



PROTECTION RELAYS

MC40-SEF2

Three phase overcurrent & sensitive earth fault relay

Three phase overcurrent & sensitive earth fault relay with programmable timecurrent 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.
4-shots Autoreclosure fully programmable.
Connection through 4 CTs.

Protective Functions

- F49 : One Thermal Image element
- F79 : Autoreclosure
- F50/51 : Three independent overcurrent elements
- F50N/51N : Two Earth Fault elements
- F64SEF : One Sensitive Earth Fault element
- 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



MICROELETTRICA

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

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.

Mounting

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

Software

- MCom2 Program interface for device management

Programmable Input Quantities		
In : Rated primary current of phase CTs	(1 ÷ 9999)A	step 1A
Fn : System frequency	(50 ÷ 60)Hz	
F49 (T>): Thermal Image		
Function enabling	Enable/Disable	
Temperature prealarm	Tal = (50 ÷ 110)%Tb	step 1%Tb
Thermal Image reset level	Tst = (10 ÷ 100)%Tb	step 1%Tb
Continuous admissible current	Ib = (50 ÷ 130)	step 1 %In
Warming-up Time constant	TW = (1 ÷ 60)min	step 1min
1F - 50/51 (I>): First Overcurrent Element		
Function enabling	Enable/Disable	
Current setting range	I> = (0.20 ÷ 4)In	step 0.01In
Definite trip time delay (10x[I>] in inverse time operation modes)	tI> = (0.05 ÷ 60)s	step 0.01s
Instantaneous output	≤ 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 ÷ 40)In	step 0.01In
Definite trip time delay	tI>> = (0.05 ÷ 60)s	step 0.01s
Instantaneous output	≤ 0,03s	
Automatic threshold doubling on inrush	2xI = Enable/Disable	
3F - 50/51 (IH): Third Overcurrent Element		
Function enabling	Enable/Disable	
Current setting range	IH = (0.50 ÷ 40)In	step 0.01In
Definite trip time delay	tIH = (0.05 ÷ 60)s	step 0.01s
Instantaneous output	≤ 0,03s	
Automatic threshold doubling on inrush	2xI = Enable/Disable	
1F - 50N/51N (Io>): First Earth Fault Element		
Function enabling	Enable/Disable	
Current setting range	Io> = (0.01 ÷ 4)Ion	step 0.01Ion
Definite trip time delay	tIo> = (0.05 ÷ 60)s	step 0.01s
Instantaneous output	≤ 0,04s	

2F - 50N/51N (I_{o>>}): 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 (10x[I _{>}] in inverse time operation modes)	$t_{I_{o>>}} = (0.05 \div 60)s$	step 0.01s
Instantaneous output	$\leq 0,04s$	

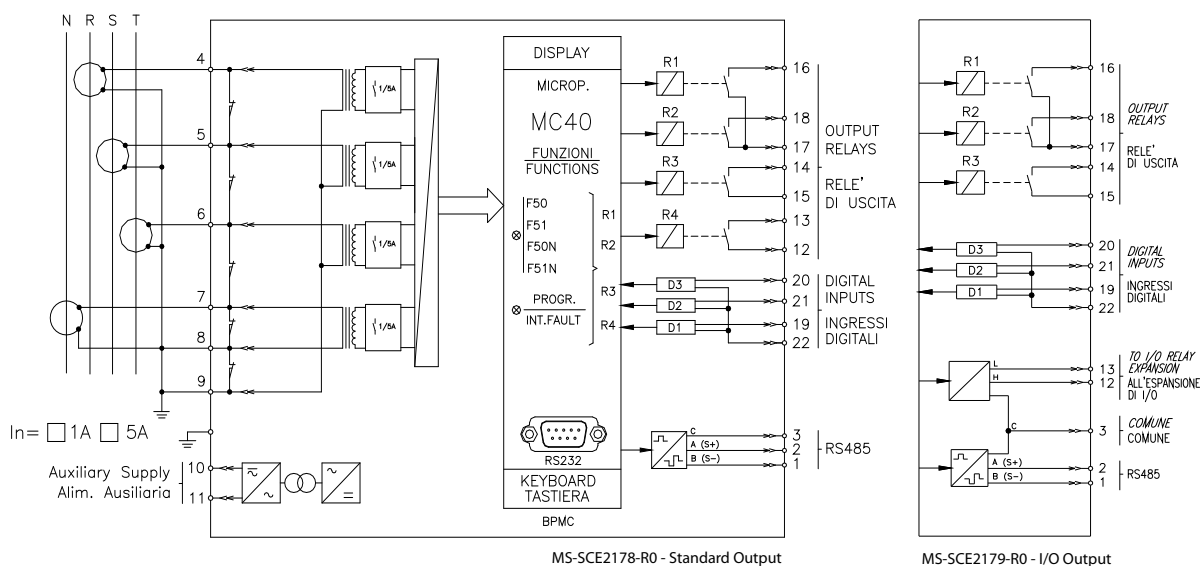
1F - 64SEF (S_{o>}): Sensitive Earth Fault Element

Function enabling	Enable/Disable	
Current setting range	$S_{o>} = (2 \div 200)mA$,	step 1mA
Definite trip time delay	$t_{S_{o>}} = (0.05 \div 180)s$	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)	

F79 - Autoreclosure Breaker Failure Element

Trip time delay	$t_{BF} = (0.05 \div 0.75)s$	step 0.01s
-----------------	------------------------------	------------

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.)			
Order code - Example				
MC40-SEF	1	2	1	1
	Power Supply	Phase Rated Input Current	Zero sequence Input Current	Output Options
	1 = Type 1	1 = 1A	1 = 1A	1 = Standard (with R4)
	2 = Type 2	2 = 5A	2 = 5A	2 = UX10-4
				3 = 14DI
				4 = 14DO

The technical specifications reported are not binding and they should be agreed in the contract.

For further technical information on our products visit www.microelettrica.com

Microelettrica Scientifica S.p.A.

20090 Buccinasco (MI) , Via Lucania 2, Italy

Tel.: +39 02 575731

E-mail: info@microelettrica.com

www.microelettrica.com



 **KNORR-BREMSE**

 **NEW YORK AIR BRAKE**

 **IFE**

 **MERAK**

 **MICROELETTRICA**

 **SELECTRON**

 **KIEPE ELECTRIC**

 **EVAC**

 **ZELISKO**

 **RAILSERVICES**