HighPROTEC | PROTECTION TECHNOLOGY MADE SIMPLE

MRA4

INTERCONNECTION PACKAGE

package is summarized within one menu:

direction depending load shedding

QV-Protection: Undervoltage-Reactive

Considerably frequency protection

f<, f>, df/dt (ROCOF), Vector Surge

Synch Check (Generator to mains,

SLIDING-MEAN-SQUARE

→ Adjustable (VDE-AR 4105)

Fault recorder: 20 faults

control and monitoring

→ SNTP, IRIG-B00X, Modbus,

TIME SYNCHRONISATION

DNP 3.0, IEC60870-5-103/-104

Event recorder: 300 events

package: Six elements configurable as

mains-to-mains), options e.g. to switch

Disturbance recorder: 120 s non volatile

Trend recorder: 4000 non volatile entries

→ Up to 80 logic equations for protection,

Non-discriminating active power

FRT (LVRT): Settable FRT-Profiles,

optional AR coordinated

Automatic Reconnection

Power protection

CB-Intertripping

onto dead bus

SUPERVISION

RECORDERS

The comprehensive interconnection

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LOGIC

APPLICATION

The MRA4 is a high precision and reliable protection and control relay. The intuitive setting concept with plausibility test enables reliable and time optimized configuration of the extensive protection function to a variety of applications such as incoming or outgoing feeder protection, network protection and generator protection.

The implemented switchgear management guaranties an efficient and safe control and supervision.

The device is a bench mark in flexibility and usability and offers various communication options. The hardware is designed for all nominal values in combination with protection and control functionality.

The parameterizing and analyzing software Smart view SE is usable for each HighPROTEC device and free of charge.

COMPREHENSIVE **PROTECTION PACKAGE** (1)

- → Six elements phase overcurrent protection directional and non-directional (ANSI/IEC/51C/51V)
- \rightarrow Four elements earth fault protection (2) non-directional or directional (multi-polarising)
- → Wattmetric Ground Fault Protection
- Two elements unbalanced load \rightarrow
- protection Voltage protection (2) \rightarrow six elements selectable: V<, V>, V<(t)
- \rightarrow Six elements unbalanced voltage supervision
- Flexible Fourth Voltage measuring input⁽²⁾ \rightarrow 2 elements VE> or VX (for synch-check)
- → Synchro-check options Generator-to-System or System-to-System
- \rightarrow Each of the six elements frequency protection can be used as: f<, f>, ROCOF, vector surge...
- Six elements power protection \rightarrow each can be used as: P>, P<, Pr, Q>, Q<, Qr, S>, S<
- Two elements power factor (PF) \rightarrow

POWER QUALITY

→ THD protection

DEMAND MANAGEMENT/ PEAK VALUES

→ Peak values of current and power, average current and energy demand

⁽¹⁾ DFT, True RMS or I2 based

⁽²⁾ DFT or True RMS based

W WOODWARD MRA4

NEW FEATURES – Release 3.6

· Wattmetric Ground Fault Protection

· Improved Frequency and ROCOF precision*

· G99 Issue 1 Amendment 3

· VDE-AR-N 4110

· IEC 60870-5-104 · SCADApter for Retrofit

· IT Security

· Usability improvements

COMMISSIONING SUPPORT

- → USB connection
- → Customizable Display (Single-Line, ...)
- \rightarrow Customizable Inserts
- \rightarrow Copy and compare parameter sets
- Configuration files are convertible \rightarrow
- Forcing and disarming of output relays \rightarrow
- \rightarrow Fault simulator: current and voltage
- Graphical display of tripping characteristics \rightarrow
- 8 languages selectable within the relay \rightarrow

COMMUNICATION OPTIONS

- → IEC 61850
- \rightarrow Profibus DP
- \rightarrow Modbus RTU and/or Modbus TCP
- → IEC 60870-5-103
- → IEC 60870-5-104
- DNP 3.0 (RTU, TCP, UDP) \rightarrow
- SCADApter for Retrofit \rightarrow

IT SECURITY

- Menu for the activation of BDEW- \rightarrow Whitepaper-compliant security settings (e.g. hardening of interfaces)
- \rightarrow Security Logger
- Self-monitoring; Syslog
- Encrypted connection with Smart view \rightarrow

CONTROL

- → 1 breaker
- → Breaker wear

PC TOOLS

- → Setting and analyzing software Smart view for free
- Including page editor to design own pages \rightarrow

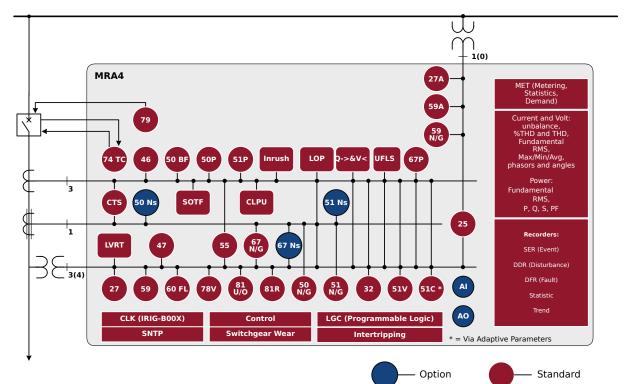
*5 mHz von 45 Hz bis 55 Hz

MRA4 | PROTECTION AND CONTROL RELAY FOR FEEDER, GRID AND GENERATOR APPLICATIONS

FUNCTIONAL OVERVIEW

	Elements	ANSI
Protective Functions		
, time overcurrent and short circuit protection, all elements can be configured for directional or non-directional supervision. Multiple reset options instantaneous, definite time, reset characteristics according to IEC and ANSI).	6	50P, 51P, 67P
/oltage controlled overcurrent protection by means of adaptive parameters /oltage dependent overcurrent protection Negative phase sequence overcurrent protection		51C 51V 51Q
2>, unbalanced load protection with evaluation of the negative phase sequence currents	2	46
B, overload protection with thermal replica and separate pick-up values for alarm and trip functions	1	49
H2/In, inrush detection with evaluation of the 2nd harmonic	1	Inrush
G, earth overcurrent and short circuit protection, all elements can be configured for directional (multi-polarising) or non-directional supervision. Tremendous reset options instantaneous, definite time, reset characteristics according to IEC and ANSI).	4	50N/G, 51N/G, 67N/G
/<, V>, V(t)<, under- and overvoltage protection, time dependent undervoltage protection	6	27, 59
/oltage asymmetry supervision (V012) /1, under and overvoltage in positive phase sequence system /2, overvoltage in negative phase sequence system	6	47
Each of the six frequency protection elements can be used as: f< fs, df, dt, ROCOF, DF/DT, vector surge,	6	81U/O, 81R, 78
/X, residual voltage protection or bus bar voltage for Synch Check	2	59N
R, automatic reclosing	1	79
xP, External alarm and trip functions	4	
QS, Power protection	6	32, 37
F, Power factor	2	55
RT (optional coordination with AR-feature)	27 (t)	27 (t, AR)
IVRT (OVRT) High Voltage Ride Through	1	59
Q(V) Protection (undervolt. dep. directional reactive power protection with reclosing disengaging)		
JFLS (non-discriminating active power direction depending load shedding)		
0-Minutes-Mean-Square-Sliding Supervision: adjustable according to VDE-AR 4105		25
Synch Check		25
Control and Logic		
Control: Position indication, supervision time management and interlockings for 1 breaker		
ogic: Up to 80 logic equations, each with 4 inputs, selectable logical gates, timers and memory function		
Supervision Functions		
BF, circuit breaker failure protection	1	50BF
CS, trip circuit supervision	1	74TC
OP, loss of potential	1	60FL
F, fuse failure protection via digital input	1	60FL
TS, current transformer supervision	1	60L
CLPU, cold load pickup	1	
OTF, switch onto fault	1	
Demand management and peak value supervision (current and power)		
THD supervision		
Breaker wear with programmable wear curves		
ecorders: Disturbance recorder, fault recorder, event recorder, trend recorder		

FUNCTIONAL OVERVIEW IN ANSI FORM



APPROVALS





certified regarding UL508 (Industrial Controls)



certified regarding CSA-C22.2 No. 14 (Industrial Controls)



certified by EAC (Eurasian Conformity)



Type tested (and certified) regarding IEC60255-1



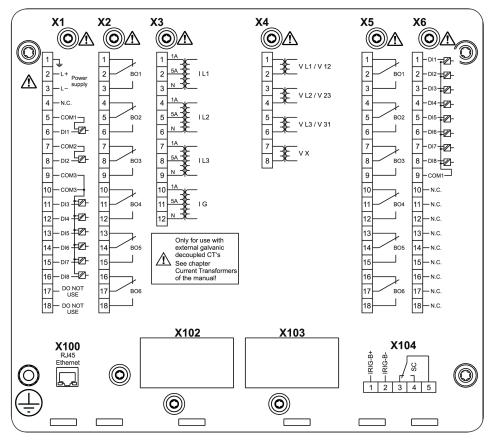
Component certificate regarding the German grid code standard VDE-AR-N 4110 (2018-11)



KESCO 동일성 선언서 (Declaration of Identity)

Complies with IEEE 1547-2003. Amended by IEEE 1547a-2014. Complies with ANSI C37.90-2005.

CONNECTIONS (EXAMPLE)



Complies with "Engineering Recommendation G99 Issue 1 Amendment 3 – May 2018".

Released

MRA4 | PROTECTION AND CONTROL RELAY FOR FEEDER, GRID AND GENERATOR APPLICATIONS

ORDER FORM MRA4

Directional Fe	eder Protect	tion			MRA4 -2			
Version 2 with USB, enhanced communication and user options								
Analog In Analog Out	Digital Inputs	Binary output relays	Housing	Large display		I		
-	8	7	B2	Х		A		
-	16	13	B2	Х		D		
-	24	20	B2	Х		E		
2+2	16	15	B2	Х		F		
Hardware var	iant 2							
Phase Current	5 A/1 A, Grou	nd Current 5 A/1 A				()	
Phase Current 5	5 A/1 A, Sensit	tive Ground Current	5 A/1 A			1		
Housing and	mounting							
Housing suitab		0					А	
Housing suitab	le for 19" rack	mounting **					В	
Communicati	on protocol							
Without protoc	ol							А
Modbus RTU, IEC60870-5-103, DNP3.0 RTU RS485/terminals							В*	
Modbus TCP, DNP3.0 TCP/UDP, IEC 60870-5-104 <i>Ethernet 100 MB/RJ45</i>							C*	
Profibus-DP optic fiber/ST-connector							D*	
							E*	
······································							F*	
Modbus RTU, IEC60870-5-103, DNP3.0 RTU <i>RS485/D-SUB</i>						G*		
							H*	
IEC60870-5-103, Modbus RTU, DNP3.0 RTU <i>RS485/terminals</i> Modbus TCP, DNP3.0 TCP/UDP, IEC60870-5-104 <i>Ethernet 100 MB/RJ45</i>							*	
					100140461			178
IEC61850, Modbus TCP, DNP3.0 TCP/UDP, IEC 60870-5-104 Optical Ethernet 100MB/LC duplex connector K*								
Modbus TCP, DNP3.0 TCP/UDP, IEC 60870-5-104 Optical Ethernet 100MB/LC duplex connector							L*	
IEC60870-5-103, Modbus RTU, DNP3.0 RTU <i>RS485/terminals</i> IEC61850, Modbus TCP, DNP3.0 TCP/UDP, IEC60870-5-104 <i>Ethernet 100 MB/RJ45</i>							T*	
Harsh Enviror			170-J-104 LL					
None	ment option							
Conformal Coa	-	· (*** *** * * * * *						
Available mer	nu language	s (in every device)						
English / Corm	an / Chanich /	Dussian / Dolish / Do	artuquiasa / Ei	ranch / Dama	nian			

English / German / Spanish / Russian / Polish / Portuguese / French / Romanian

* Within every communication option only one communication protocol is usable. Smart view can be used in parallel via the Ethernet interface (RJ45).

The parameterizing- and disturbance analyzing software Smart view is included in the delivery of HighPROTEC devices.

Current inputs Voltage inputs	4 (1 A and 5 A) with automatic CT Disconnect 4 (0 800 V)		
Digital Inputs	Switching thresholds adjustable via software		
Power supply	Wide range power supply		
	$24 V_{DC} - 270 V_{DC} / 48 V_{AC} - 230 V_{AC} (-20/+10\%)$		
Terminals	All terminals plug type		
Type of enclosure	IP54		
Dimensions of housing	19" flush mounting:	212.7 mm \times 173 mm \times 208 mm	
(W x H x D)		8.374 in. × 6.811 in. × 8.189 in.	
	Door mounting	212.7 mm × 183 mm × 208 mm	
		8.374 in. × 7.205 in. × 8.189 in.	
Weight (max. components)	approx. 4.7 kg / 10.36 lb		



http://wwdmanuals.com/hpt-2

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