

# HighPROTEC-2 | PROTECTION TECHNOLOGY MADE SIMPLE

## MRDT4-2 | TRANSFORMER DIFFERENTIAL PROTECTION RELAY

**NEW  
FEATURES**

- DNP 3.0
- Multiple Communication with one device
- ANSI Menu structure
- Page Editor
- New front plate with USB
- IEC61850 with LC interface



### 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 ELEMENTS 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 ELEMENTS UNBALANCED LOAD PROTECTION

- Supervision by definite time or tripping characteristic

#### RECORDERS

- Disturbance recorder: 120 s non volatile
- Fault recorder: 20 faults
- Event recorder: 300 events
- Trend recorder: 4000 non volatile entries

#### ADDITIONAL HIGHLIGHTS

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

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

#### COMMUNICATION OPTIONS

- IEC61850
- Profibus DP
- Modbus RTU or Modbus TCP
- IEC60870-5-103
- DNP 3.0 (RTU, TCP, UDP)

#### CONTROL

- Two breakers (or isolators/grounding switches)
- Breaker wear

#### LOGIC

- Up to 80 logic equations for protection, control and monitoring

#### TIME SYNCHRONISATION

- SNTP or IIRIG-B00X

#### PC TOOLS

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

**FUNCTIONAL OVERVIEW**

|   | Elements | ANSI     |
|---|----------|----------|
| <b>Protective Functions</b>   |          |          |
| Transformer differential protection (2 windings), Id:<br>Curve with zero point and three settable slopes and highset element (Id>>),<br>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)<br>Multiple 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)<br>Tremendous reset options (instantaneous, definite time, reset characteristics according to IEC and ANSI)                        | 4        | 50N, 51N |
| ExP, External alarm and trip functions<br>RTD temperature supervision via optional RTD-Box with 12 sensors  | 4        | 26       |
| <b>Control and Logic</b>  |          |          |
| Control: Position indication, supervision time management and interlockings for 2 breakers<br>Logic: Up to 80 logic equations, each with 4 inputs, selectable logical gates, timers and memory function |          |          |
| <b>Supervision Functions</b>  |          |          |
| 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        |          |
| BW, breaker wear  | 2        |          |
| Non volatile event recorder up to 120 s with 32 samples per cycles<br>THD supervision   |          |          |

**APPROVALS**



Type Approval



certified regarding UL508 (Industrial Controls)



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



certified by EAC (Eurasian Conformity)

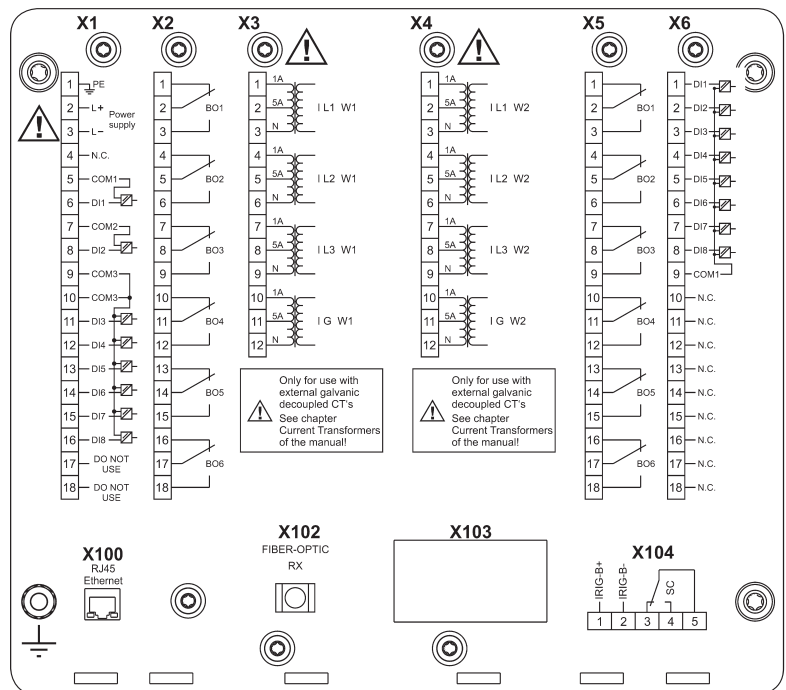


Type tested (and certified) regarding IEC60255-1

complies with IEEE 1547-2003 amended by IEEE 1547a-2014

complies with ANSI C37.90-2005

**CONNECTIONS (EXAMPLE)**



**FUNCTIONAL OVERVIEW IN ANSI FORM**

