

HighPROTEC-2 | PROTECTION TECHNOLOGY MADE SIMPLE

MRU4-2 | VOLTAGE AND FREQUENCY 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 MRU4 is a protection relay which uses the latest Dual-Core-Processor Technology to provide precise and reliable protective functions and is very easy to operate. It is designed to protect electrical equipment from dangerous voltage fluctuations. For example protection against under voltages caused by mains shortcircuits, or overvoltages due to load shedding or failure of a generator voltage controller. Its compact design makes the MRU4 ideal for installation within the LV terminal compartments of compact SF6-insulated MV systems.

ALL INCLUSIVE:

- All protection features inclusive
- Parameter setting software
- Disturbance analysis software

COMPREHENSIVE FREQUENCY PROTECTION PACKAGE

Each of the six elements can be used as:

- $f <$ or $f >$ (over- and underfrequency supervision)
- df/dt (ROCOF)
Rate of change of frequency
- ($f <$ and df/dt) or ($f >$ and df/dt)
Combination of over-, under- and rate of change of frequency (ROCOF)
- ($f <$ and DF/DT) or ($f >$ and DF/DT)
Combination of over-, under- and increase of frequency
- Delta Phi (Vector surge)

SIX ELEMENTS VOLTAGE PROTECTION

- Under- and overvoltage
- Programmable time dependent undervoltage tripping characteristic

SLIDING-MEAN-SQUARE SUPERVISION

- Adjustable (VDE-AR 4105)

FRT (LRVT)

- Adjustable LRVT-profiles
- Optionally AR-controlled

FLEXIBLE FOURTH VOLTAGE MEASURING INPUT

- 2 elements $VE >$ or VX (for Synch Check)

SYNCH CHECK

- Generator-to-System, System-to-System
- Options to switch onto dead bus bars

TWO ELEMENTS RESIDUAL VOLTAGE PROTECTION

- $VE >$

SIX ELEMENTS VOLTAGE ASYMMETRY SUPERVISION

- Under- and overvoltage in positive phase sequence system, overvoltage in negative phase sequence system

POWER QUALITY

- THD-protection

SUPERVISION

- Voltage transformer supervision
- Trip circuit supervision
- CBF via position indicators

RECORDERS

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

PC TOOLS

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

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)

ADDITIONAL HIGHLIGHTS

- Plausibility checks
- Status display
- Comprehensive measured values and statistics
- Masking of unused functions
- Multi-Password-Level

CONTROL

- one breaker
- Breaker wear

LOGIC

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

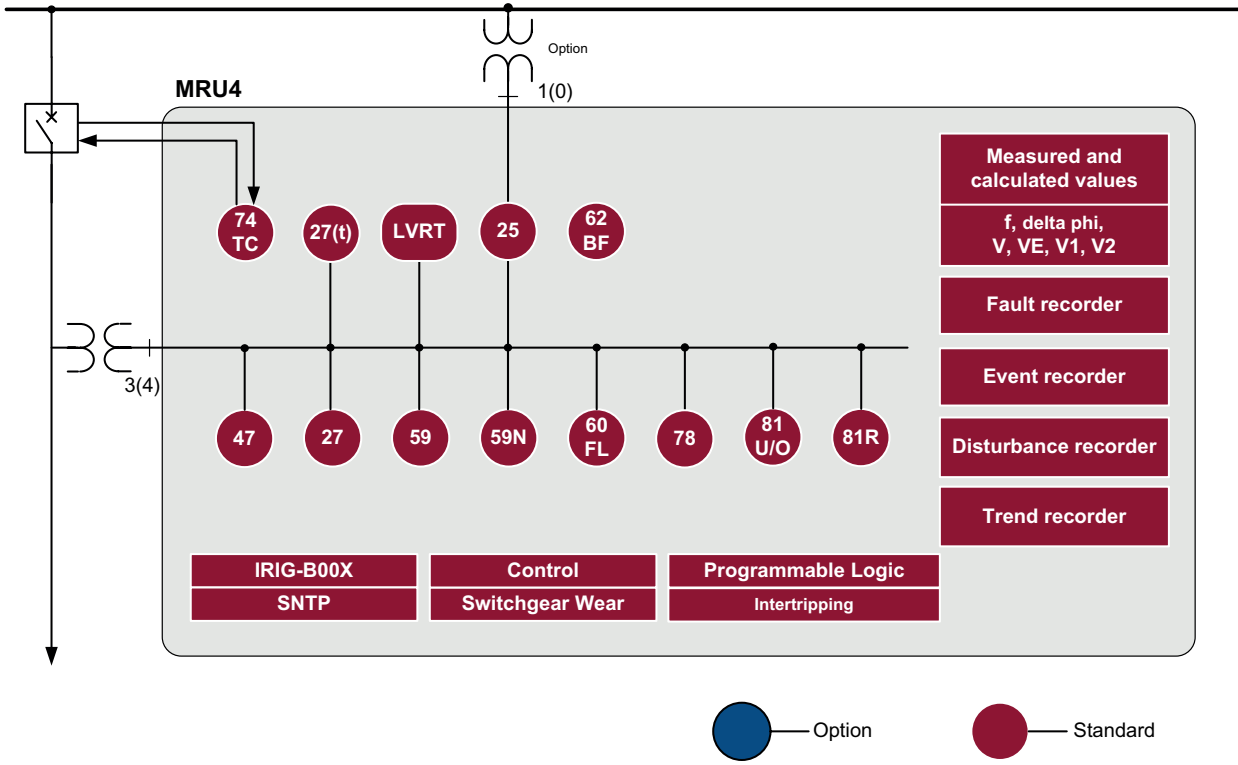
TIME SYNCHRONISATION

- SNTP or IRIG-B00X

FUNCTIONAL OVERVIEW

	Elements	ANSI
Protective Functions		
V>, V<, V<(t) under- and overvoltage protection, programmable time dependent undervoltage tripping characteristic	6	27, 59
FRT (optional coordination with AR-feature)	1	27 (t, AR)
Synchronism check	1	25
Each of the six frequency protection elements can be used as:	6	
→ f< or f> (over- and under frequency supervision)		81U/O
→ df/dt rate of change of frequency (ROCOF)		81R
→ (f< and df/dt) or (f> and df/dt) combination of over-, under- and rate of change of frequency (ROCOF)		
→ (f< and DF/DT) or (f> and DF/DT) combination of over-, under- and increase of frequency		
→ Delta Phi (Vector surge)		78
VE, residual voltage protection	2	59N
Voltage asymmetry supervision (V012) V1, under and overvoltage in positive phase sequence system V2, overvoltage in negative phase sequence system	6	47
ExP, External alarm and trip functions	4	
10-Minutes-Mean-Square-Sliding Supervision: adjustable according to VDE-AR 4105		
Control and Logic		
Control: Position indication, supervision time management and interlockings for 1 breaker		
Logic: Up to 80 logic equations, each with 4 inputs, selectable logical gates, timers and memory function		
Supervision Functions		
CBF, circuit breaker failure protection (via position indicators)	1	62BF
TCS, trip circuit supervision	1	74TC
VTS, voltage transformer supervision by comparing phase and residual voltages	1	60FL
VTS, fuse failure protection via digital input	1	60FL
THD supervision		

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)

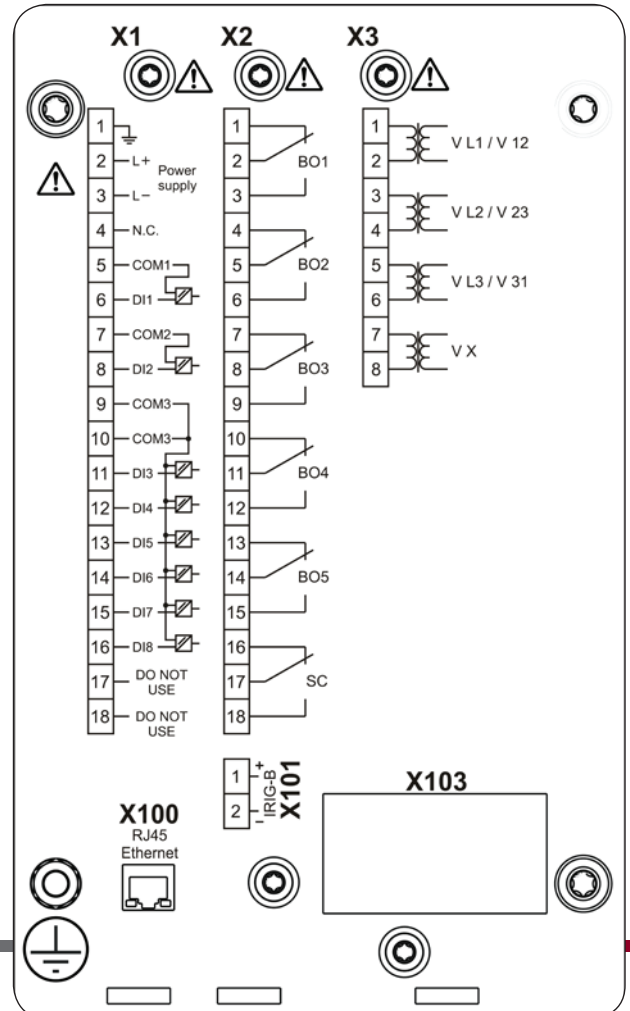


Type tested (and certified) regarding IEC60255-1

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

complies with ANSI C37.90-2005

CONNECTIONS (EXAMPLE)



ORDER FORM MRU4-2

Voltage and Frequency supervision				MRU4	-2	A	0
Version 2 with USB, enhanced communication and user options							
Digital Inputs	Binary output relays	Housing	Large display				
8	6	B1	-				
Hardware variant							
Standard							
Housing and mounting							
Door mounting							A
Door mounting 19" (flush mounting)							B
Communication protocol							
Without protocol							A
Modbus RTU, IEC60870-5-103, DNP3.0 RTU <i>RS485/terminals</i>							B*
Modbus TCP, DNP3.0 TCP/UDP <i>Ethernet 100 MB/RJ45</i>							C*
Profibus-DP <i>optic fiber/ST-connector</i>							D*
Profibus-DP <i>RS485/D-SUB</i>							E*
Modbus RTU, IEC60870-5-103, DNP3.0 RTU <i>optic fiber/ST-connector</i>							F*
Modbus RTU, IEC60870-5-103, DNP3.0 RTU <i>RS485/D-SUB</i>							G*
IEC61850, Modbus TCP, DNP3.0 TCP/UDP <i>Ethernet 100MB/RJ45</i>							H*
IEC60870-5-103, Modbus RTU, DNP3.0 RTU <i>RS485/terminals</i>							I*
Modbus TCP, DNP3.0 TCP/UDP <i>Ethernet 100 MB/RJ45</i>							
IEC61850, Modbus TCP, DNP3.0 TCP/UDP <i>Optical Ethernet 100MB/LC duplex connector</i>							K*
Modbus TCP, DNP3.0 TCP/UDP <i>Optical Ethernet 100MB/LC duplex connector</i>							L*
Harsh Environment Option							
None							A
Conformal Coating							B
Available menu languages (in every device)							
Standard English/German/Spanish/Russian/Polish/Portuguese/French							

* 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.

Voltage inputs	4 (0–800 V) with automatic CT Disconnect
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
Mounting	Door mounting
Type of enclosure (Front)	IP54
Dimensions of housing (W x H x D)	19" flush mounting: 141.5 mm x 173 mm x 209 mm 5.571 in. x 6.811 in. x 8.228 in. Door mounting: 141.5 mm x 183 mm x 209 mm 5.571 in. x 7.205 in. x 8.228 in.
Weight (max. components)	approx. 2.4 kg

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