



## MC20

### OVERCURRENT and EARTH FAULT - RELAY

Overcurrent + Earth Fault relay with programmable time-current curves suitable for protection of power distribution systems with insulated, resistance earthed or compensated neutral.

Rated input current selectable 1A or 5A, 50/60 Hz.

3<sup>rd</sup> Harmonic Filter on the neutral input current.

As Optional Trip Coil Supervision function is available.

#### Protective Functions

- F50/51 : Three Phase-Fault elements
- F50N/51N : Three Earth Fault elements
- F51BF : Breaker Failure protection

#### Measurements

- Real Time Measurements (IA - IB - IC - Io)
- Maximum Demand and Inrush Recording (IA - IB - IC - Io)
- Trip Recording (last 20 trips with date & time)

#### Control

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

#### Technical Characteristics

- Complete autodiagnostic 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 Communication Protocols

#### Expansion Modules (optional)

The relay support only one expansion module

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

#### Mounting

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

#### 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.

#### Software

- MCom2 Program interface for device management

## Programmable Input Quantities

In : Rated primary current of phase CTs	: $(1 \div 9999)A$	step 1A
Fn : System frequency	: $(50 \div 60)Hz$	

### 1F - 50/51 (I>): First Overcurrent Element

Function enabling	: Enable/Disable	
Current setting range	: $I> = (0.20 \div 4)I_n$	step $0.01I_n$
Definite trip time delay ( $10 \times I>$ in inverse time operation modes)	: $tI> = (0.05 \div 60)s$	step 0.01s
Instantaneous output	: $\leq 0.03s$	
Time current curves	: Indep.Definite Time (D), IEC (A / B / C), IEEE (MI / VI / I / EI / SI)	

### 2F - 50/51 (I>>): Second Overcurrent Element

Function enabling	: Enable/Disable	
Current setting range	: $I>> = (0.50 \div 40)I_n$	step $0.01I_n$
Definite trip time delay	: $tI>> = (0.05 \div 60)s$	step 0.01s
Instantaneous output	: $\leq 0.03s$	
Automatic threshold doubling on inrush	: $2 \times I = \text{Enable/Disable}$	

### 3F - 50/51 (IH): Third Overcurrent Element

Function enabling	: Enable/Disable	
Current setting range	: $I_H = (0.50 \div 40)I_n$	step $0.01I_n$
Definite trip time delay	: $tI_H = (0.05 \div 60)s$	step 0.01s
Instantaneous output	: $\leq 0.03s$	
Automatic threshold doubling on inrush	: $2 \times I = \text{Enable/Disable}$	

### 1F - 50N/51N (Io>): First Earth Fault Element

Function enabling	: Enable/Disable	
Current setting range	: $I_{o>} = (0.01 \div 4)I_{on}$	step $0.01I_{on}$
Definite trip time delay ( $10 \times I_{o>}$ in inverse time operation modes)	: $tI_{o>} = (0.05 \div 60)s$	step 0.01s
Instantaneous output	: $\leq 0.04s$	
Time current curves	: Indep.Definite Time (D), IEC (A / B / C), IEEE (MI / VI / I / EI / SI)	

### 2F - 50N/51N (Io>>): Second Earth Fault Element

Function enabling	: Enable/Disable	
Current setting range	: $I_{o>>} = (0.01 \div 9.99)I_{on}$	step $0.01I_{on}$
Definite trip time delay	: $tI_{o>>} = (0.05 \div 60)s$	step 0.01s
Instantaneous output	: $\leq 0.04s$	

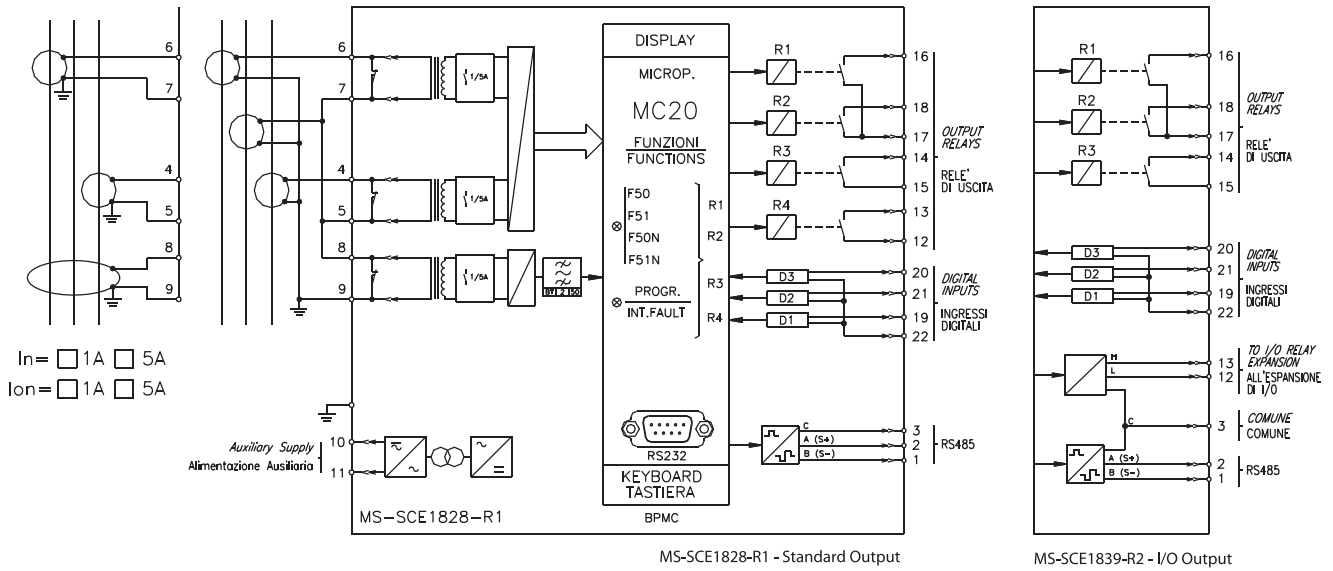
### 3F - 50N/51N (IoH): Third Earth Fault Element

Function enabling	: Enable/Disable	
Current setting range	: $I_{oH} = (0.01 \div 9.99)I_{on}$	step $0.01I_{on}$
Definite trip time delay	: $tI_{oH} = (0.05 \div 60)s$	step 0.01s
Instantaneous output	: $\leq 0.04s$	

### Breaker Failure Element

Trip time delay	: $t_{BF} = (0.05 \div 0.75)s$	step 0.01s
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### Connection Diagram



#### Typical Characteristics

Accuracy at reference value of influencing factors	2% In 0.2%On	for measurements
	2% + (to=20 ÷ 30ms)	for times
Rated current	In = 1A/5A; On = 1A/5A	
Current Overload	400A for 1 sec; 20A continuous	
Burden on current input	Phase : 0.05VA at In = 1A; 0.2VA at In = 5A Neutral : 0.05VA at On = 1A; 0.2VA at On = 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.)	

#### Order code - Example :

MC20	1	2	1	1
	Power Supply	Phase Rated Input Current	Zero sequence Input Current	Output Options
	1 = Type 1 2 = Type 2	1 = 1A 2 = 5A	1 = 1A 2 = 5A	1 = Standard (with R4) 2 = UX10-4 3 = 14DI 4 = 14DO

The performances and the characteristics reported in this document are not binding and can modified at any moment without notice.