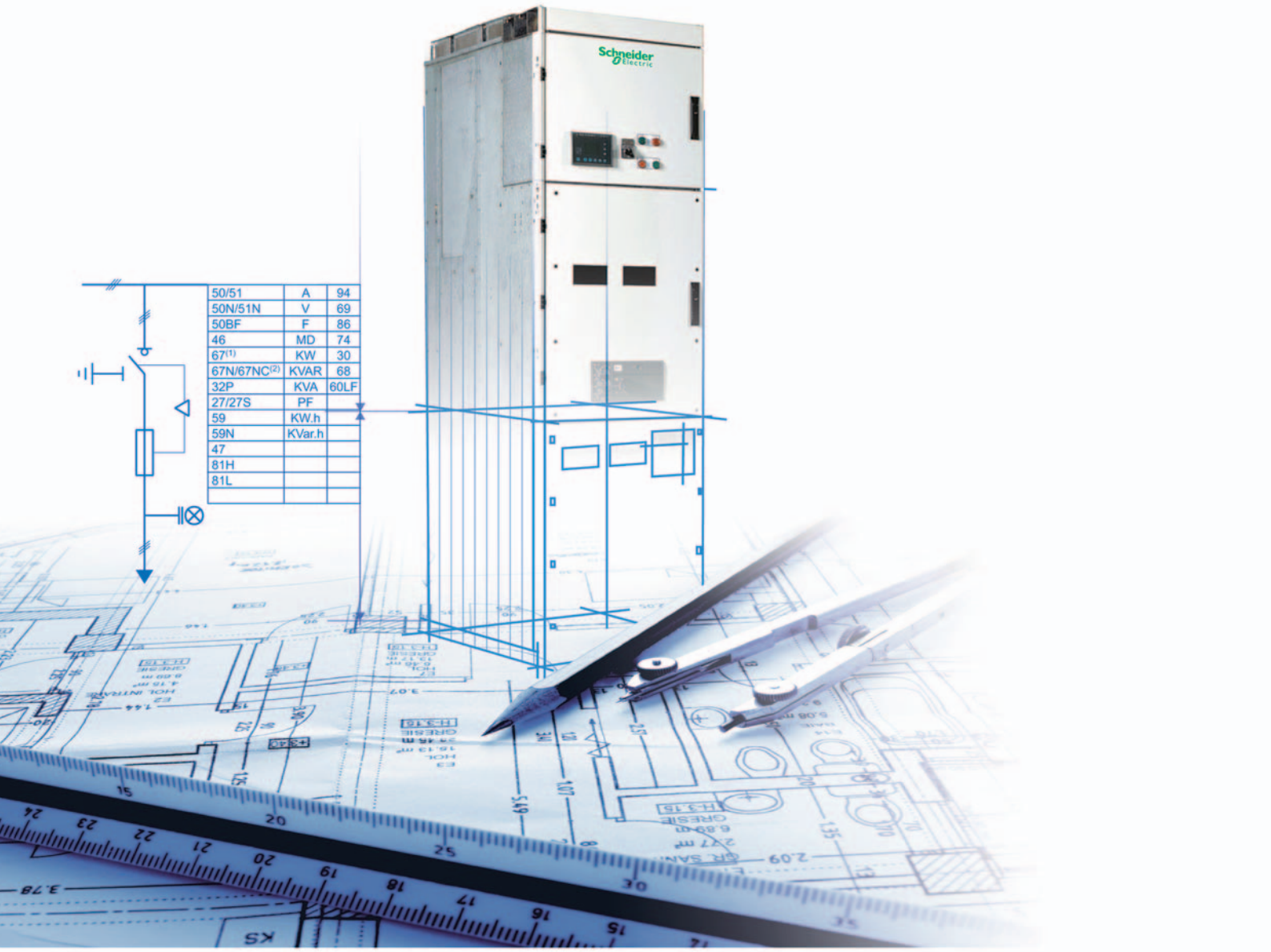
Medium Voltage Distribution

Application Catalogue

A tool for all MV equipment designers

May 2008



Schneider Electric

Application Catalogue
A tool for all MV equipment designers

Contents

General

The Medium Voltage Application Catalogue is a tool for all Medium Voltage equipment designers.

Purpose

■ To help you produce Medium Voltage switchgear assemblies which include Schneider Electric components
■ To help you specify standard solutions.

How?

By offering you standard applications for the protection of different Medium Voltage network configurations.
By providing you with a guarantee of the full protection chain composed of different Schneider Electric components.

■ With specification of the equipment required for each standard application
■ And the complete wiring diagram of the Medium Voltage equipment for each application.

Step 1: Selection table

Using the selection table, you select your application from the different standard applications offered:

■ Based on the network component to be protected:
substation incomer or feeder, transformer, motor or generator
■ Based on the formulated protection, metering and monitoring requirements
The application chosen from the selection table is detailed in the application pages.

Step 2: Application page

Each standard application is presented in a page which includes:

■ A single-line diagram of the application, with the different components to be combined:
□ Switching device
□ Measurement sensors
□ Protection unit
□ Details of the functions offered by the protection unit:
□ Protection functions
□ Monitoring and control functions
■ Optional functions available
■ Reference of the complete wiring diagram for the application.

Step 3: Wiring diagrams

A diagram library on CD-ROM contains the wiring diagrams, in AutoCad format, of all the standard applications offered.

Each diagram:
■ Corresponds to a standard application
■ Contains all the information required for the complete wiring, power and control current, of the Medium Voltage equipment
■ May be easily adapted by you to match the options you choose and your particular needs.

Selection tables

Application		Line or substation							
		Feeder				Incomer			
Protection and control type		**S1**	**S2**	**S2**	**S2**	**S3**	**S3**	**S3**	**S4**
Page No.		**10**	**11**	**11**	**11**	**12**	**12**	**12**	**13**
Sepam series 20		**S20**							**S20**
Sepam series 40			**S40**	**S41**	**S42**	**S40**	**S41**	**S42**	
NEX 17.5 kV diagram 5130…		*7350*	*7356*	*7358*	*7360*	*7357*	*7359*	*7361*	
NEX 24 kV diagram 5130…		*7373*	*7378*			*7379*			*7374*
Protection function	**ANSI code**								
Phase overcurrent	50/51	■	■	■	■	■	■	■	■
Voltage-restrained phase overcurrent	50V/51V								
Earth fault, sensitive earth fault	50N/51N 50G/51G	■	■	■	■	■	■	■	■
Breaker failure	50BF		■	■	■	■	■	■	
Negative sequence/unbalance	46	■	■	■	■	■	■	■	■
Directional phase overcurrent	67				■ (1)			■	
Directional earth fault	67N/67NC			■	■		■	■	
Directional active overpower	32P			■ (1)	■ (1)		■	■	
Directional reactive overpower	32Q/40								
Thermal overload	49RMS								
Phase undercurrent	37								
Excessive starting time, locked rotor	48/51LR/14								
Starts per hour	66								
Positive sequence undervoltage	27D								
Remanent undervoltage	27R								
Undervoltage	27/27S		■	■	■	■	■	■	
Overvoltage	59		■	■	■	■	■	■	
Neutral voltage displacement	59N		■ (1)	■ (1)	■ (1)	■	■	■	
Negative sequence overvoltage	47		■ (1)	■ (1)	■ (1)	■	■	■	
Overfrequency	81H		■ (1)	■ (1)	■ (1)	■	■	■	
Underfrequency	81L		■ (1)	■ (1)	■ (1)	■	■	■	
Rate of change of frequency	81R								
Recloser (4 cycles)	79	□	□	□	□				□
Temperature monitoring (8 to 16 RTDs, 2 set points per RTD)	38/49T								
Thermostat/Buchholz/DGPT									
Measurement and diagnostic									
Phase current I1; I2; I3 RMS, residual current I0		■	■	■	■	■	■	■	■
Average current I1; I2; I3; peak demand current IM1, IM2, IM3		■	■	■	■	■	■	■	■
Voltage U21; U32; U13; V1; V2; V3; residual voltage V0			■	■	■	■	■	■	
Positive sequence voltage Vd/rotation direction; neg. seq. voltage Vi (only S40)			■	■	■	■	■	■	
Frequency			■	■	■	■	■	■	
Active; reactive and apparent power P. Q. S Peak demand power PM. QM Power factor			■	■	■	■	■	■	
Calculated active and reactive energy (+/-W.h. +/- var.h)			■	■	■	■	■	■	
Active and reactive energy by pulse counting (+/-W.h. +/- var.h)			□ (1)	□ (1)	□ (1)	□ (1)	□ (1)	□ (1)	
Temperature									
Network and machine diagnosis									
Tripping context			■	■	■	■	■	■	
Tripping current Trip1; Trip2; Trip3; Trip0		■	■	■	■	■	■	■	■
Unbalance ratio/negative sequence current Ii		■	■	■	■	■	■	■	■
Phase displacement φ0; φ1; φ2; φ3			■	■	■	■	■	■	
Disturbance recording		■	■	■	■	■	■	■	■
Thermal capacity used									
Remaining operating time before overload tripping									
Waiting time after overload tripping									
Running hours counter/operating time									
Start current and time									
Start inhibit time delay, number of starts before inhibition									

■ Standard

□ According to parameter setting and MES module or MET module

(1) Not used in schematic diagram

Bus tie		Bus riser	Busbar VT's		Transformer									Motor		Generator
					Feeder					Incomer				Feeder		Incomer
S5	S6	B2	B1	B1	T1	T2	T3	T3	T6	T4	T4	T5	T5	M1	M2	G1
14	15	16	17	17	18	19	20	20	21	22	22	23	23	24	25	26
S20		B22	B21	B22	T20	T20									M20	
	S40						T40	T42	T40	T40	T42	T40	T42	M41		G40
			7354	*7355*	*7351*	*7352*	*7362*	*7365*		*7363*	*7366*	*7364*	*7367*	*7353*	*7368*	*7369*
7372	*7377*	*7371*		*7370*	*7375*	*7376*	*7380*		*7382*	*7381*		*7383*				
■	■				■	■	■	■	■	■	■	■	■	■	■	■
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														■	■	

Selection tables (cont.)

Application		Line or substation							
		Feeder				Incomer			
Protection and control type		**S1**	**S2**	**S2**	**S2**	**S3**	**S3**	**S3**	**S4**
Page No.		**10**	**11**	**11**	**11**	**12**	**12**	**12**	**13**
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Sepam series 40			**S40**	**S41**	**S42**	**S40**	**S41**	**S42**	
NEX 17.5 kV diagram 5130…		*7350*	*7356*	*7358*	*7360*	*7357*	*7359*	*7361*	
NEX 24 kV diagram 5130…		*7373*	*7378*			*7379*			*7374*
Switchgear diagnostic	**ANSI code**								
Cumulative breaking current		■	■	■	■	■	■	■	■
Trip circuit supervision		□	□	□	□	□	□	□	□
Number of operations, operating time, charging time		□	□	□	□	□	□	□	□
CT/VT supervision	60FL		■	■	■	■	■	■	
Control and monitoring									
Circuit breaker/contactor control	94/69	□	□	□	□	□	□	□	□
Latching/acknowledgment	86	■	■	■	■	■	■	■	■
Logic discrimination	68	□	□	□	□	□	□	□	□
Switching of groups of settings		■ (1)	■ (1)	■ (1)	■ (1)	■ (1)	■ (1)	■ (1)	■ (1)
Logic equation editor			■	■	■	■	■	■	
Optional features									
8 temperature sensor inputs - MET148-2 module		□	□	□	□	□	□	□	□
1 low level analog output - MSA141 module		□	□	□	□	□	□	□	□
Logic inputs/outputs - MES114 (10I/4O) module		□	□	□	□	□	□	□	□
RS485 interface - ACE949-2 (2-wire) or ACE959 (4-wire) module		■	■	■	■	■	■	■	■
Test box		■	■	■	■	■	■	■	■
Local remote/switch		■	■	■	■	■	■	■	■
CT's option									
LPCT sensors		■	■	■	■	■	■	■	■
Core balance CT		□	□	□	□	□	□	□	□

■ Standard

□ According to parameter setting and MES module or MET module

(1) Not used in schematic diagram

	Bus tie		Bus riser	Busbar VT's		Transformer									Motor		Generator
						Feeder					Incomer				Feeder		Incomer
	S5	S6	B2	B1	B1	T1	T2	T3	T3	T6	T4	T4	T5	T5	M1	M2	G1
	14	15	16	17	17	18	19	20	20	21	22	22	23	23	24	25	26
	S20		B22	B21	B22	T20	T20									M20	
		S40						T40	T42	T40	T40	T42	T40	T42	M41		G40
				7354	*7355*	*7351*	*7352*	*7362*	*7365*		*7363*	*7366*	*7364*	*7367*	*7353*	*7368*	*7369*
	7372	*7377*	*7371*		*7370*	*7375*	*7376*	*7380*		*7382*	*7381*		*7383*				
	■	■				■	■	■	■	■	■	■	■	■	■	■	■
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	□	□	□ (1)	□ (1)	□ (1)	□	□	□	□	□	□	□	□	□	□	□	□
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	■ (1)	■ (1)				■ (1)	■ (1)	■ (1)	■ (1)	■ (1)	■ (1)	■ (1)	■ (1)	■ (1)	■ (1)	■ (1)	■ (1)
		■						■	■	■	■	■	■	■		■	■
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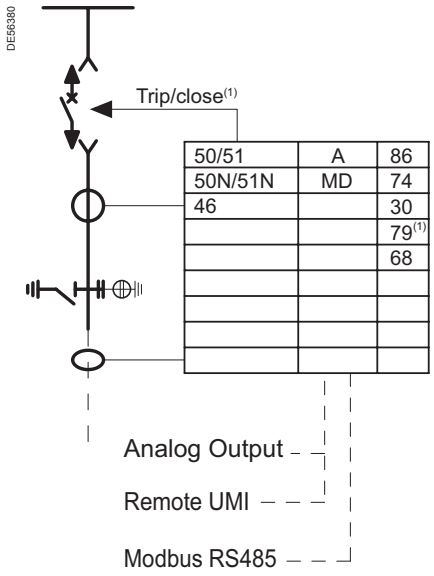
						■	■	■	■	■	■	■	■	■	■	■	■

Substation feeder S1

■ Protection against phase to phase and phase to earth short circuits
■ Detecting of unbalanced power supplied
■ Recloser
■ It suited for integration into a supervisory system using Modbus serial interface. Several standard options are available to ensure maximum flexibility and cost effectiveness in meeting the requirements of different systems.



Substation feeder S1

(1) Close by communication and recloser
(2) O11 reserved for closing order

Protection

Sepam S20
- 50/51: overcurrent - IDMT, DT (4 settings)
- 50N/51N: earth fault - IDMT, DT (4 settings)
- 46: negative sequence overcurrent.

Measurement and diagnostic

Sepam S20, LCD display LED (Light Emitting Diode)
- Phase current: I1, I2, I3 RMS
- Residual current: I0
- Average currents: I1, I2, I3
- Peak demand phase currents
- Tripping currents: I1, I2, I3, I0
- Unbalance ratio/negative sequence current Ii
- Disturbance recording.

CT's option
- CLP1: LPCT sensors 100 A to 1250 A
- Core balance CT: CSH120 or CSH200.

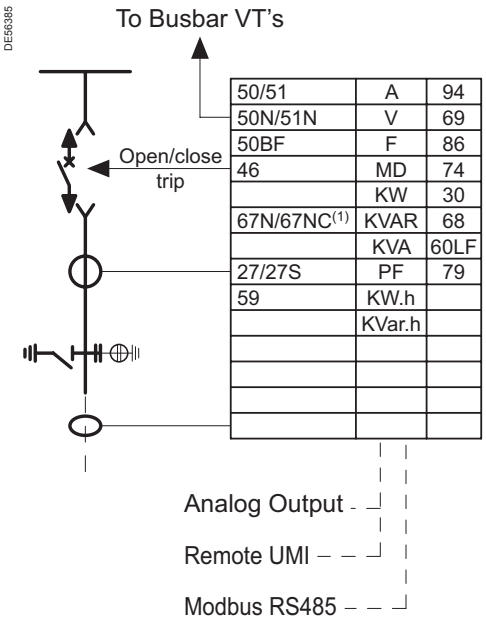
Control

Sepam S20	Basic apparatus	MES114 module (10 I/4 O)
Cumulative breaking current	■	■
Trip CB output (O1)	■	■
Closing lockout (O2)	■	■
Logic discrimination block send (O3)	■	■
Watch dog (O4)	■	■
CB control (86)	■	■
CB open/closed status indication		■
Number of operations, operating time		■
Logic discrimination block receive		■
External tripping		■
Trip circuit supervision (74)		■
Fault and alarm contact (O11(2) to O14)		■
Recloser 4 cycles (79)		■
External network time synchronization		■
External trip		■
Local/remote control selection		■
Inhibition recloser		■

Optional features
- Communication interface module, 2 wires (ACE949-2) Modbus
- Communication interface module, 4 wires (ACE959) Modbus
- One low level analog output (0-10 mA/ 4-20 mA/ 0-20 mA) MSA141 module
- Remote advanced UMI (type DSM303)
- Test box
- Local/remote switch
- Logic inputs and outputs module MES114 (10I/4O).

Substation feeder S2

■ Protection against phase to phase and phase to earth short circuits
■ Detecting of unbalanced power supplied
■ Recloser
■ It suited for integration into a supervisory system using Modbus serial interface. Several standard options are available to ensure maximum flexibility and cost effectiveness in meeting the requirements of different systems.



Substation feeder S2

Protection

Sepam S40/S41/S42
- 50/51: overcurrent - IDMT, DT (4 settings)
- 50N/51N: earth fault - IDMT, DT (4 settings)
- 50BF: breaker failure
- 46: negative sequence overcurrent - IDMT, DT (2 settings)
- 67N/67NC: directional earth fault (1) - IDMT, DT (2 settings)
- 27/27S: undervoltage (2 settings)
- 59: overvoltage (2 settings).

(1) On Sepam S41 and S42
(2) O11 reserved for closing order

Measurement and diagnostic

Sepam S40/S41/S42, LCD display LED (Light Emitting Diode)
- Phase current: I1, I2, I3 RMS
- Residual current: I0
- Average currents: I1, I2, I3
- Peak demand phase currents
- Line voltage: U21, U32, U13
- Phase to neutral voltage: V1, V2, V3
- Residual voltage: V0
- Positive sequence voltage/rotation direction
- Frequency
- Active, reactive and apparent power: P, Q, S
- Peak demand power PM, QM and power factor
- Active and reactive energy
- Tripping currents: I1, I2, I3, I0
- Unbalance ratio/negative sequence current Ii
- Phase displacement
- Disturbance recording
- Tripping context.

CT's option
- CLP1: LPCT sensors 100 A to 1250 A
- Core balance CT: CSH120 or CSH200.

Control

Sepam S40/S41/S42	Basic apparatus	MES114 module (10 I/4 O)
Cumulative breaking current	■	■
Trip CB output (O1)	■	■
Closing lockout (O2)	■	■
Logic discrimination block send (O3)	■	■
Watch dog (O4)	■	■
CB control (86)	■	■
CB open/closed status indication		■
Number of operations, operating time		■
Trip circuit supervision (74)		■
Logic discrimination block receive BI1		■
CB closing order		■
Fault and alarm contact (O11(2) to O14)		■
Recloser 4 cycles (79)		■
CB opening order		■
Inhibit closing		■
External tripping		■
Local/remote control selection		■
Inhibition recloser		■
External network time synchronization		■

Optional features
- Communication interface module, 2 wires (ACE949-2) Modbus
- Communication interface module, 4 wires (ACE959) Modbus
- Logic inputs and outputs module MES114 (10I/4O)
- One low level analog output (0-10 mA/ 4-20 mA/ 0-20 mA) MSA141 module
- Remote advanced UMI (type DSM303)
- Test box
- Local/remote switch.

Substation incomer S3

■ Protection against phase to phase and phase to earth short circuits
■ Detecting of unbalanced power supplied
■ It suited for integration into a supervisory system using Modbus serial interface. Several standard options are available to ensure maximum flexibility and cost effectiveness in meeting the requirements of different systems.

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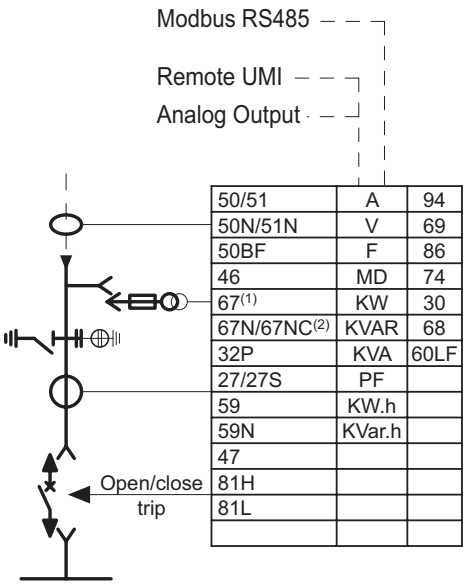


50/51	A	94
50N/51N	V	69
50BF	F	86
46	MD	74
67(1)	KW	30
67N/67NC(2)	KVAR	68
32P	KVA	60LF
27/27S	PF	
59	KW.h	
59N	KVar.h	
47		
81H		
81L		

Substation incomer S3

Protection

Sepam S40/S41/S42
- 50/51: overcurrent - IDMT, DT (4 settings)
- 50N/51N: earth fault - IDMT, DT (4 settings)
- 50BF: breaker failure
- 46: negative sequence overcurrent - IDMT, DT (2 settings)
- 67: directional phase overcurrent (1) - IDMT, DT (2 settings)
- 67N/67NC: directional earth fault (2) - IDMT, DT (2 settings)
- 32P: directional active overpower (2)
- 27/27S: undervoltage (2 settings)
- 59: overvoltage (2 settings)
- 59N: neutral voltage displacement (2 settings)
- 47: negative sequence overvoltage
- 81H: overfrequency (2 settings)
- 81L: underfrequency (4 settings).

(1) On Sepam S42 only
(2) On Sepam S41 and S42
(3) O11 reserved for closing order

Measurement and diagnostic

Sepam S40/S41/S42, LCD display LED (Light Emitting Diode)
- Phase current: I1, I2, I3 RMS
- Residual current: I0
- Average currents: I1, I2, I3
- Peak demand phase currents
- Line voltage: U21, U32, U13
- Phase to neutral voltage : V1, V2, V3
- Residual voltage: V0
- Positive sequence voltage/rotation direction
- Frequency
- Active, reactive and apparent power: P, Q, S
- Peak demand power PM, QM and power factor
- Active and reactive energy
- Tripping currents: I1, I2, I3, I0
- Unbalance ratio/negative sequence current Ii
- Phase displacement
- Disturbance recording
- Tripping context.

CT's option
- CLP1: LPCT sensors 100 A to 1250 A
- Core balance CT: CSH120 or CSH200.

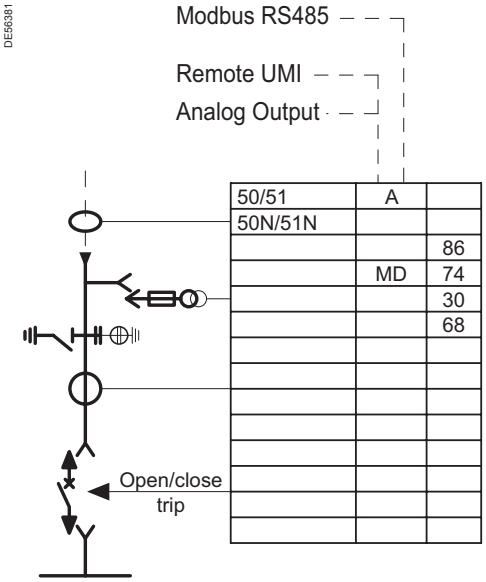
Control

Sepam S40/S41/S42	Basic apparatus	MES114 module (10 I/4 O)
Cumulative breaking current	■	■
Trip CB output (O1)	■	■
Closing lockout (O2)	■	■
Logic discrimination block send (O3)	■	■
Watch dog (O4)	■	■
CB control (86)	■	■
CB open/closed status indication		■
Number of operations, operating time		■
Trip circuit supervision (74)		■
Logic discrimination block receive BI1		■
CB closing order		■
Fault and alarm contact (O11(3) to O14)		■
CB opening order		■
Inhibit closing		■
External tripping		■
Local/remote control selection		■
External network time synchronization		■

Optional features
- Communication interface module, 2 wires (ACE949-2) Modbus
- Communication interface module, 4 wires (ACE959) Modbus
- Logic inputs and outputs module MES114 (10I/4O)
- One low level analog output (0-10 mA/ 4-20 mA/ 0-20 mA) MSA141 module
- Remote advanced UMI (type DSM303)
- Test box
- Local/remote switch.

Substation incomer S4

■ Protection against phase to phase and phase to earth short circuits
■ Detecting of unbalanced power supplied
■ It suited for integration into a supervisory system using Modbus serial interface. Several standard options are available to ensure maximum flexibility and cost effectiveness in meeting the requirements of different systems.



Substation incomer S4

(1) Close by communication and recloser
(2) O11 reserved for closing order

Protection

Sepam S20
- 50/51: overcurrent - IDMT, DT (4 settings)
- 50N/51N: earth fault - IDMT, DT (4 settings)
- 46: negative sequence overcurrent.

Measurement and diagnostic

Sepam S20, LCD display LED (Light Emitting Diode)
- Phase current: I1, I2, I3 RMS
- Residual current: I0
- Average currents: I1, I2, I3
- Peak demand phase currents
- Tripping currents: I1, I2, I3, I0
- Unbalance ratio/negative sequence current Ii
- Disturbance recording.

CT's option
- CLP1: LPCT sensors 100 A to 1250 A
- Core balance CT: CSH120 or CSH200.

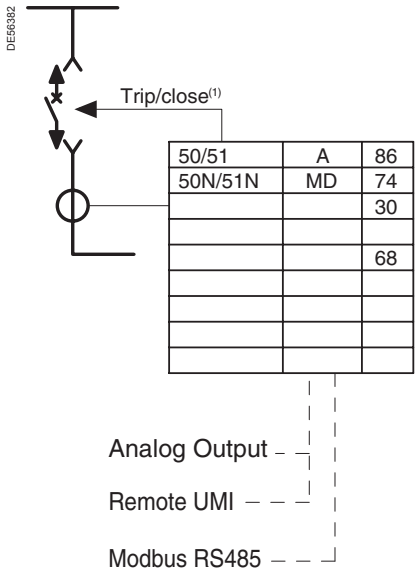
Control

Sepam S20	Basic apparatus	MES114 module (10 I/4 O)
Cumulative breaking current	■	■
Trip CB output (O1)	■	■
Closing lockout (O2)	■	■
Logic discrimination block send (O3)	■	■
Watch dog (O4)	■	■
CB control (86)	■	■
CB open/closed status indication		■
Number of operations, operating time		■
Logic discrimination block receive		■
External tripping		■
Trip circuit supervision (74)		■
Fault and alarm contact (O11(2) to O14)		■
External network time synchronization		■
External trip		■
Local/remote control selection		■
Inhibition recloser		■

Optional features
- Communication interface module, 2 wires (ACE949-2) Modbus
- Communication interface module, 4 wires (ACE959) Modbus
- One low level analog output (0-10 mA/ 4-20 mA/ 0-20 mA) MSA141 module
- Remote advanced UMI (type DSM303)
- Test box
- Local/remote switch
- Logic inputs and outputs module MES114 (10I/4O).

Bus tie S5

■ Protection against phase to phase and phase to earth short circuits
■ Detecting of unbalanced power supplied
■ It suited for integration into a supervisory system using Modbus serial interface. Several standard options are available to ensure maximum flexibility and cost effectiveness in meeting the requirements of different systems.



Bus tie S5

(1) Close by communication and recloser
(2) O11 reserved for closing order

Protection

Sepam S20
- 50/51: overcurrent - IDMT, DT (4 settings)
- 50N/51N: earth fault - IDMT, DT (4 settings)
- 46: negative sequence overcurrent.

Measurement and diagnostic

Sepam S20, LCD display LED (Light Emitting Diode)
- Phase current: I1, I2, I3 RMS
- Residual current: I0
- Average currents: I1, I2, I3
- Peak demand phase currents
- Tripping currents: I1, I2, I3, I0
- Unbalance ratio/negative sequence current Ii
- Disturbance recording.

CT's option
- CLP1: LPCT sensors 100 A to 1250 A
- Core balance CT: CSH120 or CSH200.

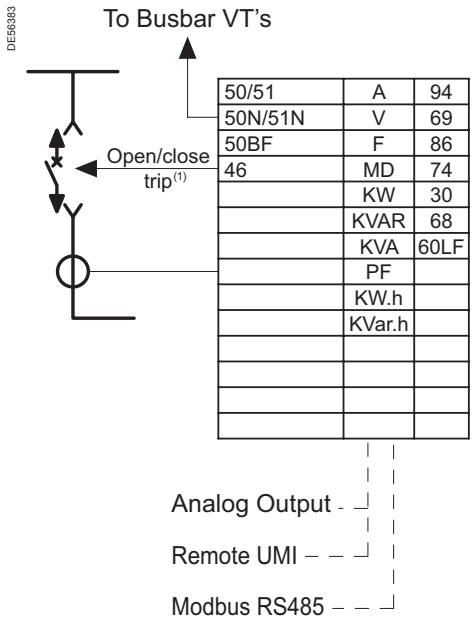
Control

Sepam S20	Basic apparatus	MES114 module (10 I/4 O)
Cumulative breaking current	■	■
Trip CB output (O1)	■	■
Closing lockout (O2)	■	■
Logic discrimination block send (O3)	■	■
Watch dog (O4)	■	■
CB control (86)	■	■
CB open/closed status indication		■
Number of operations, operating time		■
Logic discrimination block receive		■
External tripping		■
Trip circuit supervision (74)		■
Fault and alarm contact (O11(2) to O14)		■
External network time synchronization		■
External trip		■
Local/remote control selection		■
Inhibition recloser		■

Optional features
- Communication interface module, 2 wires (ACE949-2) Modbus
- Communication interface module, 4 wires (ACE959) Modbus
- One low level analog output (0-10 mA/ 4-20 mA/ 0-20 mA) MSA141 module
- Remote advanced UMI (type DSM303)
- Test box
- Local/remote switch
- Logic inputs and outputs module MES114 (10I/4O).

Bus tie S6

■ Protection against phase to phase and phase to earth short circuits
■ Detecting of unbalanced power supplied
■ Recloser
■ It suited for integration into a supervisory system using Modbus serial interface. Several standard options are available to ensure maximum flexibility and cost effectiveness in meeting the requirements of different systems.



Bus tie S6

(1) Close by communication
(2) O11 reserved for closing order

Protection

Sepam S40
- 50/51: overcurrent - IDMT, DT (4 settings)
- 50N/51N: earth fault - IDMT, DT (4 settings)
- 50BF: breaker failure
- 46: negative sequence overcurrent - IDMT, DT (2 settings).

Measurement and diagnostic

Sepam S40, LCD display LED (Light Emitting Diode)
- Phase current: I1, I2, I3 RMS
- Residual current: I0
- Average currents: I1, I2, I3
- Peak demand phase currents
- Line voltage: U21, U32, U13
- Phase to neutral voltage: V1, V2, V3
- Residual voltage: V0
- Positive sequence voltage/rotation direction
- Frequency
- Active, reactive and apparent power: P, Q, S
- Peak demand power PM, QM and power factor
- Active and reactive energy
- Tripping currents: I1, I2, I3, I0
- Unbalance ratio/negative sequence current Ii
- Phase displacement
- Disturbance recording
- Tripping context.

CT's option
- CLP1: LPCT sensors 100 A to 1250 A
- Core balance CT: CSH120 or CSH200.

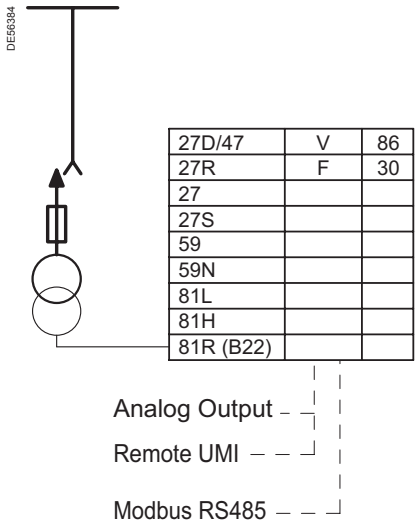
Control

Sepam S40	Basic apparatus	MES114 module (10 I/4 O)
Cumulative breaking current	■	■
Trip CB output (O1)	■	■
Closing lockout (O2)	■	■
Logic discrimination block send (O3)	■	■
Watch dog (O4)	■	■
CB control (86)	■	■
CB open/closed status indication		■
Number of operations, operating time		■
Trip circuit supervision (74)		■
Logic discrimination block receive BI1		■
CB closing order		■
Fault and alarm contact (O11(2) to O14)		■
CB opening order		■
Inhibit closing		■
External tripping		■
Local/remote control selection		■
Inhibition recloser		■
External network time synchronization		■

Optional features
- Communication interface module, 2 wires (ACE949-2) Modbus
- Communication interface module, 4 wires (ACE959) Modbus
- Logic inputs and outputs module MES114 (10I/4O)
- One low level analog output (0-10 mA/ 4-20 mA/ 0-20 mA) MSA141 module
- Remote advanced UMI (type DSM303)
- Test box
- Local/remote switch.

Bus riser B2

■ Detecting of variation in network voltage or frequency
■ It suited for integration into a supervisory system using Modbus serial interface. Several standard options are available to ensure maximum flexibility and cost effectiveness in meeting the requirements of different systems.



Bus riser B2

Protection

Sepam B22
- 27D/47: positive sequence undervoltage (2 sets)
- 27R: remanent undervoltage
- 27: phase to phase undervoltage (2 sets)
- 27S: phase to neutral undervoltage
- 59: phase to phase overvoltage (2 sets)
- 59N: neutral voltage displacement (2 sets)
- 81H: overfrequency
- 81L: underfrequency (2 sets)
- 81R: rate of change of frequency (B22 only).

Measurement and diagnostic

Sepam B22, LCD display LED (Light Emitting Diode)
- Line voltage: U21, U32, U13
- Phase to neutral voltage: V1, V2, V3
- Residual voltage: V0
- Positive sequence voltage/rotation direction
- Frequency
- Disturbance recording.

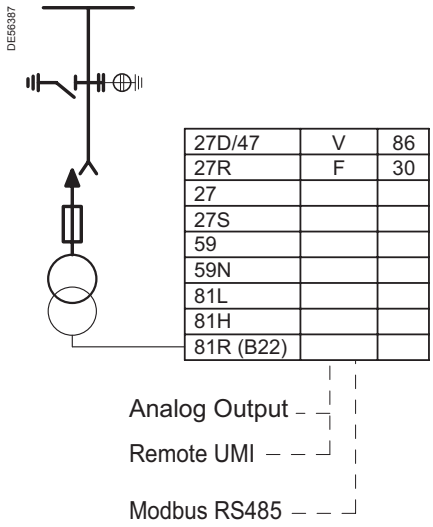
Control

Sepam B22	Basic apparatus	MES114 module (10 I/4 O)
Trip CB output (O1)	■	■
Closing lockout (O2)	■	■
Logic discrimination block send (O3)	■	■
Watch dog (O4)	■	■
Fault and alarm contact (O11 to O14)	■	■
External network time synchronization		■

Optional features
- Communication interface module, 2 wires (ACE949-2) Modbus
- Communication interface module, 4 wires (ACE959) Modbus
- One low level analog output (0-10 mA/ 4-20 mA/ 0-20 mA) MSA141 module
- Remote advanced UMI (type DSM303)
- Test box
- Logic inputs and outputs module MES114 (10I/4O).

Busbar VT's B1

■ Detecting of variation in network voltage or frequency
■ It suited for integration into a supervisory system using Modbus serial interface. Several standard options are available to ensure maximum flexibility and cost effectiveness in meeting the requirements of different systems.



Busbar VT's B1

Protection

Sepam B21/B22
- 27D/47: positive sequence undervoltage (2 sets)
- 27R: remanent undervoltage
- 27: phase to phase undervoltage (2 sets)
- 27S: phase to neutral undervoltage
- 59: phase to phase overvoltage (2 sets)
- 59N: neutral voltage displacement (2 sets)
- 81H: overfrequency
- 81L: underfrequency (2 sets)
- 81R: rate of change of frequency (B22 only).

Measurement and diagnostic

Sepam B21/B22, LCD display LED (Light Emitting Diode)
- Line voltage: U21, U32, U13
- Phase to neutral voltage: V1, V2, V3
- Residual voltage: V0
- Positive sequence voltage/rotation direction
- Frequency
- Disturbance recording.

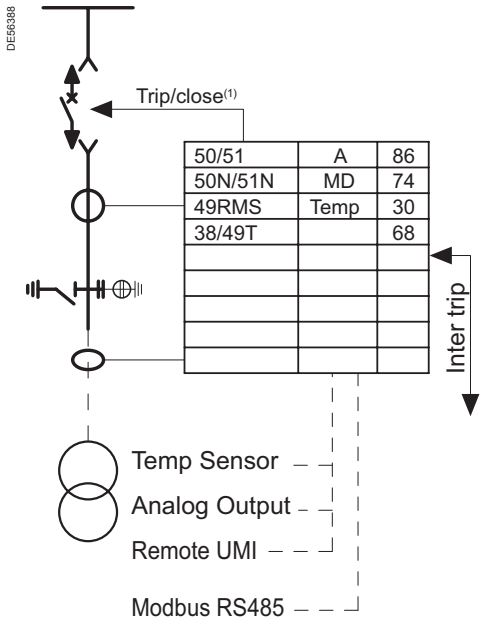
Control

Sepam B21/B22	Basic apparatus	MES114 module (10 I/4 O)
Trip CB output (O1)	■	■
Closing lockout (O2)	■	■
Logic discrimination block send (O3)	■	■
Watch dog (O4)	■	■
Fault and alarm contact (O11 to O14)	■	■
External network time synchronization		■

Optional features
- Communication interface module, 2 wires (ACE949-2) Modbus
- Communication interface module, 4 wires (ACE959) Modbus
- One low level analog output (0-10 mA/ 4-20 mA/ 0-20 mA) MSA141 module
- Remote advanced UMI (type DSM303)
- Test box
- Logic inputs and outputs module MES114 (10I/4O).

Transformer feeder T1

■ Protection against internal faults and overload protection
■ It also monitors the winding temperature by probes providing local and remote indication of operation
■ It suited for integration into a supervisory system using Modbus serial interface. Several standard options are available to ensure maximum flexibility and cost effectiveness in meeting the requirements of different systems.



Transformer feeder T1

(1) Close by communication
(2) O11 reserved for closing order

Protection

Sepam T20
- 50/51: overcurrent - IDMT, DT (4 settings)
- 50N/51N: earth fault - IDMT, DT (4 settings)
- 46: negative sequence overcurrent
- 49RMS: thermal overload (2 settings)
- 38/49T: temperature monitoring (2 settings/probe).

Measurement and diagnostic

Sepam T20, LCD display LED (Light Emitting Diode)
- Phase current: I1, I2, I3 RMS
- Residual current: I0
- Average currents: I1, I2, I3
- Peak demand phase currents
- Temperature measurement
- Tripping currents: I1, I2, I3, I0
- Unbalance ratio/negative sequence current Ii
- Disturbance recording
- Running hours counter/operating time
- Thermal capacity used
- Remaining operating time before overload trip
- Waiting time after overload tripping.

CT's option
- CLP1: LPCT sensors 100 A to 1250 A
- Core balance CT: CSH120 or CSH200.

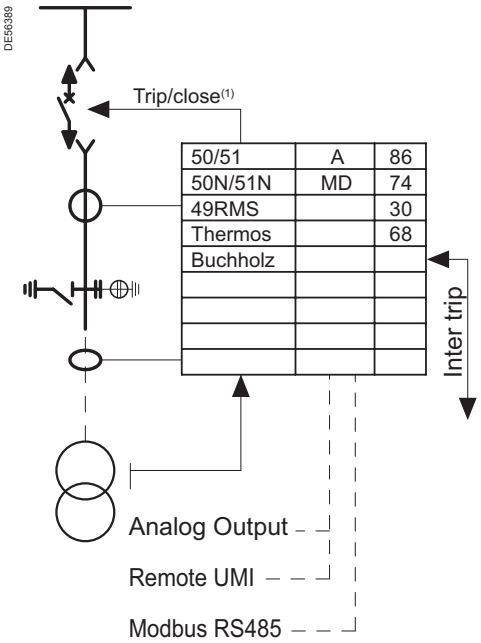
Control

Sepam T20	Basic apparatus	MES114 module (10 I/4 O)
Cumulative breaking current	■	■
Trip CB output (O1)	■	■
Closing lockout (O2)	■	■
Logic discrimination block send (O3)	■	■
Watch dog (O4)	■	■
CB control (86)	■	■
CB open/closed status indication		■
Number of operations, operating time		■
Logic discrimination block receive		■
External tripping		■
Trip circuit supervision (74)		■
Fault and alarm contact (O11(2) to O14)		■
Local/remote control selection		■
Inhibition thermal overload		■

Optional features
- Communication interface module, 2 wires (ACE949-2) Modbus
- Communication interface module, 4 wires (ACE959) Modbus
- One low level analog output (0-10 mA/ 4-20 mA/ 0-20 mA) MSA141 module
- 8 temperature sensor inputs (38/49T) MET148-2 module
- Logic inputs and outputs module MES114 (10I/4O)
- Remote advanced UMI (type DSM303)
- Test box
- Local/remote switch.

Transformer feeder T2

■ Protection against internal faults and overload protection
■ It also monitors the winding temperature and Buchholz providing local and remote indication of operation
■ It suited for integration into a supervisory system using Modbus serial interface. Several standard options are available to ensure maximum flexibility and cost effectiveness in meeting the requirements of different systems.



Transformer feeder T2

(1) Close by communication
(2) O11 reserved for closing order

Protection

Sepam T20
- 50/51: overcurrent - IDMT, DT (4 settings)
- 50N/51N: earth fault - IDMT, DT (4 settings)
- 46: negative sequence overcurrent
- 49RMS: thermal overload (2 settings)
- Thermostat/Buchholz.

Measurement and diagnostic

Sepam T20, LCD display LED (Light Emitting Diode)
- Phase current: I1, I2, I3 RMS
- Residual current: I0
- Average currents: I1, I2, I3
- Peak demand phase currents
- Tripping currents: I1, I2, I3, I0
- Unbalance ratio/negative sequence current Ii
- Disturbance recording
- Running hours counter/operating time
- Thermal capacity used
- Remaining operating time before overload trip
- Waiting time after overload tripping.

CT's option
- CLP1: LPCT sensors 100 A to 1250 A
- Core balance CT: CSH120 or CSH200.

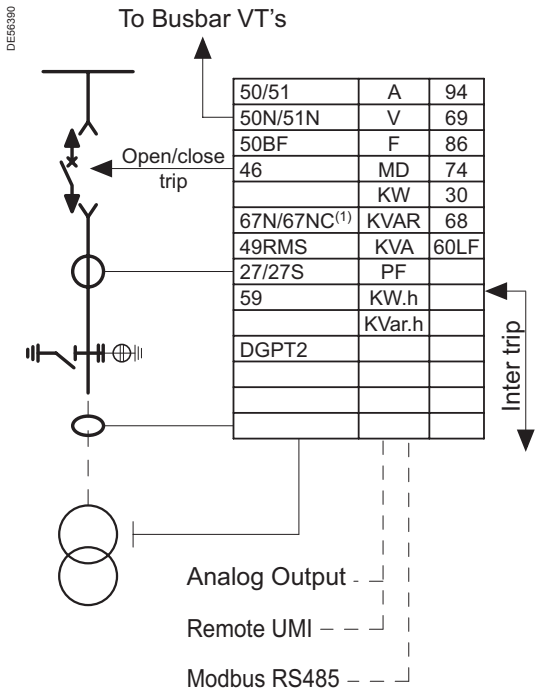
Control

Sepam T20	Basic apparatus	MES114 module (10 I/4 O)
Cumulative breaking current	■	■
Trip CB output (O1)	■	■
Closing lockout (O2)	■	■
Logic discrimination block send (O3)	■	■
Watch dog (O4)	■	■
CB control (86)	■	■
CB open/closed status indication		■
Number of operations, operating time		■
Logic discrimination block receive		■
External tripping		■
Trip circuit supervision (74)		■
Fault and alarm contact (O11(2) to O14)		■
External tripping (Buchholz)		■
External tripping (Winding temperature)		■
Buchholz alarm		■
Winding temperature alarm		■
Local/remote control selection		■
Inhibition thermal overload		■

Optional features
- Communication interface module, 2 wires (ACE949-2) Modbus
- Communication interface module, 4 wires (ACE959) Modbus
- One low level analog output (0-10 mA/ 4-20 mA/ 0-20 mA) MSA141 module
- Logic inputs and outputs module MES114 (10I/4O)
- Remote advanced UMI (type DSM303)
- Test box
- Local/remote switch.

Transformer feeder T3

■ Protection against internal faults and overload protection
■ It also monitors pressure device providing local and remote indication of operation
■ It suited for integration into a supervisory system using Modbus serial interface. Several standard options are available to ensure maximum flexibility and cost effectiveness in meeting the requirements of different systems.



Transformer feeder T3

Protection

Sepam T40 or T42
- 50/51: overcurrent - IDMT, DT (4 settings)
- 50N/51N: earth fault - IDMT, DT (4 settings)
- 50BF: breaker failure
- 46: negative sequence overcurrent - IDMT, DT (2 settings)
- 67: directional phase overcurrent (1) - IDMT, DT (2 settings)
- 67N/67NC: directional earth fault (1) - IDMT, DT (2 settings)
- 49RMS: thermal overload (2 settings)
- 27/27S: undervoltage (2 settings)
- 59: overvoltage (2 settings)
- 59N: neutral voltage displacement (2 settings).

(1) On Sepam T42 only
(2) O11 reserved for closing order

Measurement and diagnostic

Sepam T40 or T42, LCD display LED (Light Emitting Diode)
- Phase current: I1, I2, I3 RMS
- Residual current: I0
- Average currents: I1, I2, I3
- Peak demand phase currents
- Line voltage: U21, U32, U13
- Phase to neutral voltage: V1, V2, V3
- Residual voltage: V0
- Positive sequence voltage/rotation direction
- Frequency
- Active, reactive and apparent power: P, Q, S
- Peak demand power PM, QM and power factor
- Active and reactive energy
- Tripping currents: I1, I2, I3, I0
- Unbalance ratio/negative sequence current Ii
- Phase displacement
- Disturbance recording
- Running hours counter/Operating time
- Thermal capacity used
- Remaining operating time before overload trip
- Waiting time after overload tripping
- Tripping context.

CT's option
- CLP1: LPCT sensors 100 A to 1250 A
- Core balance CT: CSH120 or CSH200.

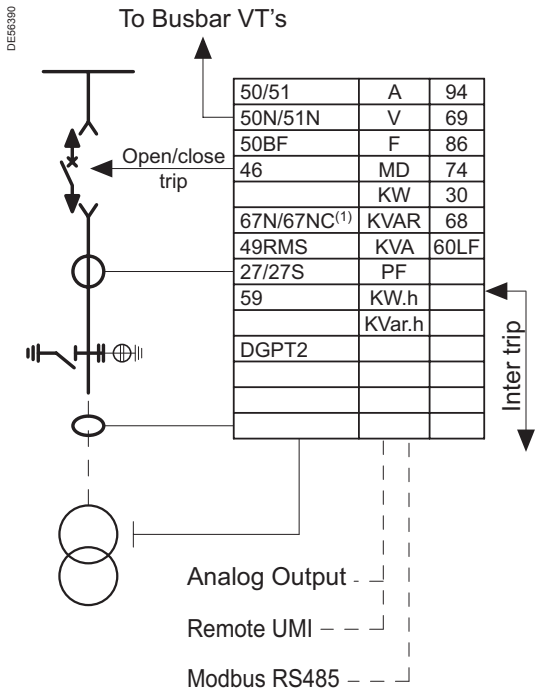
Control

Sepam T40 or T42	Basic apparatus	MES114 module (10 I/4 O)
Cumulative breaking current	■	■
Trip CB output (O1)	■	■
Closing lockout (O2)	■	■
Logic discrimination block send (O3)	■	■
Watch dog (O4)	■	■
CB control (86)	■	■
CB open/closed status indication		■
Number of operations, operating time		■
Trip circuit supervision (74)		■
Logic discrimination block receive BI1		■
CB closing order		■
Fault and alarm contact (O11(2) to O14)		■
CB opening order		■
Pressure alarm		■
Pressure tripping		■
Thermostat alarm		■
Thermostat tripping		■
External network time synchronization		■

Optional features
- Communication interface module, 2 wires (ACE949-2) Modbus
- Communication interface module, 4 wires (ACE959) Modbus
- Logic inputs and outputs module MES114 (10I/4O)
- One low level analog output (0-10 mA/ 4-20 mA/ 0-20 mA) MSA141 module
- Remote advanced UMI (type DSM303)
- Test box
- Local/remote switch.

Transformer feeder T6

■ Protection against internal faults and overload protection
■ It also monitors the windings by probes providing device local and remote indication of operation
■ It suited for integration into a supervisory system using Modbus serial interface. Several standard options are available to ensure maximum flexibility and cost effectiveness in meeting the requirements of different systems.



Transformer feeder T6

Protection

Sepam T40
- 50/51: overcurrent - IDMT, DT (4 settings)
- 50N/51N: earth fault - IDMT, DT (4 settings)
- 50BF: breaker failure
- 46: negative sequence overcurrent - IDMT, DT (2 settings)
- 67: directional phase overcurrent (1) - IDMT, DT (2 settings)
- 67N/67NC: directional earth fault (1) - IDMT, DT (2 settings)
- 49RMS: thermal overload (2 settings)
- 27/27S: undervoltage (2 settings)
- 59: overvoltage (2 settings)
- 59N: neutral voltage displacement (2 settings)
- 38/49T: temperature monitoring.

(1) On Sepam T42 only
(2) O11 reserved for closing order

Measurement and diagnostic

Sepam T40, LCD display LED (Light Emitting Diode)
- Phase current: I1, I2, I3 RMS
- Residual current: I0
- Average currents: I1, I2, I3
- Peak demand phase currents
- Line voltage: U21, U32, U13
- Phase to neutral voltage: V1, V2, V3
- Residual voltage: V0
- Positive sequence voltage/rotation direction
- Frequency
- Active, reactive and apparent power: P, Q, S
- Peak demand power PM, QM and power factor
- Active and reactive energy
- Tripping currents: I1, I2, I3, I0
- Unbalance ratio/negative sequence current Ii
- Phase displacement
- Disturbance recording
- Running hours counter/operating time
- Thermal capacity used
- Remaining operating time before overload trip
- Waiting time after overload tripping
- Tripping context.

CT's option
- CLP1: LPCT sensors 100 A to 1250 A
- Core balance CT: CSH120 or CSH200.

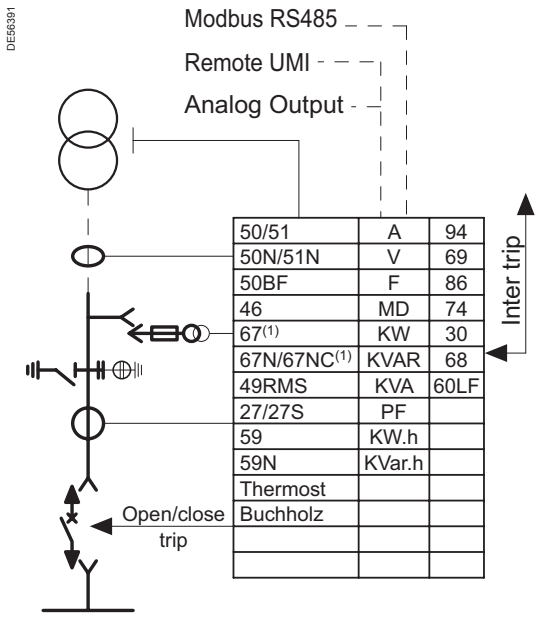
Control

Sepam T40	Basic apparatus	MES114 module (10 I/4 O)
Cumulative breaking current	■	■
Trip CB output (O1)	■	■
Closing lockout (O2)	■	■
Logic discrimination block send (O3)	■	■
Watch dog (O4)	■	■
CB control (86)	■	■
CB open/closed status indication		■
Number of operations, operating time		■
Trip circuit supervision (74)		■
Logic discrimination block receive BI1		■
CB closing order		■
Fault and alarm contact (O11(2) to O14)		■
CB opening order		■
Pressure alarm		■
Pressure tripping		■
Thermostat alarm		■
Thermostat tripping		■
External network time synchronization		■

Optional features
- Communication interface module, 2 wires (ACE949-2) Modbus
- Communication interface module, 4 wires (ACE959) Modbus
- Logic inputs and outputs module MES114 (10I/4O)
- One low level analog output (0-10 mA/ 4-20 mA/ 0-20 mA) MSA141 module
- 8 temperature sensor inputs (38/49T) MET148-2 module
- Remote advanced UMI user machine interface (type DSM303)
- Test box
- Local/remote switch.

Transformer incomer T4

■ Protection against internal faults and overload protection
■ It also monitors the winding temperature and Buchholz device providing local and remote indication of operation
■ It suited for integration into a supervisory system using Modbus serial interface. Several standard options are available to ensure maximum flexibility and cost effectiveness in meeting the requirements of different systems.



Transformer feeder T4

Protection

Sepam T40 or T42
- 50/51: overcurrent - IDMT, DT (4 settings)
- 50N/51N: earth fault - IDMT, DT (4 settings)
- 50BF: breaker failure
- 46: negative sequence overcurrent - IDMT, DT (2 settings)
- 67: directional phase overcurrent (1) - IDMT, DT (2 settings)
- 67N/67NC: directional earth fault (1) - IDMT, DT (2 settings)
- 49RMS: thermal overload (2 settings)
- 27/27S: undervoltage (2 settings)
- 59: overvoltage (2 settings)
- 59N: neutral voltage displacement (2 settings).

(1) On Sepam T42 only
(2) O11 reserved for closing order

Measurement and diagnostic

Sepam T40 or T42, LCD display LED (Light Emitting Diode)
- Phase current: I1, I2, I3 RMS
- Residual current: I0
- Average currents: I1, I2, I3
- Peak demand phase currents
- Line voltage: U21, U32, U13
- Phase to neutral voltage: V1, V2, V3
- Residual voltage: V0
- Positive sequence voltage/rotation direction
- Frequency
- Active, reactive and apparent power: P, Q, S
- Peak demand power PM, QM and power factor
- Active and reactive energy
- Tripping currents: I1, I2, I3, I0
- Unbalance ratio/negative sequence current Ii
- Phase displacement
- Disturbance recording
- Running hours counter/Operating time
- Thermal capacity used
- Remaining operating time before overload trip
- Waiting time after overload tripping
- Tripping context.

CT's option
- CLP1: LPCT sensors 100 A to 1250 A
- Core balance CT: CSH120 or CSH200.

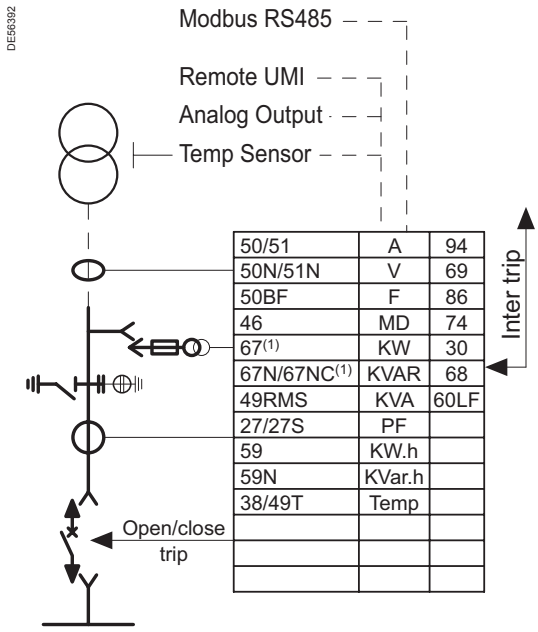
Control

Sepam T40 or T42	Basic apparatus	MES114 module (10 I/4 O)
Cumulative breaking current	■	■
Trip CB output (O1)	■	■
Closing lockout (O2)	■	■
Logic discrimination block send (O3)	■	■
Watch dog (O4)	■	■
CB control (86)	■	■
CB open/closed status indication		■
Number of operations, operating time		■
Trip circuit supervision (74)		■
Logic discrimination block receive BI1		■
CB closing order		■
Fault and alarm contact (O11(2) to O14)		■
CB opening order		■
Buchholz alarm		■
Buchholz tripping		■
Thermostat alarm		■
Thermostat tripping		■
External network time synchronization		■

Optional features
- Communication interface module, 2 wires (ACE949-2) Modbus
- Communication interface module, 4 wires (ACE959) Modbus
- Logic inputs and outputs module MES114 (10I/4O)
- One low level analog output (0-10 mA/ 4-20 mA/ 0-20 mA) MSA141 module
- Remote advanced UMI user machine interface (type DSM303)
- Test box
- Local/remote switch.

Transformer incomer T5

■ Protection against internal faults and overload protection
■ It also monitors the winding by probes providing device local and remote indication of operation
■ It suited for integration into a supervisory system using Modbus serial interface. Several standard options are available to ensure maximum flexibility and cost effectiveness in meeting the requirements of different systems.



Transformer feeder T5

Protection

Sepam T40 or T42
- 50/51: overcurrent - IDMT, DT (4 settings)
- 50N/51N: earth fault - IDMT, DT (4 settings)
- 50BF: breaker failure
- 46: negative sequence overcurrent - IDMT, DT (2 settings)
- 67: directional phase overcurrent - IDMT, DT (2 settings)
- 67N/67NC: directional earth fault - IDMT, DT (2 settings)
- 49RMS: thermal overload (2 settings)
- 27/27S: undervoltage (2 settings)
- 59: overvoltage (2 settings)
- 59N: neutral voltage displacement (2 settings)
- 38/49T: temperature monitoring.

(1) O11 reserved for closing order

Measurement and diagnostic

Sepam T40 or T42, LCD display LED (Light Emitting Diode)
- Phase current: I1, I2, I3 RMS
- Residual current: I0
- Average currents: I1, I2, I3
- Peak demand phase currents
- Line voltage: U21, U32, U13
- Phase to neutral voltage: V1, V2, V3
- Residual voltage: V0
- Positive sequence voltage/rotation direction
- Frequency
- Active, reactive and apparent power: P, Q, S
- Peak demand power PM, QM and power factor
- Active and reactive energy
- Tripping currents: I1, I2, I3, I0
- Unbalance ratio/negative sequence current Ii
- Phase displacement
- Disturbance recording
- Running hours counter/operating time
- Thermal capacity used
- Remaining operating time before overload trip
- Waiting time after overload tripping
- Tripping context.

CT's option
- CLP1: LPCT sensors 100 A to 1250 A
- Core balance CT: CSH120 or CSH200.

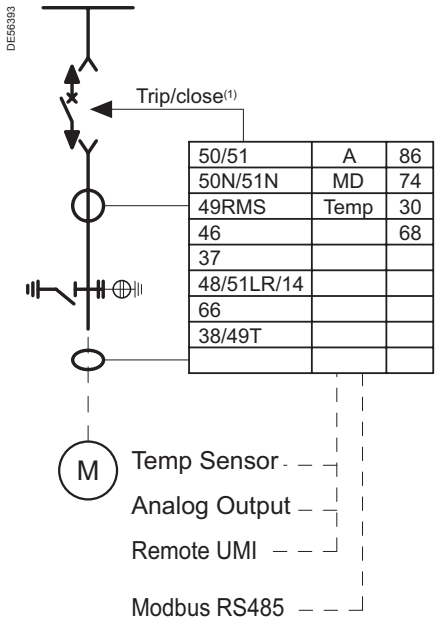
Control

Sepam T40 or T42	Basic apparatus	MES114 module (10 I/4 O)
Cumulative breaking current	■	■
Trip CB output (O1)	■	■
Closing lockout (O2)	■	■
Logic discrimination block send (O3)	■	■
Watch dog (O4)	■	■
CB control (86)	■	■
CB open/closed status indication		■
Number of operations, operating time		■
Trip circuit supervision (74)		■
Logic discrimination block receive BI1		■
CB closing order		■
Fault and alarm contact (O11(1) to O14)		■
CB opening order		■
Inhibit closing		■
External tripping		■
Local/remote control selection		■
Inhibition thermal overload		■
External network time synchronization		■

Optional features
- Communication interface module, 2 wires (ACE949-2) Modbus
- Communication interface module, 4 wires (ACE959) Modbus
- Logic inputs and outputs module MES114 (10I/4O)
- One low level analog output (0-10 mA/ 4-20 mA/ 0-20 mA) MSA141 module
- 8 temperature sensor inputs (38/49T) MET148-2 module
- Remote advanced UMI user machine interface (type DSM303)
- Test box
- Local/remote switch.

Motor feeder M1

■ Protection against internal faults and loads faults
■ Monitoring of motor starting conditions and winding temperature by probes providing local and remote indication of operation
■ It suited for integration into a supervisory system using Modbus serial interface. Several standard options are available to ensure maximum flexibility and cost effectiveness in meeting the requirements of different systems.



Motor feeder M1

(1) Close by communication
(2) O11 reserved for closing order

Protection

Sepam M20
- 50/51: overcurrent - IDMT, DT (4 settings)
- 50N/51N: earth fault - IDMT, DT (4 settings)
- 46: negative sequence overcurrent
- 49RMS: thermal overload (2 settings)
- 37: undercurrent
- 48/51LR: exces. start. time, locked rotor
- 66: starts per hour
- 38/49T: temperature monitoring.

Measurement and diagnostic

Sepam M20, LCD display LED (Light Emitting Diode)
- Phase current: I1, I2, I3 RMS
- Residual current: I0
- Average currents: I1, I2, I3
- Peak demand phase currents
- Temperature measurement
- Tripping currents: I1, I2, I3, I0
- Unbalance ratio/negative sequence current Ii
- Disturbance recording
- Running hours counter/operating time
- Thermal capacity used
- Remaining operating time before overload trip
- Waiting time after overload tripping
- Starting current and time/overload
- Start inhibit time delay/numb. start before inhibition.

CT's option
- CLP1: LPCT sensors 100 A to 1250 A
- Core balance CT: CSH120 or CSH200.

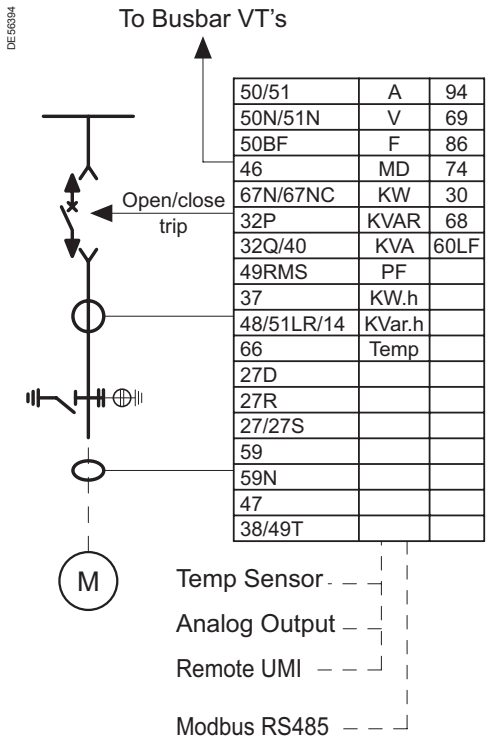
Control

Sepam M20	Basic apparatus	MES114 module (10 I/4 O)
Cumulative breaking current	■	■
Trip CB output (O1)	■	■
Closing lockout (O2)	■	■
Logic discrimination block send (O3)	■	■
Watch dog (O4)	■	■
CB control (86)	■	■
CB open/closed status indication		■
Number of operations, operating time		■
External trip		■
Trip circuit supervision (74)		■
Fault and alarm contact (O11(2) to O14)		■
Motor reacceleration		■
Motor shaft rotation		■
Local/remote control selection		■
Inhibition thermal overload		■
External network time synchronization		■

Optional features
- Communication interface module, 2 wires (ACE949-2) Modbus
- Communication interface module, 4 wires (ACE959) Modbus
- One low level analog output (0-10 mA/ 4-20 mA/ 0-20 mA) MSA141 module
- 8 temperature sensor inputs (38/49T) MET148-2 module
- Remote advanced UMI (type DSM303)
- Test box
- Local/remote switch
- Logic inputs and outputs module MES114 (10I/4O).

Motor feeder M2

■ Protection against internal faults, network related and loads faults
■ Monitoring of motor starting conditions and the winding temperature
■ It suited for integration into a supervisory system using Modbus serial interface. Several standard options are available to ensure maximum flexibility and cost effectiveness in meeting the requirements of different systems.



Motor feeder M2

Protection

Sepam M41
- 50/51: overcurrent - IDMT, DT (4 settings)
- 50N/51N: earth fault - IDMT, DT (4 settings)
- 50BF: breaker failure
- 46: negative sequence overcurrent
- 67N/67NC: directional earth fault - IDMT, DT (2 settings)
- 32P: directional active overpower
- 32Q/40: directional reactive overpower
- 49RMS: thermal overload (2 settings)
- 37: phase undercurrent
- 48/51LR/14: exces. start. time, locked rotor
- 66: starts per hour
- 27D: positive sequence undervoltage (2 settings)
- 27R: remanent undervoltage
- 27/27S: undervoltage (2 settings)
- 59: overvoltage (2 settings)
- 59N: neutral voltage displacement (2 settings)
- 47: negative sequence overvoltage
- 38/49T: temperature monitoring.

(1) O11 reserved for closing order

Measurement and diagnostic

Sepam M41, LCD display LED (Light Emitting Diode)
- Phase current: I1, I2, I3 RMS
- Residual current: I0
- Average currents: I1, I2, I3
- Peak demand phase currents
- Line voltage: U21, U32, U13
- Phase to neutral voltage: V1, V2, V3
- Residual voltage: V0
- Positive sequence voltage/rotation direction
- Frequency
- Active, reactive and apparent power: P, Q, S
- Peak demand power PM, QM and power factor
- Active and reactive energy
- Tripping currents: I1, I2, I3, I0
- Unbalance ratio/negative sequence current Ii
- Phase displacement
- Disturbance recording
- Running hours counter/operating time
- Thermal capacity used
- Remaining operating time before overload trip
- Waiting time after overload tripping
- Starting current and time
- Start inhibit time delay/number of start before inhibition
- Tripping context.

CT's option
- CLP1: LPCT sensors 100 A to 1250 A
- Core balance CT: CSH120 or CSH200.

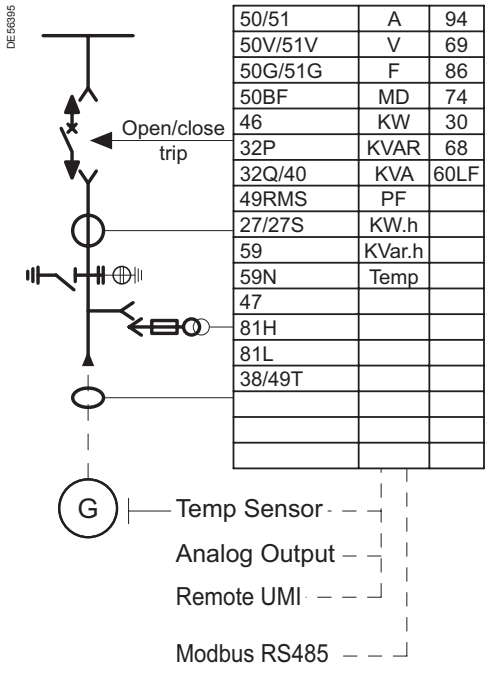
Control

Sepam M41	Basic apparatus	MES114 module (10 I/4 O)
Cumulative breaking current	■	■
Trip CB output (O1)	■	■
Closing lockout (O2)	■	■
Logic discrimination block send (O3)	■	■
Watch dog (O4)	■	■
CB control (86)	■	■
CB open/closed status indication		■
Number of operations, operating time		■
Trip circuit supervision (74)		■
Motor rotation detection		■
CB closing order		■
Fault and alarm contact (O11(1) to O14)		■
CB opening order		■
Inhibit closing		■
External tripping		■
Local/remote control selection		■
Inhibition thermal overload		■
External network time synchronization		■

Optional features
- Communication interface module, 2 wires (ACE949-2) Modbus
- Communication interface module, 4 wires (ACE959) Modbus
- Logic inputs and outputs module MES114 (10I/4O)
- One low level analog output (0-10 mA/ 4-20 mA/ 0-20 mA) MSA141 module
- 8/16 temperature sensors inputs MET148-2 module
- Remote advanced UMI (type DSM303)
- Test box
- Local/remote switch.

Generator incomer G1

■ Protection against faults, network and loads faults
■ Monitoring of winding temperature
■ It suited for integration into a supervisory system using Modbus serial interface. Several standard options are available to ensure maximum flexibility and cost effectiveness in meeting the requirements of different systems.



Generator incomer G1

Protection

Sepam G40
- 50/51: overcurrent - IDMT, DT (4 settings)
- 50G/51G: earth fault - IDMT, DT (4 settings)
- 50BF: breaker failure
- 46: negative sequence overcurrent
- 32P: directional active overpower
- 32Q/40: directional reactive overpower
- 49RMS: thermal overload
- 27/27S: undervoltage (2 settings)
- 59: overvoltage (2 settings)
- 59N: neutral voltage displacement (2 settings)
- 47: negative sequence overvoltage
- 81H: overfrequency (2 settings)
- 81L: underfrequency (4 settings)
- 38/49T: temperature monitoring.

(1) O11 reserved for closing order

Measurement and diagnostic

Sepam G40, LCD display LED (Light Emitting Diode)
- Phase current: I1, I2, I3 RMS
- Residual current: I0
- Average currents: I1, I2, I3
- Peak demand phase currents
- Line voltage: U21, U32, U13
- Phase to neutral voltage: V1, V2, V3
- Residual voltage: V0
- Positive sequence voltage/rotation direction
- Frequency
- Active, reactive and apparent power: P, Q, S
- Peak demand power PM, QM and power factor
- Active and reactive energy
- Tripping currents: I1, I2, I3, I0
- Unbalance ratio/negative sequence current Ii
- Phase displacement
- Disturbance recording
- Running hours counter/operating time
- Thermal capacity used
- Remaining operating time before overload trip
- Waiting time after overload tripping
- Tripping context.

CT's option
- CLP1: LPCT sensors 100 A to 1250 A
- Core balance CT: CSH120 or CSH200.

Control

Sepam G40	Basic apparatus	MES114 module (10 I/4 O)
Cumulative breaking current	■	■
Trip CB output (O1)	■	■
Closing lockout (O2)	■	■
Logic discrimination block send (O3)	■	■
Watch dog (O4)	■	■
CB control (86)	■	■
CB open/closed status indication		■
Number of operations, operating time		■
Trip circuit supervision (74)		■
Logic discrimination block receive BI1		■
CB closing order		■
Fault and alarm contact (O11(1) to O14)		■
CB opening order		■
Inhibit closing		■
External tripping		■
Local/remote control selection		■
Inhibition thermal overload		■
External network time synchronization		■

Optional features
- Communication interface module, 2 wires (ACE949-2) Modbus
- Communication interface module, 4 wires (ACE959) Modbus
- Logic inputs and outputs module MES114 (10I/4O)
- One low level analog output (0-10 mA/ 4-20 mA/ 0-20 mA) MSA141 module
- 8/16 temperature sensors inputs MET148-2 module
- Remote advanced UMI (type DSM303)
- Test box
- Local/remote switch.

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