Electrical network protection

Sepam series 10

Reference manual

Schneider Electric

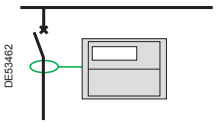
Panorama of Sepam applications

The selection guide proposes the types of Sepam suited to your protection needs.

Sepam series 10

For simple applications

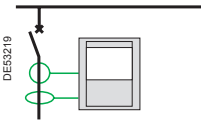
Characteristics
- 4 logic inputs
- 7 relay outputs
- 1 communication port

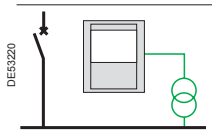


Sepam series 20

For usual applications

Characteristics
- 10 logic inputs
- 8 relay outputs
- 1 communication port
- 8 temperature-sensor inputs

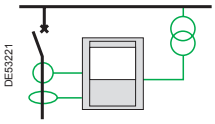




Sepam series 40

For demanding applications

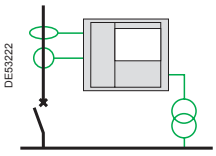
Characteristics
- 10 logic inputs
- 8 relay outputs
- logical-equation editor
- 1 communication port
- 16 temperature-sensor inputs

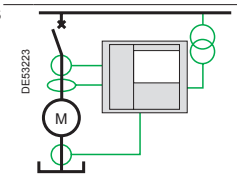


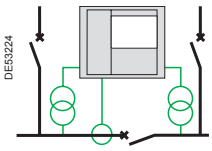
Sepam series 80

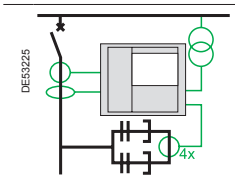
For custom applications

Characteristics
- 42 logic inputs
- 23 relay outputs
- logical-equation editor
- 2 communication ports for multi-master or redundant architectures
- 16 temperature-sensor inputs
- removable memory cartridge containing settings and parameters for rapid return to service
- user-machine interface with mimic for local control in complete safety
- optional Logipam programming software for specific functions









Overcurrent Protection Tripping Curves

Applicable to Sepam Series 10

N	B	A

Introduction

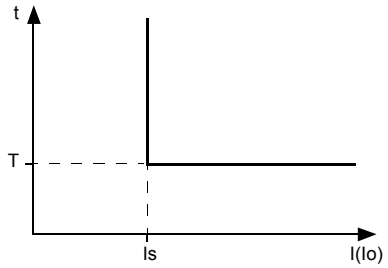
Phase or earth fault overcurrent protection can be delayed using the following types of tripping curve:
- Definite time (DT): low set points I>, Io> and high set points I>>, Io>>
- IDMT: low set points I>, Io> only

In the case of standardized IDMT curves (IEC and IEEE type only), a reset time can be activated. This reset time enables Sepam's coordination with electromechanical relays, placed upstream.

Definite Time (DT) Curve

In definite time (DT) protection functions, the tripping time is constant. The time delay is initialized as soon as the operating set point Is is passed.

Definite time protection principle



Settings

I> Set Point Settings		Authorized Values
Tripping curve For more information on tripping curves and the reset time, refer to *Overcurrent Protection Tripping Curves, p. 90*.		● OFF: Set point off ● DT: Definite time ● SIT/A: IEC standard inverse time ● VIT/B: IEC very inverse time ● LTI/B: IEC long time inverse ● EIT/C: IEC extremely inverse time ● MI: IEEE moderately inverse ● VI: IEEE very inverse ● EI: IEEE extremely inverse ● RI
I> set point	DT curve	0.1...24 In (minimum: 1 A)
	IDMT curves	0.1...2.4 In (minimum: 1 A)
Time delay	DT curve	0.05...300 s in steps of: ● 0.01 s, from 0.05 to 9.99 s ● 0.1 s, from 10.0 to 99.9 s ● 1 s, from 100 to 300 s
	IEC, RI curves	TMS: 0.02...2 (step: 0.01)
	IEEE curves	TD: 0.5...15 (step: 0.1)
	Reset time	Setting common to I> and Io> set points: ● OFF: Reset time off ● ON: Reset time on

I>> Set Point Settings		Authorized Values
Tripping curve		● OFF: Set point off ● DT: Definite time
I>> set point	DT curve	0.1 In...24 In (minimum: 1 A)
Time delay	DT curve	Instantaneous (pick-up) or 0.05...300 s in steps of: ● 0.01 s, from 0.05 to 9.99 s ● 0.1 s, from 10.0 to 99.9 s ● 1 s, from 100 to 300 s

Remark: In is the phase CT primary rated current.

Introduction

The Sepam Series 10 Family

The Sepam series 10 family of protection relays is designed for the protection and operation of MV/LV utility substations and electrical distribution networks in industrial installations.

It comprises three models suitable for normal protection applications involving current measurement:
- Sepam series 10 N, for earth fault protection
- Sepam series 10 B, for phase, earth fault and thermal overload protection
- Sepam series 10 A, for phase, earth fault and thermal overload protection, which may require logic inputs and a communication port

Example: Sepam series 10 A

Main Advantages of Sepam

Sepam is easily installed in a switchboard:
- It is compact.
- It is held in place in the switchboard by catches which are locked and unlocked from the front.
- The connection terminals are clearly identified.

Sepam is quick to commission:
- It comes with default parameters.
- Its settings are entered on the front panel by means of its display and well-designed keypad.
- It can be commissioned without using a PC.

Sepam makes it easy to operate substations:
- It has numerous customization options so that it can be adapted to specific operating constraints.
- Its display unit can display screens in several languages.
- It indicates tripping explicitly and spontaneously.

Sepam is a robust product that is easy to maintain:
- The case is made of insulated plastic.
- The unit can withstand harsh environments:
  - Front panel degree of protection: IP54
  - Range of operating temperatures: –40 to +70 °C (–40 to +158 °F)
- The current input connector can be disconnected while on load.

Sepam Series 10 N Applications

Sepam series 10 N units are suitable for the following applications:
- Protection against earth faults for feeders protected against phase-to-phase short-circuits by fuses
- Protection of the transformer neutral point

Sepam Series 10 B Applications

Sepam series 10 B units are suitable for the following applications:
- Protection of substation incomers and feeders
- Protection of MV/LV transformers

They offer the following protection functions:
- Phase overcurrent protection
- Earth fault protection
- Thermal overload protection

Sepam Series 10 A Applications

Sepam series 10 A units are suitable for the following applications:
- Protection of substation incomers and feeders
- Protection of MV/LV transformers

They offer the following main functions:
- Phase overcurrent protection
- Earth fault protection
- Thermal overload protection
- Trip circuit supervision (TCS)
- Logic discrimination
- External trip
- Communication for remote operation

Selection Table

The selection table lists the functions performed by the various Sepam series 10 models in standard operation.

The customization options for these functions are described in the *Custom Operation* chapter.

Function		**ANSI Code**	**Sepam Series 10**		
			N	**B**	**A**
Earth fault protection	Standard	50N-51N 50G-51G	••	••	••
	Sensitive			••	••
	Very sensitive		••	••	••
Phase overcurrent protection		50-51		•	•
Thermal overload protection		49 RMS		•	•
Phase overcurrent cold load pick-up				•	•
Earth fault cold load pick-up				•	•
Circuit breaker trip lockout		86	•	•	•
Tripping annunciation			•	•	•
Trip circuit supervision					•
Logic discrimination - Send blocking input		68	•••	•••	•
Logic discrimination - Receive blocking input		68			•••
External trip					•
Communication via Modbus protocol or IEC 60870-5-103					•
Circuit breaker remote control					•
Customized operation of output relays and fault LEDs			•••	•••	•••
Customized assignment of the logic inputs					•••
Earth fault current measurement			•	•	•
Phase current measurement				•	•
Phase peak demand current values				•	•
Record of the last fault			•	•	
Time-tagged record of the last 5 events					•
Watchdog			•••	•••	•

- • Function available in standard mode
- •• Function available in standard mode depending on the Sepam type
- ••• Function available in custom mode

Earth Fault Protection

To protect networks against phase-to-earth faults, choose the earth fault protection sensitivity level from one of three values. The sensors to be used and the set point setting range depend on the chosen sensitivity:

Sensitivity	Sensor	Setting range
Standard	3 phase CTs or 1 earth CT, at primary rated current Ino	0.1...24 Ino
Sensitive	3 phase CTs or 1 earth CT, at primary rated current Ino	0.01...2.4 Ino
Very sensitive	CSH120, CSH200 or GO110 specific core balance CT, with ratio 470/1	0.2...240 A primary, i.e. 0.0004...0.5 Ino

Resources

The table below lists the Sepam resources:

Inputs/Outputs	Sepam Series 10 N	Sepam Series 10 B	Sepam Series 10 A
Earth fault current inputs	1	1	1
Phase current inputs	0	2 or 3	3
Output relays	3	3	7
Logic inputs	0	0	4
Communication port	0	0	1

Power Supply Voltage

The Sepam power supply voltage can be DC or AC. Three power supply voltage ranges are available, as indicated in the table below:

Power supply	Sepam Series 10 N	Sepam Series 10 B	Sepam Series 10 A
24...125 V DC or 100...120 V AC	•	•	•
110...250 V DC or 100...240 V AC	•	•	•
220...250 V DC	–	–	•

Sepam series 10 A relays powered by 220...250 V DC have high-set logic inputs.

Operating Modes

There are two possible operating modes for the output relays, the fault LEDs on the front panel and, in the case of Sepam series 10 A, the logic inputs:

- *Standard* operating mode is operation resulting from the pre-assignment of the output relays, the fault LEDs on the front panel and the logic inputs. Sepam series 10 relays are delivered from the factory in this mode.
- *Custom* operating mode is used, if necessary, to modify operation of the output relays, the fault LEDs on the front panel and the logic inputs.

Circuit Breaker Control

Sepam relays are compatible with the following types of circuit breaker trip:

- Shunt trip coils
- Undervoltage trip coils

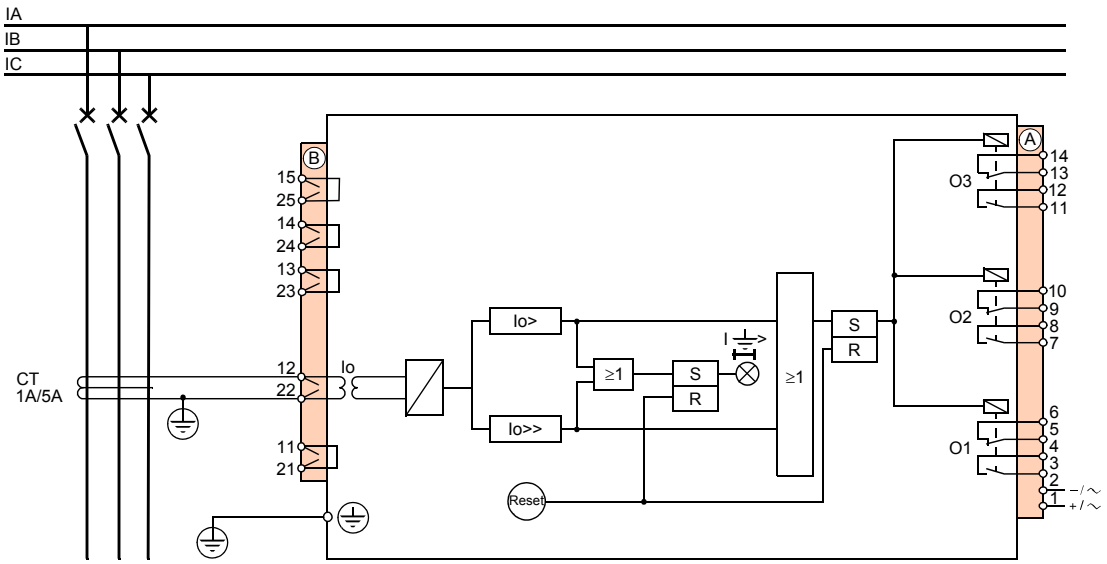
Standard Operation

Introduction

The mimic diagrams below show the functional chains for each Sepam model in standard operating mode with:

- Connection of the earth fault current input to an earth CT, for example
- Connection of the phase current inputs, if necessary
- Connection of the protective earth

Mimic Diagram of Sepam Series 10 N Operation

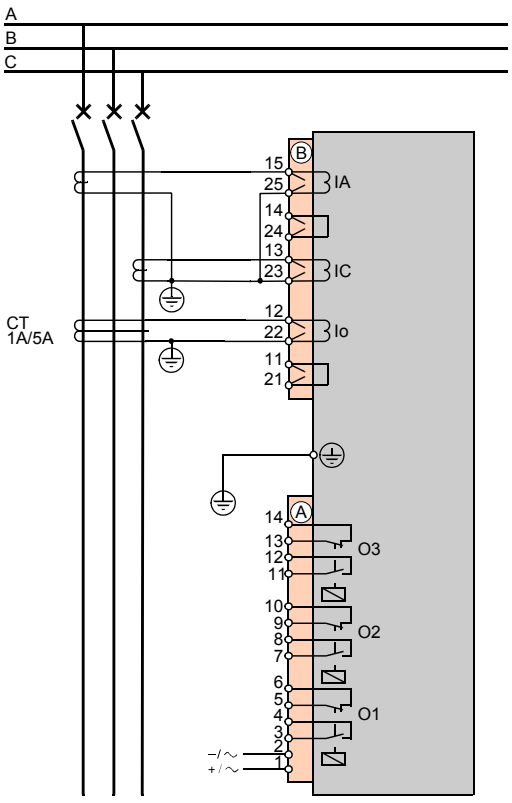
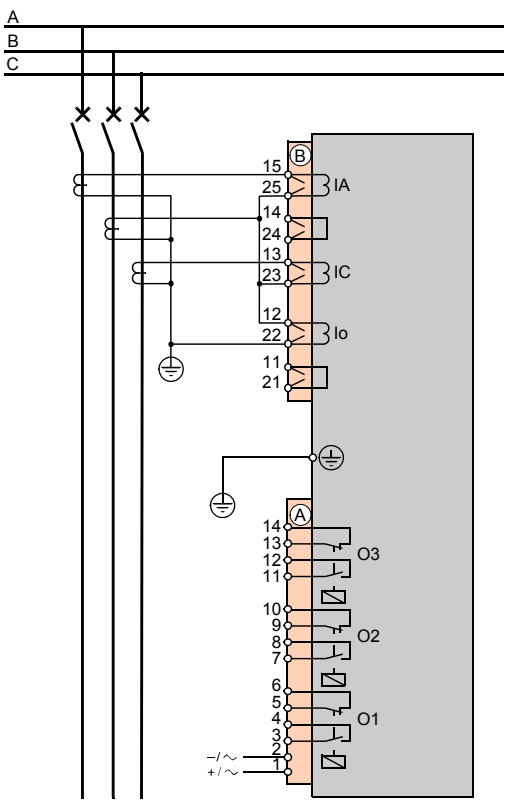


Output Relays	Assignment
O1	Circuit breaker tripping
O2	Circuit breaker trip lockout
O3	Tripping annunciation

Sepam Series 10 B 31•

Sepam series 10 B 31• relays measure 3 currents:

- 2 phase currents measured by 2 phase CTs
- 1 earth fault current measured either:
  - By 1 earth CT
  - On the common point of the 3 phase CTs

Variant no. 1	**Variant no. 2**
Earth fault current measured by 1 earth CT	Earth fault current measured on the common point of the 3 phase CTs
	

Connecting Current Transformers (CTs)

Connecting CTs

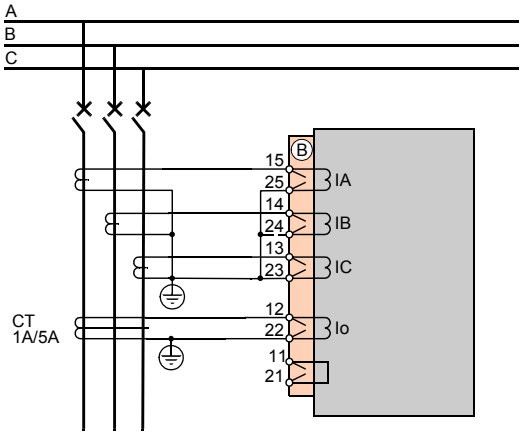
Standard 1 A or 5 A current transformers (CTs) can be connected to Sepam, to measure phase currents and the earth fault current.

To determine the CT size, refer to *Dimensioning the CTs, p. 44*.

Connection Example

The diagram below shows the connection of:

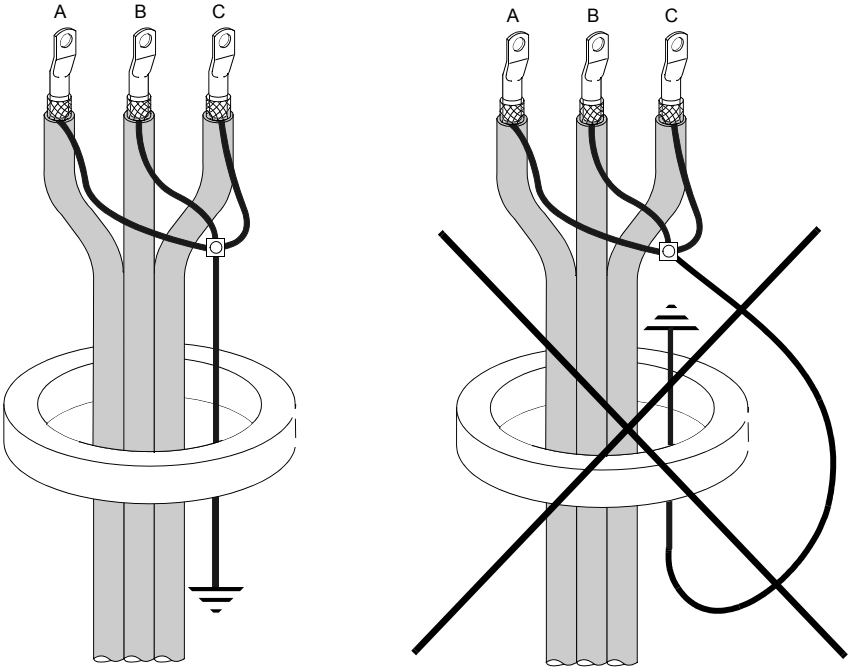
- 3 phase CTs to measure phase currents
- 1 earth fault CT to measure the earth fault current



Earth CT

The earth fault CT must only measure the sum of the 3 phase currents. The current circulating in the medium voltage cable shielding must therefore be excluded. To avoid the current circulating in the cable shielding being detected by the CT, its component must be canceled by making this current circulate a second time through the CT in the opposite direction.

This is achieved by connecting the shields coming out of the cable ends to earth via a wire that crosses the CT. This wire must not come into contact with any part connected to earth before it passes through the CT, otherwise use an insulated wire.



Connecting a Core Balance CT

Connecting a Core Balance CT

The specifically designed CSH120, CSH200 and GO110 core balance CTs are for direct earth fault current measurement. They should be used with Sepam relays with very sensitive earth fault protection.

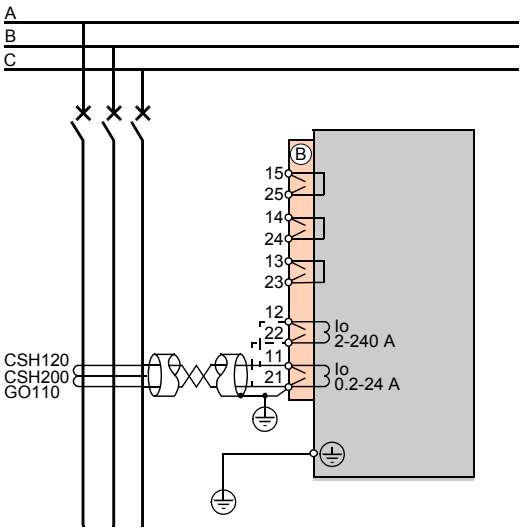
They can be connected to 2 earth fault current inputs with different sensitivities:

- 2-240 A input
- 0.2-24 A input

For detailed characteristics of core balance CTs, refer to *CSH120, CSH200 and GO110 Core Balance CTs, p. 46*.

Connection Diagram

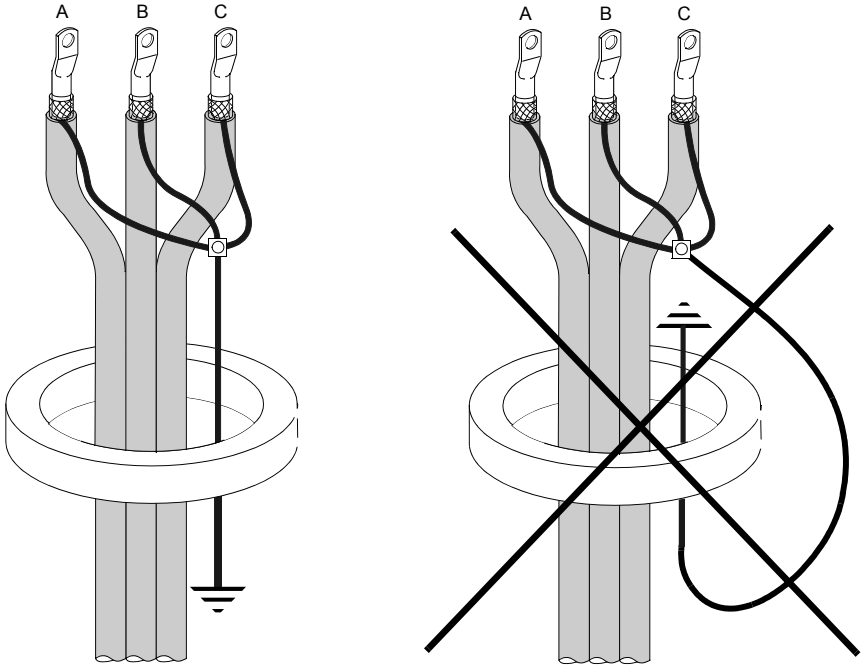
The diagram below shows the connection of a core balance CT to measure the earth fault current:



Core Balance CT

The core balance CT must only measure the sum of the 3 phase currents. The current circulating in the medium voltage cable shielding must therefore be excluded. To avoid the current circulating in the cable shielding being detected by the core balance CT, its component must be canceled by making this current circulate a second time through the core balance CT in the opposite direction.

This is achieved by connecting the shields coming out of the cable ends to earth via a wire that passes through the core balance CT. This wire must not come into contact with any part connected to earth before it passes through the core balance CT, otherwise use an insulated wire.



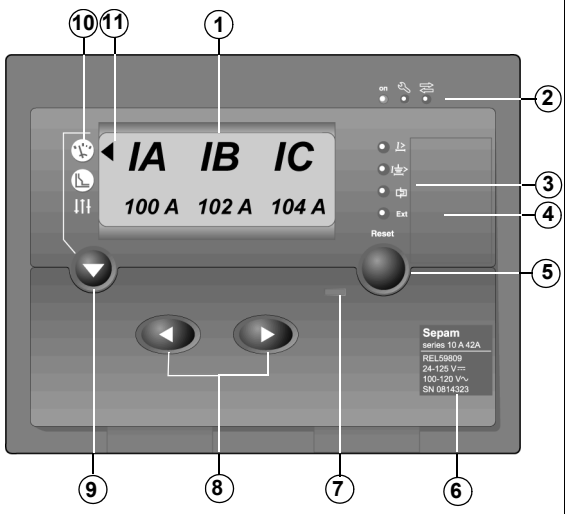
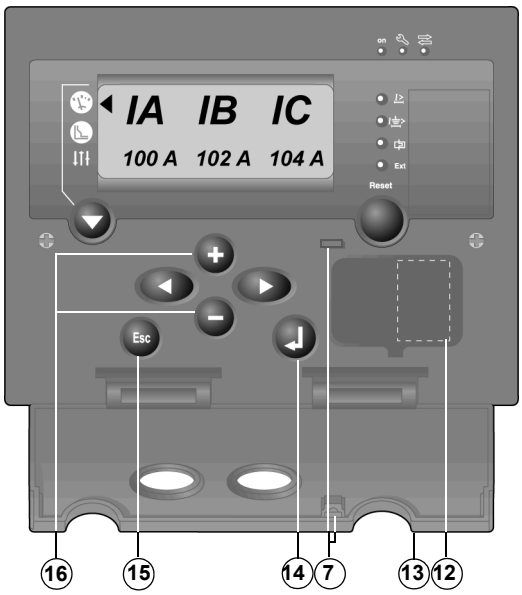
User-Machine Interface

Front Panel

The User-Machine Interface (UMI) on the front panel of Sepam relays consists of a display, LEDs and keys.

A sealable pivoting flap can prevent access to the setting keys by unauthorized persons.

The illustrations below show the two flap positions:

Flap Closed	Flap Open
	

1 Display
2 Status LEDs
3 Fault LEDs
4 Zone for a user-customizable label with pictograms of the fault LEDs
5 Sepam reset and peak demand value reset key
6 Identification label
7 Sealing ring
8 Selection keys
9 Key for selecting menus and testing LEDs
10 Menu pictograms
11 Menu selection pointer
12 Battery slot (Sepam series 10 A)
13 Settings protective flap
14 Confirm entry key
15 Abort entry key
16 Setting keys

Status LEDs

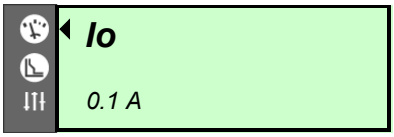
The status LEDs provide information about the Sepam's general status:

Pictogram	Function	Sepam Series 10		
ON	Green LED: Sepam on	N	B	A
	Red LED: Sepam unavailable (Sepam in the fail-safe position)	N	B	A
	Yellow LED: Communication activity	–	–	A

Display

The display is a backlit LCD unit.

Each Sepam function is presented in a screen consisting of the following items:
- First line: Symbols for electrical values or function name
- Second line: Displays the values of measurements or parameters associated with the function
- A menu pointer, on the left, it is pointing to the pictogram for the selected menu



Menu Organization

All the data available in the Sepam relay is divided between three menus:
- The metering menu contains the current measurements and records of the most recent events.
- The protection menu contains the essential settings for setting up the protection functions.
- The parameters menu contains the parameters that can be used to adapt the Sepam operation to particular applications. All these parameters have a default value. The protection functions are operational even with the parameters menu default values.

The menu content depends on the Sepam model. The list of screens by menu, for each model, is given at the end of this chapter:
- *List of Sepam Series 10 N Screens, p. 60*
- *List of Sepam Series 10 B Screens, p. 63*
- *List of Sepam Series 10 A Screens, p. 67*

Selecting a Screen in a Menu

Step	Action
1	Press the key to select one of the three menus. The menu pointer indicates the selected menu: : Metering menu : Protection menu : Parameters menu
2	Press the or keys to scroll through the screens in the selected menu, until the desired screen is displayed.

Default Screen

A default screen is displayed automatically 10 minutes after the last keystroke. This default screen is:
- The screen displaying the earth fault current for Sepam series 10 N relays
- The screen displaying the phase current for Sepam series 10 B and series 10 A relays

Operation

Access to Data

During operation, when the settings protective flap is closed, the user can access the following data:
- Readout of measurements, parameter and protection settings
- Local annunciation of the last fault:
  - by a flashing fault LED
  - by a fault screen on the display unit
- Acknowledgement of the last fault
- Readout of the last saved faults
- Reset of peak demand values
- LED and display unit test

Readout of Measurements, Settings and Parameters

When the settings protective flap is closed, the user can read all the data contained in the Sepam relay.

It is not possible to modify any protection or parameter settings.

Annunciation of the Last Fault

When a fault is detected by Sepam, it is indicated locally by:
- A fault LED, which flashes for as longs as the fault is present and has not been acknowledged
- A fault screen, which is displayed spontaneously on the display unit and remains displayed until the operator presses a key

The operator can acknowledge faults locally by pressing the Reset key.

Sepam series 10 A relays connected to a communication network:
- Indicate faults remotely by means of a remote-indication bit
- Can receive an order to acknowledge faults from the communication

Fault LEDs

The fault LEDs flash to indicate a fault, as shown in the table below.

Pictogram	Fault	Applicable to Sepam Series 10		
I>	Detection of a fault by the phase overcurrent protection	–	B	A
Io	Detection of a fault by the earth fault protection	N	B	A
	Detection of a fault by the thermal overload protection	–	B	A
Ext	External trip	–	–	A

Annunciation by a fault LED is latched in standard operating mode.

If latching of a fault LED has been disabled in custom operating mode at the time of commissioning, the fault LED goes out once the fault disappears.

For the first 3 LEDs, faster flashing may occur before the protection trips, to indicate the following information:

Pictogram	Overshoot	Applicable to Sepam Series 10		
I>	Overshoot of the instantaneous set point for phase overcurrent protection (pick-up outputs I> or I>>)	–	B	A
Io	Overshoot of the instantaneous set point for earth fault protection (pick-up outputs Io> or Io>>)	N	B	A
	Overshoot of the alarm set point for thermal overload protection	–	B	A

Refer to *Fault LEDs, p. 144*.

Remarks:

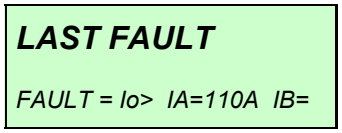
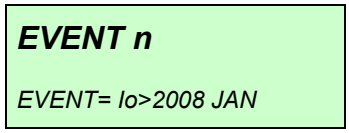
In custom mode, the protection set points cannot be associated with the output relay that causes the circuit breaker to trip but, for example, with an output relay that indicates a simple alarm. In this case, the protection LED may be active, without being associated with the circuit breaker trip.

The fault LED pictograms can be customized by sticking a label to the right of the LEDs.

Fault Screens

Fault screens inform the operator about the characteristics of the last fault detected by the Sepam relay.

The fault screens vary according to the Sepam model.

Sepam Series 10 N and Series 10 B	Sepam Series 10 A
	
First line: Name of the fault screen	First line: Name of the fault screen with its queue number *n*. Events are numbered continuously from 0 to 99999, then back to 0.
Second line: Scrolling display of the fault characteristics: ● Origin of the fault ● Values of the currents measured at the time of the fault	Second line: Scrolling display of the event characteristics: ● Origin of the event ● Date and time of the event ● Values of the currents measured at the time of the event

The operator can consult the other screens using the , or keys. In this case, the fault screen disappears, but the operator can still consult the last recorded fault in the metering menu.

Fault Acknowledgement

Pressing the Reset key acknowledges faults locally and causes:
- The latched output relays to be reset
- The fault LED to go out
- The fault screen to be cleared

After acknowledgement, the Sepam relay displays the screen that was present before the fault appeared.

Readout of the Last Recorded Faults

- Sepam series 10 N and series 10 B relays record the characteristics of the last fault.
- Sepam series 10 A relays record the characteristics of the last 5 faults.

These records can be accessed in the metering menu and are presented in the same way as the fault screens.

Reset of Peak Demand Values

The method for resetting the phase current peak demand values is indicated below:

Step	Action
1	Display the phase current peak demand values screen.
2	Press the Reset key for 2 seconds: the peak demand values are reset to zero.

LED and Display Unit Test

The LED and display unit test is used to check that each LED on the front panel and in each segment of the display is working correctly.

To perform the test, press and hold down the key.

After 2 seconds, all LEDs on the front panel and all segments of the display light up.

Battery Test

The battery in Sepam series 10 A relays is only used to power the internal clock in Sepam series 10 A relays in the event of failure of the Sepam auxiliary power supply. It is not involved in operation of the protection functions.

To check that the battery is in good working order, press the Reset key for 2 to 3 seconds. The 4 red fault LEDs should remain on clearly without fading for the whole time the key is pressed. If not, replace the battery: refer to *Replacing the Battery in the Sepam Series 10 A, p. 240*.

Setting

Access to Parameters and Settings

The Sepam protection and parameter settings can be modified using the keys that are revealed when the settings protective flap is opened.

These parameters and settings are divided into the following two menus:
- The protection menu, which contains the essential settings for setting up the protection functions
- The parameters menu, which contains the parameters that can be used to adapt Sepam operation to particular applications

Protecting the Settings with a Password

By default, modification of the Sepam protection and parameter settings is not protected by a password.

Protecting the settings by a password can be activated if necessary in the parameters menu.

If password protection has been activated at the time of commissioning, Sepam will ask for it automatically the first time the key is pressed during a setting operation. The password is a 4-digit number. Refer to *Entering a Password to Authorize a Setting, p. 57*.

Once the correct code has been entered, modification of the settings is allowed for 10 minutes after the last keystroke.

Setting a Parameter

The procedure for setting a protection function or a parameter is as follows:

Step	Action
1	Select the screen for the function to be set using the , or keys.
2	Press the key: ● If password protection is not active, the first function parameter flashes: the parameter is selected and can be set. ● Otherwise, the password entry screen is displayed: refer to the sections below.
3	Use the / keys to select the parameter to be set. The selected parameter flashes.
4	Use the / keys to scroll through the parameter values until the desired value is displayed. **Remarks**: ● Holding the / keys down makes the values scroll faster. ● Pressing the / keys aborts the parameter entry and selects the previous or next parameter.
5	● To confirm the new parameter value, press the key: the set parameter value is displayed (not flashing) to indicate that it has been taken into account by Sepam. ● To abort the current parameter entry, press the key: all parameters are deselected and are displayed (not flashing).
6	● If the set parameter is the last parameter in the function, the function is completely set and you can select a new screen using the / keys. ● Otherwise, the next parameter flashes and can be set as described in step 4.

Entering a Password to Authorize a Setting

The 4 password digits must be entered separately. The procedure for entering the password is as follows:

Step	Action
1	The password entry screen is displayed and the first digit (0) flashes: ***PASSWORD ?*** *0XXX*
2	Press the ⊕ / ⊖ keys to scroll through the digits from 0 to 9 and select the password digit.
3	Press the ↵ key to confirm the selected digit: ● A star is displayed rather than the selected digit. ● The next digit is a flashing 0.
4	Repeat steps 2 and 3 until you have entered all 4 password digits.
5	Once the password has been entered: ● If the code is correct: The current setting screen is displayed again. It is then possible to modify the protection and parameter settings. ● If the code is incorrect: The message ***PASSWORD NO OK*** is displayed temporarily, then the current setting screen is displayed again.

Activating the Password at the Time of Commissioning

The procedure for activating password protection of the settings is as follows:

Step	Action
1	Select the password setting screen in the parameters menu using the ▼, ◀ or ▶ keys: ***SET PASSWORD*** *NO PASSWORD*
2	Press the ↵ key: ***NO PASSWORD*** flashes.
3	Press the ⊕ / ⊖ keys, then the ↵ key: Sepam asks you to define the password you want. The password is defined in the next section.

Password Definition

The password is a 4-digit number, and each digit must be entered separately. The password must be re-entered to confirm it. The procedure for defining the password is as follows:

Step	Action
1	The password setting screen is displayed. Press the key until the first password digit (0) flashes: ***SET PASSWORD*** *PASSWORD = 0XXX*
2	Press the / keys to scroll through the digits from 0 to 9 and select the password digit.
3	Press the key to confirm the selected digit: ● A star is displayed rather than the selected digit. ● The next digit is a flashing 0.
4	Repeat steps 2 and 3 until you have defined all 4 password digits.
5	Once the password has been defined, it must be re-entered a second time following the same procedure as confirmation: ***SET PASSWORD*** *CONFIRM = XXXX*
6	Once the password has been entered and confirmed: ● If the two codes entered are identical: the ***PASSWORD SET*** message is displayed temporarily and the new password is active. ● If the two codes entered are not identical: the ***CONFIRMATION ERROR*** message is displayed temporarily.

Disabling the Password

The procedure for disabling password protection of the settings is as follows:

Step	Action
1	Select the password setting screen in the parameter menu using the , or keys: ***SET PASSWORD*** *PASSWORD = 0XXX*
2	Press the key: Sepam asks you to enter the active password to authorize changing the parameter. Refer to the *Entering the Password* section.
3	Once the password has been entered: ● If the code is correct and Sepam returns to the ***SET PASSWORD*** screen: use the / keys to select ***NO PASSWORD***, then press the key . Password protection is disabled. ● If the code is incorrect: The ***PASSWORD NO OK*** message is displayed temporarily. Sepam displays the screen for step 1 again.

Lost Password

If you lose the password, read the serial number on the Sepam front panel and contact your local Schneider Electric after-sales service.

Thermal Capacity Used Reset

The calculated thermal capacity used for the thermal overload protection can be reset by the user to:
- Authorize circuit breaker reclosing after a thermal overload protection trip, without waiting for the normal cooling time
- Delay tripping due to thermal overload protection after the thermal alarm set point is reached

The thermal capacity used reset is protected by the same password as the protection function settings.

Method for Resetting the Thermal Capacity Used

The procedure for resetting the thermal capacity used is as follows:

Step	Action
1	Display the ***THERMAL 49 2*** thermal alarm screen in the protection menu, where the value of the thermal capacity used calculated by Sepam appears.
2	Press the key: ● If password protection is not active, the thermal alarm set point flashes. ● Otherwise, the password entry screen is displayed. Refer to the *Entering the Password* section.
3	Select the thermal capacity used using the key: the thermal capacity used flashes.
4	Press the key to reset the thermal capacity used value.
5	Press the key to reset the thermal capacity used value.

List of Sepam Series 10 N Screens

Metering Menu

No.	Screen	Description
1	***Io*** *0.1 A*	Display of the earth fault current This is the default screen for Sepam series 10 N relays.
2	***LAST FAULT*** *FAULT = Io> Io = 60A*	Display of the characteristics of the last fault. This screen is only present when the Sepam relay has already recorded a fault.

Protection Menu

No.	Screen	Description
1a	***E/F CT*** *100A/1A*	Sepam series 10 N 11•: Display and setting of the characteristics of the earth CT or the phase CTs (Io sum): ● Primary rated current Ino or In ● Secondary rated current: 1 A or 5 A
1b	***E/F OP RANGE*** *0.2 - 24A*	Sepam series 10 N 13•: Display and selection of the measurement range by the earth fault core balance CT: 0.2-24 A/2-240 A
2	***FREQUENCY*** *50 HZ*	Network frequency selection
3	***Io>*** ***51N*** *EI 10A TD=0.8*	Display and setting of the low set point parameters for the earth fault protection: ● Activation and tripping curve ● Tripping set point ● Tripping time delay
4	***Io>>*** ***50N-51N*** *DT 10A T=0.10s*	Display and setting of the high set point parameters for the earth fault protection: ● Activation and tripping curve ● Tripping set point ● Tripping time delay

Standard Parameters Menu

No.	Screen	Description
1	***LANGUAGE*** *FRANCAIS*	Display and selection of the operating language
2	***RESET TIME*** *ON*	Activation of the reset time for the earth fault protection functions
3	***SET PASSWORD*** *PASSWORD = xxxx*	Password activation and definition
4	***OUT STATUS*** *O1 ... O3 = 000*	Display of the status of output relays O1 to O3, from left to right: State 0 (off)/State 1 (on)
5	***SEPAM*** *V1.3*	Display of the Sepam software version number
6	***I/O ASSIGN*** *STANDARD*	Display and selection of the Sepam operating mode: Standard/Custom

Custom Parameters Menu

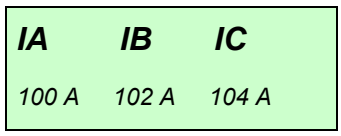
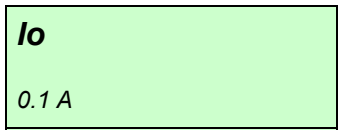
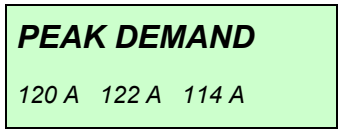
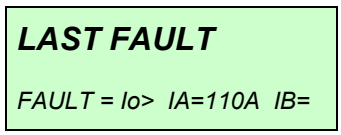
If custom operating mode has been selected, additional screens can be used to customize:

- Assignment of the output relays and fault LED
- Whether or not the output relays and fault LED are latched
- Inversion of the output relay control

No.	Screen	Description
7	***O1 ASSIGN*** *PROTECTION XX*	Display and selection of the O1 output relay assignment
8	***O2 ASSIGN*** *PROTECTION XX*	Display and selection of the O2 output relay assignment
9	***O3 ASSIGN*** *PROTECTION XX*	Display and selection of the O3 output relay assignment
10	***RELAYS LATCH*** *O1=YES O2=YES O3=YES*	Display and selection of O1, O2 and O3 output relay latching
11	***RELAYS INVER*** *O1=NO O2=NO*	Display and selection of O1 and O2 output relay control inversion
12	***LEDS LATCH*** *EARTH=YES*	Display and selection of earth fault LED latching

List of Sepam Series 10 B Screens

Metering Menu

No.	Screen	Description
1		Display of 2/3 phase currents, depending on the IA IC/IA IB IC setting in the ***I DISPLAY*** function. This is the default screen for Sepam series 10 B relays.
2		Display of the earth fault current
3		Display of the peak demand values for 2 or 3 phase currents, depending on the IA IC/IA IB IC setting
4		Display of the characteristics of the last fault. This screen is only present when the Sepam relay has already recorded a fault.

Protection Menu

No.	Screen	Description
1	***PHASE CT*** *600A/5A*	Display and setting of the characteristics of the phase CTs: ● Primary rated current In ● Secondary rated current: 1 A or 5 A
2a	***E/F CT*** *100A/1A*	Sepam series 10 B 31•, B 41• and B 42•: Display and setting of the characteristics of the earth CT or the phase CTs (Io sum): ● Primary rated current Ino or In ● Secondary rated current: 1 A or 5 A
2b	***E/F OP RANGE*** *0.2 - 24A*	Sepam series 10 B 43•: Display and selection of the measurement range by the earth fault core balance CT: 0.2-24 A/2-240 A
2c	***TC E/F RATIO*** *15*	Sepam series 10 B 42E certified GOST: Display and selection of the earth CT ratio: 15...200
3	***FREQUENCY*** *50 HZ*	Network frequency selection
4	***I>*** ***51*** *EI* *70A* *TD=0.8*	Display and setting of the low set point parameters for the phase overcurrent protection: ● Activation and tripping curve ● Tripping set point ● Tripping time delay
5	***I>>*** ***50-51*** *DT* *70A* *T=0.10s*	Display and setting of the high set point parameters for the phase overcurrent protection: ● Activation and tripping curve ● Tripping set point ● Tripping time delay
6	***Io>*** ***51N*** *EI* *10A* *TD=0.8*	Display and setting of the low set point parameters for the earth fault protection: ● Activation and tripping curve ● Tripping set point ● Tripping time delay
7	***Io>>*** ***50N-51N*** *DT* *10A* *T=0.10s*	Display and setting of the high set point parameters for the earth fault protection: ● Activation and tripping curve ● Tripping set point ● Tripping time delay
8	***THERMAL*** ***49 1*** *ON* *124A* *2MN*	Display and setting of the trip parameters for the thermal overload protection: ● Activation ● Maximum permissible continuous current ● Time constant of the protected equipment
9	***THERMAL*** ***49 2*** *ALARM=100* *HEAT.=0%*	Display and setting of the alarm parameters for the thermal overload protection if this has been activated: ● Alarm set point as a percentage of the calculated thermal capacity used ● Calculated thermal capacity used (display 0...999% and reset)