G - Base

THREE PHASE + NEUTRAL CURRENT PROTECTION RELAY

General Characteristics

G-Base is the new generation of Microelettrica Scientifica's base-performance protection relays.
This range is the ideal solution for protection and automation, thanks to its high configurability.
It is based on the same powerful microprocessor adopted on high-performance G-Pro range.
G-Base platform is based on a four-channel configuration, allowing it to be used for current and voltage protection functions.
GB310, part of the G-Base range, is a relay designed for the interface to the power distribution grid.

Protective Functions

- F49 : Thermal Image (one element)
- F50/51 : Overcurrent, with standard IEC inverse time curves (three elements)
- F50N/51N : Earth Fault, with standard IEC inverse time curves (three elements)
- F46 : Inverse sequence (two elements)
- 74TCS : Trip circuit supervision
- F51BF : Breaker Failure protection
- F79 : Four-shot programmable autoreclosing, with reclosing sequence coordination and reclosing disabling push button
- Two complete setting programs, switchable locally or remotely

Measurements

- Real Time Measurements (IA - IB - IC - Io)
- Maximum Demand and Inrush Recording (IA - IB - IC - Io)
- Trip Recording

Hardware

- 8 Output Relays
- 8 Digital Inputs
- Hi-resolution graphic dispaly (240*128)
- 10 Leds for signalization
- 6 programmable push buttons
- Two-piece plastic enclosure, IP44 protection degree (IP54 available on request)

Firmware

- Time tagged multiple event recording and jurnal
- Oscillographic wave form capture up to 40 sec.
- Complete autodiagnostic program
- Blocking Outputs and Blockings Input for pilot wire selectivity coordination

Power Supply Ratings

- Type 1 : 24V(-20%) / 110V(+15%) a.c. - 24V(-20%) / 125V(+20%) d.c.
- Type 2 : 80V(-20%) / 220V(+15%) a.c. - 90V(-20%) / 250V(+20%) d.c.

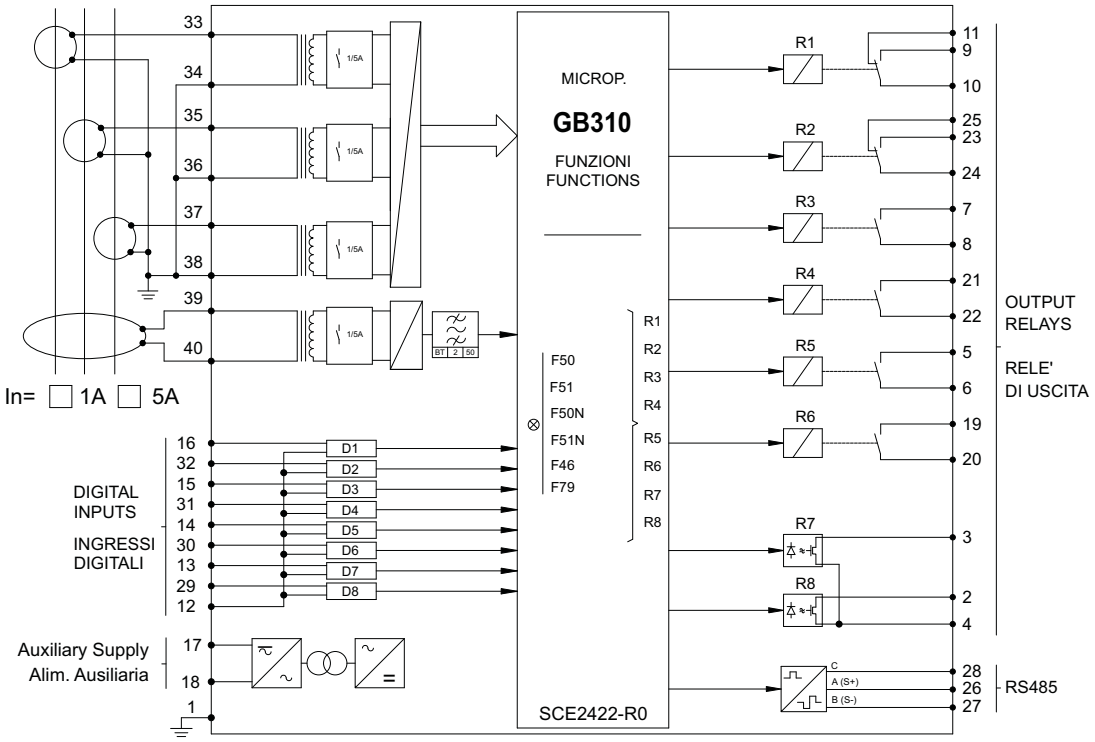
Communications

- RS485 Serial communication port on rear side
- USB communication port on front panel
- Modbus RTU / IEC870-5-103 Communication Protocols

Software

- MSCom2 Program interface for device management

Connection Diagram



Typical Characteristics		
Accuracy at reference value of influencing factors	2% In - 0.2% On	for measurements
	2% + (to = 20 ÷ 30ms @ 2xIs)	for times
Rated Current	In = 1A/5A - On = 1A/5A	
Current Overload	500A for 1 sec; 20A continuous	
Burden on current input	0.1VA a In = 1A; 0.3VA a In = 5A	
Average power supply consumption	≤ 7 VA	
Output relays	rating 6 A; Vn = 250 V	
	A.C. resistive switching = 1500W (400V max)	
	make = 30 A (peak) 0.5 sec.;	
	break = 0.3 A, 110 Vcc,	
	L/R = 40 ms (100.000 op.)	

MC line

General Characteristics

The MC line has been designed to offer to the market a very competitive protective relay responding to the latest requirements in terms of control and communication capabilities with an extremely high level of modularity. Each relay includes a limited number of protective functions but, thanks to their very compact sizes, different units can be combined in a modular enclosure to satisfy the most demanding needs.

Measurements

- Real Time Measurements
- Trip Recording (last 20 trips with date & time)
- Event recording (last 10 trips)

Control

- 4 Output Relays (programmable)
- 3 Digital Inputs
- Time tagged multiple event recording
- Oscillographic wave form capture
- Blocking Outputs and Blocking Input for pilot wire selectivity coordination
- Associate C.B. control

Technical Characteristics

- Complete self diagnosis program
- Display LCD 16 (2x8) characters
- 4 Leds for signalization

Communications

- 1 RS485 Serial communication port on rear side
- 1 RS232 Serial communication port on front panel
- Modbus RTU/IEC870-5-103/IEC61850 Communication Protocols

Expansion Modules (optional)

- "UX10-4" 10 Digital Input and 4 Output Relays
- "14DI" 14 Digital Inputs
- "14DO" 14 Output Relays

Execution

- 1 Module box (2 modules with expansion)
- Totally draw-out execution
- IP44 protection case (on request IP54)

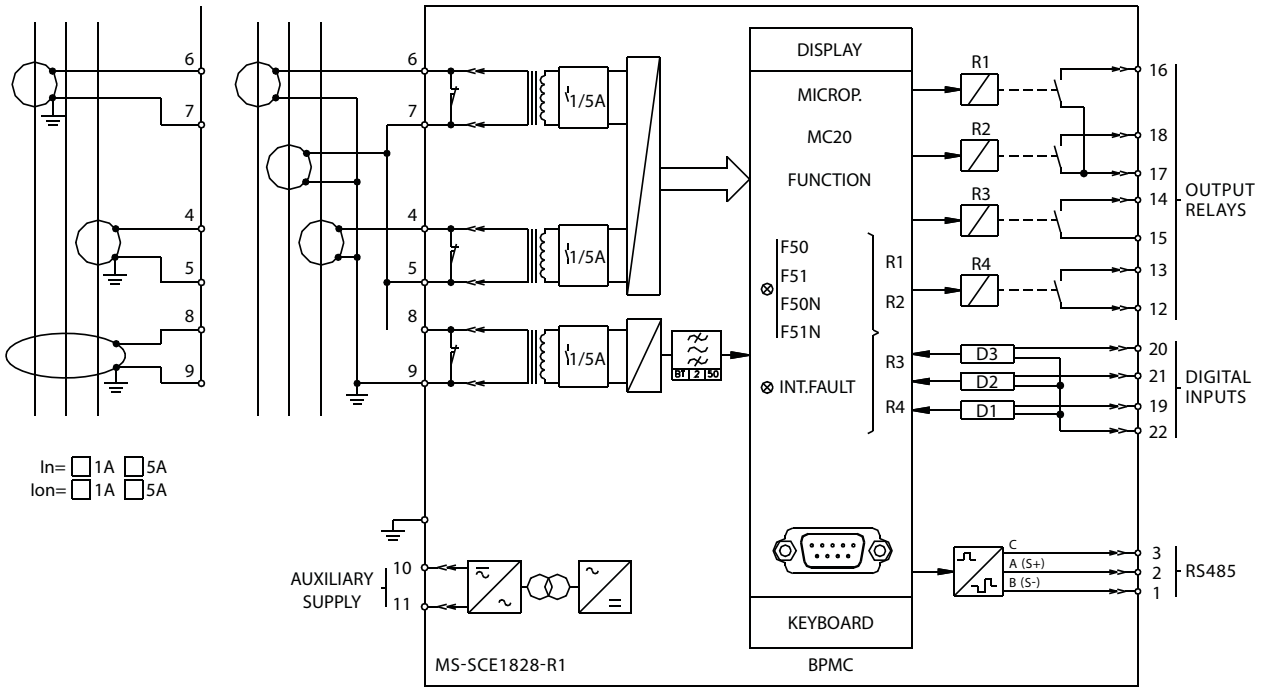
Software

- MSCom2 Program interface for device management

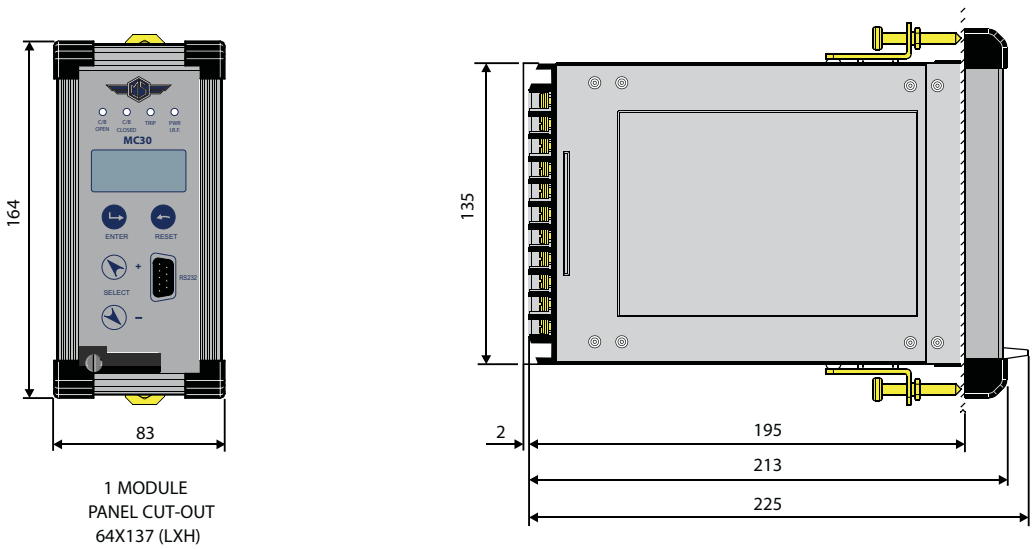
Relays Type

MC1V	Multifunction Single Phase Overvoltage/Undervoltage Relay: 59, 27, 81>, 81<
MC3V	Multifunction Three Phase Overvoltage/Undervoltage Relay: 59, 27, 81>, 81<, 59Vo, 59V2, 27V1
MC20	Overcurrent & Earth Fault Relay: 50/51, 50N/51N, 51BF
MC30	Three Phase Overcurrent & Earth Fault Relay: 49, 50/51, 50N/51N, 51BF
MC40	Three Phase Overcurrent & Earth Fault (connection with 4 CT 's): 49, 50/51, 50N/51N, 51BF
MC20-R	Overcurrent & Earth Fault Relay: 50/51, 50N/51N, 51BF, 79
MC30-R	Three Phase Overcurrent & Earth Fault with reclosing function Relay: 50/51, 50N/51N, 51BF, 79
MC30-BC	Three Phase Overcurrent & Earth Fault + Broken Conductor Relay: 50/51, 50N/51N, 51BF, BC (I2/I2)
MCDC-I	D.C. Current Relay: 76/32, 49, 51BF
MCDC-V	D.C. Voltage Relay: 45, 80
MCM	Motor Protection Relay: 37, 46, 47, 48, 49, 50/51, 51LR, 64S, 66, 68

Wiring Diagram



Overall Dimensions: mm



1 MODULE
PANEL CUT-OUT
64X137 (LXH)

ULTRA line

General Characteristics

ULTRA is the top line of Microelettrica Scientifica protective relays; it has been designed to meet the most demanding specifications for any application in Transmission, Distribution and Industrial plants. The ULTRA relays are used in all the applications where, besides the protection, a complete measuring system is needed. Each relay is a multifunctional unit combining protection, measurements and control. Thanks to the CAN BUS communication port and to a complete range of additional modules, the relays of this line can perform a complex input/output logic for interlocking substation system avoiding the use of an additional PLC. The multiprotocol makes the relay very versatile and suitable to be implemented in the most common DCS and SCADA systems.

Recording

- Event Recording (last 100 events)
- Trip Recording (last 20 trips) complete with cause of tripping and values of the input quantities at the moment of trip
- Oscillographic recording of input quantities (8 channels, 32 sample/cycle, 3 sec each)

Control

- 6 Output Relays user programmable
- 4 Digital Inputs user programmable
- Blocking input and Blocking output for pilot wire selectivity coordination
- Time tagging resolution 1ms
- Trip circuit supervision
- Associated Circuit Breaker control (OPEN/CLOSE)

Technical Characteristics

- Graphical Display (128x64 dot)
- 4 Leds for signalization
- Multilanguage Display (English/Italian standard, available - others on request)
- Complete self diagnosis program with dedicated relay

Communications

- 1 RS485 Serial communication port on rear side
- 1 RS232 Serial communication port on front panel
- Modbus RTU/IEC870-5-103/IEC61850/ TCP-IP Modbus Communication Protocols
- Canbus port for external additional modules

Expansion Modules (optional)

- "UX10-4" 10 Digital Inputs and 4 Output Relays
- "14DI" 14 Digital Inputs
- "14DO" 14 Output Relays

Execution

- 2 Module box (3 modules with 1 expansion, 4 modules with 2 expansion)
- IP44 protection case (on request IP54)
- Totally draw-out execution

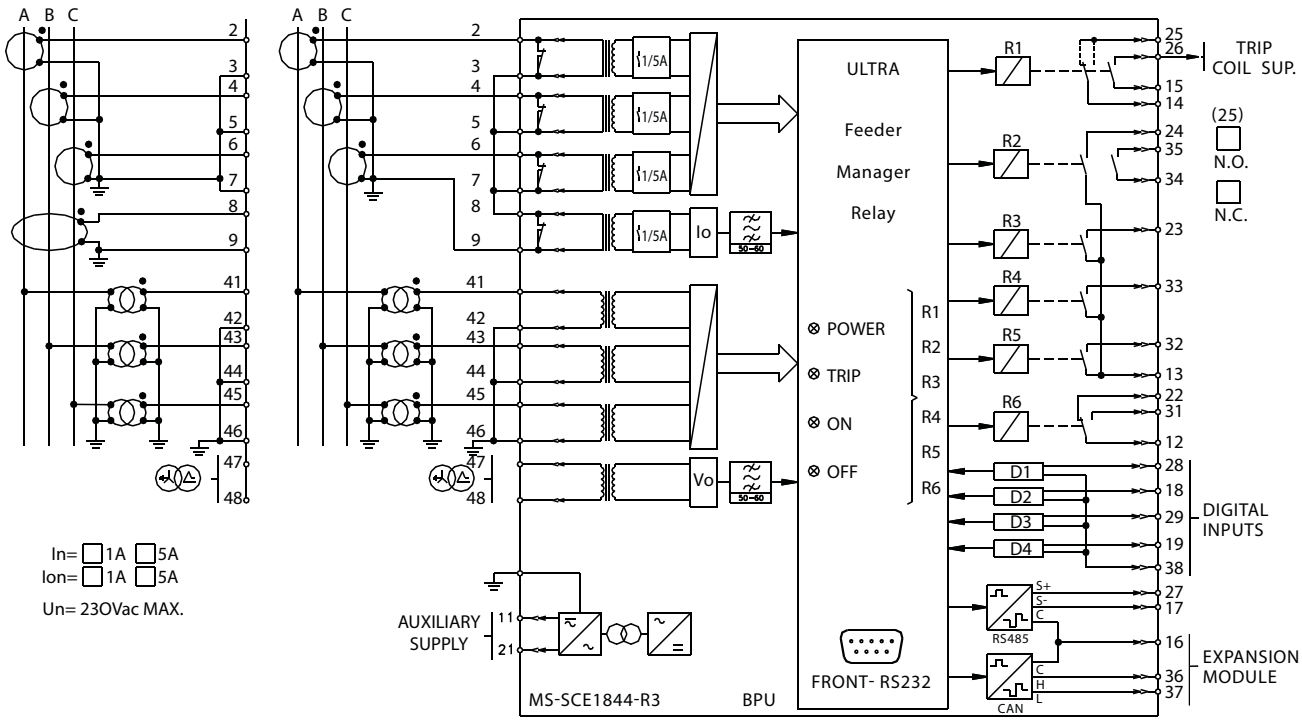
Software

- MSCom2 Program interface for device management

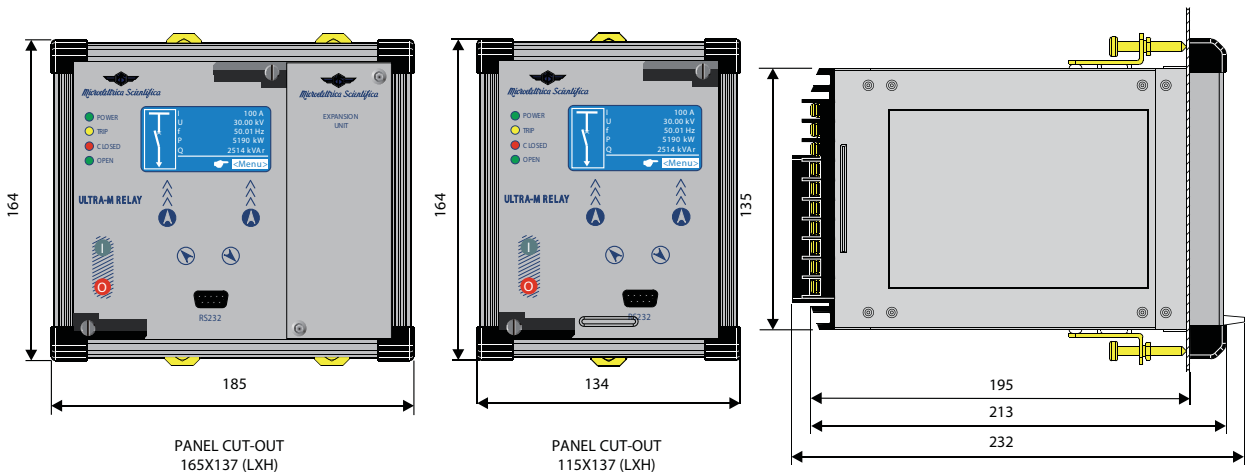
Relays Type

U-MLEs	D.C. Feeder Manager Relay: 49, 32/76, 80, 45, 64, 79, DI, di/dt, Rapp, Iapp, CMI, LT, BF
U-MLC	D.C. Feeder Manager Relay (Italian Railway Certification): 27/59, 32, 45, 49, 64, 76, 79, 80
U-MLC- M	D.C. Energy Metering: I, V, W, E
DTMR	Differential Transformer Relay: 50/51, 87T, 87N/51N
FMR	Feeder Manager Relay: 49, 50/51/67, 50N/51N/67N, 27/59, 81, 46, 59Uo, 51BF, F 27U1, 59U2/47, 79
MMR	Motor Manager Relay: 12/14, 37, 27/59, 46, 49, 50/51, 51LR, 51BF, 55, 64, 66, 81
GMR	Generator Protection & Management Relay: 21, 24, 27/59, 32, 37, 40, 46, 49, 50/27, 50V/51V, 51BF, 60FL, 64S, 81

Wiring Diagram



Overall Dimensions: mm



N-DIN line

General Characteristics

The N-DIN line has been conceived to obtain the most efficient space/performance as well as cost/performance ratio. The execution of the relay is for DIN Rail, but its Front Face Panel (FFP) - including Controls, Signals and Display - is removable and can be flush mounted apart from the Relay Main Body (RMB), on the front panel of the switchboards or the motor control centres. One FFP only can control up to 31 RMB units. The relay main body RMB can also be used as a stand-alone unit, without the front panel FFP.

Measurements

- Real Time Measurements
- Trip Recording (last 5 trips with date & time)
- Load Profile recording

Technical Characteristics

The Relay Main Body (RMB) includes:

- 2 Self powered programmable Digital Inputs for remote controls (start, stop, rev., ETC)
- 1 RTD input or User available Digital Input
- 2 Programmable output relays each with one N.O. contact rating 6A
- 1 RS485 port for connection to the communication serial bus (Modbus RTU)
- 1 RS485 port for communication to the Front Face Panel
- 2 Signal Leds, 1 Reset button

The Front Face Panel (FFP) includes:

- 2x16 characters LCD display
- Four Key buttons for local relay management, Four signal leds
- One RS232 port for connection to a local PC (on front side)
- One RS485 port for interconnection with the RMB (on back side)
- Complete self diagnosis program

Mounting

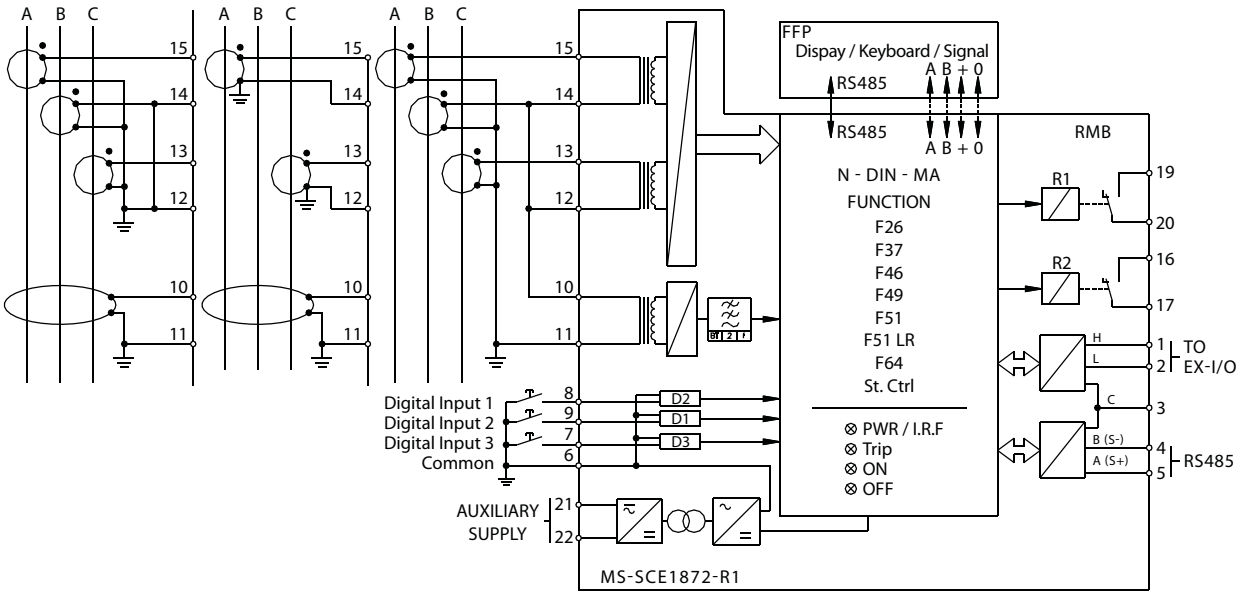
- DIN46227 (EN50022)

Relays Type

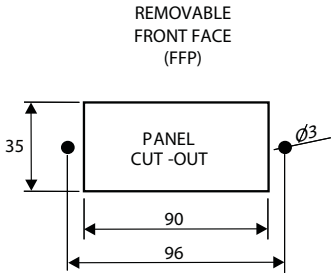
N-DIN-MA	Motor Protection Relay: 37, 46, 49, 51, 51LR, 64/51N, 66
N-DIN-F	Feeder Protection Relay: 46, 49, 51, 50N/51N, 51BF
N-DIN TO64	D.C. Current Relay with High Sensitivity Hall Effect Transducer: 64, 51BF
Accessories	
EX-I/O	Input/Output Expansion Module
CPB	Profibus Converter Module
TA-DIN	Current Transformer
TAR-DIN	Current Transformer

Electronics

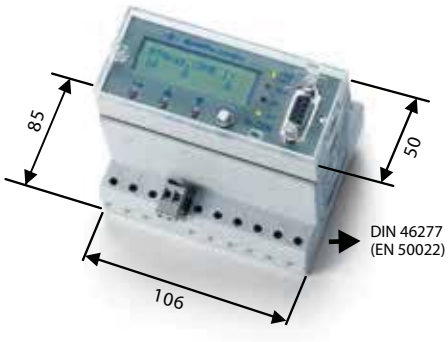
Wiring Diagram



Overall Dimensions: mm



FFP
Height= 16



RMB
Height= 72

TRANSDUCER line

DC measuring converter

General Characteristics

The DC measuring transducers are designed for high voltage measurement. The Transducers are designed and manufactured to allow safe and full isolated HV measurement of DC currents and voltages. They find their main application in all the DC Traction Substations (Railways, Tramways and Metro) where, directly connected to the high voltage systems (750V, 1,5kV and 3kV) give very accurate and safe analogue outputs for measuring and protective purposes.

The MHCO line includes three models:

- **TRANSDUCER-TV**

For VOLTAGE measurement. Directly connected to the high voltage line up to 6kV through internal voltage divider.

- **TRANSDUCER-TI**

For CURRENT measurement. Connected to the high voltage line through a dedicated shunt (not supplied).

- **TRANSDUCER-TI**

For CURRENT measurement. Connected to the high voltage line through a dedicated shunt (not supplied). For combined CURRENT & VOLTAGE measurement. Connected to the high voltage line up to 6kV through internal voltage divider & through a dedicated shunt (not supplied).

Highlights

- HV Transducer for Current & Voltage measurement
- Direct Connection up to 6kV
- Fibre Optic connection between HV transmitter and LV receiver
- Measuring channel fully redundant
- Autoranging Multivoltage Power supply (self-powered version available as optional)
- Compatible with traction application standard

Transmitter Unit

Three different models available, one for each type of transducers (current, voltage and current/voltage). Directly connected to the High Voltage DC system acquires the input signals by a redundant input channel and transmit them, after comparison and confirmation of validity, to the receiver unit through dedicated Fibre Optic connections. It has an autoranging multivoltage Power supply. As option a self powered version is available; in this case the power supply is directly taken from the line voltage through a set of dumping resistors.

Receiver Unit

Two models available, respectively suitable to be connected to the current and to the voltage transmitter by means of a dedicated Fibre Optic connection. The input signal is converted
into 4 linear analogue output signals independently programmable (ie. 0-20/4-20mA etc..). The setting of this unit can be easily done using our MSCom2 software tool.

The receiver is equipped with two output relays: one relay is used for self diagnosis (it trips in case of interruption of the Fibre Optic channels or internal failure of the receiver unit, including power supply failure or as alarm for measurement discrepancy between the two transmitter channels); the second relay can be programmed as alarm for under/over voltage and/or current level. Optionally a Front face display and Keyboard panel is available for local measurement and programming.

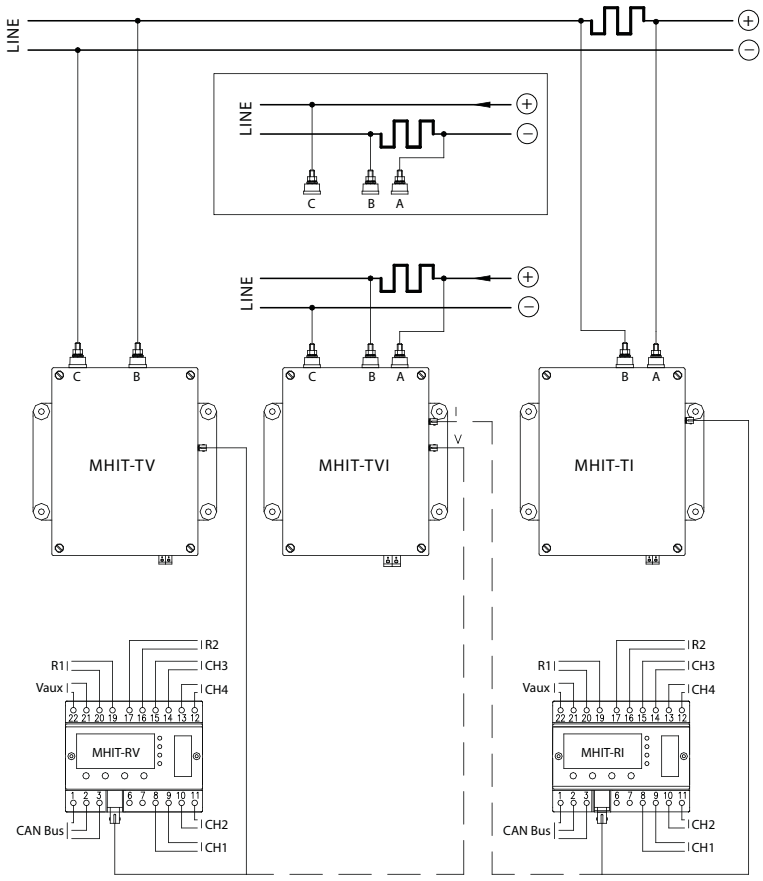
Fibre Optic Link

Transmitter and Receiver units are connected by means of a Fibre Optic link which guarantee a very hight insulation level.
Two Fibre Optic type are available both provided with standard ST connectors:
PLASTIC FIBRE: 62,5/125µ
GLASS FIBRE: 200 m HSC
The standard length of the fibre optic connection is 5 meters, other lengths are available on request.

Characteristics Transmitter/Receiver

Measurement solution: 0.1% of full scale @ (20/+70)°C
Responce time: 200ms
Connection: Fiber optic type 200.230.500m HCS (plastic) or 62.5/125m (glass) connection type ST
Fiber optic standard length 5m (max 1 km with glass fiber)

Wiring Diagram



DC-Pro

HIGH PERFORMANCE PROTECTION RELAY

General Characteristics

DC-Pro protection relay provides top-performance in terms of protection functions, memory and communication characteristic.
Designed for DC railway applications, is the best solution for the most demanding protection and control tasks.

Communication

- IEC61850 server with GOOSE messages.
- "Internet ready" with multiple connections
  - FTP server (File Transfer) to download/upload files from/to internal memory, or from external USB memory stick.
  - Web server provides information on protection status.
    DHCP/AUTO IP/STATIC IP / Telnet / UDP
- Modbus on TCP, MODBUS RTU on RS485 and USB, IEC103 / NTP (time sync), NMEA (GPS), IRIG-B

Hardware

- New 32 bit microprocessor, extremely short response time and high memory capacity.
- Analogue inputs fully programmable to accept a wide range of transducers (insulation amplifier, hall effect sensor, etc…)
- Two fiber optic inputs and two fiber optic output for direct connection with Microelettrica transducers.
- Four fully programmable analog outputs for SCADA or analog instrumentation.
- 7" capacitive touch screen with 10 programmable LEDs.
- 24 digital inputs and 14 digital outputs available on the module.

Firmware

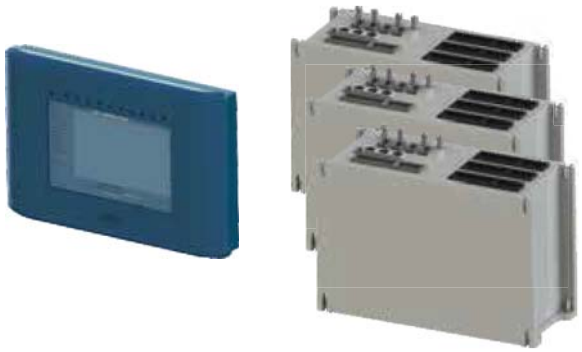
- Four independent setting groups
- PLC functionality: logical operator between inputs and outputs (logical and physical).
- Complete set of protection functions able to cover all requirement in DC traction switchgear.
- Intertripping logic: through digital IO or communication protocol (GOOSE messages).
- Events, trips and oscillographic recorder.

Electronics

Local Display Version

Remote Display One-to-One Version

One Display for all Substation Relay



Overall Dimensions (mm)