THREE INPUTS SYNCHROCHECK RELAY

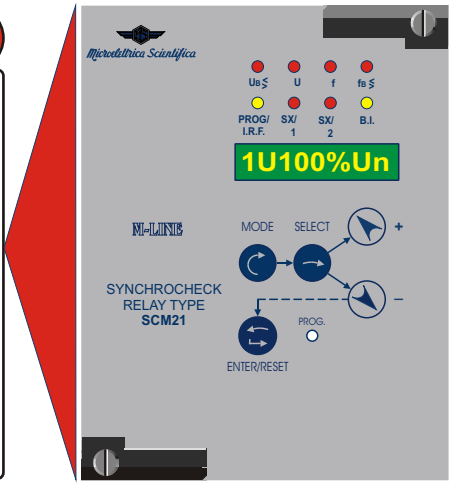
SCM21

N20-R3

LINE M

25, 27, 59, 81

- Synchrocheck relay.
- Voltage, frequency and phase displacement check.
- Over / Under Voltage.
- Over / Under Frequency.
- Dead Line / Dead Bus programmable operation.
- C/B closing time control.
- Events recording.
- Modbus Communication Protocol.
- UL / CSA listed.

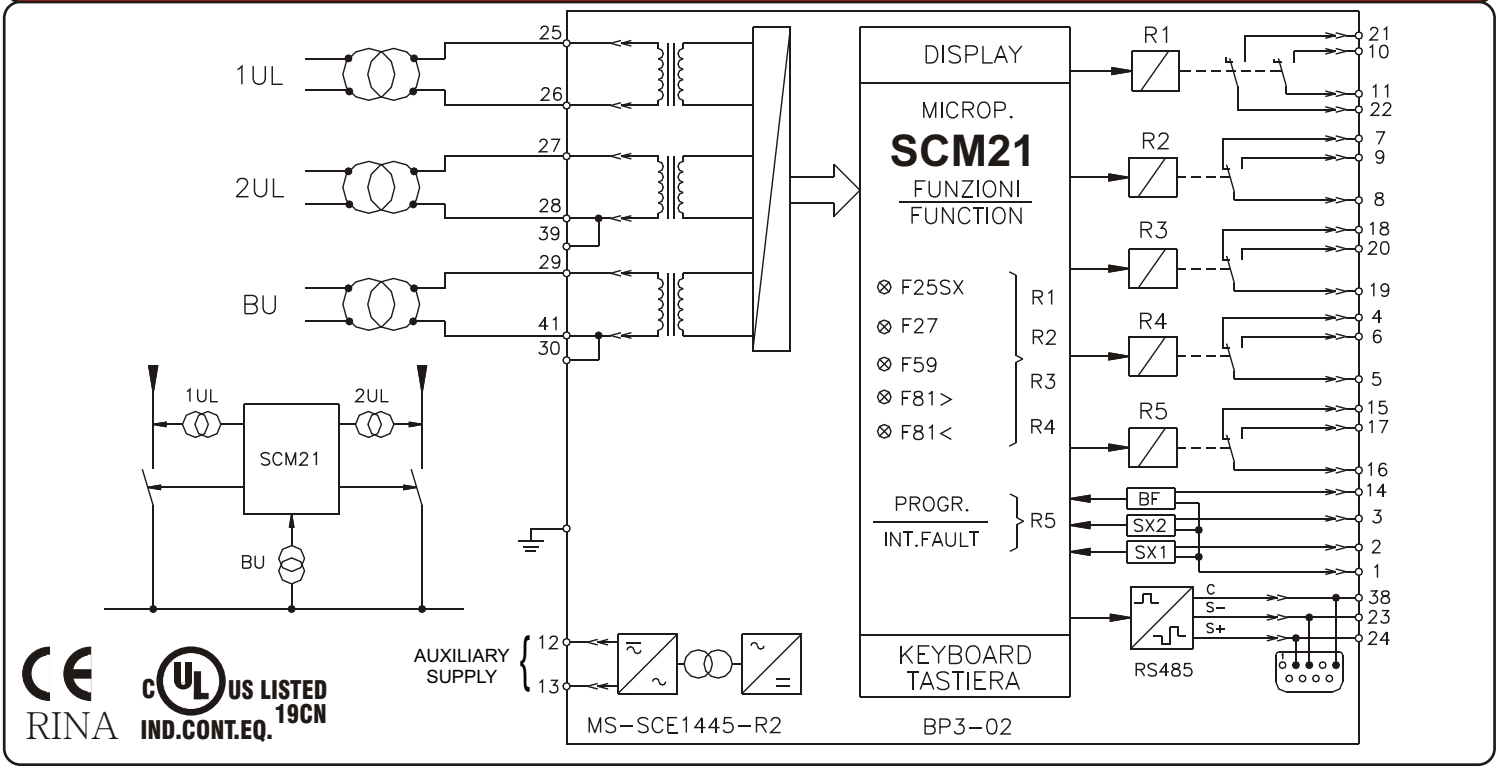


The SCM21 numerical synchrocheck relay measures voltage and frequency of three inputs; the voltage, frequency and phase angle of two inputs (1UL=Line1 and 2UL=Line2) are individually compared with those of the third input (BU=Bus) considered as reference.
The relay performs the following programmable functions:

- Synchrocheck of two lines with a third line;
- Normal/Dead Bus/Dead Line operation modes;
- Adjustable Max Voltage difference;
- Adjustable Max Frequency difference;
- Adjustable Max Phase displacement;
- Adjustable Min/Max Bus voltage for synchrocheck enable;
- Adjustable Min/Max Bus frequency for synchrocheck enable;
- Adjustable Reclose time;
- Automatic Adjusting of phase angle for circuit breaker close ;
- Adjustable Over Voltage level (F59) with adjustable time delay;
- Adjustable Under Voltage level (F27) with adjustable time delay;
- Adjustable Over Frequency level (F81>) with adjustable time delay;
- Adjustable Under Frequency level (F81<) with adjustable time delay;
- 3 Digital Inputs optically isolated 2kV;
- Measurement display of voltage, frequency and other parameters.

Real Time Measurements = 1U - 2U - BU - 1Hz - 2Hz - BHz - 1 U-2 U-1 f-2 f-1 -2

Connection Diagram



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Programmable Input Quantities

⊙ **Fn**	= System frequency	: (50 - 60)Hz	
⊙ **Un**	= Rated input voltage	: (100 - 240)V,	step 1V

Main Setting Variable

⊙ **U<**	= Undervoltage level	: (15 - 120)%Un,	step 1% (*)
⊙ **tU<**	= Undervoltage trip time delay	: (0.1 - 30)s,	step 0.1s
⊙ **U>**	= Overvoltage level	: (20 - 150)%Un,	step 1% (*)
⊙ **tU>**	= Overvoltage trip time delay	: (0.1 - 30)s,	step 0.1s
⊙ **f<**	= Underfrequency level	: (45 - 60)Hz,	step 0.1Hz (*)
⊙ **tf<**	= Underfrequency trip time delay	: (0.1 - 30)s,	step 0.1s
⊙ **f>**	= Overfrequency level	: (50 - 65)Hz,	step 0.1Hz (*)
⊙ **tf>**	= Overfrequency trip time delay	: (0.1 - 30)s,	step 0.1s
⊙ **DB**	= Dead Bus operation mode	: (ON/OFF)	
⊙ **DL**	= Dead Line operation mode	: (ON/OFF)	
⊙ **1 U**	= Line1/Bus Max voltage difference	: (1 - 20)%BU,	step 1%
⊙ **2 U**	= Line2/Bus Max voltage difference	: (1 - 20)%BU,	step 1%
⊙ **1 f**	= Line1/Bus Max frequency difference	: (0.02 - 0.5)Hz,	step 0.01Hz
⊙ **2 f**	= Line2/Bus Max frequency difference	: (0.02 - 0.5)Hz,	step 0.01Hz
⊙ **1**	= Line1/Bus Max phase difference	: (3 - 30)°,	step 1°
⊙ **2**	= Line2/Bus Max phase difference	: (3 - 30)°,	step 1°
⊙ **tk**	= Max operate time delay	: (0.1 - 30 - Dis)s,	step 0.1s
⊙ **ts**	= Min Synchrocheckig time	: (0 - 60)s,	step 0.1s
⊙ **tcb**	= Circuit Breaker Operate time to control the automatic selectionof the closing phase angle	: (0.05 - 0.5 - Dis)s,	step 0.01s
⊙ t_o	= Min reclosing time delay	: (0 - 600)s,	step 1s

(*) *The instantaneous output of these functions inhibits the synchrocheck operation.*

Configuration of the Output Relays

One of the five standard output relays is normally energised, and Drops-off on detection of internal fault or power supply failure. Four relays are userprogrammable to be energised by tripping of any of the instantaneous or time delayed functions with only limitation that any relay associated to Sx1 (synchrocheck of Line1) or Sx2 cannot be associated to any other function. Relays associated to Sx1 and/or Sx2 are automatically reset when synchronising conditions are not present, or after 100ms from CB closing.

Digital Inputs

⊙ **Sx1** (Terminals 1-2) : status of C.B. Line1 (closed when 1-2 shorted)

⊙ **Sx2** (Terminals 1-3) : status of C.B. Line2 (closed when 1-3 shorted)

⊙ **BF** (Terminals 1-14) : blocking of relays Sx1 and Sx2; when removed starts time delay to.