

MC3V-AR

MC15_{R1}



27, 59, 59Vo, 47, 81

- Two Under Voltage elements
- Two Over Voltage elements
- One UnderFrequency element
- One OverFrequency element
- One Zero Sequence Voltage Control Element
- One Negative Sequence Undervoltage Element
- One Positive Sequence Overvoltage 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.

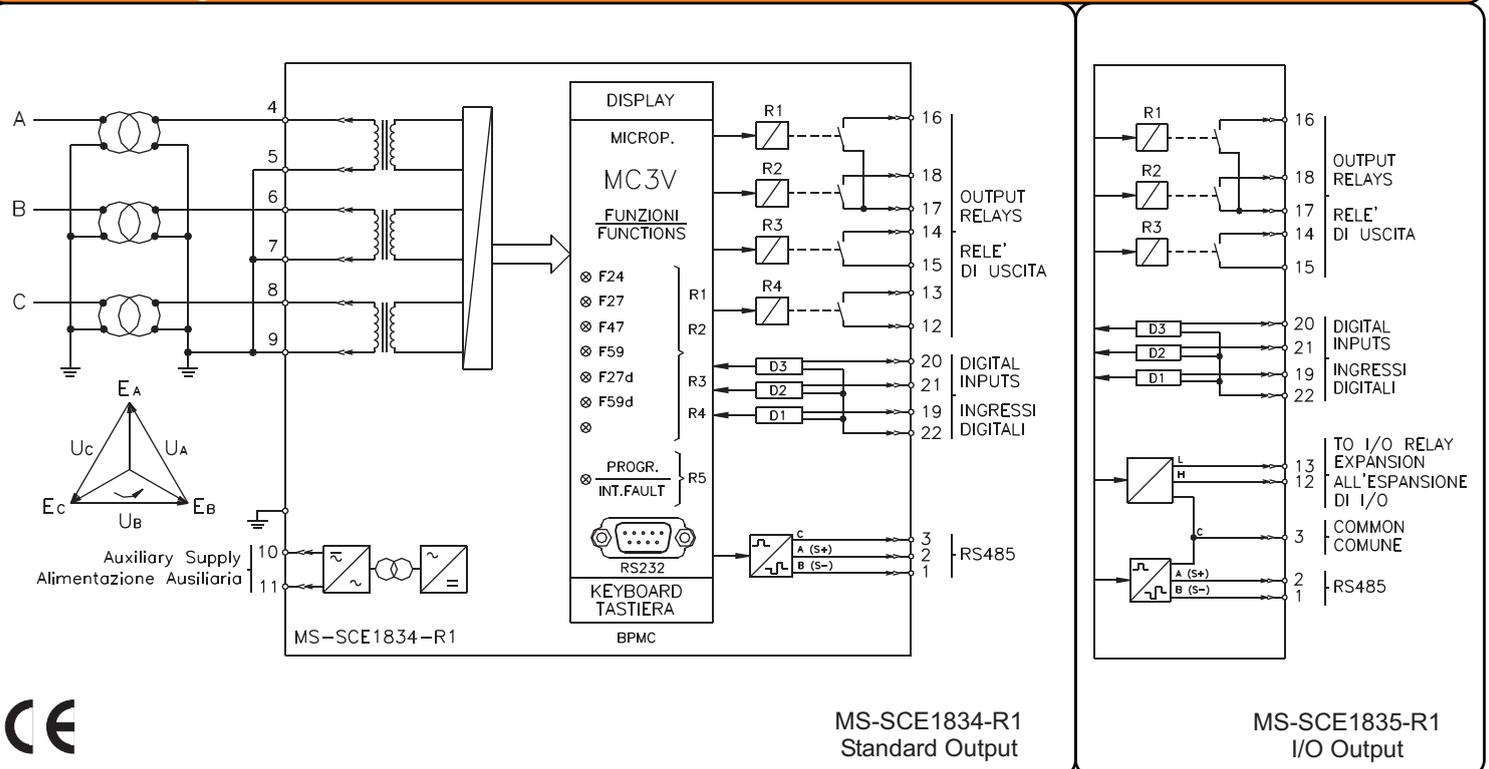
The relay MC3V measures the true R.M.S. value of the 3 phase to neutral voltages fed to three high-impedance inputs.

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 | |
| ⊙ Independent 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 | |
| ⊙ Independent 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 | |
| ⊙ Independent time delay | : | tVo> = (0.05 - 60)s, | step 0.01s |

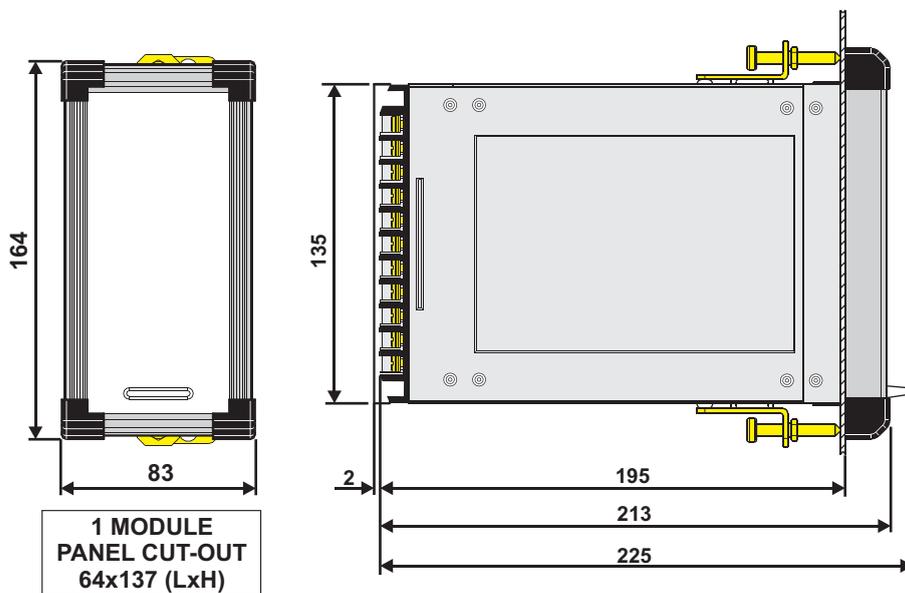
1 - 47 (V2>): Positive Sequence (Unbalanced) Overvoltage Element

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

1 - 27 (V1<): Negative Sequence (Unbalanced) Undervoltage Element

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

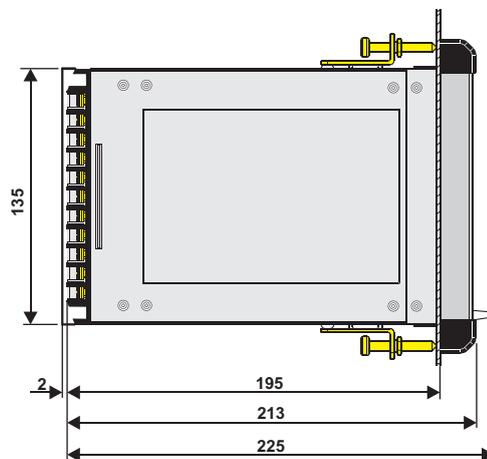
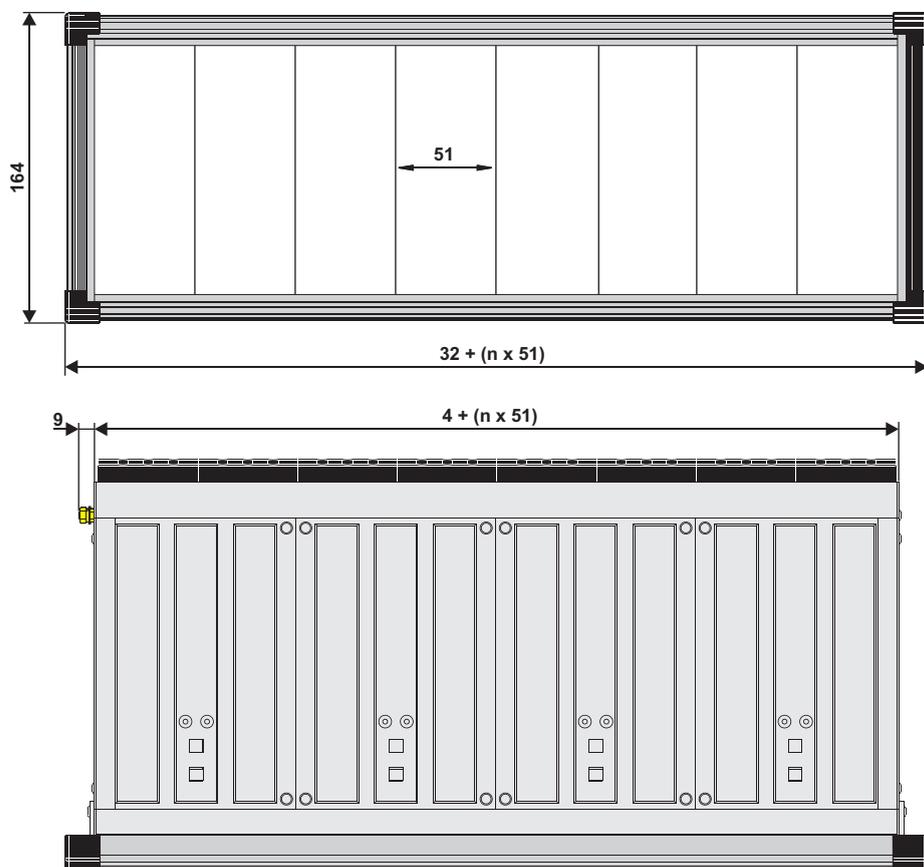
OVERALL DIMENSIONS (mm)



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 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 | 2% Un | for measurements |
| | 2% + (to=20-30ms) | for times |
| Rated Voltage | (50-230)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 |

Order code - Example : MC3V-AR-1-1

