

# 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

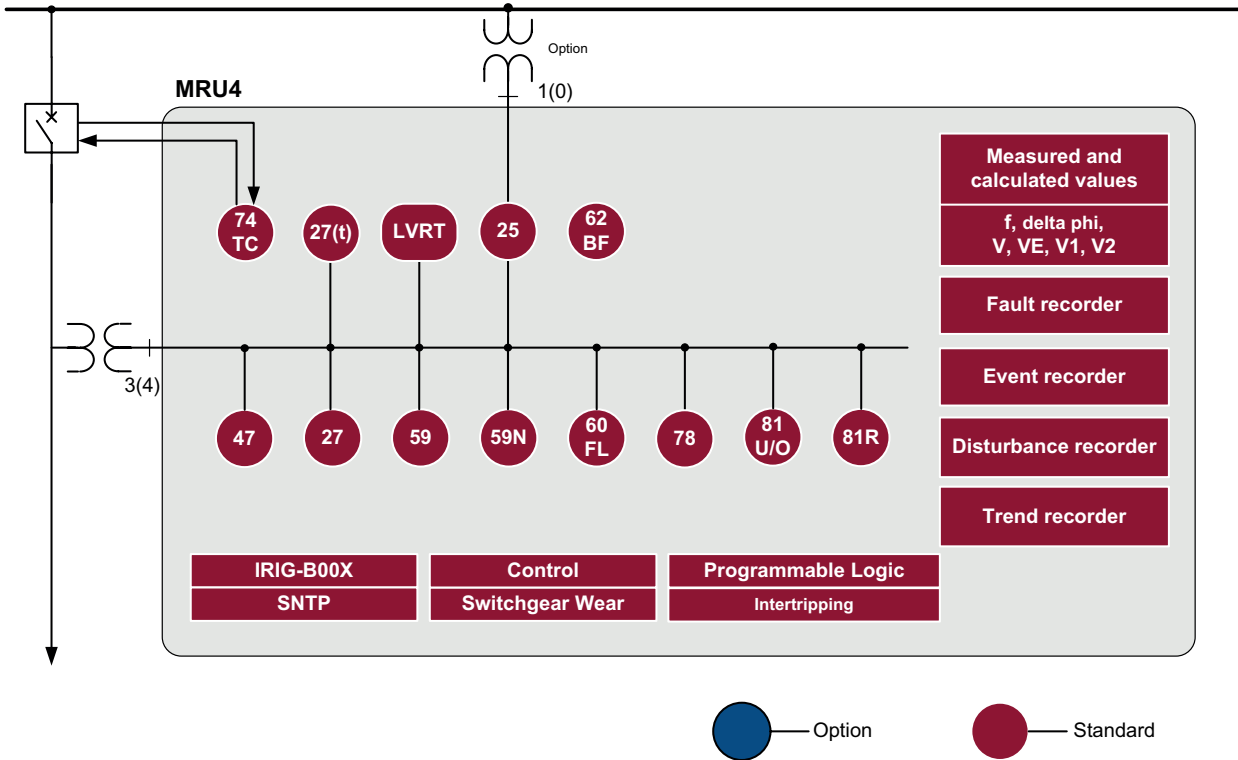
#### TIME SYNCHRONISATION

- SNTP or IRIG-B00X

## FUNCTIONAL OVERVIEW

	Elements	ANSI
<b>Protective Functions</b>		
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		
<b>Control and Logic</b>		
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		
<b>Supervision Functions</b>		
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)

