

## MC3V

## MC05<sub>-R3</sub>



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.

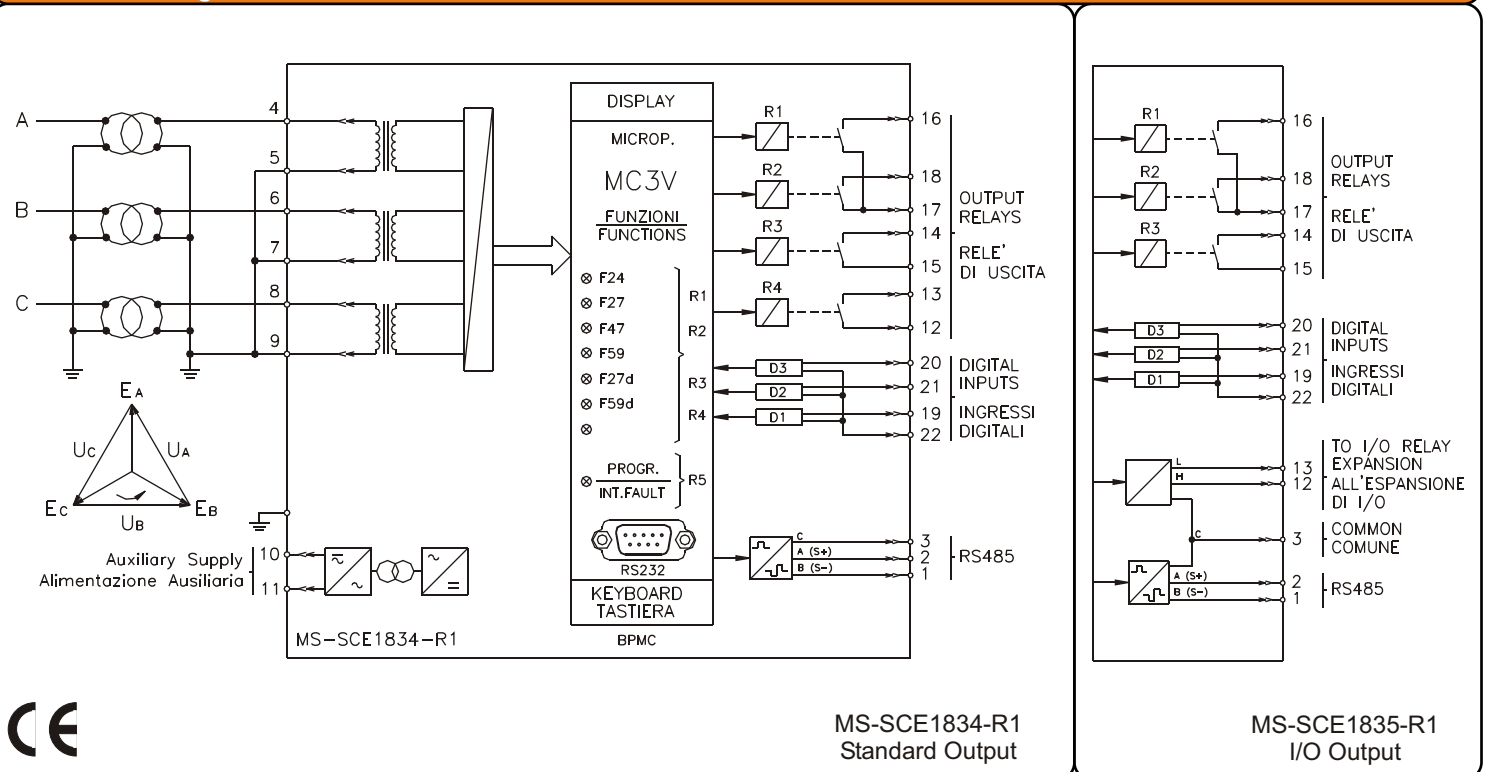
The relay MC3V measures the true R.M.S. value of the 3 phase to neutral voltages fed to three transformers isolated high-impedance inputs.

**Real Time Measurements =** f - EA - EB - EC - Vo - V1 - V2

### 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



**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

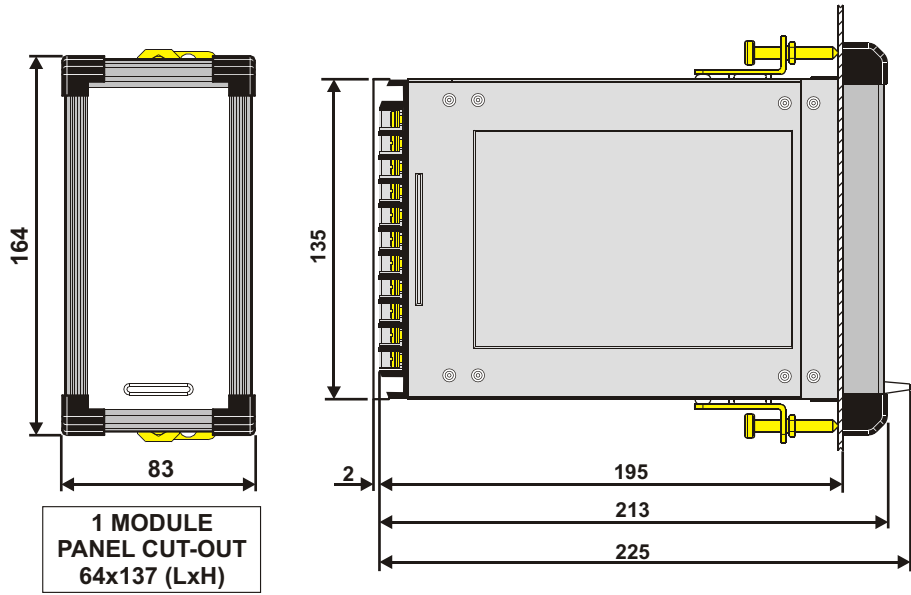
**1 - 27 (V1<) : Positive Sequence Undervoltage Element**

⊙ 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

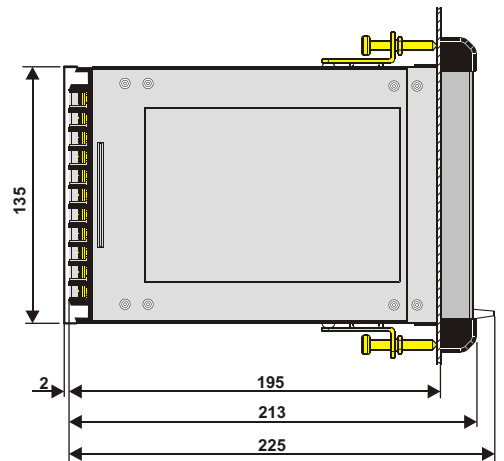
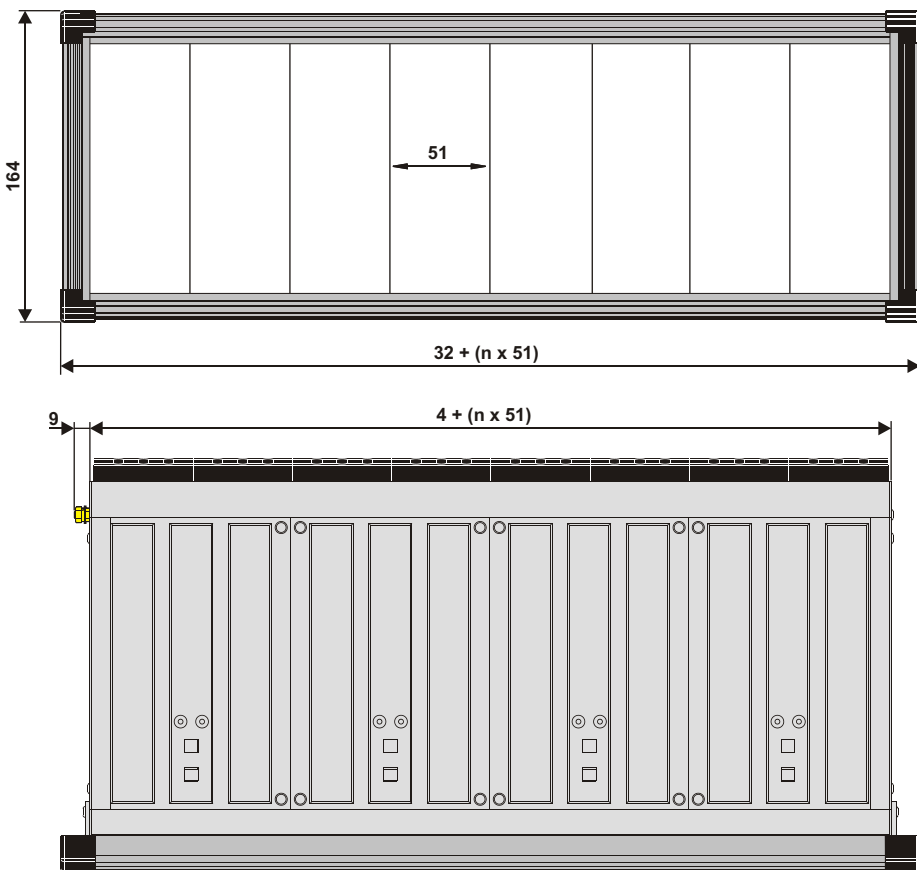
**OVERALL DIMENSIONS (mm)**



**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.) - 1,2/50 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 Environment
⊙ Radiated electromagnetic field immunity test	IEC61000-4-3	level 3
	ENV50204	80-2000MHz/10V/m 900MHz/200Hz 10V/m
⊙ Conducted disturbances immunity test	IEC61000-4-6	level 3
⊙ Electrostatic discharge test	IEC61000-4-2	level 4
⊙ Power frequency magnetic test	IEC61000-4-8	0.15-80MHz/10V 6kV contact / 8kV air
⊙ Pulse magnetic field	IEC61000-4-9	1000A/m, 50/60Hz
⊙ Damped oscillatory magnetic field	IEC61000-4-10	1000A/m, 8/20ms 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
⊙ HF disturbance test with damped oscillatory wave (1MHz burst test)	IEC60255-22-1	class 3
		2kV, 5kHz 400pps, 2.5kV (m.c.), 1kV (d.m.)
⊙ Oscillatory waves (Ring waves)	IEC61000-4-12	level 4
⊙ Surge immunity test	IEC61000-4-5	level 4
⊙ 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**

<b>Type 1</b> : 24	110V A.C.( 20%)	-	24	125V D.C. ( 20%)
<b>Type 2</b> : 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 : MC3V-1-1****MC3V****Power Supply**

- 1 = Type 1
- 2 = Type 2

**Output Options**

- 1 = Standard (with R4)
- 2 = Can bus port

