PROTECTION RELAYS

MC2-30MW

Motor protection relay with voltage & power control

General Characteristics

MC2 is the new generation of Microelettrica Scientifica's entry level protection relays.

Complete motor protection relay designed for the protection and active security of medium and lage size induction motor.

The relay also computes the positive and negative sequence components of system. The earth current input circuit includes a 3rd harmonic active filter.

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

Protective Functions

- F27/59 : Over/Under Voltage
- F37 : No-Load Running
- F46 : Curent Unbalance
- F47 : Phase sequence or phase-balance voltage (Negative sequence)
- F48 : Starting Control
- F49 : Thermal Image
- F50/51 : Overcurrent
- F51LR : Locked Rotor
- F55 : Low Power Factor
- F64 : Earth Fault
- F66 : Control of n° of starting
- F74 : Trip circuit supervision
- F81 : Over/Under Frequency
- Breaker failure protection
- Reduced Voltage Starting Control

Measurements

- Real Time Measurements (IA - IB - IC - Io)
- Maximum Demand and Inrush Recording (IA - IB - IC - Io)
- Trip Recording (30 last trip)

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Control

- Two complete setting programs switchable locally or remotely
- Time tagged multiple event recording and jurnal (500 events)
- Oscillographic wave form capture up to 40 sec.
- Complete autodiagnostic program
- Blocking Outputs and Blockings Inputs for pilot wire
- file system - Mass storage device
- Oscillo available also in comtrade format

Technical Characteristics

- 8 Programmable Output Relays
- 8 Programmable Digital Inputs
- Hi-resolution graphic display (240*128)
- 10 Programmable Leds
- 6 Programmable push button

Communications

- RS485 Serial communication port on rear side
- USB communication port on front panel
- Modbus RTU / IEC870-5-103 Communication protocol

Software

- MSCom2 Program interface for device management

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.

Execution

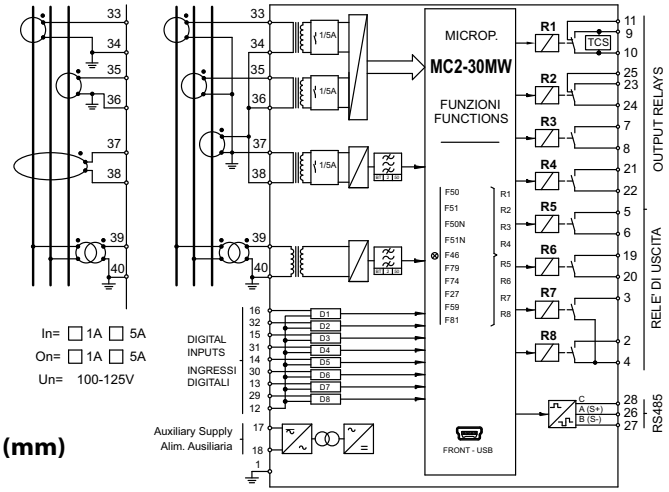
- Plastic Enclosure
- IP44 degree of protection

Programmable Input Quantities		
Fn = System frequency	(50 ÷ 60) Hz	
In = Rated primary current of phase CTs	(0 ÷ 9999)A	step 1A
On = Rated primary current of earth fault detection CT	(0 ÷ 9999)A	step 1A
F49 : Thermal Image		
Function enabling	No - Yes	
Operation Mode	I1.I2 / IMax	
Temperature prealarm	Tal = (10 ÷ 100)%Tn	step 1%
Temperature reset	Tres = (10 ÷ 100)%Tn	step 1%
Continuous admissible current	Is = (0.5 ÷ 1.5)In	step 0.01In
Warming-up time constant of the load	To = (1 ÷ 10)	step 1
F50/51 (1I>): 1st Overcurrent Element		
Function enabling	No - Yes	
Time current curves	f(t) = Indep.Definite Time (D), IEC (A/B/C), IEEE (MI/VI/I/EI/SI)	
Operation level	Is = (0.1 ÷ 4)In	step 0.01In
Independent time delay	ts = (0.02 ÷ 100)s	step 0.01s
F50/51 (2I>): 2nd Overcurrent Element		
Function enabling	No - Yes	
Automatic doubling of trip level on inrush	Enable / Disable	
Operation level	Is = (0.1 ÷ 40)In	step 0.01In
Independent time delay	ts = (0.02 ÷ 100)s	step 0.01s
F50/51 (3I>): 3rd Overcurrent Element		
Function enabling	No - Yes	
Automatic doubling of trip level on inrush	Enable / Disable	
Operation level	Is = (0.1 ÷ 40)In	step 0.01In
Independent time delay	ts = (0.02 ÷ 100)s	step 0.01s
F64 (1Io>): 1st Earth Fault Element		
Function enabling	No - Yes	
Time current curves	f(t) = Indep.Definite Time (D), IEC (A/B/C), IEEE (MI/VI/I/EI/SI)	
Operation level	Is = (0.01 ÷ 4)On	step 0.01On
Independent time delay	ts = (0.02 ÷ 100)s	step 0.01s

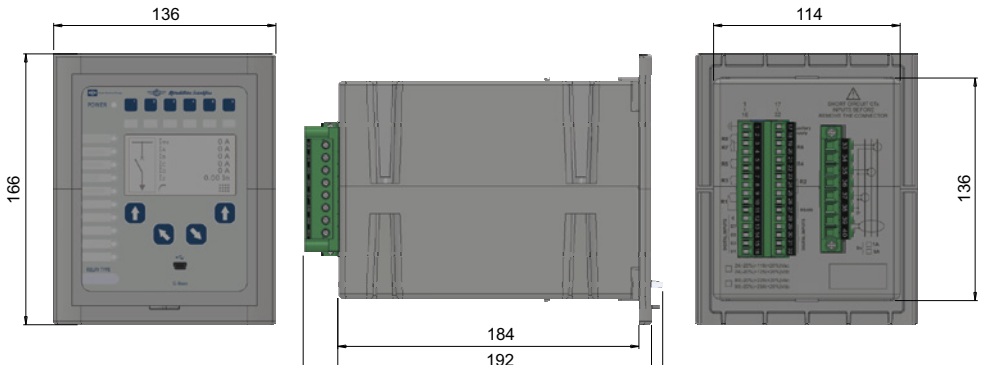
F64 (2Io>): 2nd Earth Fault Element		
Function enabling	No - Yes	
Operation level	Is = (0.01 ÷ 9.99)On	step 0.01On
Independent time delay	ts = (0.02 ÷ 100)s	step 0.01s
F64 (3Io>): 3rd Earth Fault Element		
Function enabling	No - Yes	
Operation level	Is = (0.01 ÷ 9.99)On	step 0.01On
Independent time delay	ts = (0.02 ÷ 100)s	step 0.01s
F46 (1Is>): 1st Current Unbalance Element		
Function enabling	No - Yes	
Time current curves	f(t) = Indep.Definite Time (D), IEC (A/B/C), IEEE (MI/VI/I/EI/SI)	
Operation level	Is = (0.1 ÷ 4)In	step 0.01In
Independent time delay	ts = (0.02 ÷ 100)s	step 0.01s
F46 (2Is>): 2nd Current Unbalance Element		
Function enabling	No - Yes	
Operation level	Is = (0.1 ÷ 4)In	step 0.01In
Independent time delay	ts = (0.02 ÷ 100)s	step 0.01s
F27 : Undervoltage Element		
Function enabling	No - Yes	
Undervoltage level	Us = (0.3 ÷ 1)Un	step 0.01Un
Time delay of under voltage level	ts = (0.1÷ 99.9)s	step 0.1s
F59 : Overvoltage Element		
Function enabling	No - Yes	
Overvoltage level	Us = (0.7 1÷ 1.4)Un	step 0.01Un
Time delay	ts = (0.1 1÷ 99.9)s	step 0.1s
F81< : Underfrequency Element		
Function enabling	No - Yes	
Underfrequency level	fs = (0 1÷ 9.99)Hz	step 0.01Hz
Time delay	ts = (0.1 1÷ 99.9)s	step 0.1s
F81> : Overfrequency Element		
Function enabling	No - Yes	
Overfrequency level	fs = (0 1÷ 9.99)Hz	step 0.01Hz
Time delay	ts = (0.1 1÷ 99.9)s	step 0.1s
F55 : Low Power Factor Element		
Function enabling	No - Yes	
Low power factor level	PFs = (0.5 1÷ 0.98)	
Time delay	ts = (1 1÷ 999)s	step 1s
F51LR - (LR) Locked Rotor		
Function enabling	No - Yes	
Setting range	ILR = (1 ÷ 5)In	step 0.1In
Trip time delay	tLR = (1 ÷ 120)s	step 1s
F66 (StNo) - Limitation of N° of Startings		
Function enabling	No - Yes	
Numbers of starting	StNo = (1 ÷ 60)	step 1
Time interval for counting of StNo	tstNo = (60 ÷ 3600)s	step 1s
Reset time after trip	tBst = (60 ÷ 3600)s	step 1s

F37 - (I<) No-Load Running		
Function enabling	No - Yes	
Setting Range	I< = (0.15 ÷ 1)In	step 0.01In
Trip time delay	tI< = (0.1 ÷ 90)s	step 0.01s
StSeq - Starting Sequence Control		
Function enabling	No - Yes	
Setting Range	ITr = (0.1 ÷ 1)In	step 0.1In
Trip time delay	tTr = (0.5 ÷ 50)s	step 0.1s
Motor Starts		
Setting Range (Min. level for motor ON)	Is = (0.05 ÷ 1)In	step 0.01In
Motor start filter time	tfSt = (0.02 ÷ 1)s	step 0.01s
Motor Starting time	tSt = (10 ÷ 120)s	step 0.01s
Breaker Failure Element		
Alarm time delay	tBF= (0.05 ÷ 0.75)s	step 0.01s
Trip Circuit Supervision Element		
Function enabling	No - Yes	
Independent time delay	ts = (0.1 ÷ 100)s	step 0.01s
Trip circuit voltage	= (24 ÷ 250)Vdc	step 0.1s

Connection Diagram



Overall Dimensions (mm)



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		500 A for 1 sec; 20 A continuous	
Burden on current input		0.1 VA at In = 1A; 0.3 VA at In = 5A	
Average power supply consumption		≤ 7 VA	
Output relays		rating 6 A; Vn = 250V 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			
MC2-30M	1	2	1
	Power Supply	Phase Rated Input Current	Zero sequence Input Current
	1 = Type 1	1 = 1A	1 = 1A
	2 = Type 2	2 = 5A	2 = 5A

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

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