MULTIFUNCTION THREE PHASE OVERVOLTAGE / UNDERVOLTAGE RELAY

MC3V

MC05-R3

LINE MC

27, 59, 59Vo, 47, 81

- Two Under Voltage elements
- Two Over Voltage elements
- One UnderFrequency element
- One OverFrequency element
- One Zero Sequence Overvoltage Element
- One Negative Sequence Overvoltage Element
- One Positive Sequence Undervoltage Element
- Time tagged multiple event recording
- Oscillographic wave form capture
- Modbus RTU / IEC870-5-103 Communication Protocols
- Display LCD 16 (2x8) characters

Three-phase voltage relay, suitable for protection of HV, MV, LV power transmission and distribution systems.

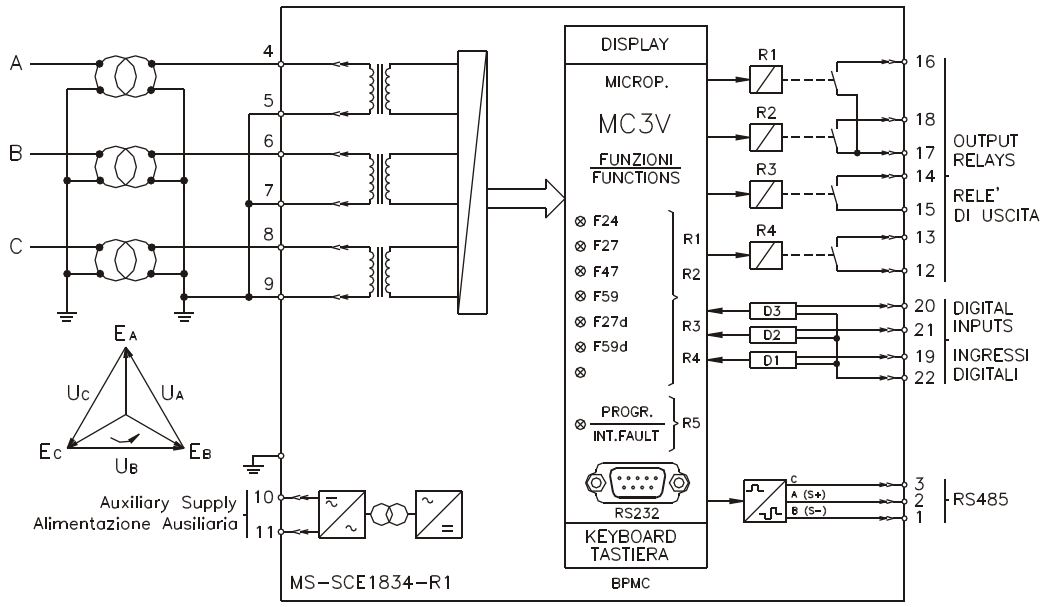
The relay MC3V measures the true R.M.S. value of the 3 phase to neutral voltages fed to three transformers isolated high-impedance inputs.

Real Time Measurements = **f** - EA - EB - EC - Vo - V_1 - V_2

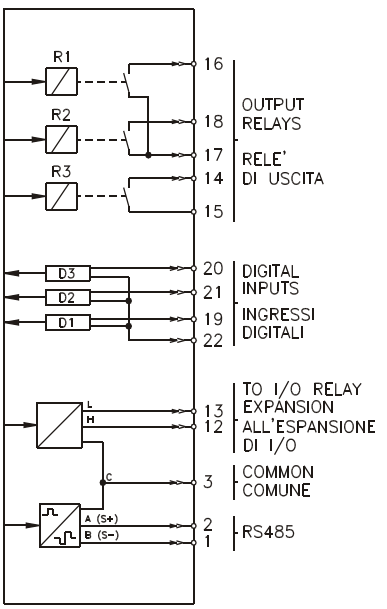
Programmable Input Quantities

Fn	= System frequency	: (50 - 60)Hz
V1	= Rated primary phase to phase voltage of system's Pts	: (0.05 - 500)kV, step 0.01kV.
V2	= Rated secondary phase to phase voltage of system's Pts	: (50 - 400)V, step 0.01V.

Connection Diagram



MS-SCE1834-R1
Standard Output



MS-SCE1835-R1
I/O Output

1 - F59 (V>) : First OverVoltage Element

Function enabling	: **= Enable - Disable**	
Setting range	: **V> = (0.5 - 1.50)Vn**,	step 0.01Vn
Instantaneous output	: £ **0.03s**	
Trip time delay	: **tV> = (0.05 - 60)s**,	step 0.01s

2 - F59 (V>>) : Second OverVoltage Element

Function enabling	: **= Enable - Disable**	
Setting range	: **V>> = (0.5 - 1.50)Vn**,	step 0.01Vn
Instantaneous output	: £ **0.03s**	
Trip time delay	: **tV>> = (0.05 - 60)s**,	step 0.01s

1 - F27 (V<) : First UnderVoltage Element

Function enabling	: **= Enable - Disable**	
Setting range	: **V< = (0.2 - 1.20)Vn**,	step 0.01Vn
Instantaneous output	: £ **0.03s**	
Trip time delay	: **tV< = (0.05 - 60)s**,	step 0.01s

2 - F27 (V<) : Second UnderVoltage Element

Function enabling	: **= Enable - Disable**	
Setting range	: **V<< = (0.2 - 1.20)Vn**,	step 0.01Vn
Instantaneous output	: £ **0.03s**	
Trip time delay	: **tV<< = (0.05 - 60)s**,	step 0.01s

1 - 81> (f>): Maximum Frequency Element

Function enabling	: **= Enable - Disable**	
Setting range	: **f> = (40 - 70)Hz**,	step 0.01Hz
Instantaneous output	: **= £ 0.03s**	
Trip time delay	: **tf> = (0.05 - 60)s**,	step 0.01s

1 - 81< (f<): Minimum Frequency Element

Function enabling	: **= Enable - Disable**	
Setting range	: **f< = (40 - 70)Hz**,	step 0.01Hz
Instantaneous output	: **= £ 0.03s**	
Trip time delay	: **tf< = (0.05 - 60)s**,	step 0.01s

1 - 59o (Vo>): Zero Sequence Voltage Control Element

Function enabling	: **= Enable - Disable**	
Setting range	: **Vo> = (0.1 - 2)Vn**,	step 0.01Vn
Instantaneous output	: **= £ 0.03s**	
Trip time delay	: **tVo>= (0.05 - 60)s**,	step 0.01s

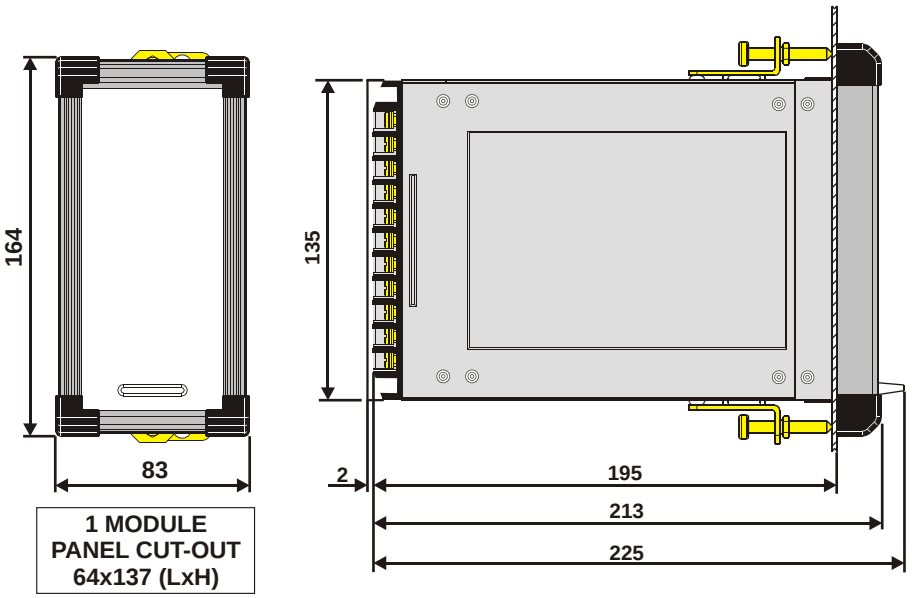
1 - 27 (V1<): Positive Sequence Undervoltage Element

Function enabling	: **= Enable - Disable**	
Setting range	: **V1< = (0.02 - 1.5)Vn**,	step 0.01Vn
Instantaneous output	: **= £ 0.03s**	
Trip time delay	: **tV1<= (0.05 - 60)s**,	step 0.01s

1 - 47 (V2>): Negative Sequence (Unbalanced) Overvoltage Element

Function enabling	: **= Enable - Disable**	
Setting range	: **V2> = (0.1 - 1.5)Vn**,	step 0.01Vn
Instantaneous output	: **= £ 0.03s**	
Trip time delay	: **tV2<= (0.05 - 60)s**,	step 0.01s

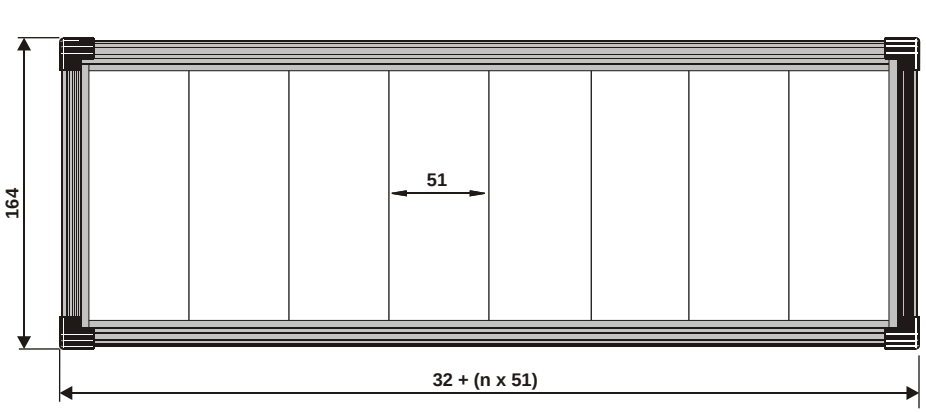
OVERALL DIMENSIONS (mm)

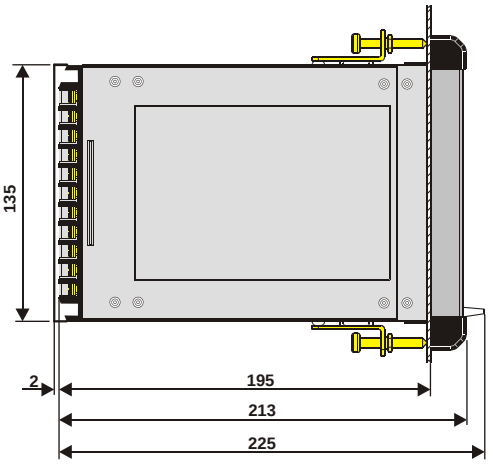


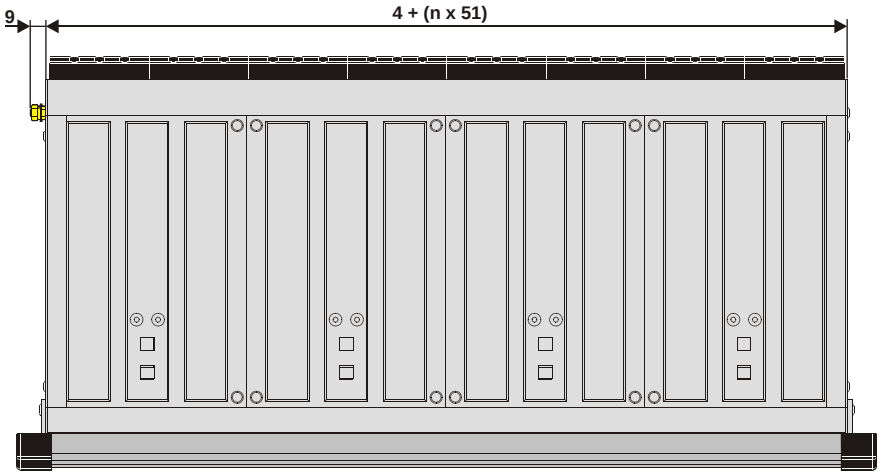
1 MODULE
PANEL CUT-OUT
64x137 (LxH)

PROTECTION
DEGREE
IP54

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.) - 1,2/50ms
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	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% Un for measurements 2% + (to=20-30ms) for times
Rated Voltage	Un = (50 - 400)Vac phase to phase
Voltage Overload	2Un for 1sec
Burden on voltage input	0.2 VA/phase at Un
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

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