

User Machine Interfaces

Sepam series 80 is available with two different types of User Machine Interfaces (UMI):
 ■ an advanced User Machine Interface that provides users with complete information
 ■ a mimic-based User Machine Interface that also allows local switchgear control.



The mimic-based UMI offers all the functions of the advanced UMI plus local switchgear control:
 ■ selection of Sepam control mode
 ■ display of switchgear status on an animated mimic diagram
 ■ local opening and closing of all Sepam-controlled devices



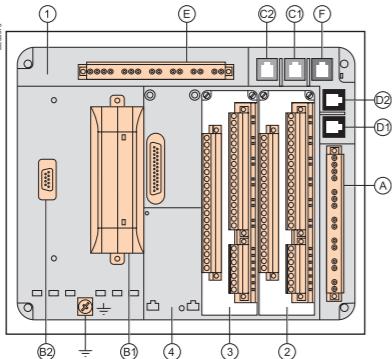
The advanced UMI offers all the functions required for local equipment operation:
 ■ display of measurements, diagnostics and operating and alarm messages in the user's language
 ■ alarm acknowledgement and Sepam reset.



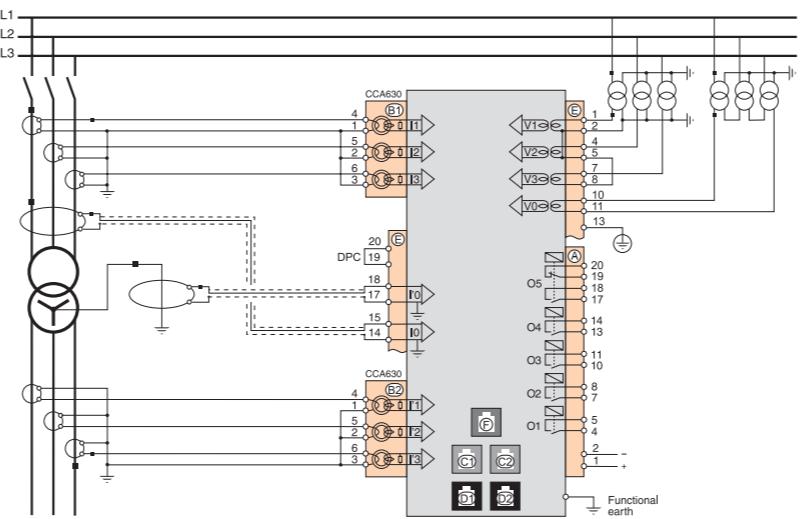
The User Machine Interface can either be integrated in the base unit or installed remotely in a convenient location.

Rear panel

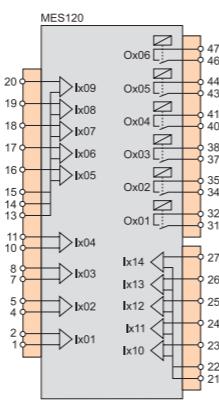
- ① Base unit.
- ② 20-pin connector for:
 ■ 24 V DC to 250 V DC auxiliary supply
 ■ 5 relay outputs (O1 to O5).
- ③ Connector for 3 phase current I1, I2, I3 inputs.
- ④ Sepam T87, M87, M88, G87, G88 : connector for 3 phase current I'1, I'2, I'3 inputs
- ⑤ Sepam B83 : connector for:
 □ 3 phase voltage V1, V2, V3 inputs
 □ 1 residual voltage V0 input
- Sepam C86 : connector for capacitor unbalance current inputs.
- ⑥ Modbus communication port 1.
- ⑦ Modbus communication port 2.
- ⑧ Remote module connection port 1.
- ⑨ Remote module connection port 2.
- ⑩ 20-pin connector for:
 ■ 3 phase voltage V1, V2, V3 inputs
 ■ 1 residual voltage V0 input
 ■ 2 residual current I0, I'0 inputs.
- ⑪ Spare port.
- ⑫ First optional logic I/O module (I101 to I114 and O101 to O106).
- ⑬ Second optional logic I/O module (I201 to I214 and O201 to O206).
- ⑭ Free slot for third optional logic I/O module (I301 to I314 and O301 to O306).
- ⑮ Functional earth.



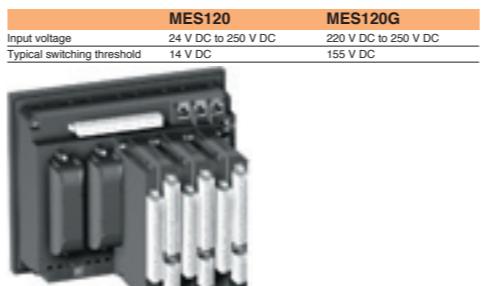
Sepam series 80 base unit



Logic input/output modules



The 5 relay outputs provided on the Sepam series 80 base unit can be extended by adding 1, 2 or 3 modules each offering 14 logic inputs and 6 relay outputs. Two modules (MES120 and MES120G) are available to cover the different input power supply voltages and offer different switching thresholds.



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As standards, specifications and designs change from time to time, please ask for confirmation of the information given in this publication.

Technical data sheet
2005



Electrical network protection
Sepam series 80

Sepam **series 80** is a family of **high performance** digital protection units, for all electrical networks and all markets, IEC and ANSI.



Sepam series 80 and its optional modules

- 1 **Base unit, with two types of User Machine Interfaces:**
 - integrated mimic-based UMI
 - integrated or remote advanced UMI
 Each unit includes:
 - 5 relay outputs
 - 12 (maximum) current and voltage sensor inputs
- 2 **Parameters and protection settings saved on removable memory cartridge.**
- 3 **42 logic inputs and 23 relay outputs,** with 3 optional modules providing 14 inputs and 6 outputs.
- 4 **4 independent Modbus communication ports:**
 - direct connection to 2-wire RS 485, 4-wire RS 485 and fibre optic networks
 - connection Ethernet TCP/IP network via PowerLogic System webserver (Transparent Ready™).
- 5 **Processing of temperature data from 16 sensors,** Pt100, Ni100, or Ni120.
- 6 **1 low level analogue output,** 0-10 mA, 4-20 mA or 0-20 mA.
- 7 **Synchro-check module**
- 8 **Software tools:**
 - Sepam parameter and protection setting and adaptation of the predefined control functions
 - local or remote installation operation
 - programming of specific functions (Logipam)
 - recovery and display of disturbance recording data.



Merlin Gerin

Selection guide

The Sepam series 80 family includes 16 types to offer the right solution for each application.

Specific protection functions available						Applications					
Substation	Transformer	Motor	Generator	Busbar	Capacitor	S80	T81	M81	G82	B80	C86
Directional earth fault	S81	T81	M81								
Directional earth fault and phase overcurrent	S82	T82		G82							
Check on 3 phase voltages on 2 sets of busbars				B83							
Rate of change of frequency	S84										
Capacitor bank unbalance											
Transformer differential or machine differential		T87	M87	G87							
Machine-transformer unit differential			M88	G88							

Example: The Sepam T87 is dedicated to transformer differential protection.

Characteristics

Conformity to standards	IEC 60255 – Protection relays IEC 60529 – Degree of protection IEC 60068 – Operating temperature
Certifications	CE UL508 CSA C22.2
Auxiliary power supply	24-250 V DC Overall size of base units with MES120 module (W x H x D) 264 x 222 x 220 mm

Performances

Metering	Measurement range	Typical accuracy
Phase current	0.02 to 40 In	±0.5 % at In
Residual current	0.005 to 20 In0	±1 % at In0
Phase-to-phase / phase-to-neutral voltage	0.05 to 1.2 Vrp / Unp	±0.5 % at Vrp / Unp
Frequency	25 to 65 Hz	±0.01 Hz
Disturbance recording	22 s of recording maximum	12 or 36 points

Selection table

Protection	ANSI code	Substation				Transformer				Motor				Generator				Busbar				Cap.			
		S80	S81	S82	S84	T81	T82	T87	M81	M87	M88	G82	G87	G88	B80	B83	C86								
Phase overcurrent ⁽¹⁾	50/51	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	
Earth fault / Sensitive earth fault ⁽¹⁾	50N/51N 50G/51G	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	
Breaker failure	50BF	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
Negative sequence / unbalance	46	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	
Thermal overload for cables	49RMS	2	2	2																					
Thermal overload for machines ⁽¹⁾	49RMS																								
Thermal overload for capacitors	49RMS																							2	
Capacitor bank unbalance	51C																							8	
Restricted earth fault	64REF																								
Two-winding transformer differential	87T																								
Machine differential	87M																							1	
Directional phase overcurrent ⁽¹⁾	67																							2	
Directional earth fault ⁽¹⁾	67N/67NC																							2	
Directional active overpower	32P																							2	
Directional reactive overpower	32Q																							1	
Directional active underpower	37P																							2	
Phase undercurrent	37																							1	
Excessive starting time, locked rotor	48/51LR/14																							1	
Starts per hour	66																							1	
Field loss (underimpedance)	40																							1	
Pole slip	78PS																							1	
Overspeed (2 set points) ⁽²⁾	12																							1	
Underspeed (2 set points) ⁽²⁾	14																							1	
Voltage-restrained overcurrent	50V/51V																							2	
Underimpedance	21B																							1	
Inadvertent energisation	50/27																							1	
Third harmonic undervoltage / 100 % stator earth fault	27TN/64G2 64G																							2	
Overfluxing (V / Hz)	24																							2	
Undervoltage (L-L or L-N)	27	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4		
Positive sequence undercurrent	27D	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2		
Remanent undervoltage	27R	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2		
Overvoltage (L-L or L-N)	59	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4		
Neutral voltage displacement	59N	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2		
Negative sequence overvoltage	47	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2		
Overfrequency	81H	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2		
Underfrequency	81L	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4		
Rate of change of frequency	81R																							2	
Recloser (4 cycles) ⁽²⁾	79																								
Thermostat / Buchholz ⁽²⁾	26/63																								
Temperature monitoring (16 RTDs) ⁽³⁾	38/49T																								
Synchro-check ⁽⁴⁾	25																								
Control and monitoring																									
Circuit breaker / contactor control	94/69																								
Automatic transfer (AT) ⁽²⁾	10																								
Load shedding / automatic restart																									
De-excitation																									
Genset shutdown																									
Capacitor step control ⁽²⁾	68																								
Logic discrimination ⁽²⁾	86																								
Latching / acknowledgement	86																								
Annunciation	30																								
Switching of groups of settings																									
Adaptation using logic equations																									
Logjam programming (Ladder language)																									

The figures indicate the number of relays available for each protection function
 standard
 options
(1) Protection functions with 2 groups of settings.
(2) According to parameter setting and optional MES120 input/output modules.
(3) With optional MET148-2 temperature input modules.
(4) With optional MCS025 synchro-check module.
(5) With ACE949-2 (2-wire RS 485), ACE959 (4-wire RS 485) or ACE937 (fiber optic) communication interface.

Selection table

Metering	ANSI code	Substation				Transformer				Motor				Generator				Busbar				Cap.			