OVERCURRENT and EARTH FAULT + AUTORECLOSING - RELAY

MC20-R

MC12-R2

LINE MC

50/51, 50N/51N, 51BF, 79

- Three Phase-Fault elements.
- Three Earth Fault elements.
- Time current curves selectable according to IEC/IEEE stand.
- Four/shot programmable Autoreclosing.
- Reclosure sequence coordination.
- Breaker Failure protection.
- Trip Circuit Breaker control via serial port.
- Blocking Output and Blocking Input for pilot wire selectivity coordination.
- Time tagged multiple event recording.
- Oscillographic wave form capture.
- Modbus RTU / IEC870-5-103 Communication Protocols.
- Display LCD 16 (2x8) characters.
- Canbus port for expansion module connection.
- Optional I/O Expansion module over Canbus (EX/IO).

Overcurrent + Earth Fault + autoreclosure 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.

3rd Harmonic Filter on the neutral input current.

Real Time Measurements = IA - IB - IC - Io
Maximum Demand and Inrush Recording = IA - IB - IC - Io

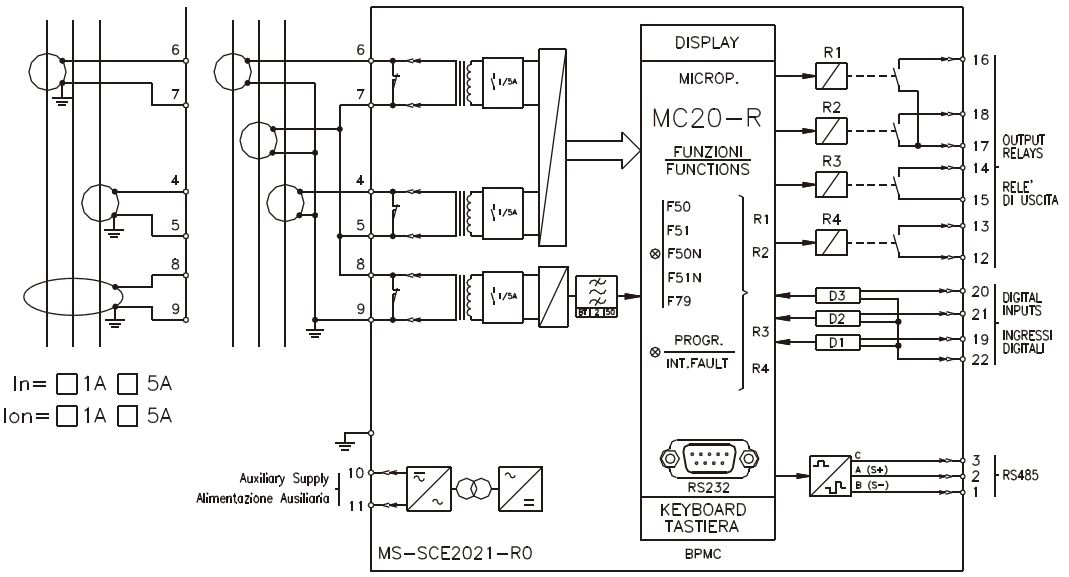
Programmable Input Quantities

Fn = System frequency : (50 - 60)Hz
In = Rated primary current of phase CTs : (1 - 9999)A, step 1A

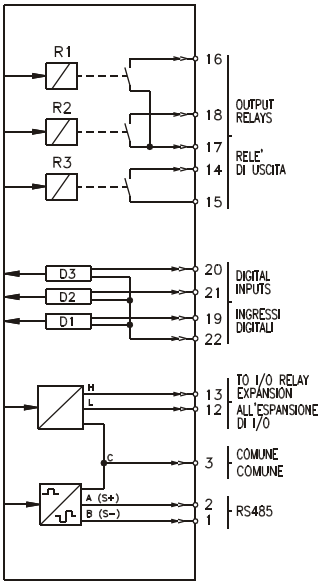
Auxiliary Power Supply

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

Connection Diagram



MS-SCE2021-R0
Standard Output



MS-SCE2022-R0
I/O Expansion module Output

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

- Function enabling : **Enable/Disable**
- Current setting range : **I> = (0.10 ¸ 4.00)In**, step 0.01In
- Instantaneous output : £ **0.03s**
- Time current curves : Indep.Definite Time **(D),** IEC **(A / B / C),** IEEE **(MI / VI / I / EI / SI)**
- Definite trip time delay (10x[I>] in inverse time operation modes) : **tI> = (0.05 - 60.00)s**, step 0.01s
- Autoreclosure shot enabling : **Shx = 1 - 2 - 3 - 4 (any combination)**

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

- Function enabling : **Enable/Disable**
- Current setting range : **I>> = (0.50 ¸ 40.00)In**, step 0.01In
- Definite trip time delay : **tI>> = (0.05 ¸ 60.00)s**, step 0.01s
- Instantaneous output : £ **0.03s**
- Automatic threshold doubling on inrush : **2xI = Enable/Disable**
- Trip time delay : **t2xI = (0.02 ¸ 9.99)s**, step 0.01s
- Autoreclosure shot enabling : **Shx = 1 - 2 - 3 - 4 (any combination)**

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

- Function enabling : **Enable/Disable**
- Current setting range : **IH = (0.50 ¸ 40.00)In**, step 0.01In
- Definite trip time delay : **tIH = (0.05 ¸ 60.00)s**, step 0.01s
- Instantaneous output : £ **0.03s**
- Automatic threshold doubling on inrush : **2xI = Enable/Disable**
- Trip time delay : **t2xI = (0.02 ¸ 9.99)s**, step 0.01s
- Autoreclosure shot enabling : **Shx = 1 - 2 - 3 - 4 (any combination)**

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

- Function enabling : **Enable/Disable**
- Current setting range : **Io> = (0.01 ¸ 4.00)Ion**, step 0.01Ion
- Instantaneous output : £ **0.04s**
- Time current curves : Indep.Definite Time **(D),** IEC **(A / B / C),** IEEE **(MI / VI / I / EI / SI)**
- Definite trip time delay (10x[Io>] in inverse time operation modes) : **tI> = (0.05 - 60.00)s**, step 0.01s
- Autoreclosure shot enabling : **Shx = 1 - 2 - 3 - 4 (any combination)**

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

- Function enabling : **Enable/Disable**
- Current setting range : **Io>> = (0.01¸ 9.99)In**, step 0.01In
- Definite trip time delay : **tIo>> = (0.05¸ 60.00)s**, step 0.01s
- Instantaneous output : £ **0.04s**
- Autoreclosure shot enabling : **Shx = 1 - 2 - 3 - 4 (any combination)**

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

- Function enabling : **Enable/Disable**
- Current setting range : **IoH = (0.01¸ 9.99)In**, step 0.01In
- Definite trip time delay : **tIoH = (0.05¸ 60.00)s**, step 0.01s
- Instantaneous output : £ **0.04s**
- Autoreclosure shot enabling : **Shx = 1 - 2 - 3 - 4 (any combination)**

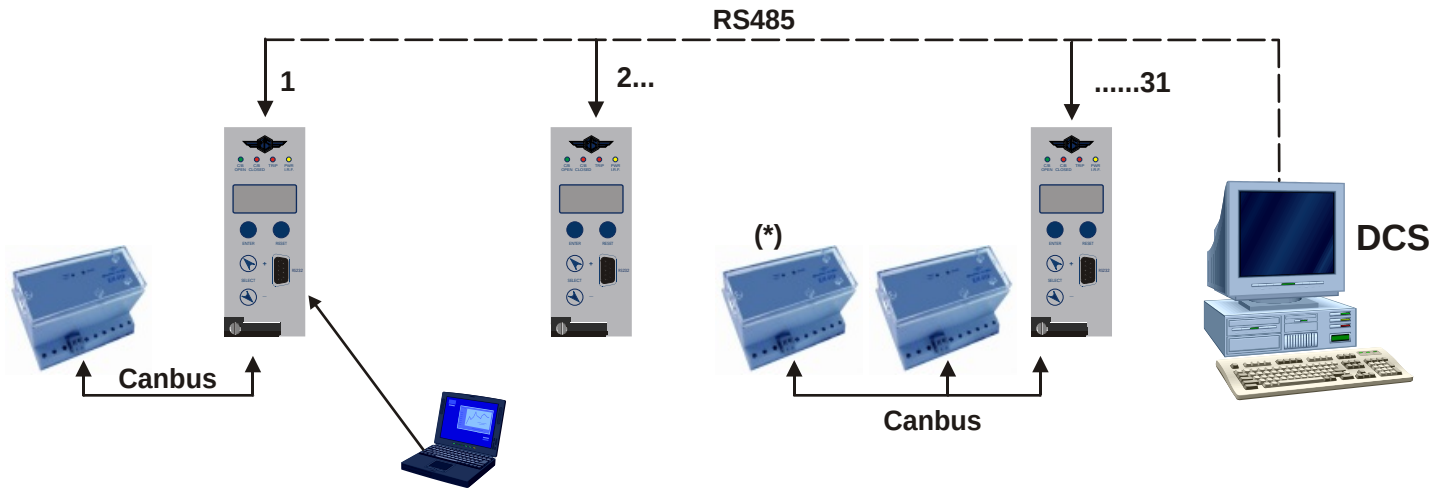
F79 - Autoreclose

- Number of reclosure shots to Lock-out : **RSh = (1 / 2 / 3 / 4)**
- Reclosing time delay first shot : **RCL1 = (0.1 ¸ 300)s**, step 0.1s
- Reclosing time delay first second : **RCL2 = (0.1 ¸ 300)s**, step 0.1s
- Reclosing time delay first third : **RCL3 = (0.1 ¸ 300)s**, step 0.1s
- Reclosing time delay first fourth : **RCL4 = (0.1 ¸ 300)s**, step 0.1s
- Reset (Reclaim) time : **RCLtr = (0.1 ¸ 300)s**, step 0.1s

Breaker Failure Element

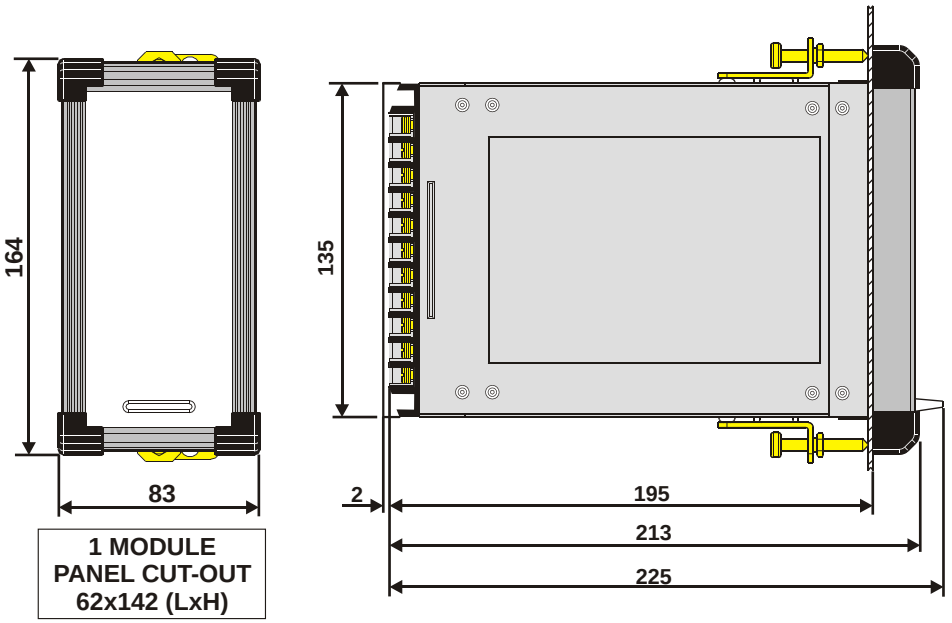
- Trip time delay : **tBF = (0.05 - 0.75)s**, step 0.01s

EXPANSION MODULE - Connection Example



(*) EX/IO - Expansion module = 5 Digital Inputs and 5 Relay Outputs

OVERALL DIMENSIONS



PROTECTION DEGREE IP44 (IP54 on request)

1 MODULE PANEL CUT-OUT 62x142 (LxH)

APPROVAL : CE
REFERENCE STANDARDS IEC 60255 - EN50263 - CE Directive - EN/IEC61000 - IEEE C37 - BSI

Dielectric test voltage	IEC 60255-5	2kV, 50/60Hz, 1 min.
Impulse test voltage	IEC 60255-5	5kV (c.m.), 2 kV (d.m.) - 1,2/50ms
Insulation resistance	>100 M	

Environmental Std. Ref. (IEC 680068)

Operation ambient temperature		-10°C / +55°C	
Storage temperature		-25°C / +70°C	
Environmental testing	(Cold)	IEC60068-2-1	
	(Dry heat)	IEC60068-2-2	
	(Change of temperature)	IEC60068-2-14	
	(Damp heat, steady state)	IEC60068-2-78	IEC68-2-3 RH 93% Without Condensing 40°C

CE EMC Compatibility (EN50081-2 - EN50082-2 - EN50263)

Electromagnetic radiated and conducted emission	EN55022	Industrial Enviroment	
Radiated electromagnetic field immunity test	IEC61000-4-3 ENV50204	level 3	80-2000MHz10V/m 900MHz/200Hz 10V/m
Conducted disturbances immunity test	IEC61000-4-6	level 3	0.15-80MHz10V
Electrostatic discharge test	IEC61000-4-2	level 4	6kV contact / 8kV air
Power frequency magnetic test	IEC61000-4-8		1000A/m, 50/60Hz
Pulse magnetic field	IEC61000-4-9		1000A/m, 8/20ms
Damped oscillatory magnetic field	IEC61000-4-10		100A/m, 0.1-1MHz
Immunity to conducted common mode disturbance 0/150KHz	IEC61000-4-16	level 4	
Electrical fast transient/burst	IEC61000-4-4	level 4	2kV, 5kHz
HF disturbance test with damped oscillatory wave (1MHz burst test)	IEC60255-22-1	class 3	400pps, 2.5kV (m.c.), 1kV (d.m.)
Oscillatory waves (Ring waves)	IEC61000-4-12	level 4	4kV(c.m.), 2kV(d.m.)
Surge immunity test	IEC61000-4-5	level 4	2kV(c.m.), 1kV(d.m.)
Voltage interruptions	IEC60255-4-11	50ms	
Resistance to vibration and shocks	IEC60255-21-1 - IEC60255-21-2		

Typical Characteristics

Accuracy at reference value of influencing factors (In,On = Nominal current of the System's CT)	2% In - 0.2% On 2% + to (to=20-30ms @ 2xIs)	for measurements for times
Rated current	In = 1A/5A On = 1A/5A	
Current Overload	400A for 1sec; 20A continuous	
Burden on current inputs	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.)	

Communication Parameters

RS485 (Back)	9600/19200 bps 8,N,1 - 8,E,1 - 8,O,1 Modbus RTU or IEC60870-5-103
RS232 (Front)	9600 8,N,1 Modbus RTU

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