PERCENTAGE BIASED GENERATOR DIFFERENTIAL RELAY

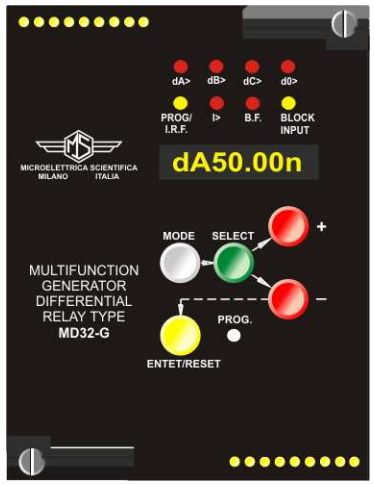
MD32-G

N15-R2

LINE M

50/51, 68, 87, 87N or 64S

Phase Differential protection
Dual slope programmable percentage bias curve
Earth Fault or Restricted Earth Fault protection
Harmonic Restraint
Phase Overcurrent protection
Breaker Failure protection
Modbus Communication Protocol
UL / CSA listed



Three-phase percentage biased differential protection relay for generators and rotating machines, with stator earth fault or restricted earth fault element.

Measurement of the System-frequency differential current with DC offset and harmonic components rejection

Real Time Measurements	= I_{dA} - I_{dB} - I_{dC} - I_{do} - I_{1A} - I_{1B} - I_{1C} - I_{2A} - I_{2B} - I_{2C}
Maximum Demand and Inrush Recording	= I_{dA} - I_{dB} - I_{dC} - I_{do} - I_{1A} - I_{1B} - I_{1C} - I_{2A} - I_{2B} - I_{2C}

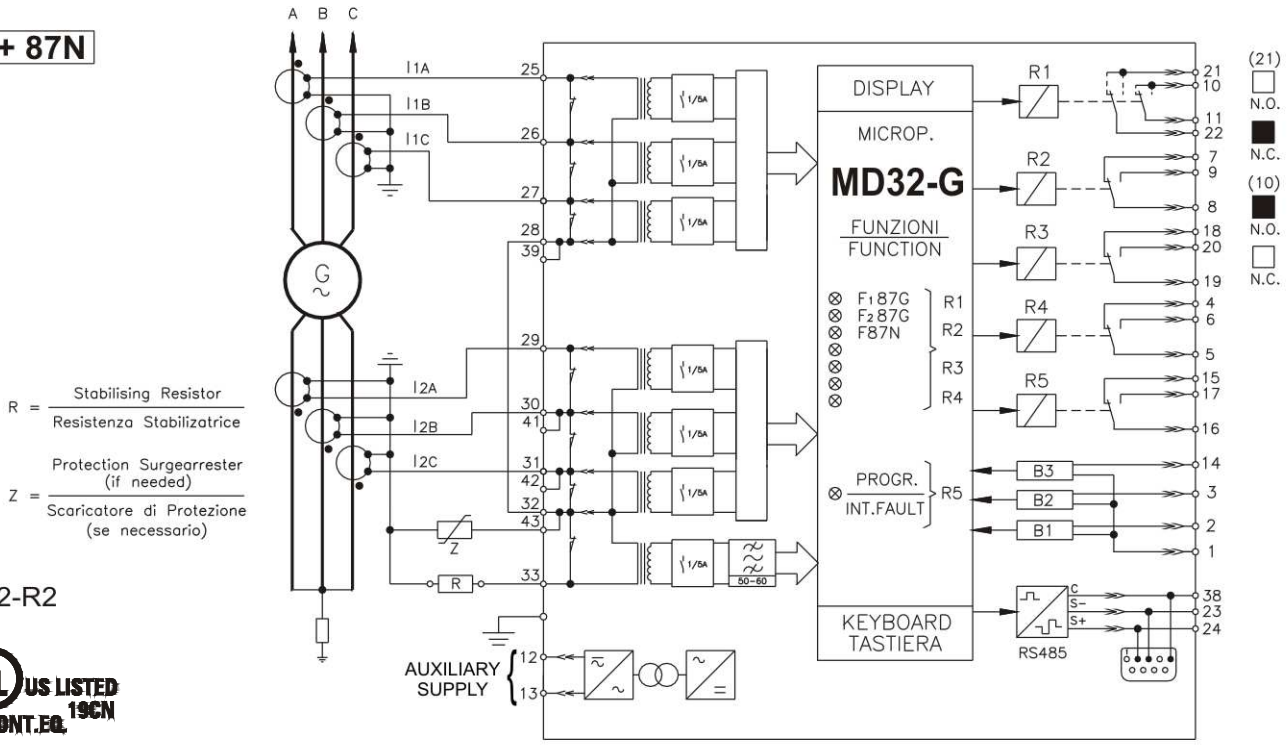
Programmable Input Quantities

Fn = System frequency : (50 - 60)Hz

In = Rated primary current of phase CTs : (1 - 9999)A, step 1A

Connection Diagram

87G + 87N



R = Stabilising Resistor / Resistenza Stabilizatrice

Z = Protection Surgearrester (if needed) / Scaricatore di Protezione (se necessario)

MS-SCE1492-R2

CE RINA c UL us LISTED IND.CONT.EQ. 19CN

F87G : Differential Protection

- Current setting range	: **Id = (0.02 - 0.2)In,**	step 0.01
- Istantaneous output	: **30ms**	
- 2nd Harmonic restraint level	: **2H = (0.1 - 1.0)Id,**	step 0.01Id
- First percent bias (0,5<I_R/In<P)	: **1R = (2 - 20)%,**	step 1%
- Second percent bias (I_R/In>P)	: **2R = (5 - 50)%,**	step 1%
- Point of slope variation	: **P = (1 - 3)**,	step 0.1

F50/51 : Overcurrent Protection

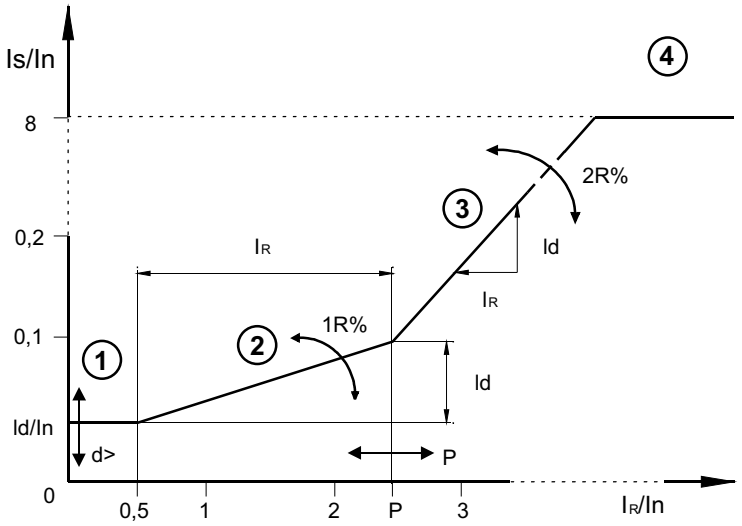
- Current setting range	: **I> = (0.5 - 10)In,**	step 0.01In
- Istantaneous output	: **30ms**	
- Definite time trip delay	: **tI> = (0.05 - 99)s,**	step 0.01s

F87N / F64S : Stator Earth Fault

- Current setting range	: **Io = (0.01 - 1)Ion,**	step 0.01Ion
- Instantaneous output	: **30ms**	
- Trip time delayed element	: **tIo = (0.02 - 9.99)s**,	step 0.01s

Breaker Failure Element

- Trip time delay	: **tBF = (0.05 - 1.00)s**, step 0.01s



Is= Effective relay's operation differential current

Id= Relay's set differential current

I_R= Relay's through current

$$R\% = 100\,\frac{I_d}{I_R}$$

① $\frac{Is}{In}$ $\frac{I_d}{In}$

② $\frac{Is}{In}$ $\frac{I_d}{In}$ $(\frac{I_R}{In}$ 0,5) $\frac{1R\%}{100}$

③ $\frac{Is}{In}$ $\frac{I_d}{In}$ $\frac{P-0,5\ 1R\%}{100}$ $(\frac{I_R}{In}$ P) $\frac{2R\%}{100}$

④ $\frac{Is}{In}$ 8