Microelettrica Scientifica

THREE PHASE OVERCURRENT & EARTH FAULT RELAY

MC30-AR

MC14-R3

LINE MC

49, 50/51, 50N/51N, 51BF

- Three independent overcurrent elements.
- Three Earth Fault elements.
- One Thermal Image element.
- Blocking Output and Blocking Input for pilot wire selectivity coordination.
- Breaker Failure protection.
- Time tagged multiple event recording.
- Oscillographic wave form capture.
- Modbus RTU / IEC870-5-103 Communication Protocols
- Display LCD 16 (2x8) characters .

Three phase 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.

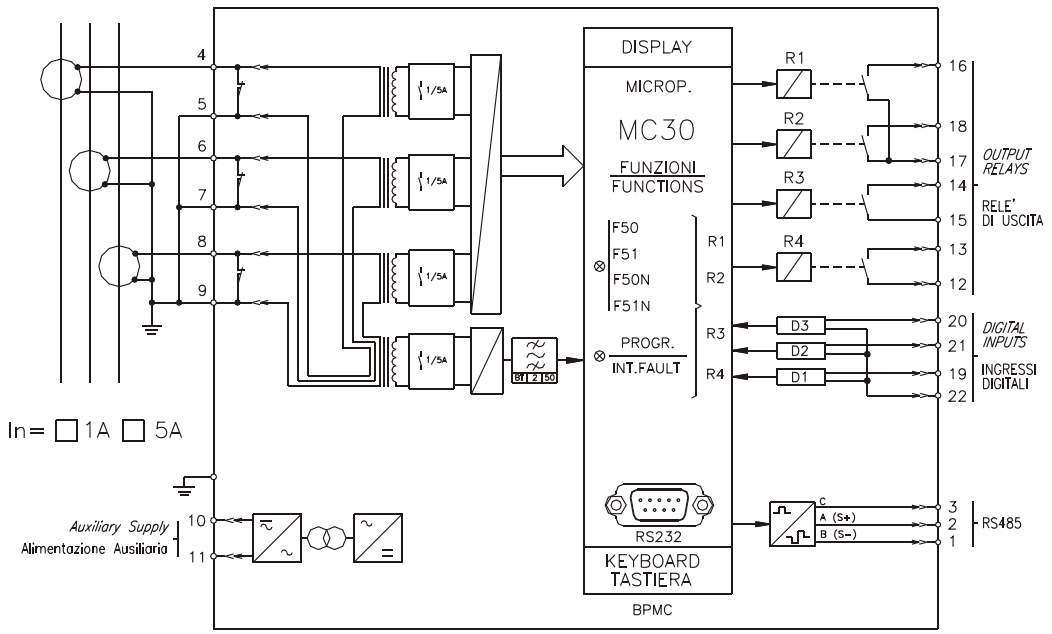
Connection through 3 CTs.

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

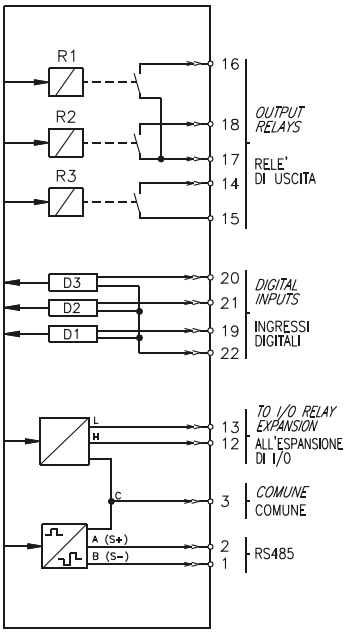
Programmable Input Quantities

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

Connection Diagram



MS-SCE1895-R2
Standard Output



MS-SCE1924-R2
I/O Output

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> = (0.10 4.00)In**, step 0.01In
- Definite trip time delay : **tI> = (0.05 60.00)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)**
- Definite trip time delay (10x[I>] in inverse time operation modes) : **tI> = (0.05 - 60.00)s**, step 0.01s

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**

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**

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

- Function enabling : **Enable/Disable**
- Current setting range : **Io> = (0.01 4.00)Ion**, step 0.01Ion
- Definite trip time delay : **tIo> = (0.05 60.00)s**, step 0.01s
- 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

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**

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

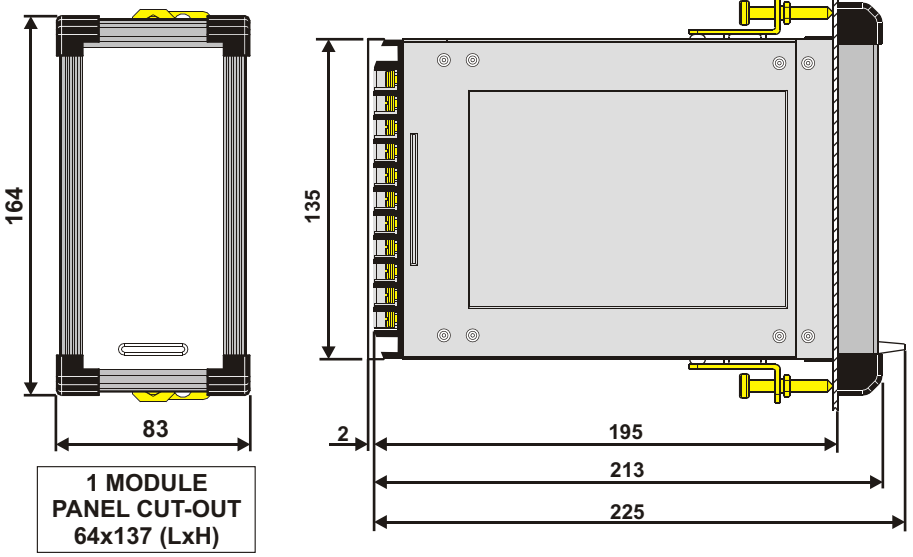
- Function enabling : **Enable/Disable**
- Current setting range : **IoH = (0.01 9.99)In**, step 0.01In
- Definite trip time delay : **tIoH = (0.05 60.00)s**, step 0.01s
- Instantaneous output : **0.04s**

Breaker Failure Element

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

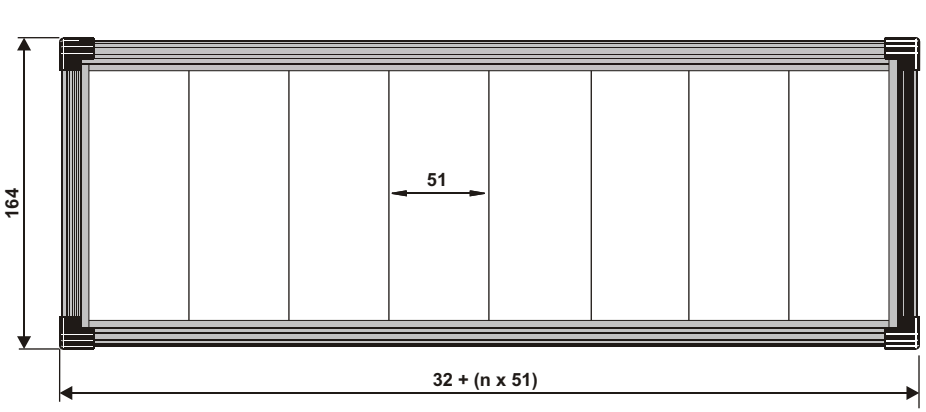
OVERALL DIMENSIONS (mm)

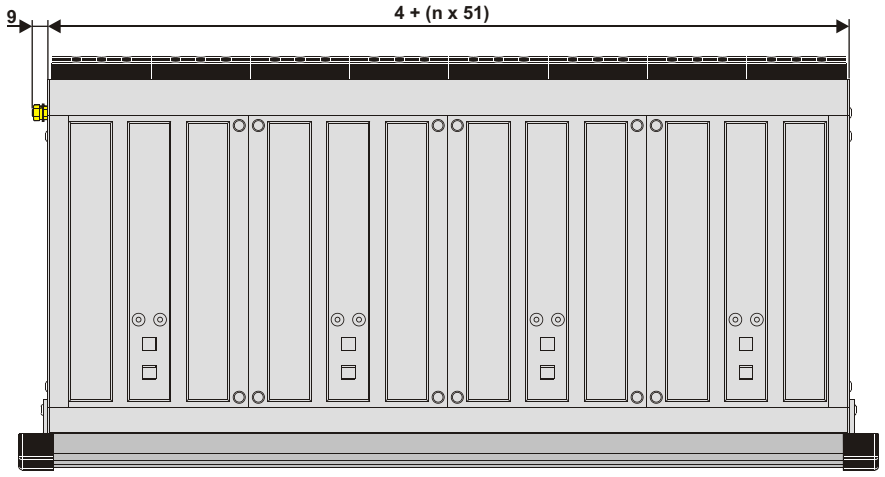
PROTECTION DEGREE IP44
(IP54 on request)

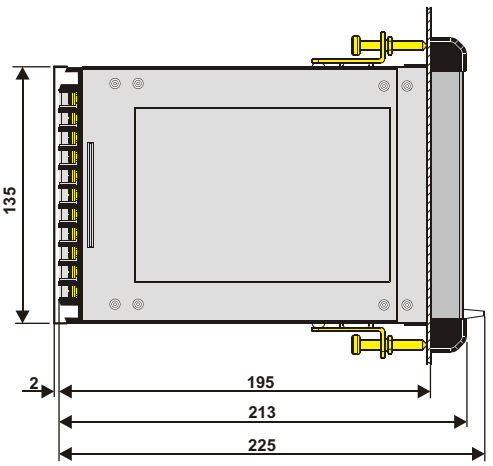


1 MODULE
PANEL CUT-OUT
64x137 (LxH)

Overall Dimensions - Multi-Modules (mm)







PROTECTION
DEGREE IP44
(IP54 on request)

PANEL CUT-OUT
(11+(n x 51)) x 137 (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.) - 1,2/50 s
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	level 3	80-2000MHz10V/m
	ENV50204		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	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.)

Power Supply

Type 1 : 24 110V A.C.(20%) - 24 125V D.C. (20%)
Type 2 : 80 220V A.C.(20%) - 90 250V D.C. (20%)

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

Order code - Example : MC30-AR-1-2-2-1

MC30-AR — ( ) — ( ) — ( ) — ( )

Power Supply
1 = Type 1
2 = Type 2

Phase Rated Input Current
1 = 1A
2 = 5A

Zero sequence Input Current
1 = 1A
2 = 5A

Output Options
1 = Standard (with R4)
2 = Can bus port

Microelettrica Scientifica
via Alberelle 56/58, 20089 Rozzano, Milano (Italy)
Tel. +3902575731 - Fax +390257510940 / **http://www.microelettrica.com - sales.relays@microelettrica.com**
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