

HighPROTEC I

PROTECTION TECHNOLOGY
MADE SIMPLE

MRDT4 I

TRANSFORMER DIFFERENTIAL
PROTECTION RELAY



APPLICATION

The various protective functions of the MRDT4 are specifically tailored to the protection of two winding transformers. The device offers in addition to the differential protection various communication and backup protection functions. Furthermore the MRDT4 can be used for generator differential protection.

ALL INCLUSIVE:

- All protection features without extra charge
- Parameter setting and evaluation software
- Disturbance record analysis software

TRANSFORMER PHASE DIFFERENTIAL PROTECTION

- Stabilized phase differential protection with transients and C.T. saturation detection
- Various selectable transformer groups
- Zero sequence removal
- Three point slope characteristic
- High set element (non-restraint)

TWO STAGES GROUND DIFFERENTIAL PROTECTION

- Three point slope characteristic
- High set element (non-restraint)

BACKUP PROTECTION

- 4 Elements Overcurrent/short-circuit protection (non-directional)
- 4 Elements Earth fault protection (non-directional)
- Tripping characteristics: DEFT
ANSI: NINV, VINV, EINV,
IEC: NINV, VINV, LINV, EINV, RXIDG
Thermal Flat, IT, I2T, I4T

TWO STAGES UNBALANCED LOAD PROTECTION

- Supervision by definite time or tripping characteristic

RECORDERS

- Disturbance recorder, 120 s non volatile
- Fault recorder
- Event recorder
- Trend recorder: 4000 non volatile entries

ADDITIONAL HIGHLIGHTS

- Inrush
- Thermal replica
- Four stages external protection
- Plausibility checks
- Adaptive parameter sets
- Status display
- Masking of unused functions
- Switchgear Manager and Switchgear wear

COMPREHENSIVE MEASURED VALUES AND STATISTICS

- THD (total harmonic distortion)
- Current phasors and angles
- RMS and fundamental
- Sequence currents
- Differential currents

TEMPERATURE PROTECTION

- Buchholz (sudden pressure), ext. oil temperature, and aux. temperature protection via digital input
- Temperature measurement via external RTD-box (option)

SUPERVISION

- Current transformer supervision
- Circuit breaker failure protection
- Trip circuit supervision
- Cold load pickup
- Switch onto fault

COMMISSIONING SUPPORT

- Copy and compare parameter sets
- Configuration files are convertible
- Forcing and disarming of output relays
- Fault simulator

COMMUNICATION OPTIONS

- IEC61850
- Profibus DP
- Modbus RTU or Modbus TCP
- IEC60870-5-103

CONTROL

- Two Switchgears
- Switchgear wear

LOGIC

- Up to 80 logic equations

TIME SYNCHRONISATION

- SNTP or IRIG-B00X

FUNCTIONAL OVERVIEW

	Elements	ANSI
Protective Functions		
Transformer differential protection (2 windings), Id: Curve with zero point and three settable slopes and highset element (Id>>), Inrush stabilisation / detection of 2nd, 4th and 5th harmonics	1	87T
Restricted earth fault IdG, IdG>>, characteristics similar to 87T	2	87TN
I, time overcurrent and short circuit protection (non-directional) Tremendous reset options (instantaneous, definite time, reset characteristics according to IEC and ANSI)	4	50P, 51P
I2>, unbalanced load protection with evaluation of the negative phase sequence currents	2	46
ThR, overload protection with thermal replica for transformers IEC60255-8, alarm and trip threshold	1	49T
IH2/In, inrush detection with evaluation of the 2nd harmonic	2	Inrush
IG, earth overcurrent and short circuit protection (non-directional) Tremendous reset options (instantaneous, definite time, reset characteristics according to IEC and ANSI)	4	50N, 51N
ExP, External alarm and trip functions	4	
Control and Logic		
Control: Position indication, supervision time management and interlockings for 2 switchgears		
Logic: Up to 80 logic equations, each with 4 inputs, selectable logical gates, timers and memory function		
Supervision Functions		
CBF, circuit breaker failure protection for both circuit breakers	2	50BF
TCS, trip circuit supervision	2	74TC
CTS, current transformer supervision	2	60L
CLPU, cold load pickup	1	
SOTF, switch onto fault	1	
SGW, switchgear wear	2	
Non volatile event recorder up to 120 s with 32 samples per cycles		
THD supervision		

APPROVALS



certified regarding UL508 (Industrial Controls)



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

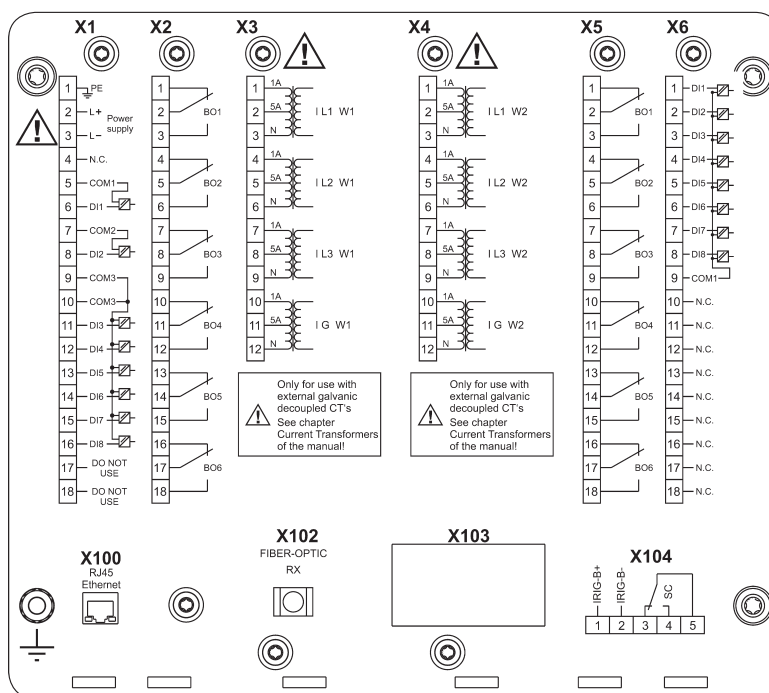


certified by EAC (Eurasian Conformity)

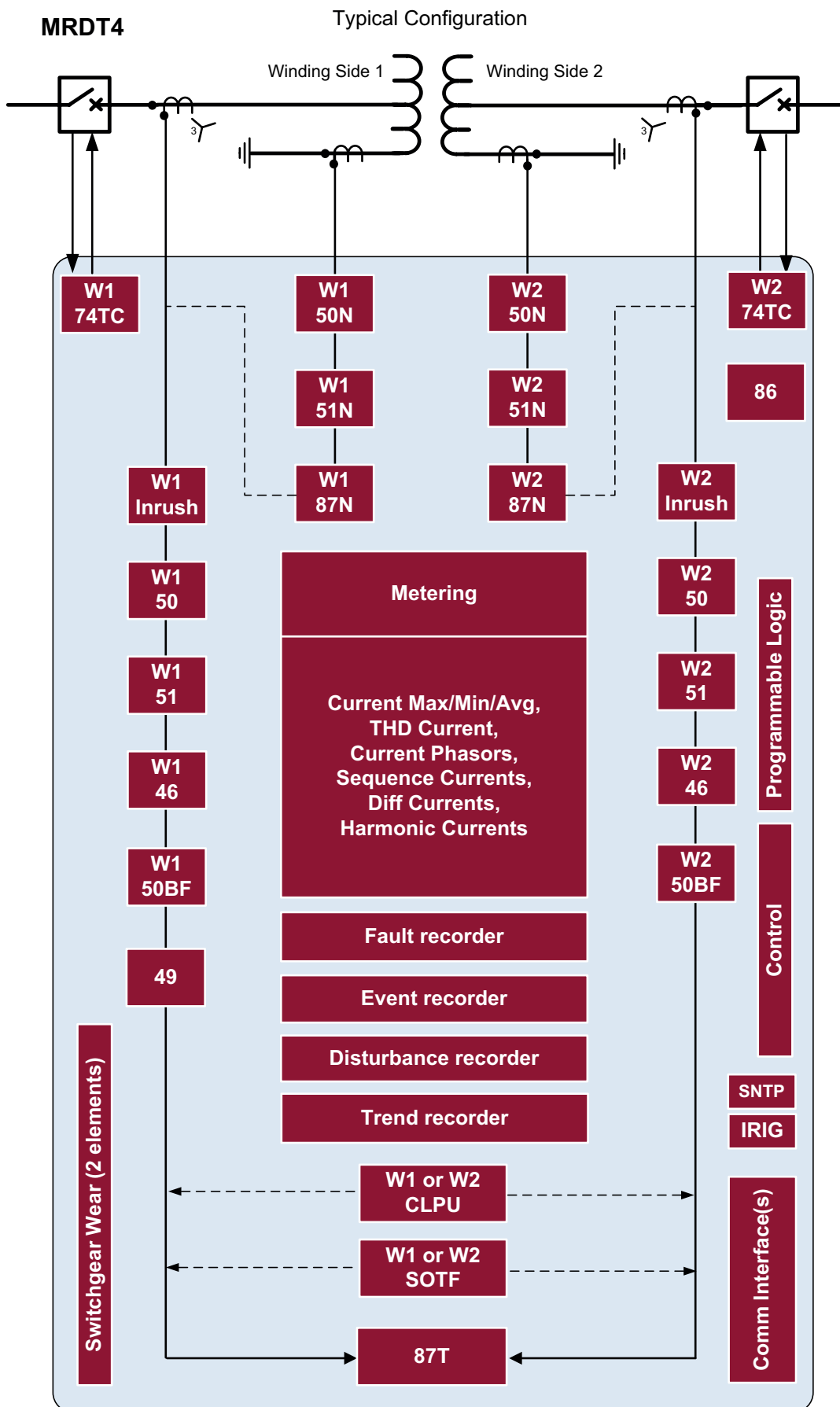


Type tested (and certified) regarding IEC60255-1

CONNECTIONS



FUNCTIONAL OVERVIEW IN ANSI FORM



ORDER FORM MRDT4

Non-directional Transformer Differential Protection			MRDT4			
Digital Inputs	Binary output relays	Housing				
8	7	B2	A			
16	13	B2	D			
Hardware variant						
Phase Current 5 A/1 A, W1/W2 Ground Current 5 A/1 A				0		
Phase Current 5 A/1 A, W1 Sen. Gr. Curr. 5 A/1 A, W2 Gr. Curr. 5 A/1 A				1		
Phase Current 5 A/1 A, W1 Gr. Curr. 5 A/1 A, W2 Sen. Gr. Curr. 5 A/1 A				2		
Phase Current 5 A/1 A, W1/W2 Sen. Gr. Curr. 5 A/1 A				3		
Housing and mounting						
Door mounting				A		
Door mounting 19" (flush mounting)				B		
Communication protocol						
Without protocol				A		
Modbus RTU, IEC60870-5-103, RS485/terminals				B		
Modbus TCP, Ethernet 100 MB/RJ45				C		
Profibus-DP, optic fiber				D		
Profibus-DP, RS485/D-SUB				E		
Modbus RTU, IEC60870-5-103, optic fiber				F		
Modbus RTU, IEC60870-5-103, RS485/D-SUB				G		
IEC61850, Ethernet 100MB/ RJ45				H		
Presetting of available menu languages						
Standard English/German/Russian/Polish/Portuguese/French						

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

Current inputs	8 (1 A and 5 A) with automatic short-circuiters
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 (W x H x D)	19" flush mounting: 212.7 mm x 173 mm x 208 mm 8.374 in. x 6.810 in. x 8.189 in. Door mounting: 212.7 mm x 183 mm x 208 mm 8.374 in. x 7.200 in. x 8.189 in.
Weight (max. components)	approx. 4 kg



CONTACT:

North & Central America

Phone: +1 970 962 7331
E-mail: SalesPGD_NAandCA@woodward.com

South America

Phone: +55 193708 4800
E-mail: SalesPGD_SA@woodward.com

Europe

Phone: +49 2152 145 331
E-mail: SalesPGD_EUROPE@woodward.com

Middle East & Africa

Phone: +971 2 6275185
E-mail: SalesPGD_MEA@woodward.com

Russia

Phone: +7 812 319 3007
E-mail: SalesPGD_RUSSIA@woodward.com

China

Phone: +86 512 8818 5515
E-mail: SalesPGD_CHINA@woodward.com

India

Phone: +91 124 4399 500
E-mail: SalesPGD_INDIA@woodward.com

ASEAN & Oceania

Phone: +49 711 78954 510
E-mail: SalesPGD_ASEAN@woodward.com