD-00222	X	X			CG-90200
	Pack of 3 units (CG-90200) for circuit breaker with 2 Breaks/Phase	X	X			CG-90230
	SDRM Cable for TM1600 GB-03421 SDRM multi cable extension, 7.5 m (24.6 ft) GA-12815 Current cable, red, 2 pcs, 3 m (9.8 ft) GA-12820 Current cable, black 2 pcs, 0.5 m (1.6 ft) GA-12830 Ground cable, 2.5 mm² 10 m (33 ft) GA-00208 Charger HC-04210 Cable XLR/Banana 2 pcs. GA-00040 Accessory bag GD-31040 Case GD-00222			X		CG-90210
	SDRM Cable for EGIL GB-03430 SDRM multi cable extension, 7.5 m (24.6 ft) GA-12815 Voltage sense cable, 2 m (6.5 ft) GA-00175 Voltage sense extension cable, 10 m (33 ft) GA-00150 Current cable, red, 2pcs, 3 m (9.8 ft) GA-12820 Current cable, black 2 pcs, 0.5 m (1.6 ft) GA-12830 Clamps (2 pcs) KD-03040 Ground cable, 2.5 mm² 10 m (33 ft) GA-00208 Charger HC-04210 Accessory bag GD-31040 Case GD-00222				X	CG-90220

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Item	Description			TM1800	TM1700	TM1600	EGIL	Art. No.
SDRM202 Cable								
	SDRM Cable for TM1700/1800 *Including:* Accessory bag	GD-31040		X	X			CG-90205
	SDRM Cable for TM1600 *Including:* Accessory bag Cable XLR/Banana 2 pcs.	GD-31040 GA-00040				X		CG-90215
SDRM Cable (CG-90205)	SDRM Cable for EGIL *Including:* Voltage sense extension cable 10 m (33 ft) Accessory bag Voltage sense cable, 2 m (6.5 ft) Clamps 2 pcs)	GA-00150 GD-31040 GA-00175 KD-03040					X	CG-90225
Extension cable, SDRM201/202	Extension cable for CG-90200 and CG-90210 10 m (33 ft)			X	X	X	X	GA-12810
	7.5 m (24.6 ft)			X	X	X	X	GA-12815
Current cables and clamps for SDRM202	Cable, red 2.5 m (8.2 ft)			X	X	X	X	GA-12820
	Cable, black, 0.5 m (1.6 ft)			X	X	X	X	GA-12830
	Clamps (2 pcs)			X	X	X	X	KD-03040

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Item	Description	TM1800	TM1700	TM1600	EGIL	Art. No.
Transducers						
Linear						
Analog						
TLH-150	150 mm (5.9") travel [1]	X	X	X	X	XB-30016
TLH-225	225 mm (8.8") travel [1]	X	X	X	X	XB-30017
TLH-500	500 mm (19.7") travel [1]	X	X	X	X	XB-30020
TLH-750	750 mm (29.5") travel [1]	X	X	X	X	XB-30022
TLH-1000	1000 mm (39.4") travel [1]	X	X	X	X	XB-30023
	[1] Including cable, 0.5 m (20") GA-00049					
LWG 150	150 mm (5.9") travel [2]	X	X	X	X	XB-30116
LWG 225	225 mm (8.8") travel [2]	X	X	X	X	XB-30117
LWG 500	500 mm (19.7") travel [2]	X	X	X	X	XB-30120
	[2] Including cable, 0.5 m (20") GA-00050					
TS 150	150 mm (5.9") travel [3]	X	X	X	X	XB-30030
TS 50	50 mm (1.9") travel [3]	X	X	X	X	XB-30031
TS 25	25 mm (1") travel [3]	X	X	X	X	XB-30033
	[3] Including cable, 1 m (39") GA-00044					
Digital						
Linear transducer TP1 300 mm	NOVOTECHNIC TP1 (Highspeed design for Megger) 300 mm (11.8") travel *Including:* Cable 10 m (33 ft)	X	X			XB-39140
	Cable 20 m (66 ft)	X	X			XB-39145
Linear transducer TP1 500 mm	NOVOTECHNIC TP1 (Highspeed design for Megger) 500 mm (19.7") travel *Including:* Cable 10 m (33 ft)	X	X			XB-39150
	Cable 20 m (66 ft)	X	X			XB-39155

The above transducers are also available in other lengths, please contact Megger for more information.

Item	Description	TM1800	TM1700	TM1600	EGIL	Art. No.
Touchless linear digital transducer (kit)	*Including:* Magnetic band, 2 m (6 ft), XB-39250 Touchless linear digital transducer, SIKO, XB-39237 Cable, 10 m (33 ft), GA-00889 Clamping base, XB-39014 Flexible arm, XB-39012	X	X			XB-39230
Rotary						
Analog						

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Item	Description	TM1800	TM1700	TM1600	EGIL	Art. No.
Transducer kit	Novotechnic IP6501 *Including:* Cable, 1 m (39"), Flex coupling, 6 mm Hexagon wrench	X	X	X	X	XB-31010
Digital						
Transducer kit	Baumer EIL580-SC10.5RH.03600.A *Including:* Flex coupling, 10/6 mm Hexagon wrench					
	With Cable, 10 m (33 ft)	X	X			XB-39130
	With Cable, 20 m (66 ft)	X	X			XB-39135
Transducer accessories						
Slider	Slider for linear transducer TP1	X	X			XB-39199

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Item	Description	TM1800	TM1700	TM1600	EGIL	Art. No.
Transducer mounting kits						
Universal kits						
TLH/LWG kit						
	For use with linear transducers (TLH/LWH)	X	X	X	X	XB-39065
Transducer kit 500/600 mm	Single phase, Analog, Linear, 500 mm (19.7")	X	X	X	X	XB-40101
	Single phase, Analog, Linear, 600 mm (23.6")	X	X	X	X	XB-40102
	Single phase, Digital, Linear, 500 mm (19.7")	X	X			XB-40105
	Single phase, Digital, Linear, 600 mm (23.6")	X	X			XB-40106
Transducer kit 300 mm						
	Single phase, Analog, Linear, 300 mm (11.8")	X	X	X	X	XB-40103
	Single Phase, Digital, Linear, 300 mm (11.8")	X	X			XB-40107
	3 phase, Analog, Linear, 300 mm (11.8")	X	X	X		XB-40104
	3 Phase, Digital, Linear, 300 mm (11.8")	X	X			XB-40108
Transducer kit w/o transducer	Single phase, Analog, Linear, 500-600 mm (19.7"-23.6")	X	X	X	X	XB-40110
	Single phase, Analog, Linear, 300 mm (11.8")	X	X	X	X	XB-40111
	3 phase, Analog, Linear, 300 mm (11.8")	X	X	X		XB-40112
	Single Phase, Digital, Linear, 500-600 mm (19.7"-23.6")	X	X			XB-40113
	Single Phase, Digital, Linear, 300 mm (11.8")	X	X			XB-40114
	3 Phase, Digital, Linear, 300 mm (11.8")	X	X			XB-40115
Rotary transducer mounting kit	For transducers XB-31010 and XB-39130 *Including:* Clamping base XB-39014 Flexible arm XB-39021 Holder for angular transducer XB-39022 Plastic transport case XB-39023 Adapter M6/6 2 Nuts M6 XB-39025 Adapter M8/6 2 Nuts M8 XB-39026 Adapter M10/6 2 Nuts M10 XB-39027 Adapter M12/6 2 Nuts M12 XB-39028 Holder for dig. rotary EIL and linear LWG, Ø 36 mm XB-39005	X	X	X	X	XB-51010

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Item	Description			TM1800	TM1700	TM1600	EGIL	Art. No.
Universal transducer mounting kit 	For linear and rotary transducers *Including:*							
	Magnetic base		XB-39013					
	Clamping base		XB-39014					
	Flexible arm		XB-39021					
	Holder for angular transducer		XB-39022					
	Plastic transport case		XB-39023					
	Adapter M6/6 2 Nuts M6		XB-39025					
	Adapter M8/6 2 Nuts M8		XB-39026					
	Adapter M10/6 2 Nuts M10		XB-39027					
	Adapter M12/6 2 Nuts M12		XB-39028					
	Universal support		XB-39029					
	Holder for dig. rotary EIL and linear LWG, Ø 36 mm		XB-39005	X	X	X	X	XB-51020
AnaDig 100 	Analog to Digital converter for transducers			X	X			XB-51050
Universal adapter for rotary transducer 	Universal adapter to breaker and drive types HPL/BLG 3AP1FG			X	X	X	X	XB-51060
Circuit breaker specific kits								
HPL kit (ABB) 	For use on ABB HPL circuit breakers			X	X	X	X	XB-39080
BLG kit (ABB) 	For use on ABB mechanisms BLG 352, 352C, 1002 and 1002A			X				XB-39085
LTB kit (ABB) 	For use on ABB LTB circuit breakers with 3-column stand			X	X	X	X	XB-39090
LTB Kit (ABB)	*Including:*							
	Mounting kit		XB-51010					
	Software conversion table		BL-8730X					
	Universal adapter for rotary transducer		XB-51060	X	X	X	X	XB-61010
HPL/BLG Kit (ABB)	*Including:*							
	Mounting kit		XB-51010					
	Software conversion table		BL-8720X					
	Universal adapter for rotary transducer		XB-51060	X	X	X	X	XB-61020

Item	Description	TM1800	TM1700	TM1600	EGIL	Art. No.
AHMA Kit (ABB)	3-Phase Diagnostic Set for ABB drive mechanism type AHMA 4/8 *Including:* 3 Transducers 3 Adapter cable GA-00044 Mounting details Transport case	X	X	X		XB-61030
HMB Kit (ABB)	For drive mechanism type HMB 4/8 Three phase set complete in case *Including:* 3 PES-HMB8 Transducers 3 Adapter cable GA-00055 1 Alu transport case GD-00766 3 Calibration Certificates	X	X	X		XB-61040
Ready-to-use kits – Rotary						
Analog						
1-phase kit	Incl. transducer XB-31010, mounting kit XB-51010	X	X	X	X	XB-71010
3-phase kit	Incl. 3 x 1-phase kits XB-71010	X	X	X		XB-71013
Digital						
1-phase kit	*Including:* Transducer XB-39130 Mounting kit XB-51010 With Cable, 10 m (33 ft)	X	X			XB-71020
	With Cable, 20 m (66 ft)	X	X			XB-71022
3-phase kit	*Including:* 3 x 1-pase kits XB-71020	X	X			XB-71023
	Including: 3 x 1-pase kits XB-71022	X	X			XB-71025
Transducer mounting accessories						
Holder for transducer	Holder for dig. rotary Baumer EIL and linear LWG, Ø 36 mm	X	X			XB-39005
Flexible arm		X	X	X	X	XB-39012
Switch magnetic base		X	X	X	X	XB-39013
Clamping base		X	X	X	X	XB-39014

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Item	Description	TM1800	TM1700	TM1600	EGIL	Art. No.
Flexible arm		X	X	X	X	XB-39021
Holder for transducer	Holder for analog rotary transducer and Baumer BDH digital rotary transducer	X	X	X	X	XB-39022
Flex coupling	For shaft diam. 6 mm (for Novotechnic IP6501)	X	X	X	X	XB-39030
Flex coupling	For shaft diam. 10 / 6 mm (for Baumer BDH)	X	X			XB-39032
Thread adapter kit	Imperial / metrics adapter kit for TLH / TP1 *Including:* 1 nut metrics, M5 / 1 spacer nut, M5 / UNF 10-32 / 1 spacer nut, M5 / UNC 1/4-20 / 1 nut, UNF 10-32 / 1 nut, UNC 1/4-20	X	X	X	X	XB-39036
Distance screw	Metrics (M5) / metrics (M5) for TP1	X	X			XB-39160
Rod for digital transducer TP1	Rod for NOVOTECHNIC TP1, 300 mm (11.8")	X	X	X	X	XB-39193

Item	Description	TM1800	TM1700	TM1600	EGIL	Art. No.
Other						
Dolphin clamps						
	Black	X	X	X	X	40-083220
	Red	X	X	X	X	40-08322
Timing clamp						
	Timing clamp for bolt head	X	X	X	X	53-31800
Cable organizer						
	Hook-and-loop straps, 10 pcs.	X	X	X	X	AA-00100
Long term monitoring	EPROM to be mounted in the TM1600					
LTM1	Starts measurement when there is a change at any of the time-measuring inputs.			X		BL-80010
LTM2	Functions in the same way as a standard TM1600, but returns automatically to the READY state after measurement.			X		BL-80011
VD401	Voltage divider, ratio 400/1 (for TM1600 and EGIL with analog channel)			X	X	BL-90070
USB to fiber adapte	CABA Hardware USB to fiber adapter			X		BL-90165
Current	AC/DC clamp/clip-on/current probe, Fluke 80i-110s					
	Current sensor kit 1 channel (Fluke 80i-110s incl. cable GA-00140)	X	X	X	X	BL-90600
	Current sensor kit 3 channels 3 x (Fluke 80i-110s incl. cables GA-00140)	X	X	X		BL-90610
Temperature sensor	With the temperature sensor the ambient temperature is automatically recorded with each measurement and stored together with the test result. The temperature becomes a parameter in CABA Win. Suitable cable is the Analog cable, 10 m GA-01005. Range: -20°C to +50°C (-4°F to +122°F) Resolution: 0.5°C (0.9°F)	X				CG-90070

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Item	Description		TM1800	TM1700	TM1600	EGIL	Art. No.
Thermopaper, for Fujitsu		114 mm, 30 m			X	X	GC-00030
		Box/24 pcs			X	X	GC-00032
Thermopaper		114 mm, Ø 40 mm	X				GC-00040
Soft case		Made from sturdy nylon fabric	X	X			GD-00340
Clamp			X	X	X	X	KD-03040
Clamps		Multipurpose Timing clamp, black, 4 mm banana	X	X	X	X	XB-39200
		Multipurpose Timing clamp, red, 4 mm banana	X	X	X	X	XB-39202
Ferrite kit		Accessory for timing of GIS circuit breakers using TM1800 with DualGround™ *Including:* C-shape ferrite 7 XB-40010 I-shape ferrite 4 XB-40020 Round ferrite 4 30-67090 Hook and loop fastener 4 09-10140 Transport case GD-00440 User's Manual ZP-CG04E	X	X			XB-40090

For more information about optional accessories please contact Megger

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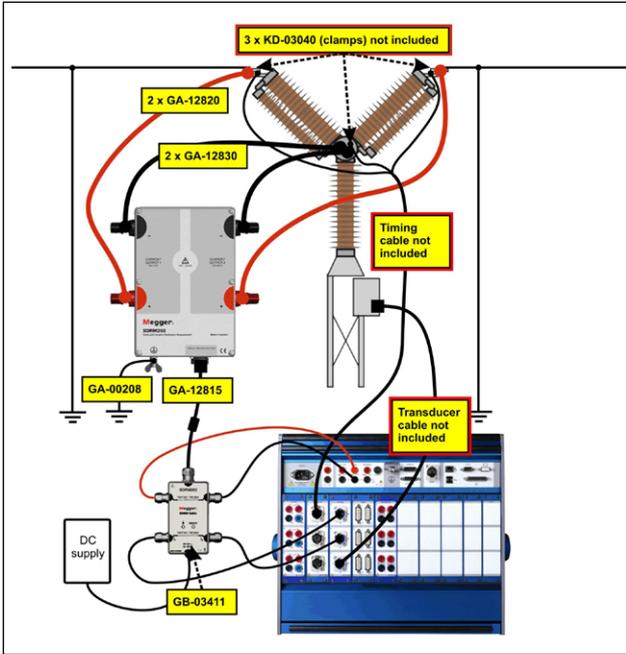
Timing cable is included with the TM1800 timing module. Transducer cable is selected together with the the type of transducer used.
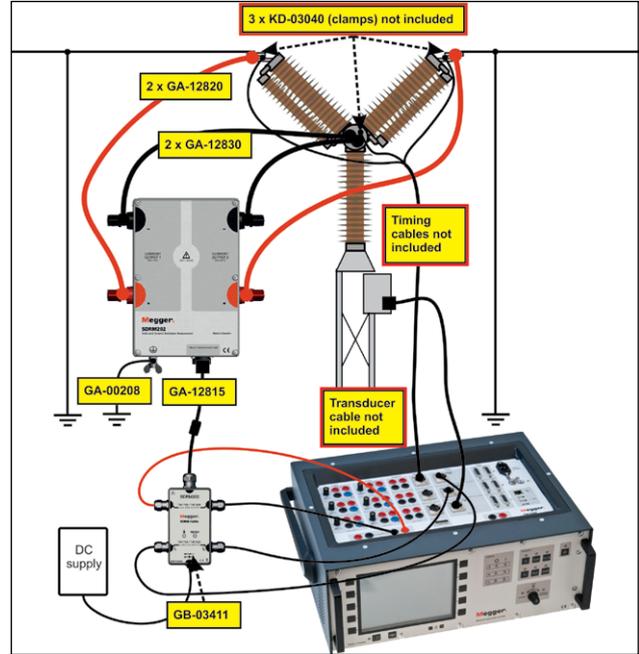
Timing cable is included with the TM1700. Transducer cable is selected together with the the type of transducer used.
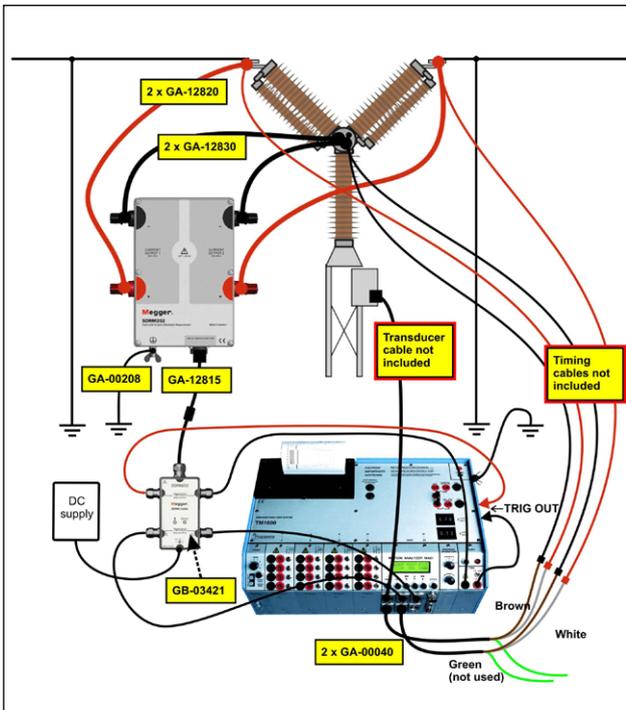
Timing cable is an optional accessory to TM1600. Transducer cable is selected together with the the type of transducer used.
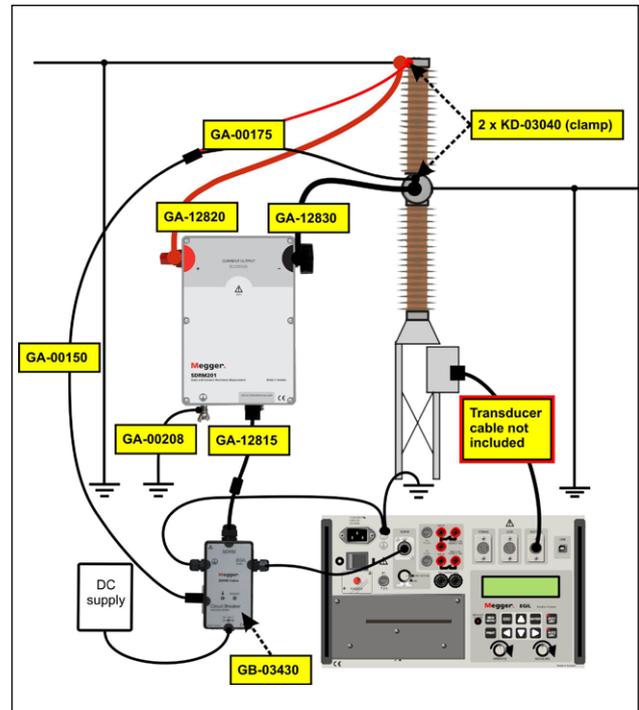
Transducer cable is selected together with the the type of transducer used.

Megger.

DualGround - safe testing

The best way to provide safety in circuit breaker testing is to keep both sides of the circuit breaker grounded throughout the test. This will also make the test faster and easier. Minimum time shall be spent in the substation and focus shall be on the test rather than the equipment.

One side grounded

High voltage

Up to several kV if not earthed (grounded)

capacitive coupled current

capacitive coupled current

Test equipment

Grounding

Protective earth cable

Station earth (ground)
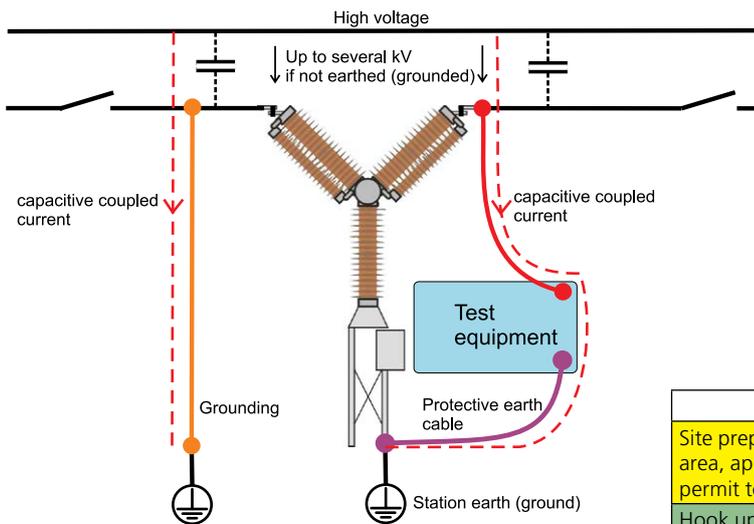
| Conventional vs. DualGround	
Site preparation (isolate work area, apply safety ground, issue permit to work)	Site preparation (isolate work area, apply safety ground, issue permit to work)
Hook up test equipment. Issue sanction for test	Hook up test equipment. Issue sanction for test
Authorised person removes the ground	Risky step left out
Perform testing	Safe testing with both sides grounded
Authorised person applies ground	Risky step left out
Cancel sanction for test. Disconnect test equipment	Cancel sanction for test. Disconnect test equipment
Site closing (cancel permit to work, disconnect ground)	Site closing (cancel permit to work, disconnect ground)

Both sides grounded

High voltage

Up to several kV if not earthed (grounded)

capacitive coupled current

capacitive coupled current

Test equipment

Grounding

Protective earth cable

Grounding

Station earth (ground)
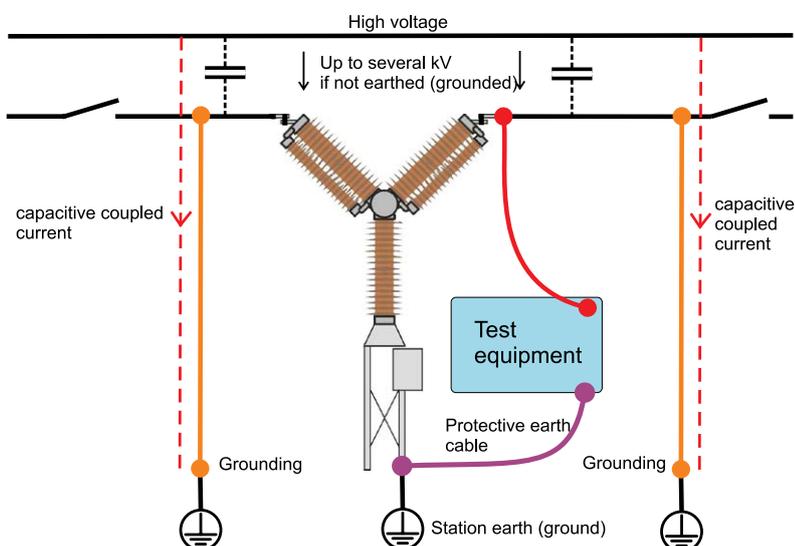
## Transducer mounting examples

Analog transducer mounted on a distribution circuit breaker

1. Clamping base
2. Flexible arm
3. Holder angular transducer
4. Novotechnik IP6501
5. Flex coupling
6. Bolt adapter
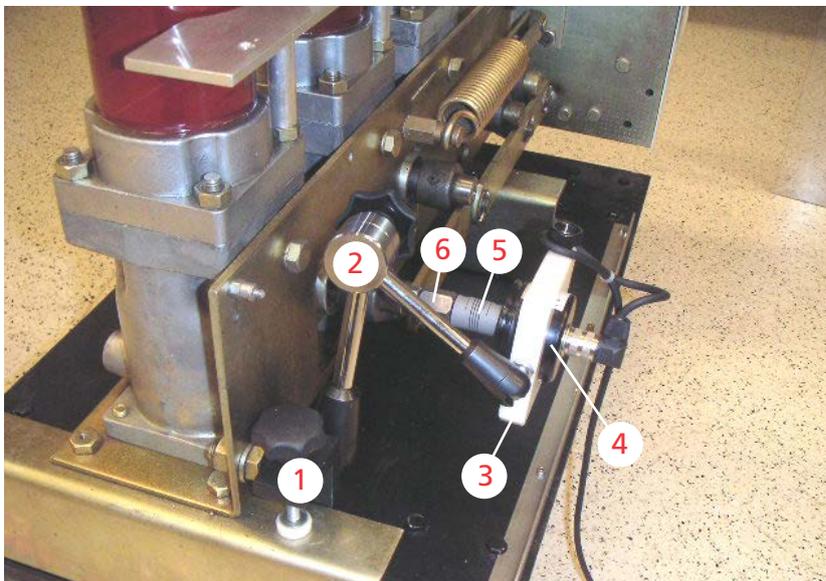
Analog transducer mounted on a distribution circuit breaker

1. Magnetic base
2. Flexible arm
3. Holder angular transducer
4. Novotechnik IP6501
5. Flex coupling
6. Bolt adapter

Megger.
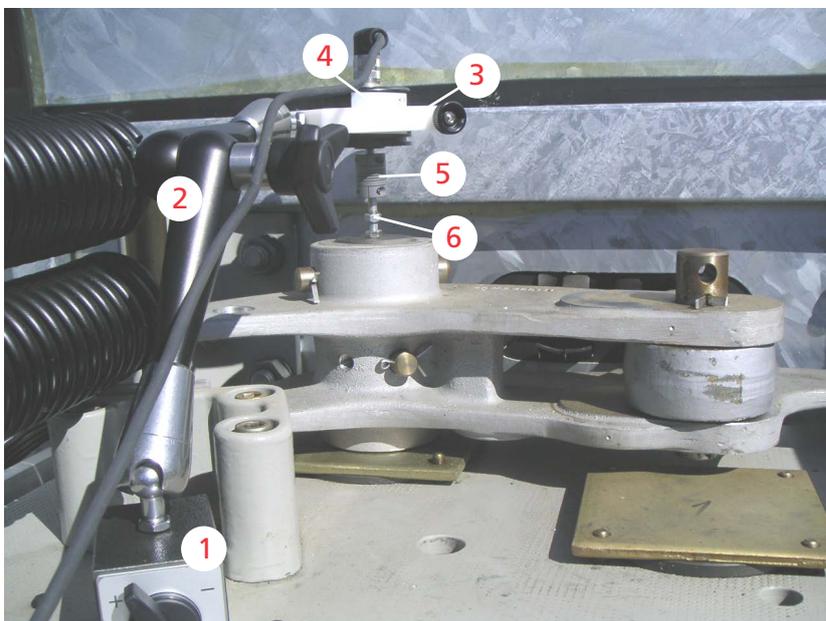
First trip measurement

When a fault occurs on a transmission or distribution line, the mission for the circuit breaker is to open the circuit to isolate the fault from the power source. A quick interruption of the current will avoid or limit damage to expensive equipment caused by the high fault currents.

Why capture first trip

Testing circuit breakers can be done in many ways, but one of the most common is timing of the main contacts, which gives a direct indication of the trip time. A typical procedure for performing a timing test on a circuit breaker is:

1. Open the CB
2. Disconnect the CB by opening the disconnector switches
3. Ground the CB
4. Perform the timing test

Will the timing tests show the true trip time? Well, not necessarily. Consider a circuit breaker that has been in service without operating for many months, even years, before it was taken out of service for testing. It might then be suffering from a lack of or dried grease and maybe corrosion in its bearings. These problems can, and most probably will, slow down the first operation.

The problem with this procedure is that the CB has been operated at least once before the testing procedure begins. This operation might be all it takes to "shake off" any corrosion problems or sticky bearings and bring the breaker's trip time up to standard. So when the actual timing test is performed, no problem exists and the service engineer thinks the breaker is in good shape and no further service is needed. Some moths later the corrosion is back and when a fault occurs the CB does not trip fast enough, or maybe not at all. This is why it is important to capture the first operation to reveal any problems with the CB.

Perform a first trip test

A good and time effective way to check the condition of a circuit breaker is to document its behavior at the first open operation after it has been idle for long time. The measurement and connections to the CB are carried out while it is still in service. The only way to measure the currents in a safe way is to use current clamps. For the coil current, either one or three clamps are needed depending on the number of operating mechanisms. The clamps shall be of DC type in order to manage all types of coils.

Connecting current clamps to the CT's secondary winding makes it possible to check the transition of the line currents to zero during the opening of the CB contacts as well as the synchronization of the opening times on the three phases.

The equipment needed for a first trip measurement depends on the configuration of the circuit breaker. All the connections are made inside the control cabinet.
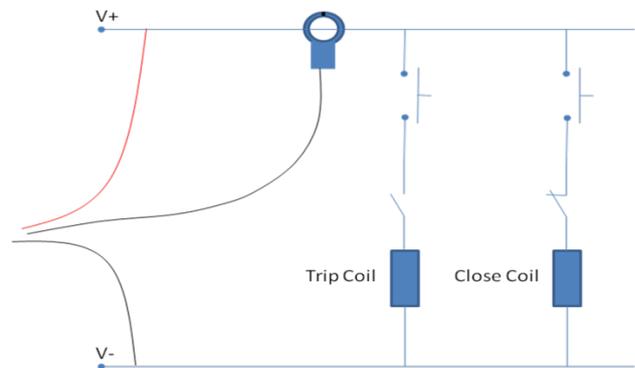

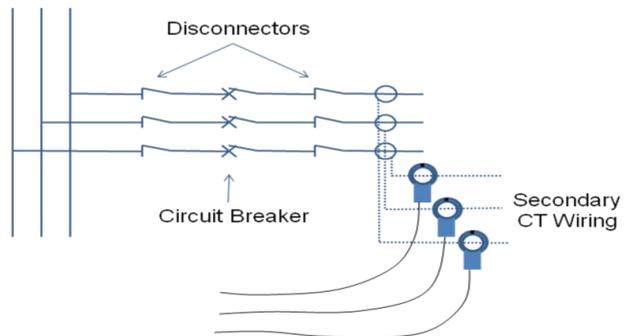Figure 1. Point for measuring coil current and control voltage.

Figure 2. Points for measuring the line currents. Since the CB is in service, the conventional way with leads across the CB cannot be used. Instead, three current clamps are used on the secondary side of the current transformer for each phase.
For ordering information, see "First trip kit" on page 11.

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