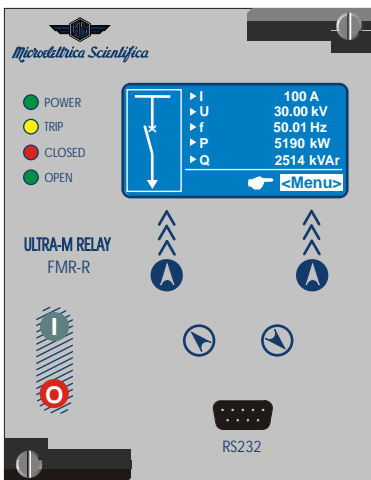


UFM/R
UFM/R/1S10

M09_{-R1}



46,49,50/51,67,50N/51N,67N,27/59,59U_o,74,79,81,86,I²t

- Three levels for phase overcurrent independently programmable as directional or non directional
- Three levels for Earth Fault independently programmable as directional or non directional
- Selectable Time current curves according to IEC and IEEE standards
- Two over/under voltage levels
- Two over/under frequency levels
- Zero sequence overvoltage level
- Two Negative Sequence current levels
- One Positive Sequence overvoltage level
- One Negative Sequence undervoltage level
- Four shot autoreclosing

- Trip circuit supervision
- Associated Circuit Breaker control (OPEN / CLOSE)
- Breaker failure protection
- Breaker interruption energy Si²t

- Two complete setting programs switchable locally or remotely.
- Blocking input and Blocking output for pilot wire selectivity coordination
- Event Recording (last 100 events)
- Trip Recording (last 10 trips) complete with cause of tripping and values of the input quantities at the moment of trip
- Oscillographic recording of input quantities (8 channels, 32 sample/cycle, 2 sec each)

- Modbus RTU or IEC60870-5-103 communication protocols
- RS232 serial communication port on Front Face
- RS485 serial communication port on Back Panel
- Synchronisation with other relays (resolution 1ms)

- Graphical display 128x64 dots
- 4 LEDs for: Power on/internal relay fault, Trip / alarm, Trip circuit fault ,
- 6 Output relays totally user programmable
- 4 Digital inputs user programmable
- IP44 Protection degree (IP54 on request)
- Totally draw-out execution.

Three-phase Current, Voltage and Earth Fault multifunction relay for protection and management of MV/HV distribution lines.

Real time measurement of the primary value of the input quantities are continuously available from relay's display and from the serial communication port.

Relay's programming and setting can be made directly by the front face keyboard or via the serial communication ports. Setting, event recording and oscillography are stored into non volatile memory (E2prom).

The relay is fitted with a multivoltage, autoranging power supply unit self protected and transformer isolated

Besides the normal Watchdog and Powerfail functions, a comprehensive program of self-test and self diagnostic provides:

- Diagnostic and functional test with checking of program routines and memory contents, running every time the auxiliary power supply is switched on.
- Dynamic functional test running during continuously normal operation.
- Complete Test (including or not including output relays) activated by the keyboard or via the communication bus.

Any internal fault detected is indicated by a fault message on the display and by de-energization of associated I.R.F. output relay.

The relay is available in three different executions: Flush mounting, Surface mounting or 19" Rack mounting.

Auxiliary Power Supply

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

Real Time Measurements

Ia = current of phase A	Va = Voltage of phase A	Pa, Qa = Active, Reactive Power of phase A
Ib = current of phase B	Vb = Voltage of phase B	Pb, Qb = Active, Reactive Power of phase B
Ic = current of phase C	Vc = Voltage of phase C	Pc, Qc = Active, Reactive Power of phase C
Io = neutral current	cosj = Power Factor A,B,C	P, Q = Average of Active, Reactive Power
+Wh,+Rh = Active, Reactive Exported Energy		Wh,-Rh = Active, Reactive Imported Energy

F49 (T>): Thermal Image element with prealarm

⊙ Function enabling	:	= ON - OFF
⊙ Operation Mode	:	Opmod = (I1 I2 / I _{max})
⊙ Temperature prealarm	:	Tal = (10 - 100)%T _n , step 1 %T _n
⊙ Setting range	:	Is = (0.5 - 1.5), step 0.01
⊙ Time constant	:	Kt = (1 - 600)min, step 0.01min

1F - 67/50/51 (1I>): 1st Overcurrent Element

⊙ Function enabling	:	= ON - OFF
⊙ Time current curves	:	f(t) = Indep.Definite Time (D), IEC (A/B/C), IEEE (MI/VI/I/EI/SI)
⊙ Operation Mode	:	f(a) = Non Directional - Directional Supervision - Total Directional
⊙ Voltage restraint	:	f(U) = ON - OFF
⊙ Current setting range	:	Is = (0.1 - 4)I _n , step 0.01I _n
⊙ Characteristic sensitivity direction	:	a = (0 - 359)°, step 1°
⊙ Instantaneous output	:	= £ 0.03s
⊙ Independent time delay	:	ts = (0.02 - 100)s, step 0.01s

2F & 3F - 67/50/51 (2I> & 3I>): 2nd & 3rd Overcurrent Element - Individually Programmable

⊙ Function enabling	:	= ON - OFF
⊙ Operation Mode	:	f(a) = Non Directional - Directional Supervision - Total Directional
⊙ Voltage restraint	:	f(U) = ON - OFF
⊙ Current setting range	:	Is = (0.1 - 40) I _n , step 0.01 I _n
⊙ Characteristic sensitivity direction	:	a = (0 - 359)°, step 1°
⊙ Instantaneous output	:	= £ 0.03s
⊙ Independent time delay	:	ts = (0.02 - 100)s, step 0.01s

Stabilization on Inrush current

⊙ Automatic doubling of the operation levels I>> and/or IH	:	2xl> = ON/OFF
⊙ Activation level	:	di/dt = ³ 25 I _n /s
⊙ Revert level :	:	l < 1.25I _n

1F - 67N/50N/51N (1Io>): 1st Earth Fault Element

⊙ Function enabling	:	= ON - OFF
⊙ Operation Mode	:	f(ao) = Non Directional - Total Directional
⊙ Time current curves	:	f(t) = Indep.Definite Time (D), IEC (A/B/C), IEEE (MI/VI/I/EI/SI)
⊙ Current setting range	:	Is = (0.01 - 4)On, step 0.01On
⊙ Minimum level of residual voltage for directional element	:	Vo = (0 - 20)%Un, step 0.1%Un
⊙ Characteristic sensitivity direction	:	ao = (0 - 359)°, step 1°
⊙ Trip sector amplitude	:	az = (0 - 359)°, step 1°
⊙ Instantaneous output	:	= £ 0.03s
⊙ Independent time delay	:	ts = (0.02 - 100)s, step 0.01s

2F & 3F - 67N/50N/51N (2Io> & 3Io>): 2nd & 3rd Earth Fault Elements - Individually programmable

⊙ Function enabling	:	= ON - OFF
⊙ Operation Mode	:	f(ao) = Non Directional - Total Directional
⊙ Characteristic sensitivity direction	:	ao = (0 - 359)°, step 1°
⊙ Trip sector amplitude	:	az = (0 - 359)°, step 1°
⊙ Current setting range	:	Is = (0.01 - 9.99)On, step 0.01On
⊙ Instantaneous output	:	= £ 0.03s
⊙ Independent time delay	:	ts = (0.02 - 100)s, step 0.01s

1F - 46 (1Is>): 1st Negative Zero Sequence Element

⊙ Function enabling	:	= ON - OFF	
⊙ Time current curves	:	f(t)	= Indep.Definite Time (D), IEC (A/B/C), IEEE (MI/VI/I/EI/SI)
⊙ Setting range	:	Is	= (0.1 - 4)In, step 0.01In
⊙ Instantaneous output	:		= £ 0.03s
⊙ Independent time delay	:	ts	= (0.02 - 100)s, step 0.01s

2F - 46 (2Is>): 2nd Negative Zero Sequence Element

⊙ Function enabling	:	= ON - OFF	
⊙ Setting range	:	Is	= (0.1 - 4)In, step 0.01In
⊙ Instantaneous output	:		= £ 0.03s
⊙ Independent time delay	:	ts	= (0.02 - 100)s, step 0.01s

1F & 2F - 59 (1U> & 2U>): 1st & 2nd Maximum Voltage Element - Individually programmable

⊙ Function enabling	:	= ON - OFF	
⊙ Setting range	:	Us	= (10 - 190)%Un, step 1%Un
⊙ Instantaneous output	:		= £ 0.03s
⊙ Independent time delay	:	ts	= (0.02 - 100)s, step 0.01s

1F & 2F - 27 (1U< & 2U<): 1st & 2nd Minimum Voltage Element - Individually programmable

⊙ Function enabling	:	= ON - OFF	
⊙ Setting range	:	Us	= (10 - 190)%Un, step 1%Un
⊙ Instantaneous output	:		= £ 0.03s
⊙ Independent time delay	:	ts	= (0.02 - 100)s, step 0.01s

1F & 2F - 81> (1f> & 2f>): 1st & 2nd Maximum Frequency Element - Individually programmable

⊙ Function enabling	:	= ON - OFF	
⊙ Setting range	:	fs	= (40 - 70)Hz, step 0.01Hz
⊙ Instantaneous output	:		= £ 0.03s
⊙ Independent time delay	:	ts	= (0.02 - 1000)s, step 0.01s

1F & 2F - 81< (1f< & 2f<): 1st & 2nd Minimum Frequency Element - Individually programmable

⊙ Function enabling	:	= ON - OFF	
⊙ Setting range	:	fs	= (40 - 70)Hz, step 0.01Hz
⊙ Instantaneous output	:		= £ 0.03s
⊙ Independent time delay	:	ts	= (0.02 - 1000)s, step 0.01s

1F & 2F - 59Uo (1Uo> & 2Uo>): 1st & 2nd Maximum Zero Sequence Overvoltage Element - Individually programmable

⊙ Function enabling	:	= ON - OFF	
⊙ Setting range	:	Us	= (1 - 100)%Un, step 1%Un
⊙ Instantaneous output	:		= £ 0.03s
⊙ Independent time delay	:	ts	= (0.02 - 100)s, step 0.01s

1F - 27U1 (U1<): Positive Sequence Undervoltage Element

⊙ Function enabling	:	= ON - OFF	
⊙ Setting range	:	Us	= (10 - 190)%Un, step 1%Un
⊙ Instantaneous output	:		= £ 0.03s
⊙ Independent time delay	:	ts	= (0.02 - 100)s, step 0.01s

1F - 59U2/47 (U2>): Negative Sequence Overvoltage Element

⊙ Function enabling	:	= ON - OFF	
⊙ Setting range	:	Us	= (10 - 190)%Un, step 1%Un
⊙ Instantaneous output	:		= £ 0.03s
⊙ Independent time delay	:	ts	= (0.02 - 100)s, step 0.01s

F79 : Autoreclose

- ⊙ Selection of function “initiating” the autoreclose shot (**t1l> - t2l> - t3l> - t4l> - t1lo> - t2lo> - t3lo> - t4lo>**):

- ⊙ First shot **Sh1:(t1l> - t2l> - t3l> - t4l> - t1lo> - t2lo> - t3lo> - t4lo>)**; any combination
- ⊙ Second shot **Sh2:(t1l> - t2l> - t3l> - t4l> - t1lo> - t2lo> - t3lo> - t4lo>)**; any combination
- ⊙ Third shot **Sh3:(t1l> - t2l> - t3l> - t4l> - t1lo> - t2lo> - t3lo> - t4lo>)**; any combination
- ⊙ Fourth shot **Sh4:(t1l> - t2l> - t3l> - t4l> - t1lo> - t2lo> - t3lo> - t4lo>)**; any combination

- ⊙ Reclosing time delay for each shot:

- ⊙ First shot **Sht1: (0.1 - 300)s**, step 0.1s
- ⊙ Second shot **Sht2: (0.1 - 300)s**, step 0.1s
- ⊙ Third shot **Sht3: (0.1 - 300)s**, step 0.1s
- ⊙ Fourth shot **Sht4: (0.1 - 300)s**, step 0.1s

- ⊙ Reset (Reclaim) time : **tr = (0.1 - 300)s**, step 1s

1F - (Wi): Circuit Breaker Energy Maintenance

- ⊙ Function enabling : = **ON - OFF**
- ⊙ Conventional interruption current : **li** = **(0.1 - 99)In**, step 0.1In
- ⊙ Max Energy before maintenance : **Wi** = **(1 - 9990)**, step 1

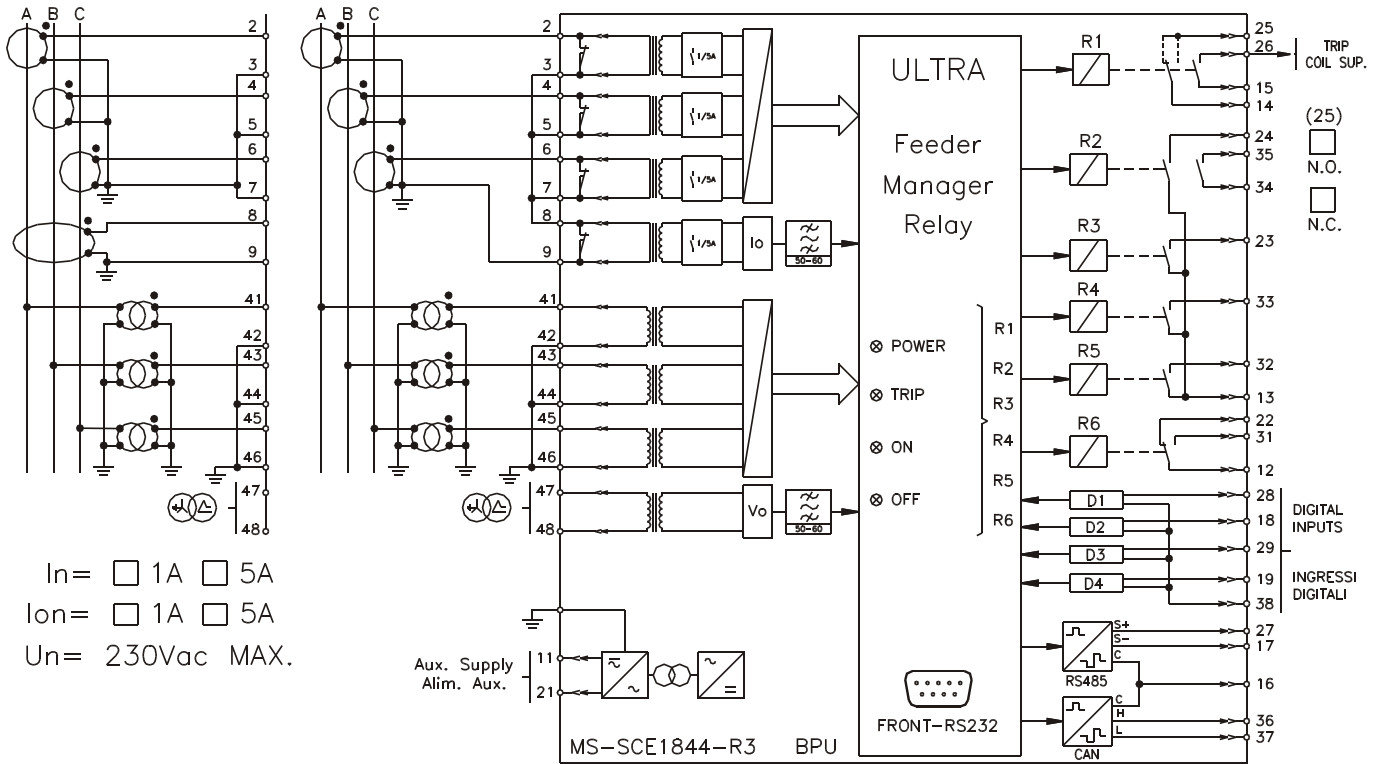
Breaker Failure Element

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

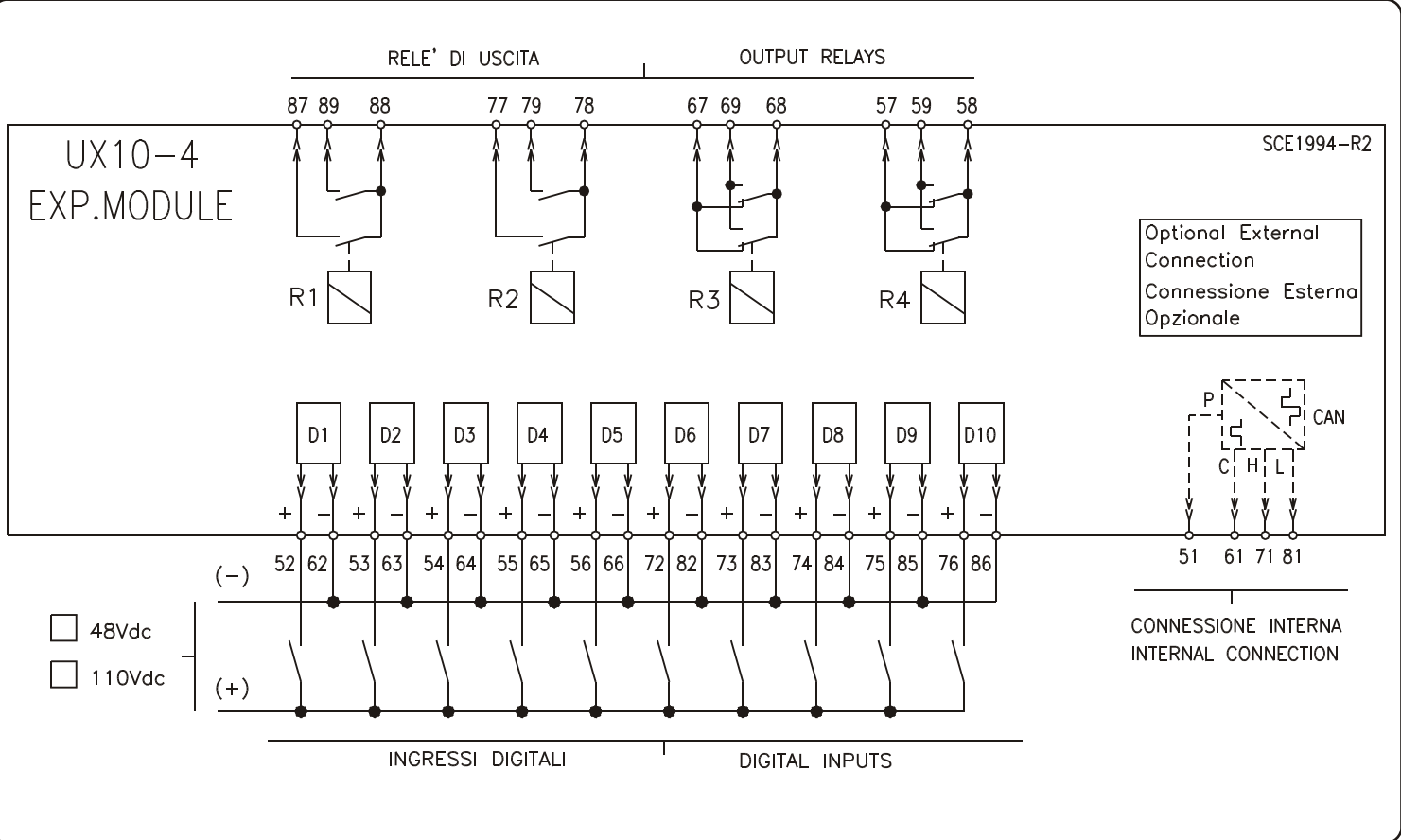
Trip Circuit Supervision Element

- ⊙ Function enabling : = **ON - OFF**
- ⊙ Independent time delay : **ts** = **(0.1 - 100)s**, step 0.01s
- ⊙ Trip circuit voltage : = **(24 - 250)Vdc**

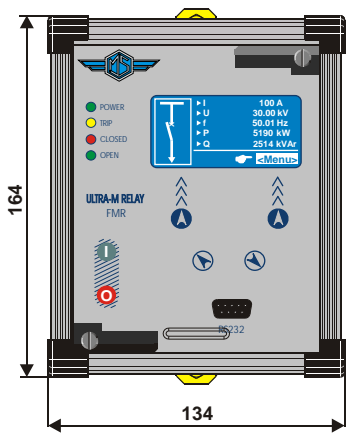
UFM/R - Connection Diagram



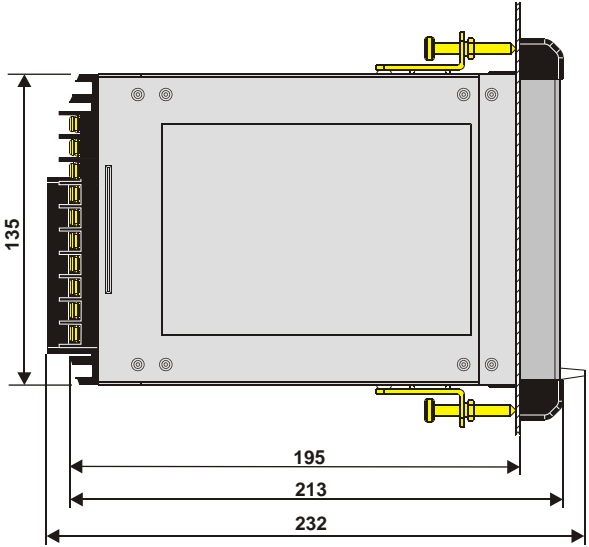
/1S10 - Expansion Module (10 Digital Input + 4 Output Relays)



UFM/R - Overall Dimensions (mm)



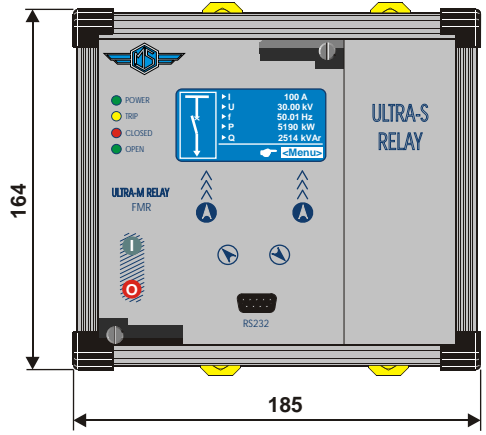
PANEL CUT-OUT
113x142 (LxH)



PROTECTION
DEGREE IP44
(IP54 on request)

UFM/R/1S10 - Overall Dimensions (mm)

(1 Expansion Module)



PANEL CUT-OUT
165x142 (LxH)

PROTECTION
DEGREE IP44
(IP54 on request)