



PROTECTION RELAYS

MC40^{SR}

Three phase overcurrent & earth fault relay

Three phase overcurrent & 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.
Connection through 4 CTs.

Protective Functions

- F49 : One Thermal Image element
- F50/51 : Three independent overcurrent elements
- F50N/51N : Three Earth Fault elements
- F51BF : Breaker Failure protection
- F86 : Lockout

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



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

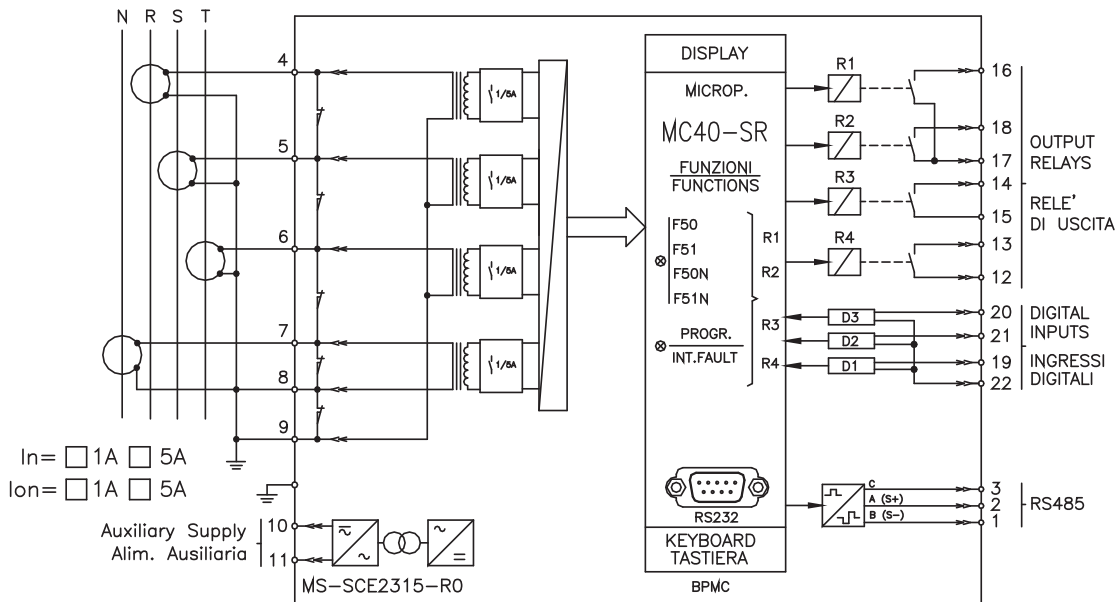
3F - 50N/51N (I_{oH}): Third Earth Fault Element

Function enabling	Enable/Disable	
Current setting range	$I_{oH} = (0.01 \div 9.99)I_{on}$	step 0.01I _{on}
Definite trip time delay	$t_{I_{oH}} = (0.05 \div 60)s$	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 @ 2xIs)		for times	
Rated current	In = 1A/5A; On = 1A/5A			
Current Overload	400A 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				
MC40SR	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

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