Medium Voltage Distribution
Catalogue | 2015

GenieEvo range

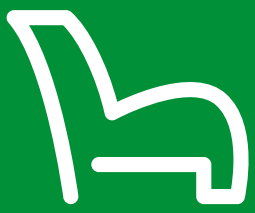
Air Insulated MV Switchgear 3.3-13.8 kV

Schneider Electric

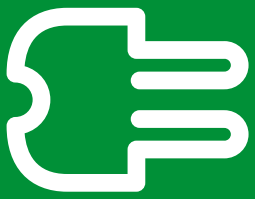
Medium Voltage
Distribution
GenieEvo

Your requirements...

Peace of mind



Energy availability



Safety

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Bringing simplicity and hi-reliability to your applications

Our solutions

Retaining its successful concept of solid insulation, GenieEvo has been extended up to 2500 A to suit primary distribution applications for utilities and private large users. In addition, an option for internal arc performance 4 sides IAC AFLR 25 kA 1 s has been included in the range.

PE50172

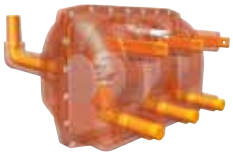
Proven Evolis
circuit-breaker

Fixed circuit-breaker: simplicity

Modern fixed CB's greatly reduce maintenance needs and provide civil cost savings by reducing space requirement by up to 40%.

- Over 75,000 CB's sold worldwide.
- Schneider Electric vacuum interrupters.
- Mass produced LV Masterpact mechanism.
- High mechanical endurance.
- Possible to replace within 1.5 hour.

PE50170



Innovative
3 position
disconnector

Solid insulation: high reliability

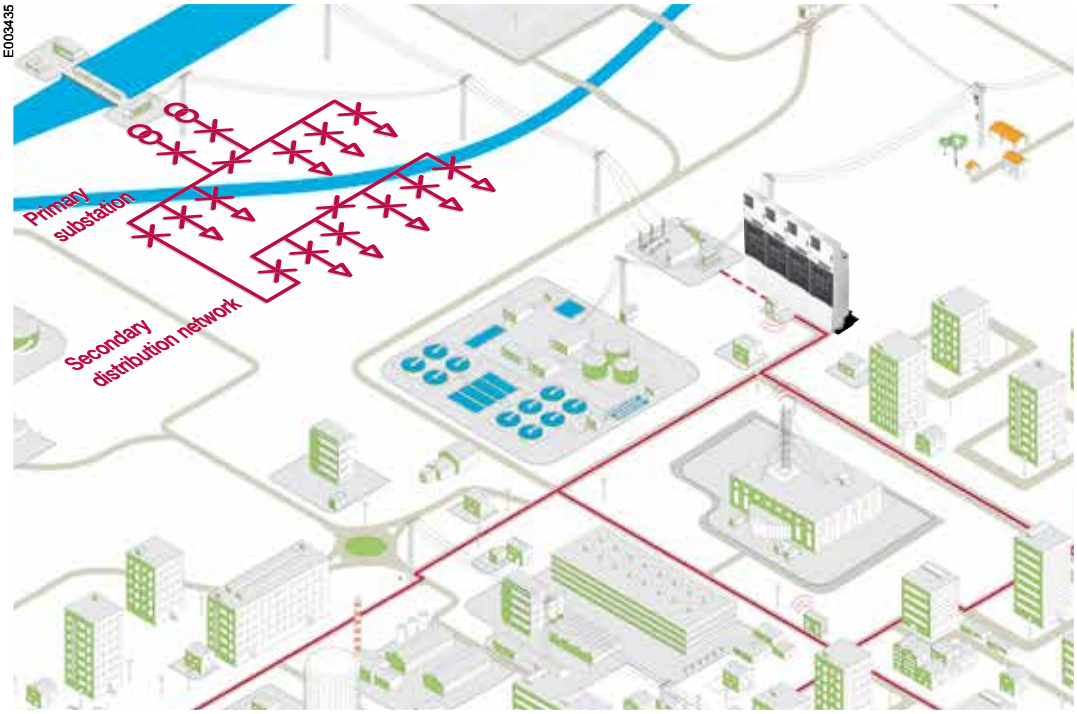
Resin encapsulated busbars and disconnector are virtually insensitive to ambient conditions offering benefits normally associated with gas insulated switchgears:

- Encapsulated and earth screened.
- Controlled air insulation.
- Maintenance free design.
- Full control of electrical stress.
- Partial discharge proof.

AFAQ
ISO 9001
ISO 14000

Locating GenieEvo in MV network

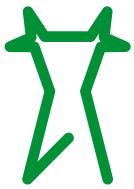
E003435



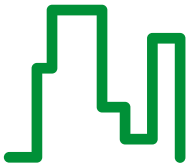
Field of application

Schneider Electric has equipped medium voltage networks with switchgear and protection, monitoring and control solutions for over 40 years.
The GenieEvo benefits from the accumulated experience of an equipment base of over 100,000 functional units, 200,000 MV circuit breakers and 300,000 MV digital protection functions.

Applications



Energy
- Distribution substation
- Delivery substation



Buildings
- Large commercial centers
- Data centers
- Hospitals

Industry
- Oil & gas
- Chemical industry
- Metallurgy
- Car industry

Infrastructures
- Airports
- Ports
- Water treatment

Product overview
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Overview
General presentation

GenieEvo offers a simple and flexible approach to switchgear with a wide choice of options covering all modern consumer applications.

The **GenieEvo** concept is an evolution from the extremely successful Genie philosophy which offers increased levels of flexibility and greater choice.
By allowing separate selection of the switchgear and protection and control modules. **GenieEvo** extends the concept of Genie by offering a gas free circuit breaker to the product portfolio.

GenieEvo comprises
- Cast resin encapsulated MV system
- Demountable vacuum circuit breaker
- Controlled air, resin encapsulated series disconnector
- Flexible pre-engineered protection and control modules.

The **GenieEvo** circuit breaker is a Schneider Electric design which offers main ON/OFF positions.
The series disconnector has three positions (ON/ISOLATED/EARTH SELECT) which can only be selected when circuit breaker is in the OFF position.
The integral cable test points are accessed through a convenient interlocked cover at the front of the unit.

GenieEvo offers 6 switchgear options and 18 protection and control module options, providing a total of 69 standard panel combinations. Customised solutions are also available on request.

PE90207

Overview
General presentation

PE90075

Evolution

Launched in 1996 Genie met the demands of the modern market through its unique philosophy.

Fixed pattern

Offering the following customer benefits
- ■ Reduced substation dimensions
- □ Saving civil and land costs
- ■ No racking mechanism
- □ Fewer switchgear components
- □ Easier to operate
- □ No associated maintenance
- □ Increased reliability
- ■ No withdrawable isolation contacts
- □ No associated maintenance
- □ Fully encapsulated MV system
- □ Increased reliability.

Pre-engineered

Offering the following customer benefits
- ■ Lower lead time
- □ Reduced engineering at factory
- □ Production line optimised for standard panels
- □ Lower engineering time for client
- ■ Lower selling costs
- □ Reduced labour time during manufacture
- □ Reduced contract engineering time
- □ Manufacturing unit optimised for standard panels
- ■ Less technical onus on client
- □ Application based solutions
- □ All information available pre-order
- □ Schemes designed as a package solution.

GenieEvo embraces this successful formula utilising the Schneider Electric established Evolis vacuum circuit breaker.

PE90081

General characteristics

Electrical characteristics - all equipment	
Rated system voltage	13.8 kV
Impulse voltage withstand (1.2/50 µs)	95 kV peak
Power frequency voltage withstand (1 min)	38 kV
Rated short time current (symm)	25 kA rms
Rated short time duration	3 s
Rated frequency	50/60 Hz
Busbar type	Copper single, cast resin insulated
Busbar ratings	630 A/1250 A /2500 A
Internal arc rating	Up to 25 kA for 1 s
AC class	AF, A-FLR
Partition class	LSC2A-PM

Electrical characteristics - circuit breaker equipment	
Technology	Vacuum interrupter
Rated breaking current (symm)	25 kA
Rated peak making current	67.5 kA
Rated normal current	200 A, 630 A, 1250 A, 2000 A, 2500 A*
Rated cable charging breaking current	25 A
Rated small inductive breaking current	10 A
Rated operating sequence	O - 0.3 s - CO - 15 s - CO
Mechanism charging time	< 10 s
Mechanism type Manual charge, stored energy, manual and electrical release Motor and manual charge, stored energy, manual and electrical release	

Electrical characteristics - series disconnector	
Technology	Sealed controlled air
Construction	Earth screened, cast resin encapsulation IP65
Rating	Off load device
Mechanism type	Dependent manual

* 2500 A is available on request

PE90209

GenieEvo
The experience of a world leader

PE58123

PE58124

PE58125

The guarantee of expertise

Schneider Electric has equipped medium voltage networks with switchgear and protection, monitoring and control solutions for over 40 years.

The **GenieEvo** benefits from the accumulated experience of an equipment base of over 100,000 functional units, 200,000 MV circuit breakers and 300,000 MV digital protection functions.

High electrical endurance

A magnetic field is applied in the axis of the vacuum interrupter contacts.
This process maintains the arc in diffused mode even at high current values.
It ensures optimal dispersion of the energy over the contact surface and avoids localised temperature rise.
The advantages of this technique are:

- A very compact vacuum interrupter
- Low energy dissipation of the arc in the vacuum interrupters.

Evolis is in conformity with the highest electrical endurance class IEC 62271-100: class E2 (10,000 operations).

High mechanical endurance

The magnetic field is generated by a patented outside coil which surrounds the contact area.
This solution has many advantages:

- A simplified and therefore reliable vacuum interrupter unit
- Heavy duty contacts which do not distort under repeated switching operations.

This is the first time that a low voltage device control mechanism has been used on a medium voltage circuit breaker. The Masterpact control unit used on Evolis has the advantages of a system which has been proven for over 10 years in hundreds of thousands of installations.

Evolis is in conformity with the most demanding mechanical endurance class IEC 60056: class M2 (10,000 operations).

Sealed for life disconnector enclosure provides zero maintenance and maximum reliability

- High levels of operator safety and reliability are achieved through the isolators robust cast resin screened enclosure that offers:
- Safety; over pressure relief system that prevents injury to an operator
- High electrical endurance
- Reliability; insensitivity to atmospheric conditions
- Maintenance free technology
- High performance, low mechanical wear with main contact materials.

The disconnector is in conformity with mechanical endurance class IEC 62271-100: class M1 (2,000 operations).

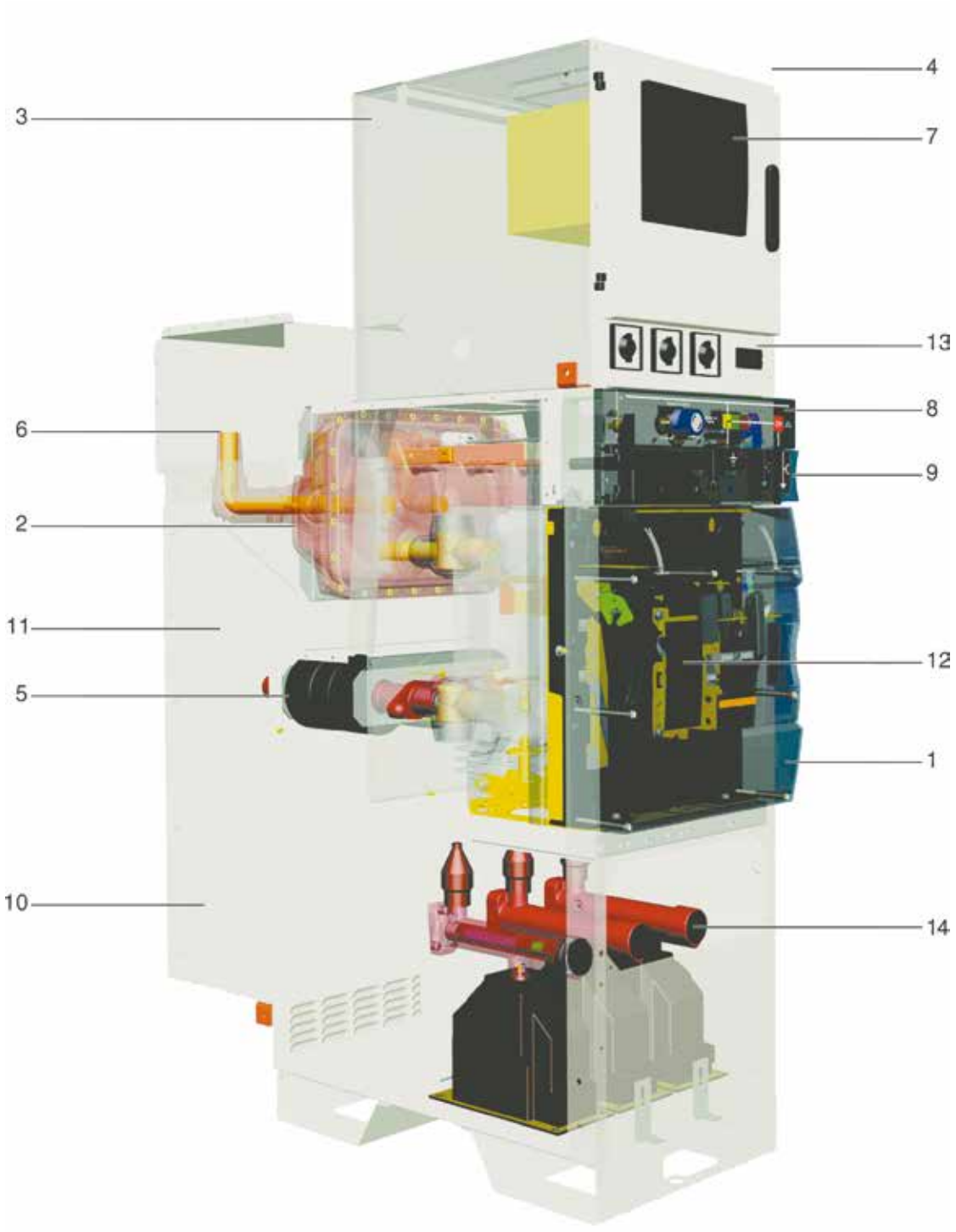
MV insulated systems

Encapsulated within cast resin, the system is virtually insensitive to ambient climate conditions offering benefits normally associated with gas insulated switchgear (GIS).
An earth shielded system is also available.
Components include:

- Disconnector enclosure (shielded as standard)
- Busbars
- Cable terminations
- Voltage transformers.

GenieEvo
Features at a glance

PE58126



GenieEvo
Features at a glance

PE58127

Genie's evolution is a result of valuable customer feedback and incorporates many improved features:

1 Vacuum circuit breaker
2 Controlled air disconnector
3 Top entry pilot box
4 Internal arc protection
5 CT chamber
6 Cast resin insulated busbar system with optional earth shielding
7 Multi functional protection and control unit
8 Unit fascia with active operating mimic display
9 Front access cable and vacuum test facility
10 Rear entry MV cable box (inverted option available)
11 Internal arc vented via dedicated trunking for complete operator safety
12 Mechanical operations counter
13 Circuit potential indicator as standard
14 VT chamber

The full GenieEvo range also benefits from:

■ Separate selection of switchgear and protection and control modules for complete flexibility to meet the needs of any application
■ Standard applications for embedded generation to the G59 standard, allowing the switchboard to be connected directly to the local utilities distribution network
■ Designed, manufactured and assembled in compliance with ISO 9001 for the upmost quality and reliability of build
■ Environmental production policies to ISO 14001 ensure the product is environmentally friendly
■ Meets all necessary international standards: IEC 60044, IEC 62271-100, IEC 60255, IEC 60265, IEC 62271-1, BS 5311, EATS 41-36 and EATS 50-18.

PACiS
Power Management Solutions

PM103121

PM103122

PM103123

Schneider Electric PACiS is the latest generation of Power Management Solutions; PACiS offers competitive, innovative and scalable solutions "to make our customer's life safe and simple".
PACiS solutions are designed to protect, supervise and control HV, MV & LV electrical networks in the most demanding environments.

Data Federation & Communication

PACiS first key feature is to manage information coming from various sources, in order to offer real added value. The sources of information are primary equipment, power meters, analysers, protections relays, PLCs or any Intelligent devices connected by serial or Ethernet communication links. In addition, one or more operators monitor, control, operate and allow maintenance locally or remotely. Electrical networks can be monitored from anywhere via the Internet using standard web browser software. This typically halves implementation costs by eliminating the need for PCs to be configured with bespoke client software.
Users can stay in control from remote sites and even obtain text messages from PACiS on their mobile phone.

Monitoring & Analysis

Schneider PowerLogic Scada software allows operators to quickly analyse data using a wide variety of standard / user defined colour graphics. Report capability is included for power quality analysis. Standards include tables, bar charts, trend plots, graphs, visual alarms and meters. Single line diagrams, site plans and equipment drawings can also be incorporated.

PACiS' base function includes the monitoring, visualisation and storage of any data collected by the system, either locally or remotely on a local SQL historian database. Open standards-based interoperability via ODBC, XML, and PQDIF allows data exchange with any EMS/DMS.

PACiS
Power Management Solutions

PM103126

PM103124

PM103125

Intelligent Electronic Devices

A typical PACiS solution is likely to integrate several Intelligent Electronic Devices (IEDs), such as protection devices, measurement centers, bay controllers, etc. communicating with the rest of the system by one or more protocols. PACiS is designed for optimum coupling with the MiCOM, Sepam, VAMP and ION equipments.
PACiS is fully open to the integration of third party devices enabling existing devices to be accommodated, as well as user's preferences.

Automation

PACiS provides additional built in libraries of automation modules, including a full range of protection, feeder recloser, and transformer voltage regulation functions.
At site level, PACiS offers decentralised automation for:

- Automatic Transfer Source
- Fast fault isolation
- Fast electrical network reconfiguration (<200ms)
- Fast load shedding (<80ms).

In addition, customised automations are available using IEC 61131-3 automation editor.

Higher Standardisation Level

Beyond its pure communication features, PACiS helps with the structuring of electrical networks, using standard schemes for the optimisation of medium term investments.
PACiS offers a large range of standard communication protocols used in electrical installations such as IEC 61850, IEC 60870-5-103, DNP3, OPC, Profibus & Modbus

Cyber-security

The PACiS PMS solution complies with the most advanced cyber-security standards such as NERC-CIP, ISA99 and IEC 62443. Firewall, anti-virus, RBAC, user identification and action logging are typical modules available to secure the installation from external and internal attackers.

Protection and control solutions

Sepam

GenieEvo switchgear integrates Schneider Electric's proven Sepam system for advanced protection, control and monitoring.

Sepam offers comprehensive protection schemes and advanced control functions for even the most demanding application. For more basic applications such as cable and transformer feeders, the range also includes a lower specification device offering communications and fault recording capabilities coupled with overcurrent and earth fault protection.
Full integration achieves the highest level of system protection at a substantially reduced overall cost.

Sepam is a self contained unit and brings many advanced features

Sepam contains:

- Protection, metering, control, monitoring and annunciation functions
- Trip circuit supervision, logic selectivity, circuit breaker fail protection, intertripping and circuit breaker lockout
- Local indication of phase currents, maximum demand, line voltages, power factor, active and reactive power
- Integral analogue and digital disturbance recorder
- High level of electromagnetic compatibility
- High reliability from advanced self supervision systems
- Indication of phase and earth fault values at the time of tripping to aid fault analysis
- Simple to set and no routine maintenance help cut costs.

The Sepam range

- **Sepam Series 20** suitable for common applications, Sepam series 20 offers simple solutions based on current or voltage metering
- **Sepam Series 40** with its current and voltage metering capabilities, offers high performing solutions for more demanding application
- **Sepam Series 60** to go further on the demanding application with more inputs/outputs (up to 28 binary inputs and 16 outputs) and an optional mimic-based display units to view a portion of single-line and phasor diagrams.
- **Sepam Series 80** is specially designed for demanding customers on large industrial sites, Sepam 80 provides proven solutions for electrical distribution and machine protection.

PE60300

Section two

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How to select the panel type for your application

Introduction to the GenieEvo circuit breaker module specification

This section is designed to assist you with the selection of the circuit breaker module for your MV network distribution systems.

Standard circuit breaker modules allow easy product selection and specification.

Protection and control module specification

This section is designed to assist you with the selection of the protection and control module for your MV distribution network.
All protection and control modules are available as standard panel types to allow easy product selection and specification.

What is a circuit breaker and protection and control module?

All **GenieEvo** panels are available as a standard panel type. This is a simple model designation that allows easy selection for specific applications.
The standard panel type philosophy enables us to streamline the factory production facilities to give you:

- Best delivery
- Competitive price
- High quality
- Comprehensive documentation
- High level of flexibility.

Circuit breaker protection and control module specifications

Each module has a detailed specification page. This includes all details of application, standard features and options available to customise equipment to suit your requirements. Use of the options and standard modules ensure we are able to give you the best delivery.

Drawings

- The installation diagrams for each **GenieEvo** panel type are included from section seven of this selection guide to allow you to prepare your foundations before delivery
- Reference to drawings for each panel type is shown on each specification page.

What do I do if I want something different?

- If the **GenieEvo** panel type you require is not listed, please contact your local Schneider Electric representative. We manufacture customised solutions with GenieEvo, to match your exact requirements.

How to select the panel type for your application

Step 1 - Network function

This section assists you in the selection of a circuit breaker module reference which relates to your network function.
Select the network function requirements

- VC - circuit breaker
- VB - bus section.

Select the current rating requirements

- 2 - 200 A
- 6 - 630 A
- 12 - 1250 A
- 20 - 2000 A
- 25 - 2500 A *.

Select the optional items associated with the circuit breakers

- Voltage transformers
- Metering/instrument current transformers
- Motor mechanism etc...

Step 2 - Application

This section assists you in the selection of the protection and control reference which relates to your application.

Select your Network application

- Transformers feeder/Incomer
- Cable feeder/Incomer
- Embedded generation feeder/Incomer
- Miscellaneous.

Select your protection and control module requirements

P1	General purpose feeder or incomer
P2	Transformer feeder
P3	Cable feeder with advanced monitoring and control
P4	Unit protected cable feeder
P5	Unit protected cable feeder with back up overcurrent and measurement
P6	Unit protected cable feeder with back up overcurrent and power measurement
P7	Single transformer incomer
P8	Cable feeder or incomer with full measurement (suitable for automatic changeover)
P9	Parallel cable feeder or incomer with directional overcurrent and earth fault
P10	Parallel dual transformer incomer
P11	Control logic for 2 out of 3 changeover scheme (fitted to bus section)
P12	Interconnection breaker (G59 power export)
P13	Interconnection breaker (G59 no power export)
P14	REC metering for embedded generation
P15	Transformer incomer for LV generator
P16	MV generator incomer
P17	Basic circuit breaker control no protection
P18	Control logic for 1 out of 2 change over scheme.

Complete Functional Design Specifications (FDS) are available for each of the above protection and control modules. These provide all information, control philosophy and signalling function.

(*) Fan cooled when current exceeds 2100 A

How to select the panel type for your application

Select the optional items associated with the protection and control modules

- Transducer
- Power meter
- Serial communications etc...

Example:
A **GenieEvo** feeder for a 2 MVA, 11 kV transformer
(primary current 104 Amps) vacuum breaker current rating 200 Amps = VC2
Protection and control module = P2
Recommended panel reference = VC2 - P2

Note:
Please refer to the recommended panel combinations on page 50 of this selection guide to ensure your required protection and control module is available with your selected circuit breaker module. If the standard modules do not cover your requirements please consult Schneider Electric.

Step 3 - Accessories

This section details the type of accessories that are available on your selected **GenieEvo** panel type.

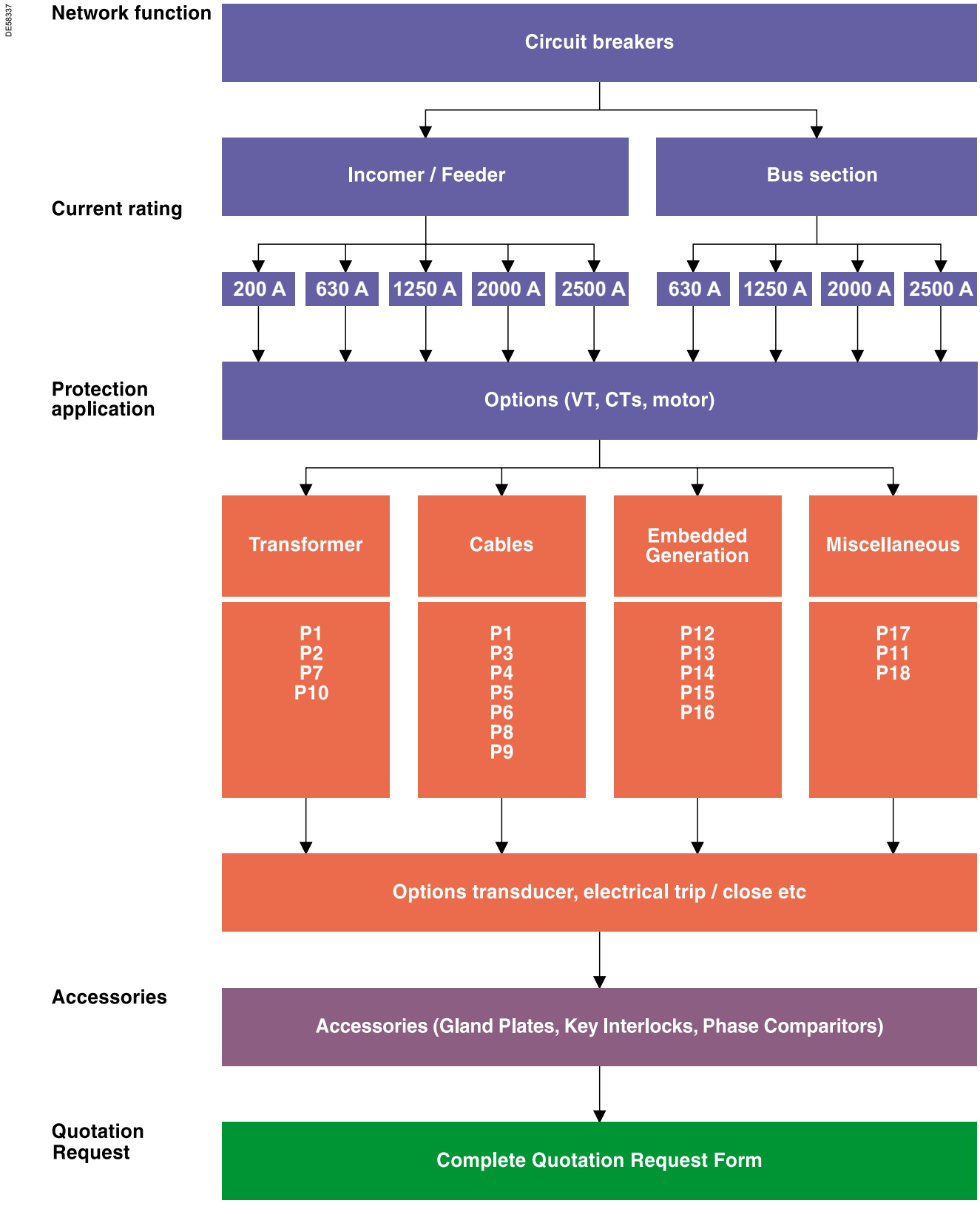
Select your accessories:
- Gland plates
- Key interlocks
- Phase comparitors.

Step 4 - Quotation request form

We have included a form which can be found at the rear of this document to assist you in the compilation of your requirements.
Once completed it can be sent to the address below and a quotation will be forwarded to you.

Selection flow chart

DE58337



Network functions
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Summary tables
Incomers/feeders

Circuit breaker module type		VC2	VC6	VC12	VC20	VC25
Page no.		26	28	30	32	34
Environment						
Indoor		□	□	□	□	□
IP3X (as standard)		□	□	□	□	□
Ratings						
Busbar current rating	630 A	■	■			
	1250 A	■	■	■		
	2500 A	■	■	■	■	■
Circuit breaker normal rated current		200 A	630 A	1250 A	2000 A	2500 A(7)
Highest system voltage		15.5 kV	15.5 kV	15.5 kV	15.5 kV	15.5 kV
Rated Voltage		13.8 kV	13.8 kV	13.8 kV	13.8 kV	13.8 kV
Service voltage 3.3, 6.6, 11, 13.8 kV		□	□	□	□	□
Rated BIL		95 kV	95 kV	95 kV	95 kV	95 kV
Rated frequency		50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz
Rated internal arc (1 s)		25 kA	25 kA	25 kA	25 kA	25 kA
Rated breaking capacity		25 kA	25 kA	25 kA	25 kA	25 kA
Rated making capacity		67.5 kA	67.5 kA	67.5 kA	67.5 kA	67.5 kA
Rated short circuit withstand current	Main circuit	25 kA	25 kA	25 kA	25 kA	25 kA
	Earth circuit	25 kA	25 kA	25 kA	25 kA	25 kA
Circuit breaker mechanism						
Manual charge, stored energy, manual and electrical release		■	■	■	■	■
Motor and manual charge, stored energy, manual and electrical release		□	□	□	□	□
Mechanical endurance		M2	M2	M2	M1	M1
Current transformers (1)						
Protection Sepam	Ratio	200/100/1 A	600/300/1 A	1250/800/1 A	2000/1600/1 A	2500/1 A
	Class	5P20	5P20	5P20	5P20	5P20
	Burden	2.5 VA	2.5 VA	2.5 VA	2.5 VA	2.5 VA
Protection (pilot wire differential) (2)	Ratio	400/300/5 A	400/300/5 A	800/1 A	2000/1600/1 A	2000/1600/1 A
	Class	X	X	X	X	X
	Knee point	52/39 V	52/39 V	191 V	260/208 V	260/208 V
	CT resistance	0.16 Ω/0.13 Ω	0.16 Ω/0.13 Ω	4.2 Ω	7.7/6.1 Ω	7.7/6.1 Ω
Instrumentation (2)	Ratio	200/100/1 A (3)	600/300/1 A (3)	1250/800/5 A	2000/1600/1 A	2500/1 A
	Class	1.0	1.0	1.0	1.0	1.0
	Burden	5 VA	5 VA	5 VA	5 VA	5 VA
Metering (2)	Ratio	200/100/5 A (3)	600/300/5 A (3)	1200/800/5 A	2000/1600/5 A	2500/5 A
			400/200/5 A (3)	600/300/5 A (3)		
	Class	0.5 s	0.5 s	0.5 s	0.2 s	0.2 s
	Burden	7.5 VA	7.5 VA	7.5 VA	7.5 VA	7.5 VA
Voltage transformers						
Circuit connected		□	□	□	□	□
Service voltage 3.3, 6.6, 11, 13.8 kV	Ratio	Service voltage/110 √3				
	Class	0.5/3P	0.5/3P	0.5/3P	0.5/3P	0.5/3P
	Burden	50 VA	50 VA	50 VA	50 VA	50 VA
	BIL	60 kV or 95 kV (4)	60 kV or 95 kV (4)	60 kV or 95 kV (4)	60 kV or 95 kV (4)	60 kV or 95 kV (4)
	Fused link	■	■	■	■	■
	Isolatable fused link	□	□	□	□	□
Construction						
Dimensions W x H x D (mm)	Standard	500 x 1900 x 1230			750 x 1900 x 1230	
Front access space required for mechanical charging (mm)		735	735	735	735	735
Rear access for cable termination (mm)		700	700	700	700	700
Maximum weight (kg)		Up to 600	Up to 600	Up to 600	Up to 700	Up to 700

Key ■ Standard feature □ Optional feature

Summary tables
Incomers/feeders

Circuit breaker module type		VC2	VC6	VC12	VC20	VC25
Page no.		26	28	30	32	34
Circuit breaker electrical control						
Trip coil	24 V DC	□	□	□	□	□
	30 V DC	□	□	□	□	□
	48 V DC	□	□	□	□	□
	110 V DC	□	□	□	□	□
Close coil	24 V DC	□	□	□	□	□
	30 V DC	□	□	□	□	□
	48 V DC	□	□	□	□	□
	110 V DC	□	□	□	□	□
Motorised stored energy	24 V DC	□	□	□	□	□
	48 V DC	□	□	□	□	□
	110 V DC	□	□	□	□	□
	220 V DC	□	□	□	□	□
	230 V AC	□	□	□	□	□
Indication						
Mechanical circuit breaker ON/OFF		■	■	■	■	■
Mechanical disconnector MAIN/ISOLATED/EARTH SELECT		■	■	■	■	■
Neon indication facility 3.3 - 13.8 kV		■	■	■	■	■
Auxiliary contacts 4NO and 4NC spare for customer use		■	■	■	■	■
Test facility						
Integral cable test/earth facility		■	■	■	■	■
Standard features						
Operating handle - series disconnector (6)		■	■	■	■	■
Mechanical operations counter - circuit breaker		■	■	■	■	■
Main cable box (5)						
Bottom entry	1 x 3c up to 300 mm^2 or 3 x 1c up to 630 mm^2	□	□			
	2 x 3c up to 300 mm^2 or 6 x 1c up to 630 mm^2	□	□	□	□	□
	4 x 3c up to 300 mm^2 or 12 x 1c up to 630 mm^2				□	□
Top entry	1 x 3c up to 300 mm^2 or 3 x 1c up to 630 mm^2	□	□			
	2 x 3c up to 300 mm^2 or 6 x 1c up to 630 mm^2	□	□	□	□	□
	4 x 3c up to 300 mm^2 or 12 x 1c up to 630 mm^2				□	□

Key ■ *Standard feature* □ *Optional feature*

(1) Not every circuit breaker has all these CTs fitted it depends on the protection and control model selected. See section four for protection and control module details.

(2) If the standard CT ratios quoted do not suit your network requirements please consult us.

(3) Please advise which CT ratio quoted is required at order placement.

(4) BIL is inline with the IEC 60185 standard for voltage transformers, i.e. 3.3 and 6.6 kV = 60 kV, 11 and 13.8 kV = 95 kV.

(5) A choice of glands and gland plates are available to suit your cable requirements. See page 77 for accessories.

(6) One supplied per switchboard.

(7) 2500 A available on request (fan cooled)

Summary tables
Bus sections

Circuit breaker module type		VB6	VB12	VB20	VB25
Page no.		36	38	40	42
Environment					
Indoor		■	■	■	■
IP3X (as standard)		■	■	■	■
Ratings					
Busbar current rating	630 A	□			
	1250 A	□	□		
	2500 A	□	□	□	□
Circuit breaker normal rated current		630 A	1250 A	2000 A	2500 A (7)
Highest system voltage		15.5 kV	15.5 kV	15.5 kV	15.5 kV
Rated Voltage		13.8 kV	13.8 kV	13.8 kV	13.8 kV
Service voltage 3.3, 6.6, 11, 13.8 kV		■	■	■	■
Rated BIL		95 kV	95 kV	95 kV	95 kV
Rated frequency		50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz
Rated internal arc (1 s)		25 kA	25 kA	25 kA	25 kA
Rated breaking capacity		25 kA	25 kA	25 kA	25 kA
Rated making capacity		67.5 kA	67.5 kA	67.5 kA	67.5 kA
Rated short circuit withstand current	Main circuit	25 kA	25 kA	25 kA	25 kA
	Earth circuit	25 kA	25 kA	25 kA	25 kA
Circuit breaker mechanism					
Manual charge, stored energy, manual and electrical release		■	■	■	■
Motor and manual charge, stored energy, manual and electrical release		□	□	□	□
Mechanical endurance		M2	M2	M1	M1
Current transformers (1)					
Protection Sepam	Ratio	600/300/1 A	1250/800/1 A	2000/1600/1 A	2500/1 A
	Class	5P20	5P20	5P20	5P20
	Burden	2.5 VA	2.5 VA	2.5 VA	2.5 VA
Instrumentation (2)	Ratio	600/300/1 A (3)	1200/800/1 A	2000/1600/1 A	2500/1 A
	Class	1.0	1.0	1.0	1.0
	Burden	5 VA	5 VA	5 VA	5 VA
Metering (2)	Ratio	600/300/5 A (3)	1200/800/5 A	2000/1600/5 A	2500/5 A
	Ratio	400/200/5 A (3)	600/300/5 A		
	Class	0.5 s	0.5 s	0.2 s	0.2 s
	Burden	7.5 VA	7.5 VA	7.5 VA	7.5 VA
Voltage transformers					
Circuit connected		□	□	□	□
Service voltage 3.3, 6.6, 11, 13.8 kV	Ratio	Service voltage/110 V 3			
	Class	0.5/3P	0.5/3P	0.5/3P	0.5/3P
	Burden	50 VA	50 VA	50 VA	50 VA
	BIL	60 kV or 95 kV (5)			
	Fused link	■	■	■	■
	Isolatable fused link	□	□	□	□
Construction					
Dimensions W x H x D (mm)	Standard	1000 x 1900 x 1230		1250 x 1900 x 1230	
Front access space required for mechanical charging (mm)		735	735	735	735
Maximum weight (kg)		Up to 750	Up to 750	Up to 1000	Up to 1000

Key ■ Standard feature □ Optional feature

Summary tables
Bus sections

Circuit breaker module type		VB6	VB12	VB20	VB25
Page no.		36	38	40	42
Circuit breaker electrical control					
Trip coil	24 V DC	□	□	□	□
	30 V DC	□	□	□	□
	48 V DC	□	□	□	□
	110 V DC	□	□	□	□
Close coil	24 V DC	□	□	□	□
	30 V DC	□	□	□	□
	48 V DC	□	□	□	□
	110 V DC	□	□	□	□
Motorised stored energy	24 V DC	□	□	□	□
	30 V DC	□	□	□	□
	48 V DC	□	□	□	□
	110 V DC	□	□	□	□
	220 V DC	□	□	□	□
	230 V AC	□	□	□	□
Indication					
Mechanical circuit breaker ON/OFF		■	■	■	■
Mechanical disconnector MAIN/ISOLATED/EARTH SELECT		■	■	■	■
Neon indication facility 3.3 - 13.8 kV both RHS and LHS busbars		■	■	■	■
Auxiliary contacts 4NO and 4NC spare for customer use		■	■	■	■
Test facility					
Integral right and left hand busbar test/earth facility		■	■	■	■
Standard features					
Operating handle - series disconnector (6)		■	■	■	■
Mechanical operations counter - circuit breaker					

Key ■ Standard feature □ Optional feature

(1) Not every circuit breaker has all these CTs fitted, it depends on the protection and control model selected. See section four for protection and control module details.

(2) If the standard CT ratios quoted do not suit your network requirements please consult us.

(3) Please advise which CT ratio quoted is required at order placement.

(4) Busbar VTs can only be fitted to the right hand side busbar of a bus section panel, left hand side shall be achieved via a separate busbar earth panel (BBM).

(5) BIL is inline with the IEC 60185 standard for voltage transformers, i.e. 3.3 and 6.6 kV = 60 kV, 11 and 13.8 kV = 95 kV.

(6) One supplied per switchboard.

(7) 2500 A available on request (fan cooled).

Summary tables
Busbar metering

Module type		BBM
Page no.		44
Environment		
Indoor		■
IP3X (as standard)		■
Ratings		
Busbar current rating (630 A)		□
Busbar current rating (1250 A)		□
Busbar current rating (2500 A)		□
Highest system voltage		15.5 kV
Rated Voltage		13.8 kV
Service voltage 3.3, 6.6, 11, 13.8 kV		■
Rated BIL		95 kV
Rated frequency		50/60 Hz
Rated internal arc (1 s)		25 kA
Current transformers (1)		
Instrumentation (2)	Ratio	600/300/1 A
	Class	1.0
	Burden	5 VA
Metering (2)	Ratio	1200/800/5 A (2)
	Ratio	600/300/5 A (2)
	Ratio	400/200/5 A (2)
	Ratio	200/100/5 A (2)
	Class	0.5 s
	Burden	7.5 VA

Key ■ Standard feature □ Optional feature

Summary tables
Busbar metering

Module type		BBM
Page no.		44

Voltage transformers		
Busbar connected		■
Service voltage 3.3, 6.6, 11, 13.8 kV	Ratio	Service voltage/110 √3
	Class	0.5/3P
	Burden	50 VA
	BIL	60 kV or 95 kV (3)
	Fused link	■
	Isolatable fused link	□

Construction		
Dimensions W x H x D (mm)	Standard	500 x 1230 x 1900 (1)
Front access space required for VT fuse isolation		735
Maximum weight (kg)		250 Max.

Indication	
Neon indication facility 3.3 - 13.8 kV	■

Key ■ Standard feature □ Optional feature

(1) If busbar current transformers are required (1250 A busbars only), the width of the busbar metering chamber increases to 1000 mm. If the standard CT ratios quoted do not suit your network requirements please consult us.

(2) Please advise which CT ratios quoted is required at order placement.

(3) BIL is inline with the IEC 60185 standard for voltage transformers, i.e. 3.3 and 6.6 kV = 60 kV, 11 and 13.8 kV = 95 kV.

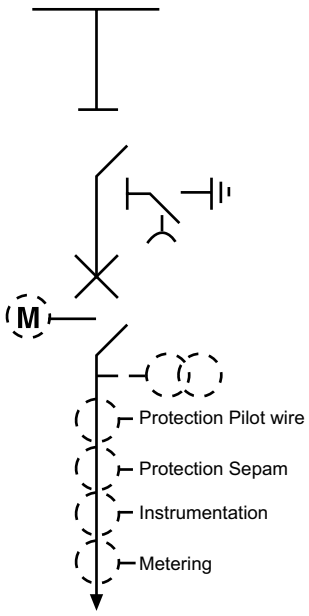
Note: 2000 A metering units must be mounted adjacent to a 750 mm wide (2000 A) unit

Circuit breakers
VC2 incomer/feeder

Application

Circuit breaker module for feeder/incomer network applications up to 3.8 MVA, 11 kV within MV/MV utility, consumer and industrial substations.
Incorporating appropriate rated current and voltage transformers for protection, monitoring or metering and control of the network distribution system.

DE58318



Circuit breaker mechanism

Independent manual stored energy

Ratings

Busbar current	630 A, 1250 A, 2500A
Normal current	200 A
Highest system voltage	15.5 kV
Rated voltage	13.8 kV
Service voltage	3.3, 6.6, 11 and 13.8 kV
Rated BIL	95 kV
Rated internal arc	25 kA (1 s)
Frequency	50/60 Hz
Rated breaking	25 kA
Rated making capacity	67.5 kA
Short time withstand current	Main 25 kA (3 s)
	Earth 25 kA (3 s)

Environment

Location	Indoor, IP3X
Ambient temperature	–5°C to + 40°C
Altitude	up to 1000 m

For values outside these ranges please contact Schneider Electric.

Protection/instrumentation/metering and indication

Current transformers

Protection - Sepam	200/100/1 A
Class	5P20
Burden	2.5 VA

Optional current transformers

Protection – Pilot wire differential	400/300/5 A
Class	X
Knee point	52/39 V
CT resistance	0.13 / 0.16 Ω
Instrumentation	200/100/1 A
Class	1.0
Burden	5 VA
Metering - Tariff	200/100/5 A
Class	0.5 s
Burden	7.5 VA

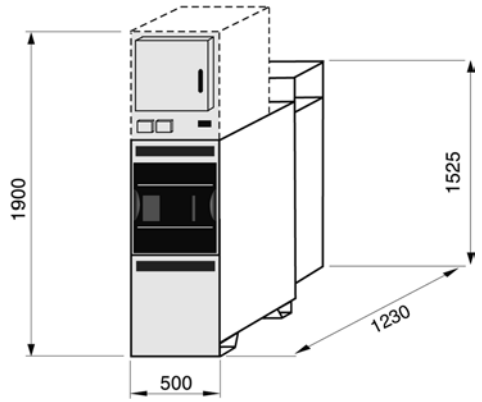
If the optional CTs do not suit your network requirements please consult us.

Voltage transformer - circuit

MV protection	Fused
Service voltage	3.3, 6.6, 11 and 13.8 kV
Secondary voltage	110 √3
Class	0.5/3 P
Burden	50 VA
Impulse voltage	60/95 kV

Circuit breakers
VC2 incomer/feeder

PE57032



Indications

Vacuum circuit breaker	Main on/off
Series disconnector	Main select
	Isolated
	Earth select
Mechanical operations counter	
Spare volt free auxiliary contacts 4NO and 4NC	
Provision for live line indication	

Standard options

Optional accessories	
Trip and close coil voltage ratings	DC: 24 V, 30 V, 48 V, 110 V
Mechanism motorisation - CB	DC: 24 V, 30 V, 48 V, 110 V, 220 V
Voltage ratings	AC: 110 V, 230 V
Key type interlocks	
Earth on key free, earth off key trapped	
Main off key free, main on key trapped	

Please consult us for any other key interlocking requirements.

Cabling

MV cabling and glands

Standard cable box	Bottom entry
Optional cable box	Inverted entry
Cable sizes	1 x 3 core up to 300 mm^2
	or 2 x 3 core up to 300 mm^2
	3 x 1 core up to 630 mm^2
	or 6 x 1 core up to 630 mm^2

Refer to accessories on page 77 for the following

Glands and glands plates

2 cables/phase

MV insulation systems

Busbars 630 A, 1250 A

Standard	Cast resin
Optional	Earth screened

Busbar 2500 A

Standard	EPDM

Voltage transformers

Standard	Cast resin
Optional	Earth screened

Cable terminations

Standard	Cast resin
Optional	Earth screened

Cable termination kits can be provided if required.

Accessories

Refer to page 77

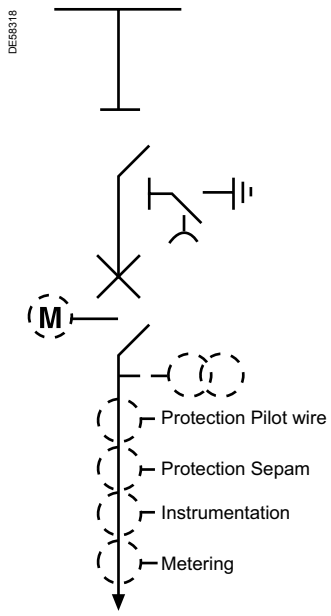
Documents

Installation drawing ref.	GDVINST-01 page 102

Circuit breakers
VC6 incomer/feeder

Application

Circuit breaker module for feeder/incomer network applications up to 12 MVA, 11 kV within MV/MV utility, consumer and industrial substations.
Incorporating appropriate rated current and voltage transformers for protection, monitoring or metering and control of the network distribution system.



Circuit breaker mechanism

Independent manual stored energy

Ratings

Busbar current	630 A, 1250 A, 2500 A
Normal current	630 A
Highest system voltage	15.5 kV
Rated voltage	13.8 kV
Service voltage	3.3, 6.6, 11 and 13.8 kV
Rated BIL	95 kV
Rated internal arc	25 kA (1 s)
Frequency	50/60 Hz
Rated breaking	25 kA
Rated making capacity	67.5 kA
Short time withstand current	Main 25 kA (3 s)
	Earth 25 kA (3 s)

Environment

Location	Indoor, IP3X
Ambient temperature	–5°C to + 40°C
Altitude	up to 1000 m

For values outside these ranges please contact Schneider Electric .

Protection/instrumentation/metering and indication

Current transformers

Protection - Sepam	600/300/1 A
Class	5P20
Burden	2.5 VA

Optional current transformers

Protection – Pilot wire differential	400/300/5 A
Class	X
Knee point	60/45 V
CT resistance	0.2 / 0.16 Ω
Instrumentation	600/300/5 A
Class	1.0
Burden	5 VA
Metering - Tariff	600/300/5 A
	or 400/200/5 A
Class	0.5 s
Burden	7.5 VA

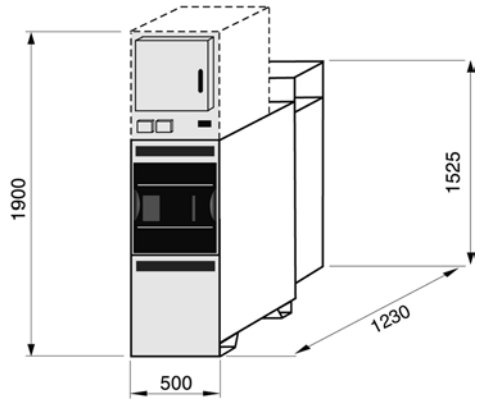
If the optional CTs do not suit your network requirements please consult us.

Voltage transformer - circuit

MV protection	Fused
Service voltage	3.3, 6.6, 11 and 13.8 kV
Secondary voltage	110 √3
Class	0.5/3 P
Burden	50 VA
Impulse voltage	60/95 kV

Circuit breakers
VC6 incomer/feeder

PE57032



Indications

Vacuum circuit breaker	Main on/off
Series disconnector	Main select
	Isolated
	Earth select
Mechanical operations counter	
Spare volt free auxiliary contacts 4NO and 4NC	
Provision for live line indication	

Standard options

Optional accessories	
Trip and close coil voltage ratings	DC: 24 V, 30 V, 48 V, 110 V
Mechanism motorisation - CB	DC: 24 V, 30 V, 48 V, 110 V, 220 V
Voltage ratings	AC: 230 V
Key type interlocks	
Earth on key free, earth off key trapped	
Main off key free, main on key trapped	

Please consult us for any other key interlocking requirements.

Cabling

MV cabling and glands

Standard cable box	Bottom entry
Optional cable box	Inverted entry
Cable sizes	1 x 3 core up to 300 mm^2
	or 2 x 3 core up to 300 mm^2
	3 x 1 core up to 630 mm^2
	or 6 x 1 core up to 630 mm^2

Refer to accessories on page 77 for the following

Glands and glands plates	
2 cables/phase	

MV insulation systems

Busbars 630 A, 1250 A

Standard	Cast resin
Optional	Earth screened

Busbar 2500 A

Standard	EPDM

Voltage transformers

Standard	Cast resin
Optional	Earth screened

Cable terminations

Standard	Cast resin
Optional	Earth screened

Cable termination kits can be provided if required.

Accessories

Refer to page 77

Documents

Installation drawing ref.	GDVINST-01 page 102

Circuit breakers
VC12 incomer/feeder

Application
Circuit breaker module for feeder/incomer network applications up to 24 MVA, 11 kV within MV/MV utility, consumer and industrial substations.
Incorporating appropriate rated current and voltage transformers for protection, monitoring or metering and control of the network distribution system.

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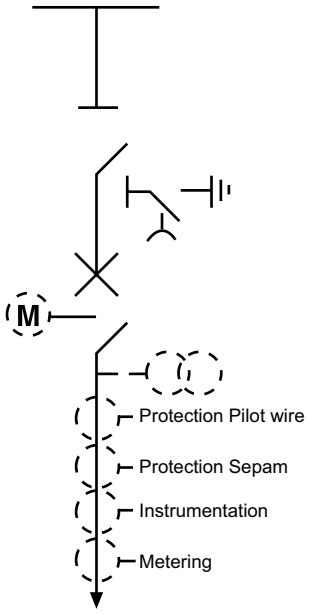


Circuit breaker mechanism
Independent manual stored energy

Ratings

Busbar current	1250 A, 2500A
Normal current	1250 A
Highest system voltage	15.5 kV
Rated voltage	13.8 kV
Service voltage	3.3, 6.6, 11 and 13.8 kV
Rated BIL	95 kV
Rated internal arc	25 kA (1 s)
Frequency	50/60 Hz
Rated breaking	25 kA
Rated making capacity	67.5 kA
Short time withstand current	Main 25 kA (3 s)
	Earth 25 kA (3 s)

Environment

Location	Indoor, IP3X
Ambient temperature	–5°C to + 40°C
Altitude	up to 1000 m

For values outside these ranges please contact Schneider Electric.

Protection/instrumentation/metering and indication

Current transformers

Protection - Sepam	1250/800/1 A
Class	5P20
Burden	2.5 VA

Optional current transformers

Protection – Pilot wire differential	800/1 A
Class	X
Knee point	191 V
CT resistance	4.2 Ω
Instrumentation	1250/800/1 A
Class	1.0
Burden	5 VA
Metering - Tariff	1200/800/5 A or 600/300/5 A
Class	0.5 s
Burden	7.5 VA

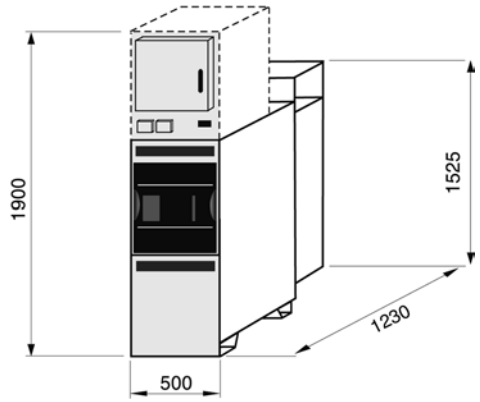
If the optional CTs do not suit your network requirements please consult us.

Voltage transformer - circuit

MV protection	Fused
Service voltage	3.3, 6.6, 11 and 13.8 kV
Secondary voltage	110 √3
Class	0.5/3 P
Burden	50 VA
Impulse voltage	60/95 kV

Circuit breakers
VC1 2 incomer/feeder

PE57032



Indications

Vacuum circuit breaker	Main on/off
Series disconnector	Main select
	Isolated
	Earth select
Mechanical operations counter	
Spare volt free auxiliary contacts 4NO and 4NC	
Provision for live line indication	

Standard options

Optional accessories	
Trip and close coil voltage ratings	DC: 24 V, 30 V, 48 V, 110 V
Mechanism motorisation - CB	DC: 24 V, 30 V, 48 V, 110 V, 220 V
Voltage ratings	AC: 110 V, 230 V
Key type interlocks	
Earth on key free, earth off key trapped	
Main off key free, main on key trapped	

Please consult us for any other key interlocking requirements.

Cabling

MV cabling and glands

Standard cable box	Bottom entry
Optional cable box	Inverted entry
Cable sizes	1 x 3 core up to 300 mm^2
	or 2 x 3 core up to 300 mm^2
	3 x 1 core up to 630 mm^2
	or 6 x 1 core up to 630 mm^2

Refer to accessories on page 77 for the following

Glands and glands plates	
2 cables/phase	

MV insulation systems

Busbars 1250 A

Standard	Cast resin
Optional	Earth screened

Busbars 2500 A

Standard	EPDM

Voltage transformers

Standard	Cast resin
Optional	Earth screened

Cable terminations

Standard	Cast resin
Optional	Earth screened

Cable termination kits can be provided if required.

Accessories

Refer to page 77

Documents

Installation drawing ref.	GDVINST-01 page 102

Circuit breakers
VC20 incomer/feeder

Application

Circuit breaker module for incomer network applications up to 40 MVA,11 kV within primary utility and large site substations. Incorporating appropriate rated current and voltage transformers for protection, monitoring or metering and control of the network distribution system.

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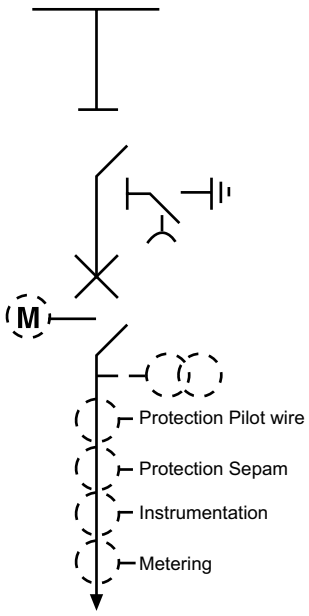


Circuit breaker mechanism

Independent manual stored energy

Ratings

Busbar current	2500 A
Normal current	2000 A
Highest system voltage	15.5 kV
Rated voltage	13.8 kV
Service voltage	3.3, 6.6, 11 and 13.8 kV
Rated BIL	95 kV
Rated internal arc	25 kA (1 s)
Frequency	50/60 Hz
Rated breaking	25 kA
Rated making capacity	67.5 kA
Short time withstand current	Main 25 kA (3 s)
	Earth 25 kA (3 s)

Environment

Location	Indoor, IP3X
Ambient temperature	–5°C to + 40°C
Altitude	up to 1000 m

For values outside these ranges please contact Schneider Electric.

Protection/instrumentation/metering and indication

Current transformers

Protection - Sepam	2000/1600/1 A
Class	5P20
Burden	2.5 VA

Optional current transformers

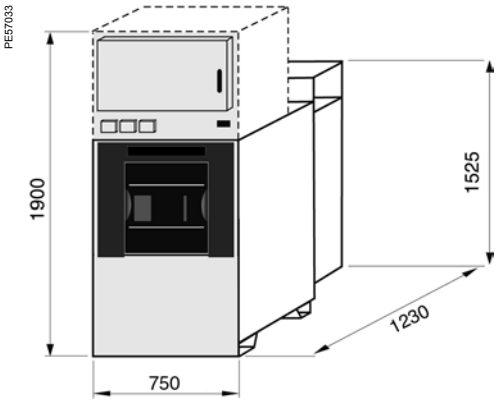
Protection – Pilot wire differential	2000/1600/1 A
Class	X
Knee point	260/208 V
CT resistance	7.7/6.1 Ω
Instrumentation	2000/1600/1 A
Class	1.0
Burden	5 VA
Metering - Tariff	2000/1600/5 A
Class	0.2 s
Burden	7.5 VA

If the optional CTs do not suit your network requirements please consult us.

Voltage transformer - circuit

MV protection	Fused
Service voltage	3.3, 6.6, 11 and 13.8 kV
Secondary voltage	110 √3
Class	0.5/3 P
Burden	50 VA
Impulse voltage	60/95 kV

Circuit breakers
VC20 incomer/feeder



Indications

Vacuum circuit breaker	Main on/off
Series disconnector	Main select
	Isolated
	Earth select
Mechanical operations counter	
Spare volt free auxiliary contacts 4NO and 4NC	
Provision for live line indication	

Standard options

Optional accessories	
Trip and close coil voltage ratings	DC: 24 V, 30 V, 48 V, 110 V
Mechanism motorisation - CB	DC: 24 V, 30 V, 48 V, 110 V, 220 V
Voltage ratings	AC: 110 V, 230 V
Key type interlocks	
Earth on key free, earth off key trapped	
Main off key free, main on key trapped	

Please consult us for any other key interlocking requirements.

Cabling

MV cabling and glands

Standard cable box	Bottom entry
Optional cable box	Inverted entry
Cable sizes	1 x 3c up to 300 mm^2 or 3 x 1c up to 630 mm^2
	2 x 3c up to 300 mm^2 or 6 x 1c up to 630 mm^2
	4 x 3c up to 300 mm^2 or 12 x 1c up to 630 mm^2

Refer to accessories on page 77 for the following

Glands and glands plates	
2 cables/phase	

MV insulation systems

Busbars

Standard	EPDM

Voltage transformers

Standard	Cast resin
Optional	Earth screened

Cable terminations

Standard	Cast resin
Optional	Earth screened

Cable termination kits can be provided if required.

Accessories

Please consult us

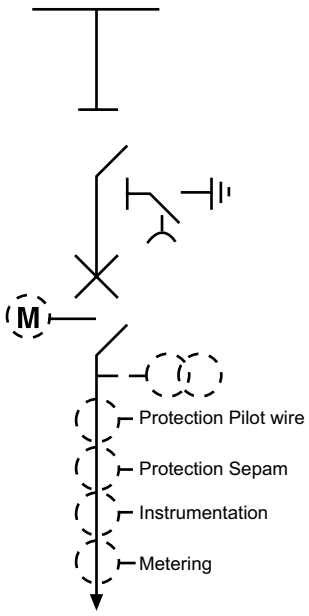
Documents

Installation drawing ref.	GDVINST-10 page 103

Circuit breakers
VC25 incomer/feeder

Application
Circuit breaker module for feeder/incomer network applications up to 50 MVA, 11 kV within primary utility and large site substations.
Incorporating appropriate rated current and voltage transformers for protection, monitoring or metering and control of the network distribution system.

DE58318



Circuit breaker mechanism
Independent manual stored energy

Ratings

Busbar current	2500A
Normal current	2500 A *
Highest system voltage	15.5 kV
Rated voltage	13.8 kV
Service voltage	3.3, 6.6, 11 and 13.8 kV
Rated BIL	95 kV
Rated internal arc	25 kA (1 s)
Frequency	50/60 Hz
Rated breaking	25 kA
Rated making capacity	67.5 kA
Short time withstand current	Main 25 kA (3 s)
	Earth 25 kA (3 s)

Environment

Location	Indoor, IP3X
Ambient temperature	–5°C to + 40°C
Altitude	up to 1000 m

For values outside these ranges please contact Schneider Electric.

Protection/instrumentation/metering and indication

Current transformers

Protection - Sepam	2500/1 A
Class	5P20
Burden	2.5 VA

Optional current transformers

Protection – Pilot wire differential	2000/1600/1 A
Class	X
Knee point	260/208 V
CT resistance	7.7/6.1 Ω
Instrumentation	2500/1 A
Class	1.0
Burden	5 VA
Metering - Tariff	2500/5 A
Class	0.2 s
Burden	7.5 VA

If the optional CTs do not suit your network requirements please consult us.

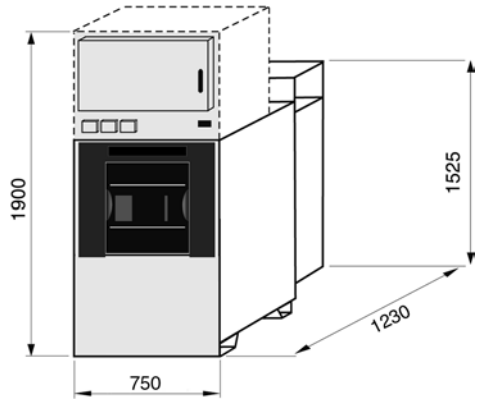
Voltage transformer - circuit

MV protection	Fused
Service voltage	3.3, 6.6, 11 and 13.8 kV
Secondary voltage	110 √3
Class	0.5/3 P
Burden	50 VA
Impulse voltage	60/95 kV

(*) Fan cooled when current exceeds 2100 A available on request.

Circuit breakers
VC25 incomer/feeder

PE57033



Indications

Vacuum circuit breaker	Main on/off
Series disconnector	Main select
	Isolated
	Earth select
Mechanical operations counter	
Spare volt free auxiliary contacts 4NO and 4NC	
Provision for live line indication	

Standard options

Optional accessories	
Trip and close coil voltage ratings	DC: 24 V, 30 V, 48 V, 110 V
Mechanism motorisation - CB	DC: 24 V, 30 V, 48 V, 110 V, 220 V
Voltage ratings	AC: 110 V, 230 V
Key type interlocks	
Earth on key free, earth off key trapped	
Main off key free, main on key trapped	

Please consult us for any other key interlocking requirements.

Cabling

MV cabling and glands

Standard cable box	Bottom entry
Optional cable box	Inverted entry
Cable sizes	1 x 3c up to 300 mm^2 or 3 x 1c up to 630 mm^2
	2 x 3c up to 300 mm^2 or 6 x 1c up to 630 mm^2
	4 x 3c up to 300 mm^2 or 12 x 1c up to 630 mm^2

Refer to accessories on page 77 for the following

Glands and glands plates	
2 cables/phase	

MV insulation systems

Busbars

Standard	EPDM

Voltage transformers

Standard	Cast resin
Optional	Earth screened

Cable terminations

Standard	Cast resin
Optional	Earth screened

Cable termination kits can be provided if required.

Accessories

Please consult us

Documents

Installation drawing ref.	GDVINST-10 page 103

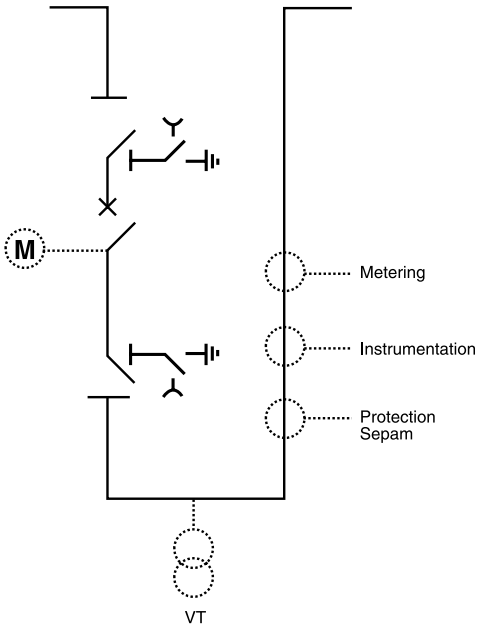
Circuit breakers
VB6 bus section

Application

Circuit breaker module for bus section applications up to 12 MVA,11 kV within MV/MV utility, consumer and industrial substations.

Incorporating appropriate rated current and voltage transformers for protection, monitoring or metering and control of the network distribution system.

DE60278



Circuit breaker mechanism

Independent manual stored energy

Ratings

Busbar current	630 A
Normal current	630 A
Highest system voltage	15.5 kV
Rated voltage	13.8 kV
Service voltage	3.3, 6.6, 11 and 13.8 kV
Rated BIL	95 kV
Rated internal arc	25 kA (1 s)
Frequency	50/60 Hz
Rated breaking	25 kA
Rated making capacity	67.5 kA
Short time withstand current	Main 25 kA (3 s)
	Earth 25 kA (3 s)

Environment

Location	Indoor, IP3X
Ambient temperature	–5°C to + 40°C
Altitude	up to 1000 m

For values outside these ranges please contact Schneider Electric.

Protection/instrumentation/metering and indication

Current transformers

Protection - Sepam	600/300/1 A
Class	5P20
Burden	2.5 VA

Optional current transformers

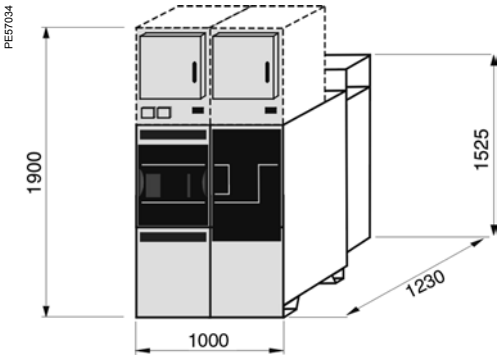
Protection – Pilot wire differential	600/300/1 A
Class	1.0
Burden	5 VA
Metering - Tariff	600/300/5 A
	400/200/5 A
Class	0.5 s
Burden	7.5 VA

If the optional CTs do not suit your network requirements please consult us.

Voltage transformer - busbar

MV protection	Fused
Service voltage	3.3, 6.6, 11 and 13.8 kV
Secondary voltage	110 √3
Class	0.5/3 P
Burden	50 VA
Impulse voltage	60/95 kV

Circuit breakers
VB6 bus section



Indications

Vacuum circuit breaker	Main on/off
LHS disconnector	Main select
	Isolated
	RHS earth select
RHS disconnector	Main select
	Isolated
	LHS earth select
Mechanical operations counter	
Spare volt free auxiliary contacts 4NO and 4NC	
Provision for live line indication	

Standard options

Optional accessories	
Trip and close coil voltage ratings	DC: 24 V, 30 V, 48 V, 110 V
Mechanism motorisation - CB	DC: 24 V, 30 V, 48 V, 110 V, 220 V
Voltage ratings	AC: 110 V, 230 V
Key type interlocks	
Main off key free, main on key trapped	

Please consult us for any other key interlocking requirements.

MV insulation systems

Busbars

Standard	Cast resin
Optional	Earth screened

Voltage transformers

Standard	Cast resin
Optional	Earth screened

Accessories

Refer to page 77

Documents

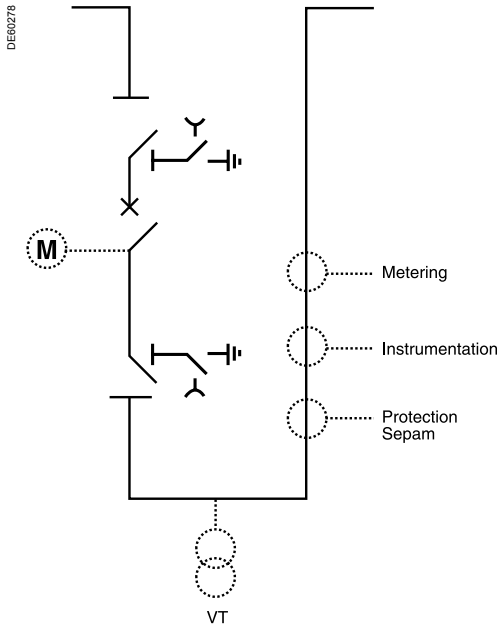
Installation drawing ref.	GDVINST-02 page 106

Circuit breakers
VB1 2 bus section

Application

Circuit breaker module for bus section applications up to 24 MVA,11 kV within MV/MV utility, consumer and industrial substations.

Incorporating appropriate rated current and voltage transformers for protection, monitoring or metering and control of the network distribution system.



Circuit breaker mechanism

Independent manual stored energy

Ratings

Busbar current	1250 A
Normal current	1250 A
Highest system voltage	15.5 kV
Rated voltage	13.8 kV
Service voltage	3.3, 6.6, 11 and 13.8 kV
Rated BIL	95 kV
Rated internal arc	25 kA (1 s)
Frequency	50/60 Hz
Rated breaking	25 kA
Rated making capacity	67.5 kA
Short time withstand current	Main 25 kA (3 s)
	Earth 25 kA (3 s)

Environment

Location	Indoor, IP3X
Ambient temperature	–5°C to + 40°C
Altitude	up to 1000 m

For values outside these ranges please contact Schneider Electric.

Protection/instrumentation/metering and indication

Current transformers

Protection - Sepam	1250/800/1 A
Class	5P20
Burden	2.5 VA

Optional current transformers

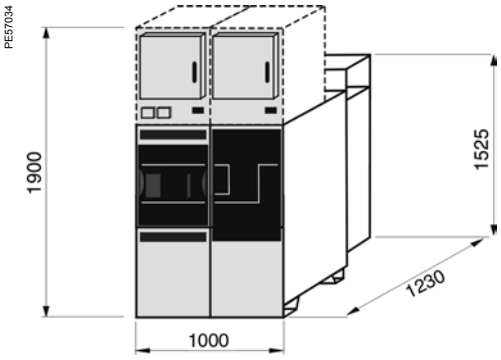
Instrumentation	1250/800/1 A
Class	1.0
Burden	5 VA
Metering - Tariff	1200/800/5 A or 600/300/5 A
Class	0.5 s
Burden	7.5 VA

If the optional CTs do not suit your network requirements please consult us.

Voltage transformer - circuit

MV protection	Fused
Service voltage	3.3, 6.6, 11 and 13.8 kV
Secondary voltage	110 √3
Class	0.5/3 P
Burden	50 VA
Impulse voltage	60/95 kV

Circuit breakers
VB1 2 bus section



Indications

Vacuum circuit breaker	Main on/off
LHS disconnector	Main select
	Isolated
	RHS earth select
RHS disconnector	Main select
	Isolated
	LHS earth select
Mechanical operations counter	
Spare volt free auxiliary contacts 4NO and 4NC	
Provision for live line indication	

Standard options

Optional accessories	
Trip and close coil voltage ratings	DC: 24 V, 30 V, 48 V, 110 V
Mechanism motorisation - CB	DC: 24 V, 30 V, 48 V, 110 V, 220 V
Voltage ratings	AC: 110 V, 230 V
Key type interlocks	
Main off key free, main on key trapped	

Please consult us for any other key interlocking requirements.

MV insulation systems

Busbars

Standard	Cast resin
Optional	Earth screened

Voltage transformers

Standard	Cast resin
Optional	Earth screened

Accessories

Refer to page 77

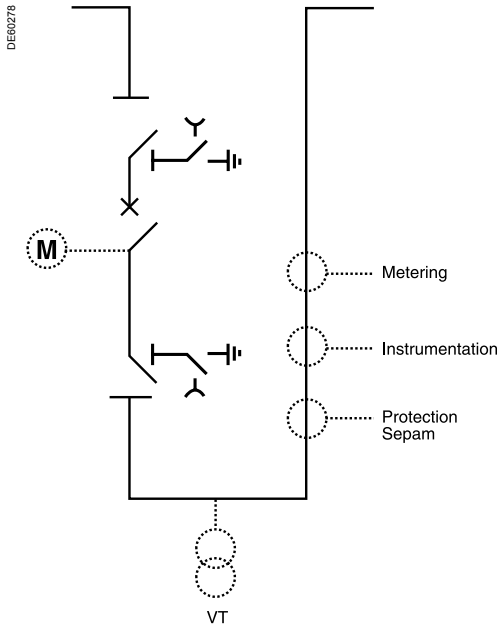
Documents

Installation drawing ref.	GDVINST-02 page 106

Circuit breakers
VB20 bus section

Application

Circuit breaker module for bus section applications up to 40 MVA,11 kV within primary utility and large site substations. Incorporating appropriate rated current and voltage transformers for protection, monitoring or metering and control of the network distribution system.



Circuit breaker mechanism

Independent manual stored energy

Ratings

Busbar current	2500 A
Normal current	2000 A
Highest system voltage	15.5 kV
Rated voltage	13.8 kV
Service voltage	3.3, 6.6, 11 and 13.8 kV
Rated BIL	95 kV
Rated internal arc	25 kA (1 s)
Frequency	50/60 Hz
Rated breaking	25 kA
Rated making capacity	67.5 kA
Short time withstand current	Main 25 kA (3 s)
	Earth 25 kA (3 s)

Environment

Location	Indoor, IP3X
Ambient temperature	–5°C to + 40°C
Altitude	up to 1000 m

For values outside these ranges please contact Schneider Electric.

Protection/instrumentation/metering and indication

Current transformers

Protection - Sepam	2000/1600/1 A
Class	5P20
Burden	2.5 VA

Optional current transformers

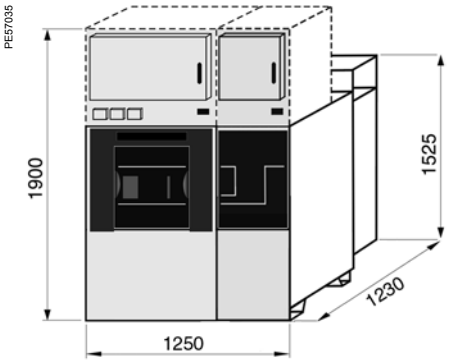
Instrumentation	2000/1600/1 A
Class	1.0
Burden	5 VA
Metering - Tariff	2000/1600/5 A
Class	0.2 s
Burden	7.5 VA

If the optional CTs do not suit your network requirements please consult us.

Voltage transformer - circuit

MV protection	Fused
Service voltage	3.3, 6.6, 11 and 13.8 kV
Secondary voltage	110 √3
Class	0.5/3 P
Burden	50 VA
Impulse voltage	60/95 kV

Circuit breakers
VB20 bus section



Indications

Vacuum circuit breaker	Main on/off
LHS disconnector	Main select
	Isolated
	RHS earth select
RHS disconnector	Main select
	Isolated
	LHS earth select
Mechanical operations counter	
Spare volt free auxiliary contacts 4NO and 4NC	
Provision for live line indication	

Standard options

Optional accessories	
Trip and close coil voltage ratings	DC: 24 V, 30 V, 48 V, 110 V
Mechanism motorisation - CB	DC: 24 V, 30 V, 48 V, 110 V, 220 V
Voltage ratings	AC: 110 V, 230 V
Key type interlocks	
Main off key free, main on key trapped	

Please consult us for any other key interlocking requirements.

MV insulation systems

Busbars

Standard	EPDM

Voltage transformers

Standard	Cast resin
Optional	Earth screened

Accessories

Please consult us

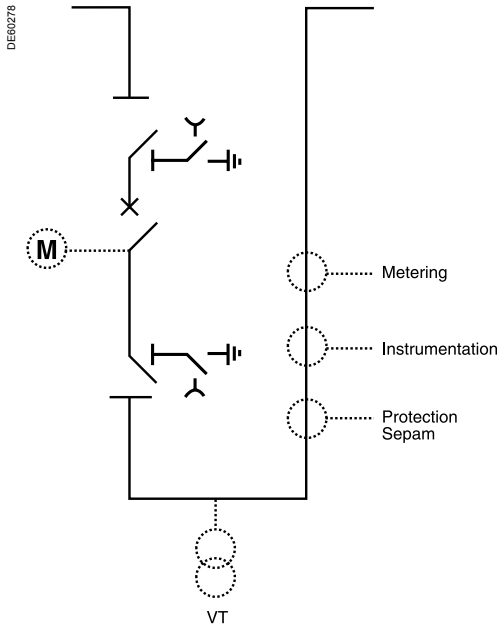
Documents

Installation drawing ref.	GDVINST-12 page 107

Circuit breakers
VB25 bus section

Application

Circuit breaker module for bus section applications up to 50 MVA,11 kV within primary utility and large site substations. Incorporating appropriate rated current and voltage transformers for protection, monitoring or metering and control of the network distribution system.



Circuit breaker mechanism

Independent manual stored energy

Ratings

Busbar current	2500 A
Normal current	2500 A *
Highest system voltage	15.5 kV
Rated voltage	13.8 kV
Service voltage	3.3, 6.6, 11 and 13.8 kV
Rated BIL	95 kV
Rated internal arc	25 kA (1 s)
Frequency	50/60 Hz
Rated breaking	25 kA
Rated making capacity	67.5 kA
Short time withstand current	Main 25 kA (3 s)
	Earth 25 kA (3 s)

Environment

Location	Indoor, IP3X
Ambient temperature	–5°C to + 40°C
Altitude	up to 1000 m

For values outside these ranges please contact Schneider Electric.

Protection/instrumentation/metering and indication

Current transformers

Protection - Sepam	2500/1 A
Class	5P20
Burden	2.5 VA

Optional current transformers

Instrumentation	2500/1 A
Class	1.0
Burden	5 VA
Metering - Tariff	2500/5 A
Class	0.2 s
Burden	7.5 VA

If the optional CTs do not suit your network requirements please consult us.

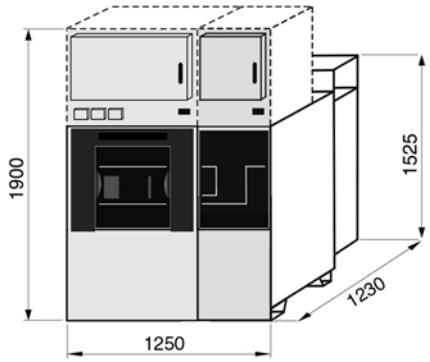
Voltage transformer - circuit

MV protection	Fused
Service voltage	3.3, 6.6, 11 and 13.8 kV
Secondary voltage	110 √3
Class	0.5/3 P
Burden	50 VA
Impulse voltage	60/95 kV

(*) Fan cooled when current exceeds 2100 A available on request

Circuit breakers
VB25 bus section

PE57035



Indications

Vacuum circuit breaker	Main on/off
LHS disconnector	Main select
	Isolated
	RHS earth select
RHS disconnector	Main select
	Isolated
	LHS earth select
Mechanical operations counter	
Spare volt free auxiliary contacts 4NO and 4NC	
Provision for live line indication	

Standard options

Optional accessories	
Trip and close coil voltage ratings	DC: 24 V, 30 V, 48 V, 110 V
Mechanism motorisation - CB	DC: 24 V, 30 V, 48 V, 110 V, 220 V
Voltage ratings	AC: 110 V, 230 V
Key type interlocks	
Main off key free, main on key trapped	

Please consult us for any other key interlocking requirements.

MV insulation systems

Busbars

Standard	EPDM

Voltage transformers

Standard	Cast resin
Optional	Earth screened

Accessories

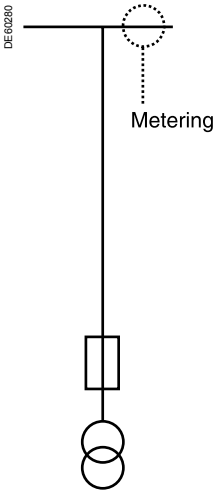
Please consult us

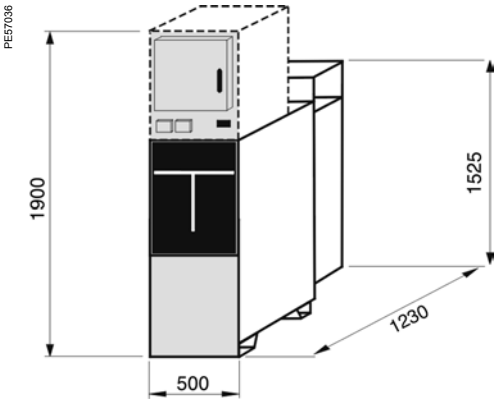
Documents

Installation drawing ref.	GDVINST-12 page 107

Busbar metering
BBM busbar metering

Application
This dedicated busbar metering panel allows busbar connected voltage and current transformers to be placed anywhere in the switchboard arrangement. Ideal for tariff check metering on joint ownership switchboards or to reduce the number of circuit VTs traditionally used with feeder metering.





Note:
Dimensions apply to CT or VT only.
Combined CT/VT unit is 1000 mm wide (1250 A).
Note: 2000 A metering units must be mounted adjacent to a 750 mm wide (2000 A) unit

Ratings

Busbar current	1250 A
Normal current	1250 A
Highest system voltage	15.5 kV
Rated voltage	13.8 kV
Service voltage	3.3, 6.6, 11 and 13.8 kV
Rated BIL	95 kV
Frequency	50/60 Hz
Short time withstand current	25 kA (3 s)

Environment

Location	Indoor, IP3X
Ambient temperature	–5°C to + 40°C
Altitude	up to 1000 m

For values outside these ranges please contact Schneider Electric.

Protection/instrumentation/metering and indication

Optional current transformers

Instrumentation	600/300/1 A
Class	1.0
Burden	5 VA
Metering - Tariff	1200/800/5 A
	600/300/5 A
	or 400/200/5 A
	or 200/100/5 A
Class	0.5 s
Burden	7.5 VA

If the optional CTs do not suit your network requirements please consult us.

Voltage transformer - busbar

MV protection	Fused
Service voltage	3.3, 6.6, 11 and 13.8 kV
Secondary voltage	110 √3
Class	0.5/3 P
Burden	50 VA
Impulse voltage	60/95 kV

MV insulation systems

Busbars

Standard	Cast resin
Optional	Earth screened

Voltage transformers

Standard	Cast resin
Optional	Earth screened

Accessories

Refer to page 77

Documents

Installation drawing ref.	GDVINST-09 page 110

Panorama

PE60175

PE57025

PE60177

PE57026

Main components

■ All units are internal arc tested to EATS 41-36/IEC 62271-200. This ensures operator safety in the extremely unlikely event of an internal fault within any MV compartment of the switchgear.
Rating: 25 kA for 1 second.
■ All units are fitted with an active mimic which clearly details the condition of the circuit breaker and series disconnector. All operating lever/selectors are comprehensively interlocked in accordance with EATS 41-36 and IEC 62271-200. In addition to this all have the facility for padlocking.

Mechanism type

■ Each unit is fitted with a rigorously prototype tested operating mechanism. The unit utilises stainless steel components which are self lubricating, resulting in minimal maintenance requirements.
The mechanism has mechanical charging and open/closing. However, electrical operation can be provided as an option. The standard mechanism has a stored charge facility to allow an auto reclose duty of O-0.3 s-CO-15 s-CO.
Please consult Schneider Electric if this facility is required.
■ Circuit breakers
□ Manual charge, stored energy, manual and electrical release
□ Motor and manual charge, stored energy, manual and electrical release
■ A mechanical operations counter is mounted on the front facia of all units to count the number of vacuum circuit breaker operations.

Test access

■ A fully interlocked integral cable test system employing a removable circuit earth star-point, accessed from the front of the panel interlocked without the need for a loose key, is fitted to every panel. On bus section circuit breakers this facility allows you to test the bus bars. In addition to this it also ensures that the cable or busbar is at earth potential before removing the earth star point connection to allow testing.

Live line indication

■ Jack sockets provide a voltage reference for circuit (incomers or feeders only) for left and right hand busbar (bus sections only) potential indication and phasing out on all panels except the busbar earthing switch. In order to utilise these options please refer to section 3 of this document ancillary items for the loose devices required. Permanent neon indication is provided via lamps on the circuit side of cable connected units or busbars for bus section panels. Integral jack sockets allow the use of an external phase capacitor, easy for phasing out during commissioning.

Panorama

PE60179

PE60180

PE60181

PE60182

Current transformers

■ Ring type, air insulated current transformers are used for protection, indication and metering.
Standard CT specification (ratio, class and burden) have been selected to suit the network requirements. However, if the standard current transformers do not suit your specific application please consult us.

Voltage transformers

■ Cast resin voltage transformers are used for protection, indication and metering.
Standard VT specification (system voltage, class and burden) have been selected to suit the network requirements. However, if the standard voltage transformers do not suit your specific application please consult us.
■ Circuit beakers
□ Circuit - fused.
■ Bus sections
□ Right hand busbar only - fused.
■ Busbar metering
□ Busbar - fused.

Electrical operation

■ A low energy motor gearbox providing an automatic close spring charging facility for remote operation.
■ Trip coil
A solenoid is used for the electrical tripping and opening of the circuit breaker.
■ Close coil
A solenoid is used for the electrical closing of the circuit breaker.
■ All units, have 8 normally open and 8 normally closed contact auxiliary switch fitted as standard.
The contacts are arranged as follows:
□ Circuit breaker control
- 4 normally open
- 4 normally closed
□ Spare, volt free contacts wired to outgoing terminals
- 4 normally open
- 4 normally closed.

Panorama

PE60183

PE60184

PE60185

PE57024

Bottom entry

This cable box is intended for termination of PILC or XLPE cables from below in accordance with Electrical Association technical specification EA12-11. The box is suitable for dry type hot or cold fit termination kits using angled boots. If Dyscon terminations are used then termination kits with a straight boot should be used.

Cable sizes

- **Up to 1250 A**
  - 1 x 3 core up to 300 mm^2
  - 3 x 1 core up to 630 mm^2
  - 2 x 3 core up to 300 mm^2
  - 6 x 1 core up to 630 mm^2.
- **2000 A, 2500 A**
  - 2 x 3 core up to 300 mm^2
  - 6 x 1 core up to 630 mm^2
  - 4 x 3 core up to 300 mm^2
  - 12 x 1 core up to 630 mm^2.

For other cable types/sizes please consult us.

Top entry

This cable box is intended for termination of PILC or XLPE cables from above in accordance with Electrical Association technical specification EA12-11. The box is suitable for dry type hot or cold fit termination kits using angled boots. If Dyscon terminations are used then termination kits with a straight boot should be used.

Cable sizes

- **Up to 1250 A**
  - 1 x 3 core up to 300 mm^2
  - 3 x 1 core up to 630 mm^2
  - 2 x 3 core up to 300 mm^2
  - 6 x 1 core up to 630 mm^2.
- **2000 A, 2500 A**
  - 2 x 3 core up to 300 mm^2
  - 6 x 1 core up to 630 mm^2
  - 4 x 3 core up to 300 mm^2
  - 12 x 1 core up to 630 mm^2.

For other cable types/sizes please consult us.
Please refer to installation drawing GDVINST-04 on page 104.

Protection and control modules
Contents

Summary tables	**52**
Summary sheets	**57**
Panorama	**75**
Vamp arc flash protection	**79**

Summary tables
Applications

The table below shows the protection and control modules that are designed to fit with a circuit breaker or bus section for a particular application.

Note: if the protection and control module you require is not listed or available with your circuit breaker type/rating, please contact your local Schneider Electric representative.

Circuit breakers		Transformers				Cables							Embedded generation					Miscellaneous	
Rating	Reference	P1	P2	P7	P10	P1	P3	P4	P5	P6	P8	P9	P12	P13	P14	P15	P16	P17	P18
200 A	VC2	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
630 A	VC6	■	■	■	■	■	■	■	■	■	■	■	■	■	■		■	■	■
1250 A	VC12	■		■	■	■	■	■	■	■	■	■	■	■	■		■	■	■
2000 A	VC20			■	■													■	■
2500 A	VC25			■	■													■	■

Bus section		General purpose				Miscellaneous		Embedded generation		
Rating	Reference	P1	P3	P8	P9	P11	P17	P12	P13	P14
630 A	VB6	■	■	■	■	■	■	■	■	■
1250 A	VB12	■	■	■	■	■	■	■	■	■
2000 A	VB20	■	■	■	■	■	■	■	■	■
2500 A	VB25	■	■	■	■	■	■	■	■	■

Summary tables
Transformer feeders and incomers protection

Protection and control module type		Transformer feeders and incomers			
		P1	P2	P7	P10
Page no.		55	56	61	64
Application		General purpose feeder or incomer	Transformer feeder	Single transformer incomer	Parallel dual transformer incomer
Environment					
Indoor		■	■	■	■
IP3X		■	■	■	■
Protection relays*					
Sepam (type)		T20	T60 / T81	T60 / T81	T62 / T82
Power meter					
PM810, PM820 or PM850 power meter		□			
Protection function	**ANSI**				
3 ph overcurrent	50/51	■	■	■	■
Earth fault	50N/51N	■	■		
Standby earth fault	51G			■	■
Negative sequence O/C	46	■			
Thermal overload	49	■	■	■	■
3 ph dir overcurrent	67				■
Restricted earth fault	64			■	■
Measurement					
Phase current		■	■	■	■
Max. demand current		■	■	■	■
Phase voltages		□ (2)		■	■
kW, kVA, cos φ		□ (2)		■	■
kWh, kVARh		□ (2)		■	■
kWh pulsed output		□ (2)			
Thermal capacity used			■	■	■
Tripping current		■	■	■	■
Monitoring and control					
Trip circuit supervision		□	■	■	■
Circuit breaker ready to close supervision			■	■	■
Lockout relay		□	■	■	■
Intertrip send		□	■	■	■
Intertrip receive		□	■	■	■
VT supervision					■
Remote emergency trip		□	■	■	■
Logic selectivity (block send)		■	■	■	■
Logic selectivity (block receive)		□	■	■	■
Current transducer (1 A/4-20 mA)		□	□	□	□
Modbus RS485 serial comms		□	□	□	□
Earth selector status (via Modbus)		□	□	□	□
Earth status (via Modbus)			□	□	□
Spring charge status (via Modbus)			□	□	□
Winding temperature alarm		□	■	■	■
Winding temperature trip		□	■	■	■
Buchholz alarm		□	■	■	■
Buchholz trip		□	■	■	■
Tripped on fault indication contact		■	■	■	■
Trip circuit fault alarm contact		□	■	■	■
Interposing trip/close		□	□	□	□
Trip/neutral/close switch		□	□	□	□
Local/remote switch		□	□	□	□
Motor ON/OFF switch		□	□	□	□
CB aux contact (4 N/O + 4 N/C) spare volt free		■	■	■	■
Remote tariff metering					
Tariff metering CTs wired out (1)		□	□	□	□

Key ■ Standard feature □ Optional feature

(1) Tariff metering CTs are fitted to the CB module. Ratio and class to be selected from a list of standard options given in section 3 of this document.

(2) Measurement available locally and via Modbus RS485 serial communication with PM810, PM820 or PM850 power meter option.

** Other manufacturers' relays are available on request.*

Summary tables
Cable feeders or incomers

Protection and control module type		Cable feeders and incomers						
		P1	P3	P4	P5	P6	P8	P9
Page no.		55	57	58	59	60	62	63
Application		General purpose feeder or incomer	Cable feeder with advanced monitoring and control	Unit protected cable feeder	Unit protected cable feeder with back up overcurrent	Unit protected Cable feeder with back up overcurrent and power measurements	Cable feeder or incomer with full measurement (suitable for automatic changeover)	Parallel cable feeder or incomer with directional OCEF
Environment								
Indoor		■	■	■	■	■	■	■
IP3X		■	■	■	■	■	■	■
Protection relays*								
Sepam (type)		S20	S60 / S80		S20	S60 / S80	S60 / S80	S62 / S82
Solkor RF or MBCI01				■	■	■		
Power meter								
PM810, PM820 or PM850 power meter		□		□	□			
Protection function	**ANSI**							
3 ph overcurrent	50/51	■	■		■	■	■	■
Earth fault	50N/51N	■	■		■	■	■	■
Negative sequence O/C	46	■			■			
Pilot wire differential	87F			■	■	■		
3 ph dir overcurrent	67							■
Directional earth fault	67N							■
Undervoltage	27					■	■	■
Measurement								
Phase current		■	■	□ (2) (3)	■	■	■	■
Max. demand current		■	■	□ (2)	■	■	■	■
Phase voltages		□ (2)		□ (2)	□ (2)	■	■	■
kW, kVA, cos φ, kVAR		□ (2)		□ (2)	□ (2)	■	■	■
kWh, kVARh		□ (2)		□ (2)	□ (2)	■	■	■
kWh pulsed output		□ (2)		□ (2)	□ (2)			
Tripping current		■	■	■	■	■	■	■
Monitoring and control								
Trip circuit supervision		□	■	□	□	■	■	■
Circuit breaker ready to close supervision		□	■		□	■	■	■
Lockout relay		□	■		□	■	■	■
Intertrip send		□	■		□	■	■	■
Intertrip receive		□	■		□	■	■	■
VT supervision						■	■	■
Remote emergency trip		□	■		□	■	■	■
Logic selectivity (block send)		■	■		■	■	■	■
Logic selectivity (block receive)		□	■		□	■	■	■
Current transducer (1 A/4-20 mA)		□	□	□	□	□	□	□
Modbus RS485 serial comms		□	□	□	□	□	□	□
Earth selector status (via Modbus)		□	□		□	□	□	□
Earth status (via Modbus)			□			□	□	□
Spring charge status (via Modbus)		□	□		□	□	□	□
Tripped on fault indication contact		■	■		■	■	■	■
Trip circuit fault alarm contact		□	■	□	□	■	■	■
Loss of voltage indication contact						■	■	
Interposing trip/close		□	□	□	□	□	□	□
Trip/neutral/close switch		□	□	□	□	□	□	□
Local/remote switch		□	□	□	□	□	□	□
Motor ON/OFF switch		□	□	□	□	□	□	□
CB aux contact (4 N/O + 4 N/C) spare volt free		■	■		■	■	■	■
Remote tariff metering								
Tariff metering CTs wired out (1)		□	□	□	□	□	□	□

Key ■ Standard feature □ Optional feature

(1) Tariff metering CTs are fitted to the CB module. Ratio and class to be selected from a list of standard options given in section 3 of this document.

(3) Yellow phase ammeter also available.

** Other manufacturers' relays are available on request.*

Summary tables
Embedded generation feeders and incomers

Protection and control module type		Embedded generation feeders and incomers				
		P12	P13	P14	P15	P16
Page no.		66	67	68	69	70
Application		Interconnection Breaker(G59 power export)	Interconnection Breaker (G59 no power export)	REC metering for embedded generation	Transformer incomer for LV generator	MV generator incomer
Environment						
Indoor		■	■	■	■	■
IP3X		■	■	■	■	■
Protection relays*						
Sepam (type)		S84	S84	S62 / S82	S82	G87
Protection function	**ANSI**					
3 ph overcurrent	50/51	■	■	■	■	■
Earth fault	50N/51N	■	■	■	■	
Standby earth fault	50G/51G					■
Voltage restrained O/C	50V/51V			■		■
3 phase directional O/C	67			■	■	
Negative sequence O/C	46	■	■			■
Undervoltage	27	■	■			■
Neutral voltage displacement	59N	■		■		
Reverse active power	32P	■	■			■
Reverse reactive power	32Q/40					■
Low forward power	37P					■
Over/under frequency	81	■	■			■
Loss of mains (dF/dt)	81R	■				
Generator differential	87G					■
Overvoltage	59	■	■			■
Measurement						
Phase current		■	■	■	■	■
Max. demand current		■	■	■	■	■
Phase voltages		■	■	■	■	■
kW, kVA, cos φ, kVAR		■	■	■	■	■
kWh, kVARh		■	■	■	■	■
Maximum demand active/reactive power		■	■	■	■	■
Tripping current		■	■	■	■	■
Monitoring and control						
Trip circuit supervision		■	■	■	■	■
Circuit breaker ready to close supervision		■	■	■	■	■
Lockout relay		■	■	■	■	■
Intertrip send		■	■	■	■	■
Intertrip receive		■	■	■	■	■
Check synchronising (MCS025)		□	□		□	□
Parallel operation timer (5 minutes)			■			
Generator breaker status monitoring			■		■	■
Earthing contactor status monitoring					■	■
Open/close neutral earthing point		■	■	■	■	■
VT supervision		■	■	■	■	■
Remote emergency trip						■
Enable/disable local earthing contact						■
Exciter trip output contact						■
Engine/turbine trip output contact						■
Excitation failure alarm						■
Diode failure alarm						■
Logic selectivity (block send/receive)		■	■	■	■	■
Current transducer (1 A/4-20 mA)		□	□	□	□	□
Modbus RS485 serial comms		□	□	□	□	□
Earth selector status (via Modbus)		□	□	□	□	□
CB spring charge status (via Modbus)		□	□	□	□	□
CB earth status (via Modbus)		□	□	□	□	□
Tripped on fault indication contact		■	■	■	■	■
Trip circuit fault indication contact		■	■	■	■	■
Interposing trip/close		■	■	■	■	■
Trip/neutral/close switch		□	□	□	□	□
Local/remote switch		□	□	□	□	□
Motor ON/OFF switch		□	□	□	□	□
CB aux contact (4 N/O + 4 N/C) spare volt free		■	■	■	■	■
Remote tariff metering						
Tariff metering CTs wired out (1)		□	□	□	□	□

Key ■ Standard feature □ Optional feature

(1) Tariff metering CTs are fitted to the CB module. Ratio and class to be selected from a list of standard options given in section 3 of this document.
** Other manufacturers' relays are available on request.*

Summary tables
Miscellaneous

Protection and control module type	Miscellaneous		
	P11	P17	P18
Page no.	65	71	72
Application	Control logic for 2 out of 3 changeover scheme (fitted to bus section)	Basic circuit breaker control no protection	Control logic for 1 out of 2 changeover scheme (fitted to incomers)
Environment			
Indoor	■	■	■
IP3X	■	■	■
Protection relays*			
Sepam (type)	S80		S80
Measurement			
Phase current	■	□ (2) (3)	■
Max. demand current	■	□ (2)	■
Phase voltages	■ Optional when VT fitted	□ (2)	■
kW, kVA, cos φ, kVAR	■ Optional when VT fitted	□ (2)	■
kWh, kVARh	■ Optional when VT fitted	□ (2)	■
Maximum demand active/reactive power	■ Optional when VT fitted	□ (2)	■
Tripping current	■		■
Monitoring and control			
Trip circuit supervision	■	□	■
Circuit breaker ready to close supervision	■		■
Lockout relay	■		■
2 out of 3 changeover logic	■		
1 out of 2 changeover			■
Current transducer (1 A/4-20 mA)	□	□	□
Modbus RS485 serial comms	□		□
Earth selector status (via Modbus)	□		□
CB spring charge status (via Modbus)	□		□
CB earth status (via Modbus)	□		□
Trip circuit fault indication contact	■	□	■
Interposing trip/close	□	□	□
Trip/neutral/close switch	□	□	□
Local/remote switch	□	□	□
Motor ON/OFF switch	□	□	□
CB aux contact (4 N/O + 4 N/C) spare volt free		■	■
Remote tariff metering			
Tariff metering CTs wired out (1)	□	□	□

Key ■ Standard feature □ Optional feature

(1) Tariff metering CTs are fitted to the CB module. Ratio and class to be selected from a list of standard options given in section 3 of this document.

(2) Measurement available locally and via Modbus RS485 serial communication with PM810, PM820 or PM850 power meter option.

(3) Yellow phase ammeter also available.

** Other manufacturers' relays are available on request.*

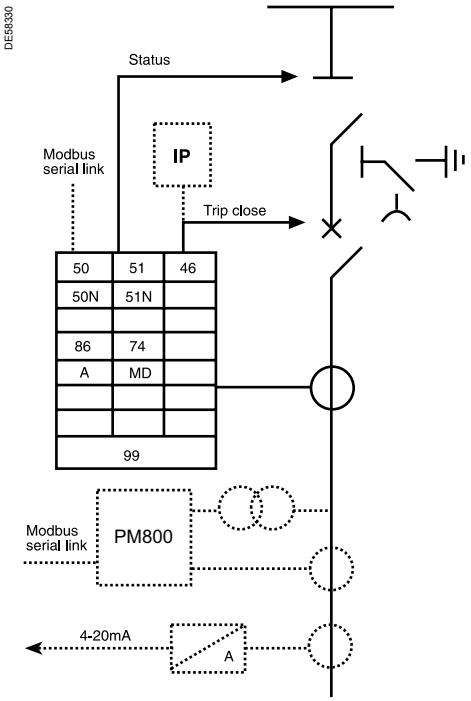
***Note:** there is a complete Functional Design Specification (FDS) available for each of the above detailed 18 protection and control modules. To receive a copy please contact your local Schneider Electric representative or local Schneider Electric office.*

Summary sheets P1

Application

This protection and control module is for use as a general purpose feeder or incomer where the protection requirements are overcurrent and earth fault.
Typical applications include:
- Cable feeder/incomer
- Transformer feeder/incomer
- Standby generator
- Back up protection for remote generator protection and control package
- Bus section protection.

Several standard options are available to ensure maximum flexibility and cost effectiveness in meeting the requirements of different systems.



Protection

Sepam S20/T20

50/51 overcurrent – IDMT, DT (4 settings)
50N/51N earth fault – IDMT, DT (4 settings)
46 negative sequence overcurrent
49 thermal overload (T20 only)

Instrumentation

Sepam S20/T20, LED display

Digital ammeters: I1, I2, I3
Record of tripping current: I1, I2, I3, I0
Maximum demand: I1, I2, I3
Unbalance ratio
Disturbance recorder

Control

Sepam S20/T20

Trip CB output
Tripped on fault indication contact
Logic selectivity block send

Optional features

Extra facilities on Sepam S20 - see page 51 for T20 functions

Input/output module:
CB status indication
Trip circuit supervision (74)
Intertrip send/receive
Remote emergency trip
Logic selectivity block receive
Circuit breaker ready to close
External protection trip
Local/remote control selection
Earth status
Lockout (86)
CB operating time
CB spring charging time
CB close control
CB close inhibit
Trip circuit fault alarm contact
Serial communication facility, RS485/Modbus/IEC 60870-103/Ethernet/DNP3/IEC61850

PM810, PM820 or PM850 digital power meter with Modbus communications providing*:

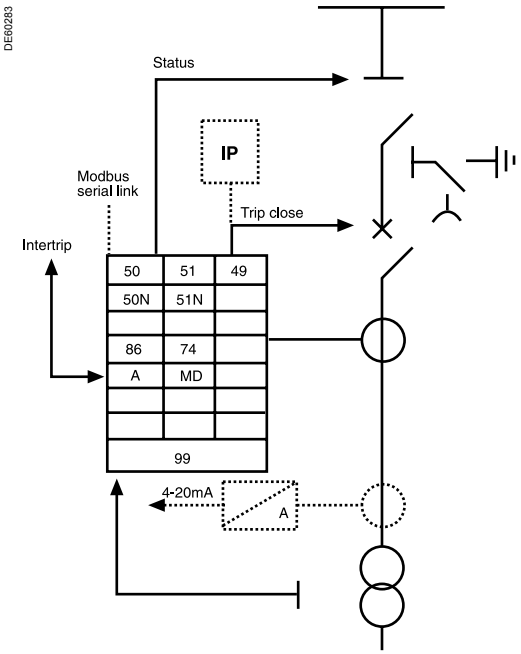
Current, voltage, frequency
Power, energy, power factor
THD voltage and current per phase
kWh pulse output
See PowerLogic selection guide for further information
Interposing trip/close relays
Current transducer 0-1 A, 0-10 V, 2-10 V, 0-5 V, +/-10 V, 0-1 mA, 0-20 mA, 4-20 mA
Trip/neutral/close switch
Local/remote selector switch
Spring charge motor on/off switch

** For integral metering within the protection device, consult Schneider Electric.*

Summary sheets
P2

Application

This protection and control module provides overcurrent, earth fault and thermal overload protection for transformer feeders above 2 MVA.
It also monitors the transformer winding temperature and Buchholz devices providing local and remote indication of operation.
Several standard options are available to ensure maximum flexibility and cost effectiveness in meeting the requirements of different systems.



Transformer feeder (>2MVA)

Protection

Sepam T60 / T81

- 50/51 overcurrent – IDMT, DT (8 settings)
- 50N/51N earth fault – IDMT, DT (8 settings)
- 49 thermal overload

Instrumentation

Sepam T81 LED display

- Digital ammeters: I1, I2, I3
- Record of tripping current: I1, I2, I3, I0
- Maximum demand: I1, I2, I3
- Thermal capacity used
- I^2 accumulated trip currents
- Disturbance recorder

Control

Sepam T81 LED display

- Trip/close CB control
- Trip circuit supervision (74)
- Circuit breaker ready to close
- External protection trip
- Remote emergency trip
- Intertrip send/receive
- CB close inhibit
- Lockout (86)
- Logic selectivity block send/receive
- Spring charge status
- Disconnector and earth status
- Local/remote control selection
- Winding temperature alarm/trip
- Buchholz alarm/trip

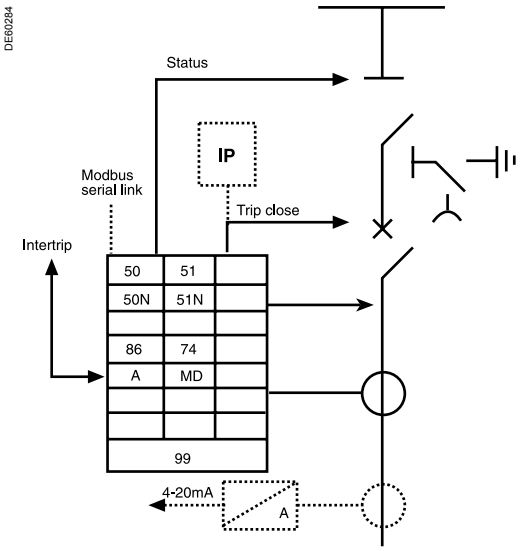
Optional features

- Serial Communication facility, RS485/Modbus/IEC 60870-103/Ethernet/DNP3/IEC61850 GOOSE Message
- Current transducer 0-1 A, 0-10 V, 2-10 V, 0-5 V, +/-10 V, 0-1 mA, 0-20 mA, 4-20 mA
- Interposing trip/close relays
- Trip/neutral/close switch
- Local/remote selector switch
- Spring charge motor on/off switch

Summary sheets
P3

Application

This protection and control module provides phase overcurrent, earth fault protection for distribution cable feeders.
It includes extensive circuit breaker monitoring and control features as standard and is ideally suited for integration into a supervisory system using its serial communication interface.
Several standard options are available to ensure maximum flexibility and cost effectiveness in meeting the requirements of different systems



Cable feeder with advanced monitoring and control

Protection
Sepam S60 / S80
50/51 overcurrent – IDMT, DT (8 settings)
50N/51N earth fault – IDMT, DT (8 settings)

Instrumentation
Sepam S80 LED display
Digital ammeters: I1, I2, I3
Record of tripping current: I1, I2, I3, I0
Maximum demand: I1, I2, I3
I^2 accumulated trip currents
Disturbance recorder

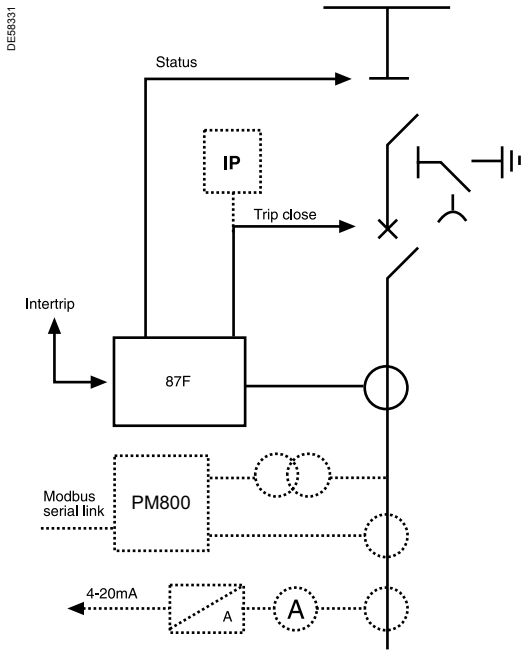
Control
Sepam S80
Trip/close CB control
Trip circuit supervision (74)
Circuit breaker ready to close
External protection trip
Remote emergency trip
Intertrip send/receive
CB close inhibit
Lockout (86)
Logic selectivity block send/receive
Spring charge status
Disconnector and earth status
Local/remote control selection

Optional features
Serial communication facility, RS485/Modbus/IEC 60870-103/Ethernet/DNP3/ IEC61850 GOOSE Message
Current transducer 0-1 A, 0-10 V, 2-10 V, 0-5 V, +/-10 V, 0-1 mA, 0-20 mA, 4-20 mA
Interposing trip/close relays
Trip/neutral/close switch
Local/remote selector switch
Spring charge motor on/off switch

Summary sheets P4

Application

This protection and control module provides a high speed differential protection in interconnected systems using pilot wires between each substation.
A choice of three of the most common relays is offered to allow matching of both ends of the feeder.
Several standard options are available to ensure maximum flexibility and cost effectiveness in meeting the requirements of different systems.



Unit protected cable feeder

Protection
87F pilot wire unit protection relay, choice of:
Solkor Rf
MBCI

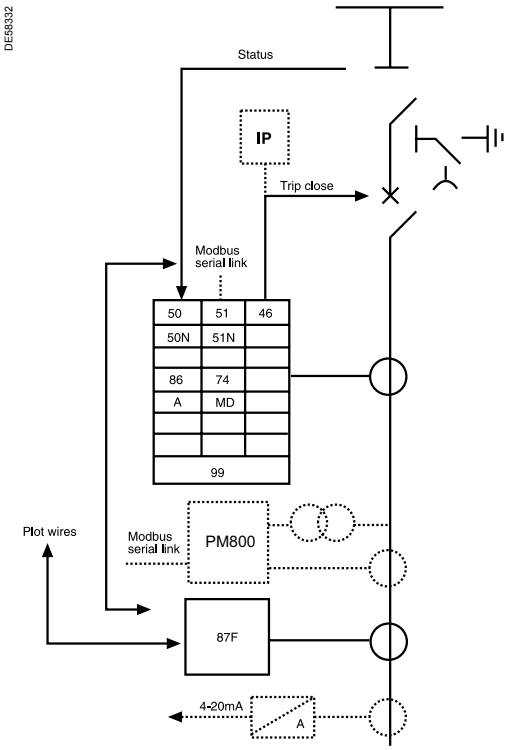
Control
Tripped on fault indication contact

Optional features
PM810, PM820 or PM850 digital power meter with Modbus communications providing:
Current, voltage, frequency
Power, energy, power factor
THD voltage and current per phase
kWh pulse output
Note: *see PowerLogic selection guide for further information*
MVAX31 trip circuit supervision relay
Ammeter
Current transducer 0-1 A, 0-10 V, 2-10 V, 0-5 V, +/-10 V, 0-1 mA, 0-20 mA, 4-20 mA
Interposing trip/close relays
Trip/neutral/close switch
Local/remote selector switch
Spring charge motor on/off switch

Summary sheets P5

Application

This protection and control module provides a high speed differential protection in interconnected systems using pilot wires between each substation with backup overcurrent and earth fault, (provided by a Sepam S20).
Several optional features are available to ensure maximum flexibility and cost effectiveness in meeting the requirements of different systems



Unit protected cable feeder with back up overcurrent and earth fault

Protection
Sepam S20 (99)
50/51 overcurrent – IDMT, DT (4 settings)
50N/51N earth fault – IDMT, DT (4 settings)
46 negative sequence overcurrent
87F pilot wire unit protection relay, choice of :
Solkor Rf
MBCI

Instrumentation
Sepam S20 LED display
Digital ammeters: I1, I2, I3
Record of tripping current: I1, I2, I3, I0
Maximum demand: I1, I2, I3
Unbalance ratio
Disturbance recorder

Control
Sepam S20 relay c/w
Trip CB output
Tripped on fault indication contact
Logic selectivity block send

Optional features
Extra features on Sepam S20
Input/output module to provide
CB status indication
Trip circuit supervision
Intertrip send/receive
Remote emergency trip
Logic selectivity block receive
Circuit breaker ready to close
External protection trip
Local/remote control selection
Earth switch status
Lockout (86)
CB operating time
CB spring charging time
CB close control
CB close inhibit
Trip circuit fault alarm contact
Serial communication facility, RS485/Modbus/IEC 60870-103/Ethernet/DNP3/IEC61850
PM810, PM820 or PM850 digital power meter with Modbus communications providing:
Current, voltage, frequency
Power, energy, power factor
THD voltage and current per phase
kWh pulse output
***Note:** see PowerLogic selection guide for further information*
Interposing trip/close relays
Trip/neutral/close switch
Local/remote selector switch
Spring charge motor on/off switch

** For integral metering within the protection device, consult Schneider Electric.*

Summary sheets P6

Application

This protection and control module is similar to P4 in that it provides a high speed differential protection in interconnected systems using pilot wires between each substation.
In addition to the differential protection, backup overcurrent and earth fault protection is provided by a Sepam S80. This includes extensive circuit breaker metering, monitoring and control features as standard and is ideally suited for integration into a supervisory system using its serial communication interface.
Several standard options are available to ensure maximum flexibility and cost effectiveness in meeting the requirements of different systems.

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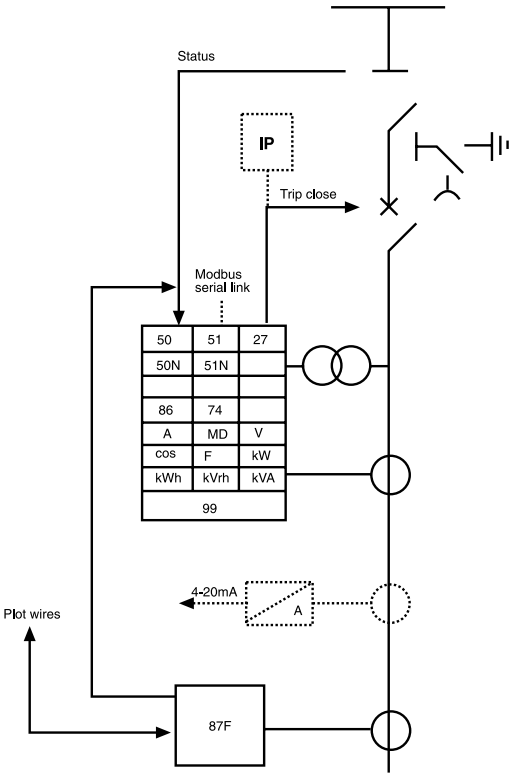


Unit protected cable feeder with back up overcurrent, earth fault and power measurements

Protection

Sepam S60 / S80

- 50/51 overcurrent – IDMT, DT (8 settings)
- 50N/51N earth fault – IDMT, DT (8 settings)
- 27 undervoltage

Pilot wire unit protection relay, choice of:

- Solkor Rf
- MBCI

Instrumentation

Sepam S80 LED display c/w

- Digital ammeters: I1, I2, I3
- Record of tripping current: I1, I2, I3, I0
- Maximum demand: I1, I2, I3
- Digital voltmeters: U21, U32, U13
- PFI, F, kWh (+/-), kVArh (+/-)
- MD and inst kW and kVAr
- I^2 accumulated trip currents
- Disturbance recorder

Control

Sepam S80

- Trip/close CB control
- Trip circuit supervision (74)
- Circuit breaker ready to close
- External protection trip
- Remote emergency trip
- Intertrip send/receive
- CB close inhibit
- Lockout (86)
- Logic selectivity block send/receive
- Spring charge status
- Disconnector and earth status
- Local/remote control selection

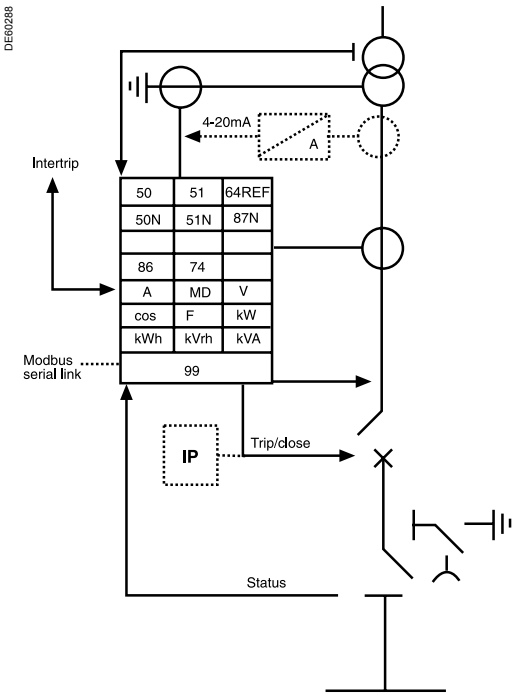
Optional features

- Serial communication facility, RS485/Modbus/IEC 60870-103/Ethernet/DNP3/ IEC61850 GOOSE Message
- Current transducer 0-1 A, 0-10 V, 2-10 V, 0-5 V, +/-10 V, 0-1 mA, 0-20 mA, 4-20 mA
- Interposing trip/close relays
- Trip/neutral/close switch
- Local/remote selector switch
- Spring charge motor on/off switch

Summary sheets P7

Application

This protection and control module provides a comprehensive protection package for switchboards with one transformer incomer or dual transformer incomers without directional overcurrent protection.
It also includes monitoring of the transformer winding temperature and Buchholz devices for local and remote indication of operation.
This includes extensive circuit breaker metering, monitoring and control features as standard and is ideally suited for integration into a supervisory system using its serial communication interface.
Several standard options are available to ensure maximum flexibility and cost effectiveness in meeting the requirements of different systems.



Single transformer incomer

Protection

Sepam T60 / T81

- 50/51 overcurrent – IDMT, DT (8 settings)
- 50N/51N earth fault – IDMT, DT (8 settings)
- 64REF thermal overload
- 87N restricted earth fault

Instrumentation

Sepam T81 LED display c/w

- Digital ammeters: I1, I2, I3
- Record of tripping current: I1, I2, I3, I0
- Maximum demand: I1, I2, I3
- Digital voltmeters: U21, U32, U13
- PFI, F, kWh (+/-), kVArh (+/-)
- MD and inst kW and kVAr
- I^2 accumulated trip currents
- Thermal capacity used
- Disturbance recorder

Control

Sepam T81

- Trip/close CB control
- Trip circuit supervision (74)
- Circuit breaker ready to close
- External protection trip
- Remote emergency trip
- Intertrip send/receive
- CB close inhibit
- Lockout (86)
- Logic selectivity block send/receive
- Spring charge status
- Disconnector and earth status
- Local/remote control selection
- Winding temperature alarm/trip
- Buchholz alarm/trip

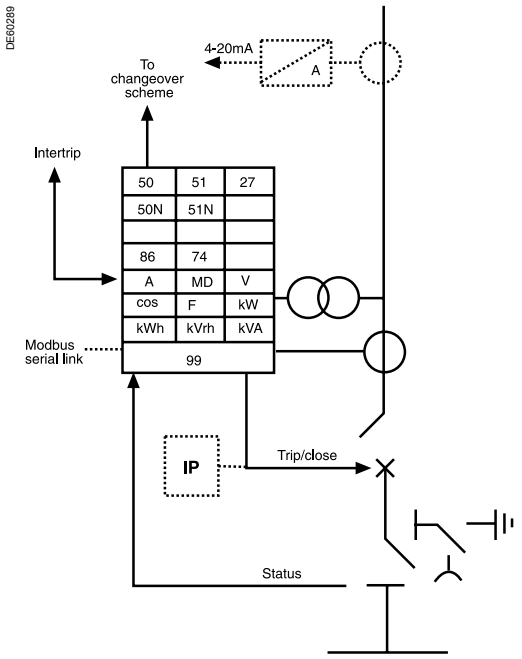
Optional features

- Serial communication facility, RS485/Modbus/IEC 60870-103/Ethernet/DNP3/ IEC61850 GOOSE Message
- Current transducer 0-1 A, 0-10 V, 2-10 V, 0-5 V, +/-10 V, 0-1 mA, 0-20 mA, 4-20 mA
- Interposing trip/close relays
- Trip/neutral/close switch
- Local/remote selector switch
- Spring charge motor on/off switch

Summary sheets
P8

Application

This protection and control module is for use as a cable feeder or incomer with overcurrent and earth fault protection.
It includes comprehensive instrumentation circuit monitoring and control as standard.
It's ideally suited for integration into a supervisory system using serial communication interface.
It can also be used as the incomer panels in the standard 2 out of 3 changeover scheme using P11 on the bus section or 1 out of 2 with P18 (no bus section).
Several standard options are available to ensure maximum flexibility and cost effectiveness in meeting the requirements of different systems.



Cable incomer/feeder with measurements

Protection

Sepam S80

- 50/51 overcurrent – IDMT, DT (4 settings)
- 50N/51N earth fault – IDMT, DT (4 settings)
- 27 undervoltage

Instrumentation

Sepam S80 LED display c/w

- Digital ammeters: I1, I2, I3
- Record of tripping current: I1, I2, I3, I0
- Maximum demand: I1, I2, I3
- Digital voltmeters: U21, U32, U13
- PFI, F, kWh (+/-), kVArh (+/-)
- MD and inst kW and kVAr
- I^2 accumulated trip currents
- Disturbance recorder

Control

Sepam S80

- Trip/close CB control
- Trip circuit supervision (74)
- Circuit breaker ready to close
- External protection trip
- Remote emergency trip
- Intertrip send/receive
- CB close inhibit
- Lockout (86)
- Logic selectivity block send/receive
- Spring charge status
- Disconnector and earth status
- Local/remote control selection
- Output contact (for interface in changeover schemes)

Optional features

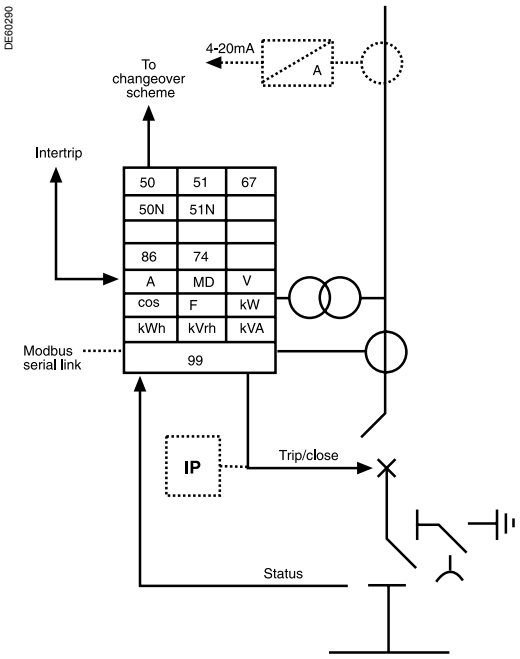
- Serial communication facility, RS485/Modbus/IEC 60870-103/Ethernet/DNP3/ IEC61850 GOOSE Message
- Current transducer 0-1 A, 0-10 V, 2-10 V, 0-5 V, +/-10 V, 0-1 mA, 0-20 mA, 4-20 mA
- Interposing trip/close relays
- Trip/neutral/close switch
- Local/remote selector switch
- Spring charge motor on/off switch

Note: *for feeder applications, the upper voltage function (if used) shows an upstream VT reference.*

Summary sheets
P9

Application

This protection and control module is for use on the incomer circuit breaker of a switchboard which has 2 cable incomers operating in parallel. It could also be applied on a feeder circuit breaker if directional protection is required.
It includes extensive metering, monitoring and control features as standard and is ideally suited for integration into a supervisory system using its serial communication interface.
Several standard options are available to ensure maximum flexibility and cost effectiveness in meeting the requirements of different systems.



Parallel cable incomer/feeder with directional protection

Protection

Sepam S62 / S82

- 50/51 overcurrent – IDMT, DT (4 settings)
- 50N/51N earth fault – IDMT, DT (4 settings)
- 67 directional overcurrent
- 67N directional earth fault

Instrumentation

Sepam S82 LED display c/w

- Digital ammeters: I1, I2, I3
- Record of tripping current: I1, I2, I3, I0
- Maximum demand: I1, I2, I3
- Digital voltmeters: U21, U32, U13
- PFI, F, kWh (+/-), kVArh (+/-)
- MD and inst kW and kVAr
- I^2 accumulated trip currents
- Disturbance recorder

Control

Sepam S82

- Trip/close CB control
- Trip circuit supervision (74)
- Circuit breaker ready to close
- External protection trip
- Remote emergency trip
- Intertrip send/receive
- CB close inhibit
- Lockout (86)
- Logic selectivity block send/receive
- Spring charge status
- Disconnector and earth status
- Local/remote control selection

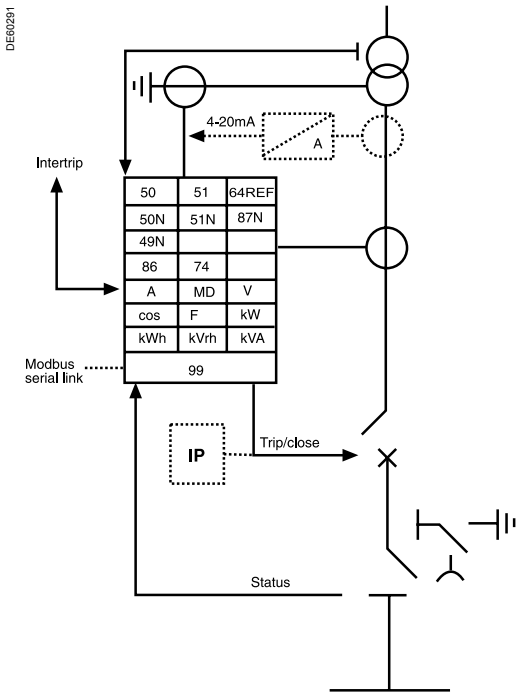
Optional features

- Serial communication facility, RS485/Modbus/IEC 60870-103/Ethernet/DNP3/ IEC61850 GOOSE Message
- Current transducer 0-1 A, 0-10 V, 2-10 V, 0-5 V, +/-10 V, 0-1 mA, 0-20 mA, 4-20 mA
- Interposing trip/close relays
- Trip/neutral/close switch
- Local/remote selector switch
- Spring charge motor on/off switch

Summary sheets
P10

Application

This protection and control module is for use on the incomer circuit breaker of a switchboard which has 2 transformer incomers operating in parallel.
It includes extensive metering, monitoring and control features as standard and is ideally suited for integration into a supervisory system using its Modbus serial interface.
It provides monitoring of the transformer winding temperature and Buchholz devices providing local and remote indication of operation.
Several standard options are available to ensure maximum flexibility and cost effectiveness in meeting the requirements of different systems.



Parallel transformer incomer

Protection

Sepam T62 / S82

- 50/51 overcurrent – IDMT, DT (4 settings)
- 50N/51N earth fault – IDMT, DT (4 settings)
- 67 directional overcurrent
- 64REF thermal overload
- 87N restricted earth fault*

Instrumentation

Sepam T82 LED display c/w

- Digital ammeters: I1, I2, I3
- Record of tripping current: I1, I2, I3, I0
- Maximum demand: I1, I2, I3
- Digital voltmeters: U21, U32, U13
- PFI, F, kWh (+/-), kVArh (+/-)
- MD and inst kW and kVAr
- I^2 accumulated trip currents
- Thermal capacity used
- Disturbance recorder

Control

Sepam T82

- Trip/close CB control
- Trip circuit supervision (74)
- Circuit breaker ready to close
- VT supervision
- External protection trip
- Remote emergency trip
- Intertrip send/receive
- CB close inhibit
- Lockout (86)
- Logic selectivity block send/receive
- Spring charge status
- Disconnector and earth status
- Local/remote control selection
- Buchholz alarm/trip

Optional features

- Serial communication facility, RS485/Modbus/IEC 60870-103/Ethernet/DNP3/ IEC61850 GOOSE Message
- Current transducer 0-1 A, 0-10 V, 2-10 V, 0-5 V, +/-10 V, 0-1 mA, 0-20 mA, 4-20 mA
- Interposing trip/close relays
- Trip/neutral/close switch
- Local/remote selector switch
- Spring charge motor on/off switch

** REFTX neutral CT supplied by others*

Summary sheets
P11

Application

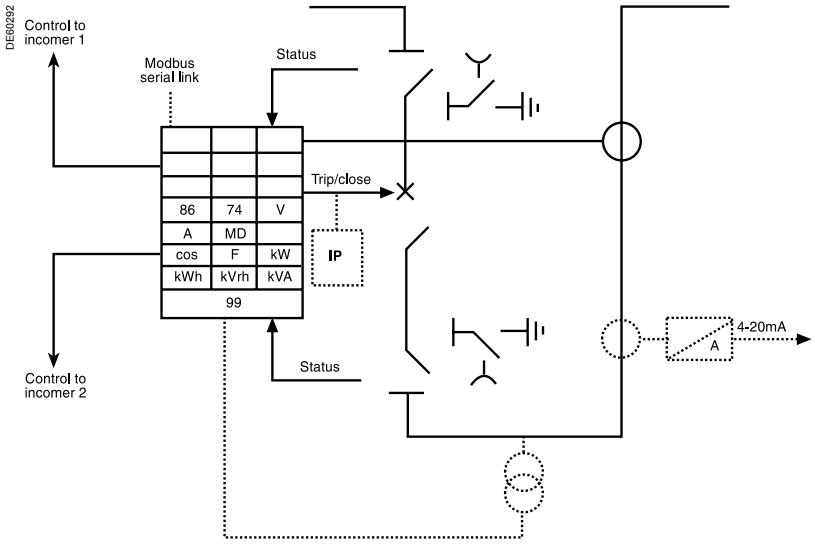
This module has no protection functions but includes the control logic for a 2 out of 3 changeover scheme and should be fitted to the bus section circuit breaker.
It has two different changeover schemes which are easily selectable within the Sepam. Both schemes are fully documented and tested therefore greatly reducing the overall delivery cycle.
It also provides comprehensive circuit breaker monitoring and the possibility of power measurements if a VT is fitted.
This module is intended for use in conjunction with 2 incoming circuit breakers equipped with P8.
Several standard options are available to ensure maximum flexibility and cost effectiveness in meeting the requirements of different systems.

Control logic for 2 out of 3 changeover scheme (fitted to bus section)

Instrumentation
Sepam S80 LED display c/w (99)
Digital ammeters: I1, I2, I3
Record of tripping current: I1, I2, I3, I0
Maximum demand: I1, I2, I3
Digital voltmeters: U21, U32, U13 (optional)
PFI, F, kWh (+/-), kVArh (+/-) (optional)
MD and inst kW and kVAr (optional)
I^2 accumulated trip currents
Disturbance recorder

Control
Sepam S80
Trip/close CB control
Trip circuit supervision (74)
Circuit breaker ready to close
CB close inhibit
Lockout (86)
Spring charge status
Disconnector and earth status
Local/remote control selection
2 out of 3 changeover logic
Changeover on/off selector switch

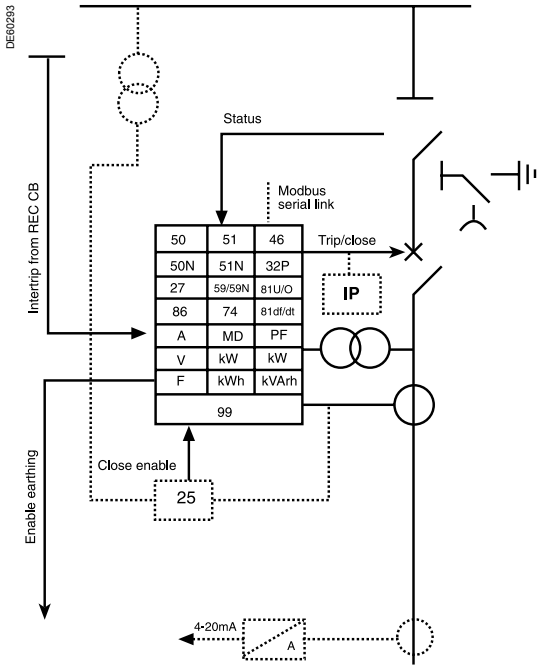
Optional features
Serial communication facility, RS485/Modbus/IEC 60870-103/Ethernet/DNP3/ IEC61850 GOOSE Message
Current transducer 0-1 A, 0-10 V, 2-10 V, 0-5 V, +/-10 V, 0-1 mA, 0-20 mA, 4-20 mA
Interposing trip/close relays
Trip/neutral/close switch
Local/remote selector switch
Spring charge motor on/off switch



Summary sheets P12

Application

This protection and control module is for use in embedded generator applications, where the generator operates in parallel with the utility supply. It satisfies the requirements of Engineering Recommendation G59/1 1991 for the point of interconnection between the generator and the utility network.
The main function is to ensure that the generators system is isolated from the public supply in the event of any abnormal operating conditions. Loss of mains protection is by a rate of change of frequency function, making the module suitable for applications where power is exported to the utility network.
It is intended for use in conjunction with metered incoming supply module P14 and generator modules P15 and P16.
Several standard options are available to ensure maximum flexibility and cost effectiveness in meeting the requirements of different systems.



G59/1 point of interconnection – power export

Protection

Sepam S84 (99)

- 50/51 overcurrent – IDMT, DT (4 settings)
- 50N/51N earth fault – IDMT, DT (4 settings)
- 46 negative sequence overcurrent
- 27 undervoltage
- 59 overvoltage
- 59N neutral voltage displacement
- 32P reverse real power
- 81O over frequency
- 81U under frequency
- 81df/dt loss of mains

Instrumentation

Sepam S84 LED display c/w

- Digital ammeters: I1, I2, I3
- Record of tripping current: I1, I2, I3, I0
- Maximum demand: I1, I2, I3
- Digital voltmeters: U21, U32, U13
- PFI, F, kWh (+/-), kVArh (+/-)
- MD and inst kW and kVAr
- I^2 accumulated trip currents
- Disturbance recorder

Control

Sepam S84

- Trip circuit supervision (74)
- Circuit breaker ready to close
- VT supervision
- External protection trip
- Remote emergency trip
- Intertrip send/receive
- CB close inhibit
- Lockout (86)
- Logic selectivity block send/receive
- Check synch close inhibit
- Disconnector and earth status
- Spring charge status
- Local/remote control selection
- Circuit breaker 52b contact for earthing connection interlocking

Optional features

- MCS025 module for synchronising check (25)
- Serial communication facility, RS485/Modbus/IEC 60870-103/Ethernet/DNP3/ IEC61850 GOOSE Message
- Current transducer 0-1 A, 0-10 V, 2-10 V, 0-5 V, +/-10 V, 0-1 mA, 0-20 mA, 4-20 mA
- Interposing trip/close relays
- Trip/neutral/close switch
- Local/remote selector switch
- Spring charge motor on/off switch

It is recommended that the FDS is read in conjunction with this page in order to review the control inputs and outputs available.

Summary sheets P13

Application

This protection and control module is for use in embedded generator applications, where the generator operates in parallel with the utility supply.

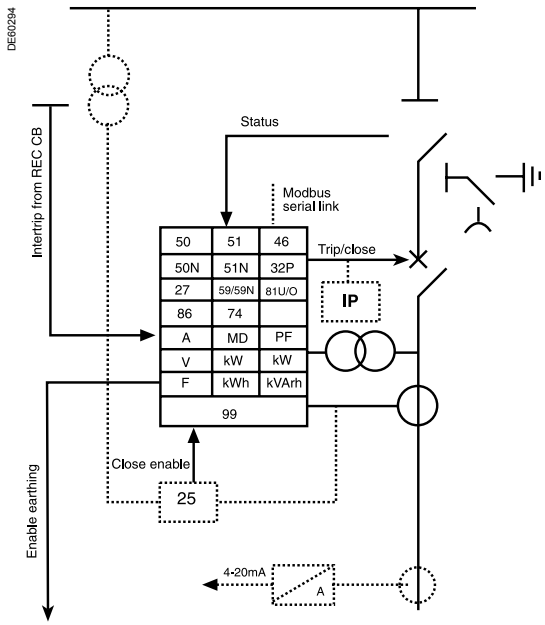
It satisfies the requirements of Engineering Recommendation G59/1 1991 for the point of interconnection between the generator and the utility network.

The main function is to ensure that the generators system is isolated from the public supply in the event of any abnormal operating conditions.

The module is designed for applications where there is no power exported to the utility.

It is intended for use in conjunction with metered incoming supply module P14 and generator modules P15 and P16.

Several standard options are available to ensure maximum flexibility and cost effectiveness in meeting the requirements of different systems.



G59/1 point of interconnection – no power export

Protection

Sepam S84

- 50/51 overcurrent – IDMT, DT (4 settings)
- 50N/51N earth fault – IDMT, DT (4 settings)
- 46 negative sequence overcurrent
- 27 undervoltage
- 59 overvoltage
- 32P reverse real power
- 81O over frequency
- 81U under frequency

Instrumentation

Sepam S81 LED display c/w

- Digital ammeters: I1, I2, I3
- Record of tripping current: I1, I2, I3, I0
- Maximum demand: I1, I2, I3
- Digital voltmeters: U21, U32, U13
- PFI, F, kWh (+/-), kVArh (+/-)
- MD and inst kW and kVAr
- I^2 accumulated trip currents
- Disturbance recorder

Control

Sepam S81

- Trip/close CB control
- Trip circuit supervision
- Circuit breaker ready to close
- VT supervision
- External protection trip
- Remote emergency trip
- Intertrip send/receive
- CB close inhibit
- Lockout (86)
- Logic selectivity block send/receive
- Spring charge status
- Disconnector and earth status
- Local/remote control selection
- Check synch close inhibit
- Parallel limit timer
- Earthing connection interlocking
- Circuit breaker 52b contact for earthing connection interlocking
- Limit timer in/out control switch
- Trip/neutral/close switch

Optional features

- MCS025 module for synchronising check (25)
- Serial communication facility, RS485/Modbus
- Current transducer 0-1 A, 0-10 V, 2-10 V, 0-5 V, +/-10 V, 0-1 mA, 0-20 mA, 4-20 mA
- Interposing trip/close relays
- Local/remote selector switch
- Spring charge motor on/off switch

It is recommended that the FDS is read in conjunction with this page in order to review the control inputs and outputs available

Summary sheets P14

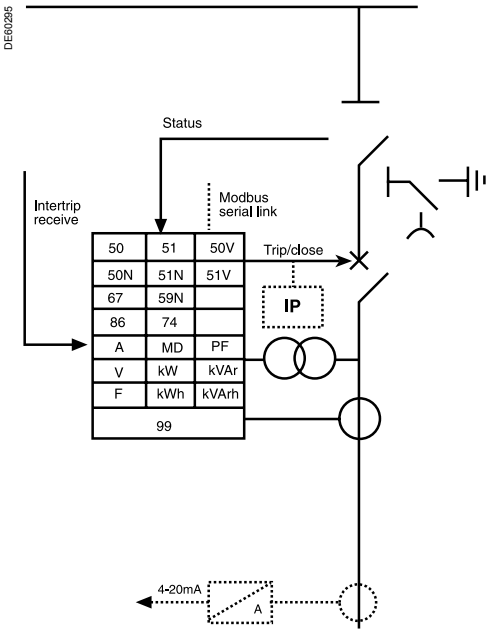
Application

This protection and control module is for use in embedded generation schemes and fulfils the requirements of the utility metering breaker.

The protection package includes overcurrent, earth fault and neutral voltage displacement.

It provides a backup protection function to the main internal breaker having the G59 protection package.

Several standard options are available to ensure maximum flexibility and cost effectiveness in meeting the requirements of different systems.



Utility metering circuit breaker

Protection

Sepam S62 / S82

- 50/51 overcurrent – IDMT, DT (4 settings)
- 50N/51N earth fault – IDMT, DT (4 settings)
- 67 directional overcurrent
- 50V/51V voltage restrained overcurrent
- 59N neutral voltage displacement

Instrumentation

Sepam S62 / S82 LED display c/w

- Digital ammeters: I1, I2, I3
- Record of tripping current: I1, I2, I3, I0
- Maximum demand: I1, I2, I3
- Digital voltmeters: U21, U32, U13
- PFI, F, kWh (+/-), kVArh (+/-)
- MD and inst kW and kVAr
- I^2 accumulated trip currents
- Disturbance recorder

Control

Sepam S62 / S82

- Trip/close CB control
- Trip circuit supervision (74)
- Circuit breaker ready to close
- VT supervision
- External protection trip
- Remote emergency trip
- Intertrip send/receive
- CB close inhibit
- Lockout (86)
- Logic selectivity block send/receive
- Spring charge status
- Disconnector and earth status
- Local/remote control selection

Optional features

- Serial communication facility, RS485/Modbus/IEC 60870-103/Ethernet/DNP3/ IEC61850 GOOSE Message
- Current transducer 0-1 A, 0-10 V, 2-10 V, 0-5 V, +/-10 V, 0-1 mA, 0-20 mA, 4-20 mA
- Interposing trip/close relays
- Trip/neutral/close switch
- Local/remote selector switch
- Spring charge motor on/off switch

Summary sheets P15

Application

This protection and control module is intended for embedded generator applications, in which an LV generator is connected to the MV distribution network via an LV/MV step up transformer for parallel operation with a utility supply.
It is intended for use with metered incoming supply module P14 and point of interconnection modules P12 and P13.
Several standard options are available to ensure maximum flexibility and cost effectiveness in meeting the requirements of different systems.

Transformer incomer for connection of LV embedded generator

Protection

Sepam S82 (99)

- 50/51 overcurrent – IDMT, DT (4 settings)
- 50N/51N earth fault – IDMT, DT (4 settings)
- 67 directional overcurrent
- 59N neutral voltage displacement

Instrumentation

Sepam S82 LED display c/w

- Digital ammeters: I1, I2, I3
- Record of tripping current: I1, I2, I3, I0
- Maximum demand: I1, I2, I3
- Digital voltmeters: U21, U32, U13
- PFI, F, kWh (+/-), kVArh (+/-)
- MD and inst kW and kVAr
- I^2 accumulated trip currents
- Disturbance recorder

Control

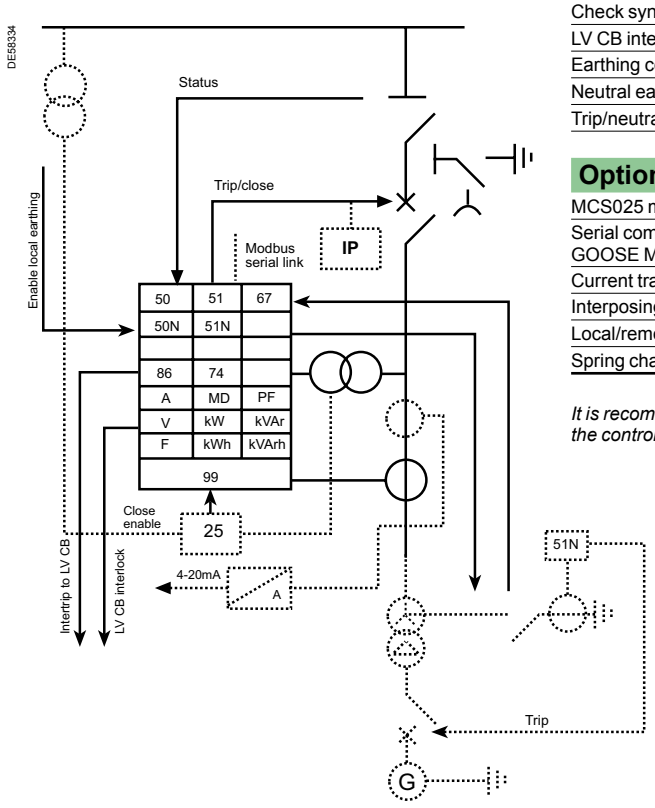
Sepam S82

- Trip/close CB control
- Trip circuit supervision (74)
- Circuit breaker ready to close
- VT supervision
- External protection trip
- Remote emergency trip
- Intertrip send/receive
- CB close inhibit
- Lockout (86)
- Logic selectivity block send/receive
- Spring charge status
- Disconnector and earth status
- Local/remote control selection
- Check synch close inhibit
- LV CB interlocking
- Earthing connection interlocking
- Neutral earth point control
- Trip/neutral/close switch

Optional features

- MCS025 module for synchronising check (25)
- Serial communication facility, RS485/Modbus/IEC 60870-103/Ethernet/DNP3/ IEC61850 GOOSE Message
- Current transducer 0-1 A, 0-10 V, 2-10 V, 0-5 V, +/-10 V, 0-1 mA, 0-20 mA, 4-20 mA
- Interposing trip/close relays
- Local/remote selector switch
- Spring charge motor on/off switch

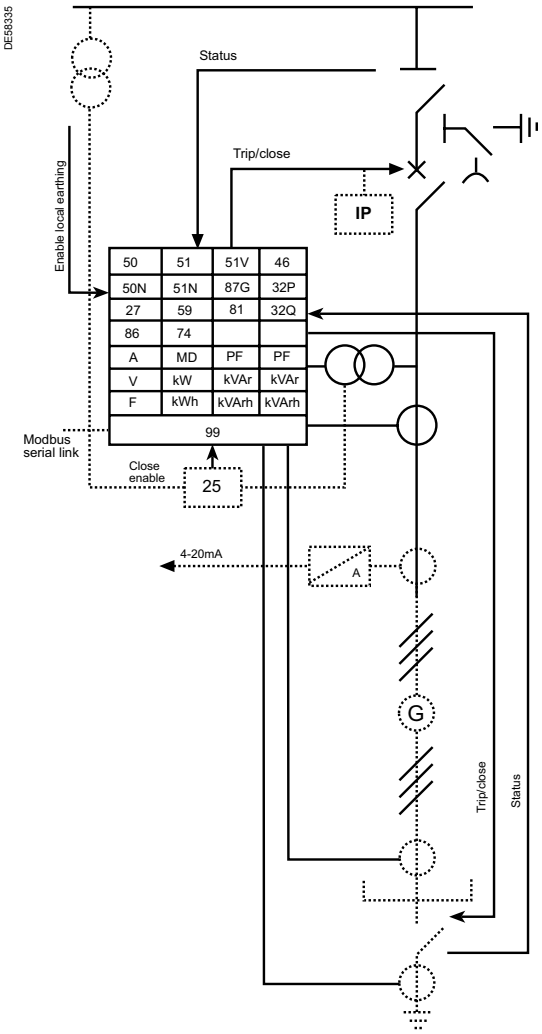
It is recommended that the FDS is read in conjunction with this page in order to review the control inputs and outputs available.



Summary sheets
P16

Application

This protection and control module is for use with Medium Voltage (MV) generators directly connected to a MV system.
Full differential protection is provided, ensuring fast, discriminative clearance of faults within the generator. It is therefore suitable for use regardless of whether the generator operates in island mode or in parallel with a utility supply.
It is intended for use in conjunction with metered incoming supply module P14 and point of interconnection modules P12 or P13.
Several standard options are available to ensure maximum flexibility and cost effectiveness in meeting the requirements of different systems.



MV generator incomer

Protection

Sepam G87 (99)

- 50/51 overcurrent – IDMT, DT (4 settings)
- 50G/51G earth fault – IDMT, DT (4 settings)
- 50V/51V voltage restrained overcurrent
- 46 negative sequence overcurrent (2 settings)
- 27 undervoltage (2 settings)
- 59 overvoltage (2 settings)
- 32P reverse real power
- 32Q reverse reactive power
- 81O over frequency (2 settings)
- 81U under frequency (2 settings)
- 59N neutral voltage displacement
- 87G generator differential

Instrumentation

Sepam G87 LED display c/w

- Digital ammeters: I1, I2, I3
- Record of tripping current: I1, I2, I3, I0
- Maximum demand: I1, I2, I3
- Digital voltmeters: U21, U32, U13
- PFI, F, kWh (+/-), kVArh (+/-)
- MD and inst kW and kVAr
- I^2 accumulated trip currents
- Disturbance recorder

Control

Sepam G87

- Trip/close CB control
- Trip circuit supervision (74)
- Circuit breaker ready to close
- External protection trip
- Intertrip receive
- CB close inhibit
- Lockout (86)
- Logic selectivity block send/receive
- Spring charge status
- Disconnector and earth status
- Local/remote control selection
- Check synch close inhibit
- Earthing contactor interlocking and monitoring
- Exciter control alarm monitoring
- Leading VAR limiter alarm monitoring
- Diode failure alarm monitoring
- Engine/turbine trip output

Optional features

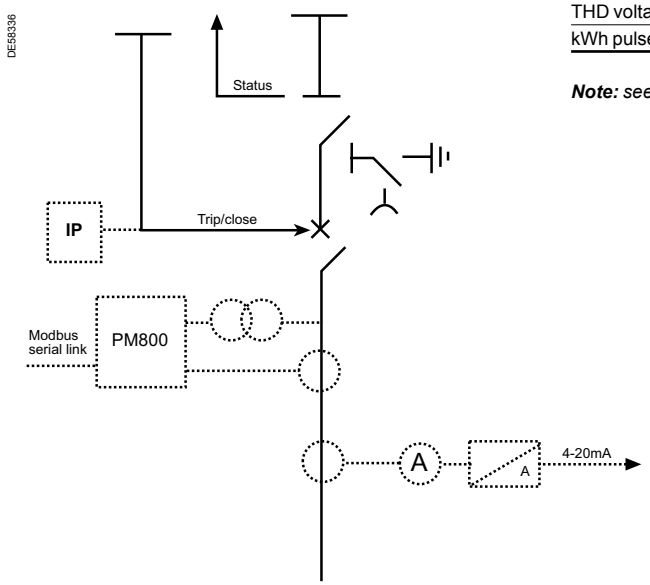
- MCS025 module for synchronising check (25)
- Serial communication facility, RS485/Modbus/IEC 60870-103/Ethernet/DNP3
- Current transducer 0-1 A, 0-10 V, 2-10 V, 0-5 V, +/-10 V, 0-1 mA, 0-20 mA, 4-20 mA
- Interposing trip/close relays
- Trip/neutral/close switch
- Local/remote selector switch
- Spring charge motor on/off switch

It is recommended that the FDS is read in conjunction with this page in order to review the control inputs and outputs available.

Summary sheets
P17

Application

This protection and control module is for use on a circuit breaker with control but no protection, such as a bus section.
Several standard options are available to ensure maximum flexibility and cost effectiveness in meeting the requirements of different customers.



Basic circuit breaker control no protection

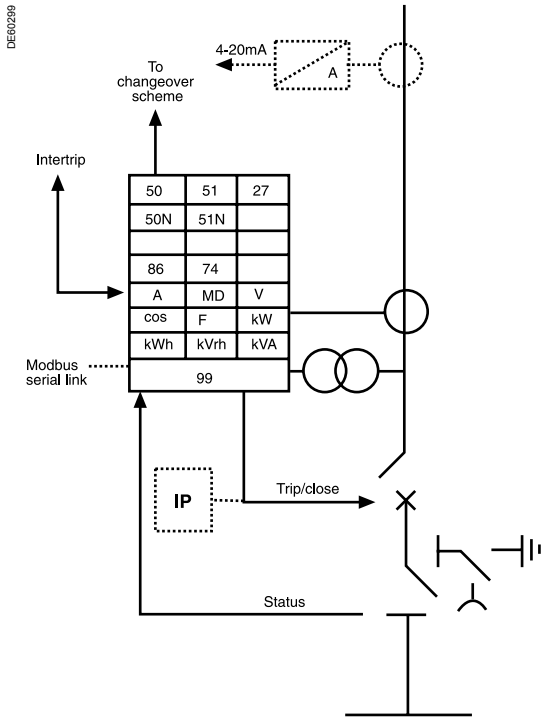
Optional features
MVAX31 trip circuit supervision relay
Ammeter
Current transducer 1 A, 4…20 mA, 0…20 mA, 0…10 mA, 0…10 V
Interposing trip/close relays
Trip/neutral/close switch
Local/remote selector switch
Spring charge motor on/off switch
PM810, PM820 or PM850 digital power meter with Modbus communications providing:
Current, voltage, frequency
Power, energy, power factor
THD voltage and current per phase
kWh pulse output

Note: *see powerLogic selection guide for further information*

Summary sheets
P18

Application

This protection and control module is for use as a cable incomer with undervoltage and overcurrent and earth fault protection.
It has 1 out of 2 changeover source intended for use in conjunction with another incoming circuit breaker equipped with P18.
Several standard options are available to ensure maximum flexibility and cost effectiveness in meeting the requirements of different systems.



Control logic for 1 out of 2 changeover scheme

Protection

Sepam S80 (99)

- 50/51 overcurrent – IDMT, DT (4 settings)
- 50N/51N earth fault – IDMT, DT (4 settings)
- 27 undervoltage

Instrumentation

Sepam S80 LED display c/w

- Digital ammeters: I1, I2, I3
- Record of tripping current: I1, I2, I3, I0
- Maximum demand: I1, I2, I3
- Digital voltmeters: U21, U32, U13
- PFI, F, kWh (+/-), kVArh (+/-)
- MD and inst kW and kVAr
- I^2 accumulated trip currents
- Disturbance recorder

Control

Sepam S80

- Trip/close CB control
- Trip circuit supervision (74)
- Circuit breaker ready to close
- External protection trip
- Remote emergency trip
- Intertrip send/receive
- CB close inhibit
- Lockout (86)
- Logic selectivity block send/receive
- Spring charge status
- Disconnector and earth status
- Local/remote control selection
- Output contact (for interface in 1 out of 2 changeover logic)
  Changeover on/off selector switch

Optional features

- Serial communication facility, RS485/Modbus/IEC 60870-103/Ethernet/DNP3
- Current transducer 0-1 A, 0-10 V, 2-10 V, 0-5 V, +/-10 V, 0-1 mA, 0-20 mA, 4-20 mA
- Interposing trip/close relays
- Trip/neutral/close switch
- Local/remote selector switch
- Spring charge motor on/off switch

Panorama

PE60188

PE57022

PE60190

PE57023

The LV cabinet contains all the protection functions and the terminals for user connection of controls and indications. The cabinet utilises a standard harness, which has the protection and/or control kits added to meet customer requirements. If required, units can be supplied with the LV cabinet removed to allow installation in areas where access is restrictive. The cabinet can then be easily fitted after installation.

Sepam Series 20 is used in applications requiring overcurrent and earth fault protection, current measurements and basic control and monitoring (e.g. cable or transformer feeder).

Sepam Series 20 key features are:

- Comprehensive graphic display
- Easy to use function keys
- Alarm and trip indication via LED
- Instrumentation
- 10 logic inputs, 8 relay outputs
- Modular construction
- Serial communication facility available
(RS485/Modbus/IEC 60870-103/Ethernet/DNP3)
- Fault recorder.

Sepam Series 80 is used for applications requiring more comprehensive protection schemes and additional control functionality (e.g. G59 Interconnectors for embedded generation). Sepam is configured according to the functionality required.
A set of standard software modules for protection, instrumentation and control logic are combined to develop a specific application. This programme is transferred to a programmable cartridge that “plugs in” to the unit.

Sepam Series 60 / 80 features are:

- Comprehensive graphic display
- Optional mimic LCD
- Full instrumentation capability (I, V, kW, kVA, kWh, kVARh)
- Pre-defined control logic schemes (e.g. 2 out of 3 autochangeover)
- Alarm annunciation (Buchholz, temperature)
- Serial communication facility available
(RS485/Modbus/IEC 60870-103/Ethernet/DNP3/ IEC61850 GOOSE Message)
- Disturbance fault recorder
- SFT 2885 Logipam software (Sepam series 80 Only)
- Up to 28 logic inputs, 16 relay outputs for Series 60
- Up to 42 logic inputs, 23 relay outputs for Series 80.

Note: *in the event of an application where another manufacturer’s relays are required, please contact Schneider Electric.*

Panorama

PE60192

PE60193

The Translay S differential relay in this application is for the protection of underground feeders.
The majority of plain feeders can be protected using this arrangement which features a unit protection scheme with no time or current grading problems, even on ring circuits.

MBCI features are:
- High stability for through faults
- High speed operation for in zone faults
- Low earth fault settings
- Can be used as definite time overcurrent relay in the event of pilot failure.

This feeder protection is based on the Merz-Price circulating current system.
The majority of plain feeders can be protected using this arrangement which features a unit protection scheme with no time or current grading problems, even on ring circuits.

The MVAX31 relay supervises the trip circuit of the GenieEvo circuit breakers, initiating alarm contacts and visual indication if the trip circuit or mechanism fails. It gives supervision with the circuit breaker in either state, open or closed.

MVAX31 features are:
- Low burden
- Trip circuit can be supervised with breaker open or closed
- Mis-tripping of breaker by accidental short circuits avoided
- No false alarms given due to protection operation.

The MCS025 measures phase angle difference and slip frequency and blocks for differential voltage above setting.
The relay provides an electrical interlock, which prevents manual electrical closing of the circuit breaker when the supplies to be paralleled are outside set limits.
When the optional check synchronism module is fitted the output is monitored by the Sepam relay, which inhibits electrical closing.

MCS025 features are:
- Wide range of phase angle setting adjustments
- Wide range of slip frequency timer settings
- Zero to infinity settings available on timer
- Live line/dead bus and dead line/live bus can be independently selected.

Panorama

PE57027

Power Meter is a high performance low cost communicating meter. There are three different models in the PM800 range (refer to the PowerLogic selection guide for specific details).

Power Meter features are:

- Comprehensive measurements (I, V, kW, kVA, kWh, kVARh)
- Power quality data (total harmonic distortion)
- Load consumption monitoring via RS485 Modbus serial communications
- Easy integration in the PowerLogic software
- KWh pulsed output.

PE60195

Analogue ammeter

Metric 72 mm, short scale (90 degrees) moving iron ammeter. This is connected via a 1 A Instrument current transformer in the yellow phase (I2) to give an accurate reading of the line current. The instrument will be scaled to suit the load requirements.

PE60196

Current transducer

This is connected via a 1 A Instrument current transformer in the yellow phase (I2) to give an accurate reading of the line current. The instrument will be scaled to suit the load requirements.
There is a choice of outputs, which should be specified at order placement.

The choice is:

- 0…1 mA, 0…20 mA and 4…20 mA
- 0…10 V, 2…10 V, 0…5 V and 1…5 V.

PE60197

Each Sepam may be linked to the network communication cable via a ACE 949 connection box mounted inside the protection and control module.
The connection box is used to tap on the communications cable.

Features are:

- ACE949 for Modbus RTU
- ACE949 for the DNP3/IEC103/Modbus RTU
- ECI850 for IEC 61850
- ACE850 for IEC 61850 GOOSE Message RSTP redundancy / Modbus TCP/ IP

Panorama

PE60220

These terminals are specifically designed to satisfy all the secondary injection and test requirements for the CT and VT circuits. The terminals have the facility to allow shorting of current before opening the secondary circuits to begin testing of the protection and monitoring equipment.

PE57031

Miniature circuit breakers are used in the protection and control auxiliary circuits. They are connected in the live and neutral, or positive and negative sides to ensure complete circuit isolation. The opening lever of the MCBs ensure both live and neutral, or positive and negative circuits are switched at the same time.

Use of MCBs provides the following benefits:

- 10,000 breaking capabilities
- Positive indication of the main contacts by the toggle handle
- No need to carry replacement parts
- Ability to padlock in off position
- Ability to fit auxiliary switch (used for supervision of VT with Sepam).

PE60222

Fuses and links are used in the protection and control auxiliary circuits when the control voltage is below 48 volts. They are connected in the live and neutral, or positive and negative sides to ensure complete circuit isolation.
Fuse holders allow for easy removal and take industry standard 6.35 mm x 32 mm (1/4 x 1 1/4 inch) fuses.

PE60223

All panels are fitted with an LV pilot wire termination box to allow connection of remote indication/control and power supplies. It is directly mounted behind the protection and control module and allows connection of pilot wires from above the switchboard or from a rear cable trench. Areva Prima relays are used as interposing relays. The interposing relays are an optional kit which can be chosen when the customer requires their remote control circuit to be isolated from the control circuit in the LV cabinet.

The interposing relays are available in:

- 24 Vdc
- 30 Vdc
- 48 Vdc
- 110 Vdc.

Solkor RF is a development of the well proven Solkor-R protection relay which offers improved performance and is suitable for an increased range of pilot wire.
The majority of plain feeders can be protected using this arrangement which features a unit protection scheme with no time or current grading problems, even on ring circuits.

Solkor RF features are:

- High transient stability
- High speed operation for in zone faults
- Low phase and earth fault settings
- Bleed off up to 20% of CT primary ratings.

Vamp arc flash protection
Vamp arc flash range

The arc protection unit detects an arc flash in an installation and trips the feeding breaker.

An arc flash protection system maximises personnel safety and minimises material damage caused by arc faults.

Arc flash protection maximises personnel safety and minimises material damage to the installation in the most hazardous power system fault situations. Minimised damage also means limited need for repair work and enables rapid restoration of the power supply.

Vamp advantages

Personnel Safety
A fast and reliable arc protection unit may save human lives in the event of an arc fault occurring in switchgear during work in or near the installation.

Reduces production losses
The shorter the operating time of the arc fl ash protection unit, the smaller will be the damage caused by the arc fault and the shorter the possible power outage.

Extended switchgear life cycle
A modern arc protection unit increases the life-cycle expectancy of switchgear installations, so that decisions to invest in new switchgear installations can be postponed and money can be saved by re-Vamping existing switchgear systems.

Reduced insurance costs
The faster and better the protection system of a power installation, the more generous will be the insurance terms and costs.

Low investment costs and fast installation
A comprehensive arc protection system is characterised by low investment costs and fast installation and commissioning times. One successful operation of the arc flash protection units provides an immediate investment payoff.

Reliable Operation
Operation is based on the appearance of light or alternatively on the appearance of light and current from an external device. Immune to nuisance trippings due to dual tripping criteria; light & current.

PE58216

Vamp 221

PE58215

Input/Output units

Vamp arc flash protection
Selection guide

Vamp 120


PE58217

System features

- Operation on light only (I > criteria can be supplied from another device)
- Integrated 19–256 Vac/dc aux. supply
- Optimised for wind power and other small applications
- Supports point and/or smoke sensors
- Up to 4 sensors
- Selective trip for 2 zones and possibility of generator set emergency trip (separate contact)
- Operation time 7 ms (including the output relay)
- Non-volatile trip status.

Sensors

Point sensor (surface)


PE103185

- Arc detection from two compartments simultaneously
- Self-monitored
- Cable length adjustable from 6 m or 20 m down.

Point sensor (pipe)


PE103186

- Self-monitored
- Cable length adjustable from 6 m or 20 m down.

Portable sensor


PE103187

Loop sensor (Fibre)


PE103188

Options

Please check in the Vamp catalogue for reference number

Vamp 121


PE58218

System features

- Operation on light only
- Supports point and/or smoke sensors
- Up to 10 sensors
- Typically trips the incoming feeder
- Straightforward installation
- Operation time 9 ms (including the output relay)
- Cost-effective solution
- Self-supervision.

Sensors

- Snap-in connection to I/O unit
- Enhanced work safety.

Options

Please check in the Vamp catalogue for reference number

Vamp 221 (+ I/O units)


PE58216

System features

- Current and light tripping criteria (possibility of tripping by light only)
- Operating time 7 ms or less (electromechanical contact)
- Accurate location of arc fault utilising point sensors
- Four selective protection zones per central unit
- Self-supervision of the entire system
- Easy interconnect using VX001 cables
- Phase current measuring
- Earth fault current measuring
- Personal protector option
- Panel or rail mount I/O units
- Circuit breaker fail protection (CBFP).

Sensors

- Monitors various compartments
- Small bending radius for easy installation.

Options

Please check in the Vamp catalogue for reference number

I/O units

	VAM 3L	VAM 10L/LD	VAM 12L/LD	VAM 4C/CD
	 PE103189	 PE103190	 PE103191	 PE103192
Communication port for central unit (Vamp 221) and I/O unit	2	2	2	2
Point sensor (surface or pipe)		10	10	
Loop sensor (Fibre)	3			
Portable sensor	1	1	1	
Protection zone supported	1	1	4	4
Current inputs				3
Trip contact	1	1	3	1

Accessories
Contents

A number of accessories are available to enhance the basic panel specifications.

These are detailed in the following section.
■ Accessories are dispatched either as:
□ Factory fitted items. These are accessories that are either too bulky to despatch loose or require testing prior to despatch: i.e. GDV-F127 - Top entry cable box
□ Loose, boxed, for assembly on site. These items are those that need to be supplied loose to ease installation:
i.e. GDV-A123, which is a gland plate, or test equipment such as GDV-A145 – foundation fixing kit.

Summary tables **82**

Panorama **86**

Earthing scheme **89**

Summary tables

Circuit breaker ancillaries	Circuit breaker VC2	VC6	VC12	Bus sections VB6	VB12	Misc BECB	Kit No
Cable Kits							
1 x 3 core gland plate	□	□	□			□	GDV-F128
3 x 1 core gland plate	□	□	□			□	GDV-F119
2 x 3 core large gland plate	□	□	□			□	GDV-F116
6 x 1 core gland plate	□	□	□			□	GDV-F115
Blank metal gland plate	□	□	□			□	GDV-F121
1 x 3 core CES5 gland plate	□	□	□			□	GDV-F120
2 x 3 core CES5 gland plate	□	□	□			□	GDV-F117
1 x 3, 2 x 3 core (large T1) up to 300 mm^2 brass wiping gland	□	□	□			□	GDV-A125
3 x 1, 6 x 1 core (small T1) up to 630 mm^2 brass wiping gland	□	□	□			□	GDV-A123
1 x 3, 2 x 3 core (large) up to 300 mm^2 tubular gland	□	□	□			□	GDV-A124
3 x 1, 6 x 1 core (small) up to 630 mm^2 tubular gland	□	□	□			□	GDV-A122
1 x 3, 2 x 3 core CES5 gland	□	□	□			□	GDV-A126
3 x 630 A single dyscon termination	□	□	□			□	GDV-A202
6 x 630 A single dyscon termination	□	□	□			□	GDV-A203
Busbar end cable box bottom entry	□	□	□				GDV-F110
Busbar end cable box top entry	□	□	□				GDV-F111
Busbar kits							
630 A standard busbar kit	□	□	□	□	□		GDV-A105
1250 A standard busbar kit	□	□	■	□	□		GDV-A106
Standard bus section busbar kit				■	■		GDV-F97
4 way busbar connection kit	□	□	□				GDV-A100
3 way busbar connection kit	□	□	□				GDV-A102
630 A earthed screened busbar kit	□	□	□				GDV-A107
1250 A earthed screened busbar kit	□	□	□				GDV-A108
Bus section earthed screened busbar kit				□	□		GDV-F98
4 way earthed screened busbar connection kit	□	□	□				GDV-A103
3 way earthed screened busbar connection kit	□	□	□				GDV-A101
Installation items							
Set of foundation bolts	■	■	■	■	■		GDV-A145
Mechanical padlocks	□	□	□	□	□		GDV-A142
Control switch padlocks (please specify quantity)	□	□	□	□	□		GDV-A143

Key ■ Standard feature □ Optional feature

For VC20, VC25, VB20, VB25 please consult us.

Summary tables

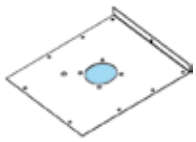
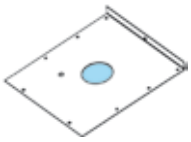
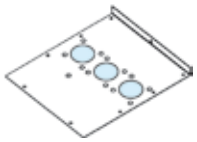
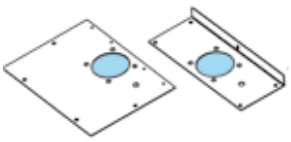
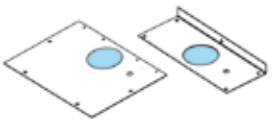
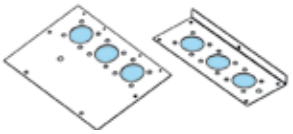
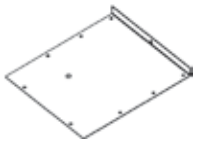
Circuit breaker ancillaries	Circuit breaker VC2	VC6	VC12	Bus sections VB6	VB12	Misc BECB	Kit No
Ancillary items							
Interpanel kit	■	■	■	■	■	■	GDV-A313
Single panel lifting kit	■	■	■	■			GDV-F285
Single bus - section lifting kit				■	■		GDV-F285
Operating handle one per switchboard as standard	■	■	■	■	■		GDV-A325
Key interlock (earth on key free)	□	□	□	□	□		GDV-F139
Key interlock (incomer/bus section, main on key trapped)	□	□	□	□	□		GDV-F138
Phase sequence indicator	□	□	□	□	□		RMR-A25
End panel earthing kit (standard cable box) required	□	□	□	□	□		
End panel earthing kit (inverted cable box) required	□	□	□	□	□		
SFT2841: software to programme Sepam via PC SFT2826: oscillography analysis on PC	Optional with all Sepam switchboards						GEN-A387
Tool box	Optional with all switchboards						GEN-A162

Key ■ Standard feature □ Optional feature

For VC20, VC25, VB20, VB25 please consult us.

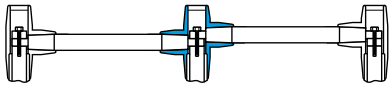
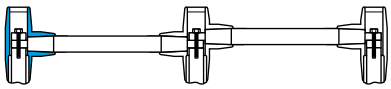
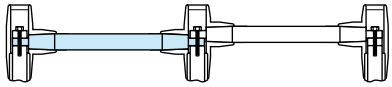
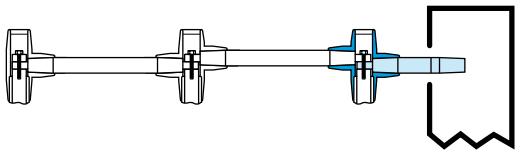
Summary tables

To assist in the selection of gland plates the guide shows the available range.

Standard	CES5	Description
GDV-F128	**GDV-F120**	
DE60300 	DE60305 	**1 x 3 core (large gland)**
GDV-F119		
DE60301 		**3 x 1 core (small gland)**
GDV-F116	**GDV-F117**	
DE60302 	DE60306 	**2 x 3 core (large gland)**
GDV-F115		
DE60303 		**6 x 1 core (small gland)**
GDV-F121		
DE60304 		**Blank metal**

For VC20, VC25, VB20, VB25 please consult us.

Summary tables

Applications	Kit reference Non-screened	Screened	Qty Panel
Mid panel busbar connection DE60307 	630 A or 1250 A **GDV-A100:** 4 way busbar connection kit	630 A or 1250 A **GDV-A103:** 4 way busbar connection kit	**1/ mid panel**
RHS or LHS end panel busbar connection DE60308 	630 A or 1250 A **GDV-A102:** 3 way busbar connection kit	630 A or 1250 A **GDV-A101:** 3 way busbar connection kit	**1/ end panel**
Panel to panel busbar connection DE60309 	630 A **GDV-A105:** 630 A busbar kit	630 A **GDV-A107:** 630 A busbar kit	**1/ end panel**
	1250 A **GDV-A105:** 1250 A busbar kit	1250 A **GDV-A108:** 1250 A busbar kit	**1/ end panel**
RHS or LHS busbar end cable box DE60310 	1250 A only 1250 A busbar end cable box **GDV-F110:** Bottom entry **GDV-F111:** Top entry	1250 A only **SBECB:** 1250 A busbar end cable box	**1/ end panel**

For VC20, VC25, VB20, VB25 please consult us.

PE60199

■ All 500 mm wide **GenieEvo** units can be off loaded by forklift truck or by using a single panel lifting kit consisting of a single fixing point and can be off loaded using a crane.
Kit ref: GDV-F285

■ All 1000 mm wide **GenieEvo** units can be off loaded by forklift truck or by using a single panel lifting kit consisting of two fixing points and can be off loaded using a crane.
kit ref: GDV-F285

PE60200

■ 630 A disconnectable cable terminations (Dyscon) can be provided to facilitate the removal of cables without the breaking down of the cable joint.
Kit ref: GDV-A202(1 X 3)
Kit ref:GDV-A203 (1 X 6)

■ All **GenieEvo** switchboards are delivered with one disconnector operating handle. An additional handle can be ordered if required.
Kit ref: GDV-A325

PE60201

■ Key type bolt interlock or equivalent. Two options are available. One to ensure that the earth has been applied to the cable before the key can be released. The second to ensure the circuit breaker is in the open position before the key is release.
Kit ref: GDV-F139 (earth on key free)
Kit ref: GEN-F138 (main on key trapped)

■ The units can be directly bolted to the concrete floor using 2 x 10 mm rawbolts for single width panels or 4 x 10 mm rawbolts for bus section.
Kit ref: GDV-F145

PE57030

■ This kit contains the padlocks which can be attached to the mechanism to prevent any unauthorised manual closing, tripping or earthing operation. The use of these padlocks does not prevent any electrical closing or tripping in accordance with EATS 41-36.
Kit ref: GDV-A142

■ This kit contains the padlocks required to prevent unauthorised operation of the electrical control switches. The size of these padlocks are in accordance with EATS 50-18.
Kit ref: GDV-A143

PE60203

■ The phase sequence indicator is a microprocessor controlled phase comparator. This device allows you to evaluate the rated frequency of the measuring signal to distinguish reliability between phase balance and phase unbalance.
Kit ref: GEN-A25

PE60204

PE60205

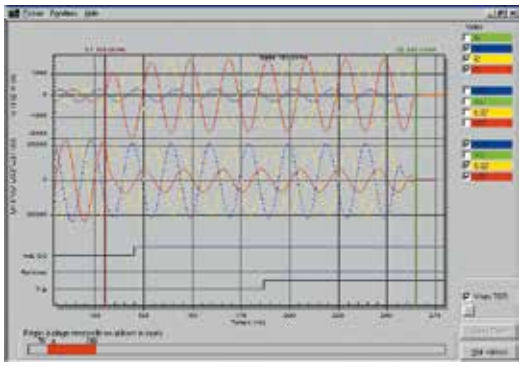
■ This kit is used to connect the front earth bar to the rear earth bar fitted on the end of a panel which has a standard cable box.
Kit ref: GDV-F191 LHS
Kit ref: GDV-F326 RHS

■ This kit is used to connect the front earth bar to the rear earth bar fitted on the end of a panel which has an inverted cable box.
Kit ref: GDV-F144 LHS
Kit ref: GDV-F327 RHS

PE60206

■ A 19 inch barn type lockable tool box, complete with the following:
□ 1 x Engineers pliers 4 1/2”
□ 1 x 5 mm A/F Allen key
□ 1 x 4 mm socket
□ 1 x 6 mm hexagon allen head wrench
□ 1 x 7/8 mm o/e spanner
□ 1 x 10/13 mm o/e spanner
□ 1 x 17/19 mm o/e spanner
□ 1 x Stanley 2006, 8” screwdriver
□ 1 x 3/8” 13-67 NM torque wrench
□ 1 x 3/8” Ratchet handle
□ 1 x 5” Ratchet extension
□ 1 x 17 mm 3/8” deep socket
□ 1 x 19 mm 3/8” deep socket
□ 1 x Terminal screwdriver
□ 1 x 3/8”, 4-20 NM torque wrench
□ 1 x Union 3104 padlock.
Kit ref: GEN-A162

PE57004



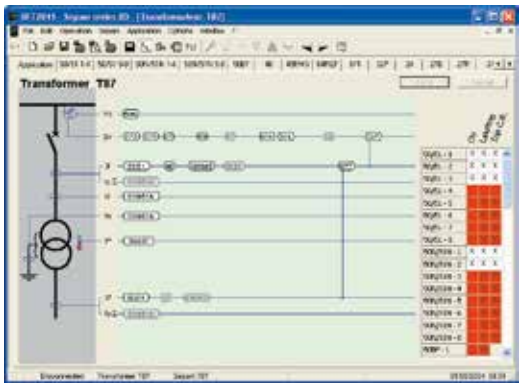
GEN-A386

The SFT 2826 is a PC based software tool that may be used to display and analyse the disturbance records provided by the Sepam.
It can be used for post fault analysis and displays both digital (status of Inputs and KFRs) and analogue (current and voltage wave forms) information.

Recommended system requirements:
- Pentium Processor 133 MHz or more
- 32 Mb of RAM (minimum)
- Hard disk (4 Mb free space)
- MS-Windows 95, 98, NT 4.00, XP, or Seven.

Kit ref: GEN-A386

PE57005



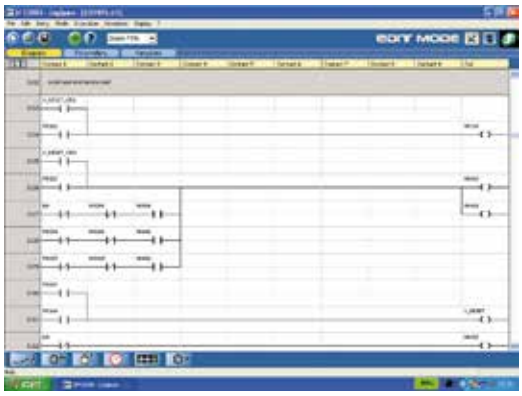
GEN-A394

The SFT 2841 software is a compliment to the user machine interface on the Sepam. It allows, via connection of a PC to the front of the relay display of all the metering, operating, system diagnosis and alarm data, setting of the protection functions, system data and parameters (password protected). It also allows the retrieval of the disturbance records and the downloading of complete settings and system data.

Recommended system requirements:
- Pentium Processor 133 MHz or more
- 32 Mb of RAM (minimum)
- Hard disk (4 Mb free space)
- MS-Windows 95, 98, NT 4.00, XP, or Seven.

Kit ref: GEN-A387

PE57006



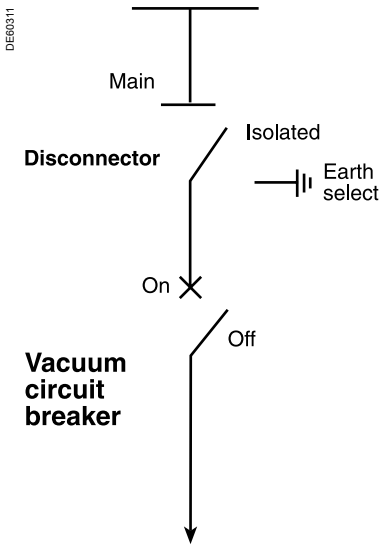
GEN-A386

SFT 2885 Logipam is intended exclusively for the Sepam Series 80 and has the following features:
- Adaption of predefined control and monitoring functions
- Ladder logic
- Simulator
- Integration into SFT 2841 software.

Earthing scheme

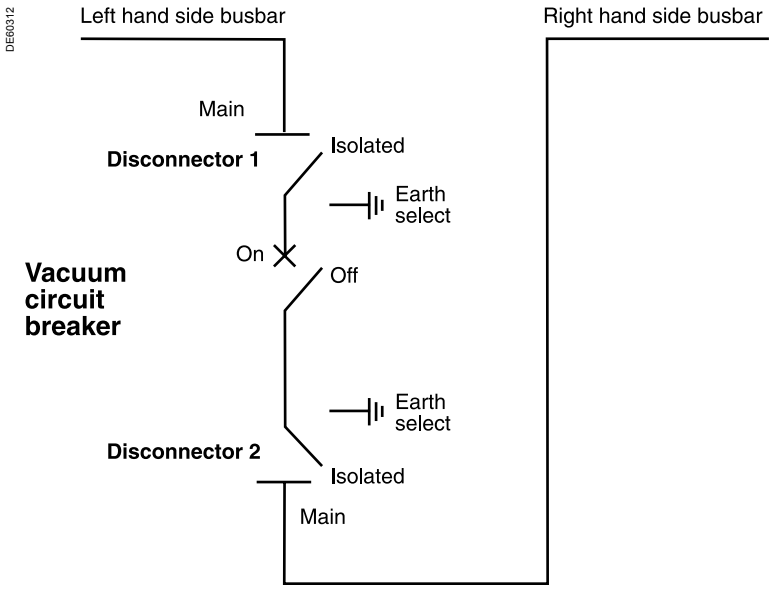
Circuit earthing

All circuit breaker panels have the ability to earth the circuit as standard. The circuit is earthed via the main vacuum circuit breaker and the position of the series disconnector. Being an off load device the circuit earth can only be selected with the circuit breaker in the open position. As can be seen on the single line diagram once the disconnector is in the earth select position the breaker can be closed earthing the circuit.



Busbar earthing

The bus section panel has two series disconnectors utilised to offer either right hand or left hand side busbar earthing from the same panel, this does away with the need for an additional busbar earth panel. To earth the right hand side of the switchboards busbars, with the vacuum circuit breaker in the off position disconnector number two can be moved to the main select position and number one to the earth position. When the circuit breaker is then closed the right hand side of the switchboards busbars are earthed. The position of the two disconnectors is reversed to earth the left hand sides of the switchboards busbars.



Auto changeover schemes
Contents

1 out of 2 auto changeover scheme **92**

2 out of 3 auto changeover schemes **96**
Scheme 1 97
Scheme 2 100

1 out of 2 auto changeover scheme

General description

DE58310

= Start/finish of process

= Decision

= Process

BD = block diagram
LK = link to other diagram

Legend for auto changeover schemes

The following scheme includes the control logic for a 1 out of 2 changeover scheme and is fitted to the two alternative supply, incoming circuit breakers. This scheme is fully documented and tested. Therefore greatly reducing the overall delivery cycle.

- Protection and control module P18 - page 72 incorporates the following scheme:
  - One incomer in service, the other incomer on standby.
- Manual or automatic restoration of the setup once supply is restored can be selected.
- The 2 incomers must be equipped with P18 protection modules that supply the following information to one another:
  - Incomer position
  - Incomer tripped on fault
  - Undervoltage on incomer
  - Inhibit auto transfer.

DE60314

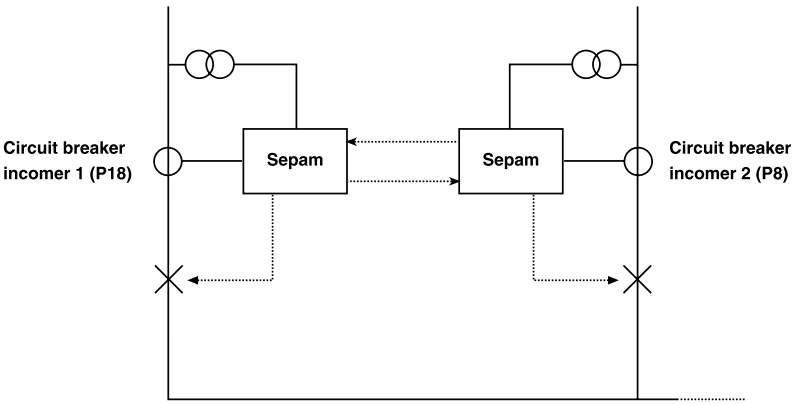


Figure 1: 1 out of 2 auto changeover scheme

1 out of 2 auto changeover scheme

Scheme operation

The normal operating configuration for scheme is either:
- Incomer 1 main supply, incomer 2 standby supply
- Incomer 2 main supply, incomer 1 standby supply.

When the main supply is lost, providing the standby supply is available, the main supply breaker is tripped and the standby supply breaker is closed.

Loss of main supply is detected by an undervoltage condition on one or more phases for a time in excess of 2.5 s*, without the incoming supply protection detecting an overcurrent or earth fault condition.

If the main supply CB does not open or if the standby supply CB does not close further operation is inhibited until the system is manually reconfigured and the auto changeover scheme is reset.

When the transfer is complete and manual restoration has been selected (MP06 = 0) further operation is inhibited until the auto changeover scheme is reset.

If automatic restoration is selected (MP06 = 1) no message is displayed when the transfer is complete. The system will remain in the new configuration unless the supply is lost.

If this occurs the sequence will be reversed by tripping the standby supply CB and closing the main supply CB provided that the main supply has returned (indicated by presence of voltage on all three phases for more than 25 s*).

If both supplies are unavailable the auto changeover scheme is inhibited until one of the supplies returns. Transfer to this supply will then take place.

Tripping of either the main supply CB or the standby supply CB due to a fault condition will lock out the auto changeover scheme. Further operation is inhibited until the system is manually reconfigured and the auto changeover scheme is reset.

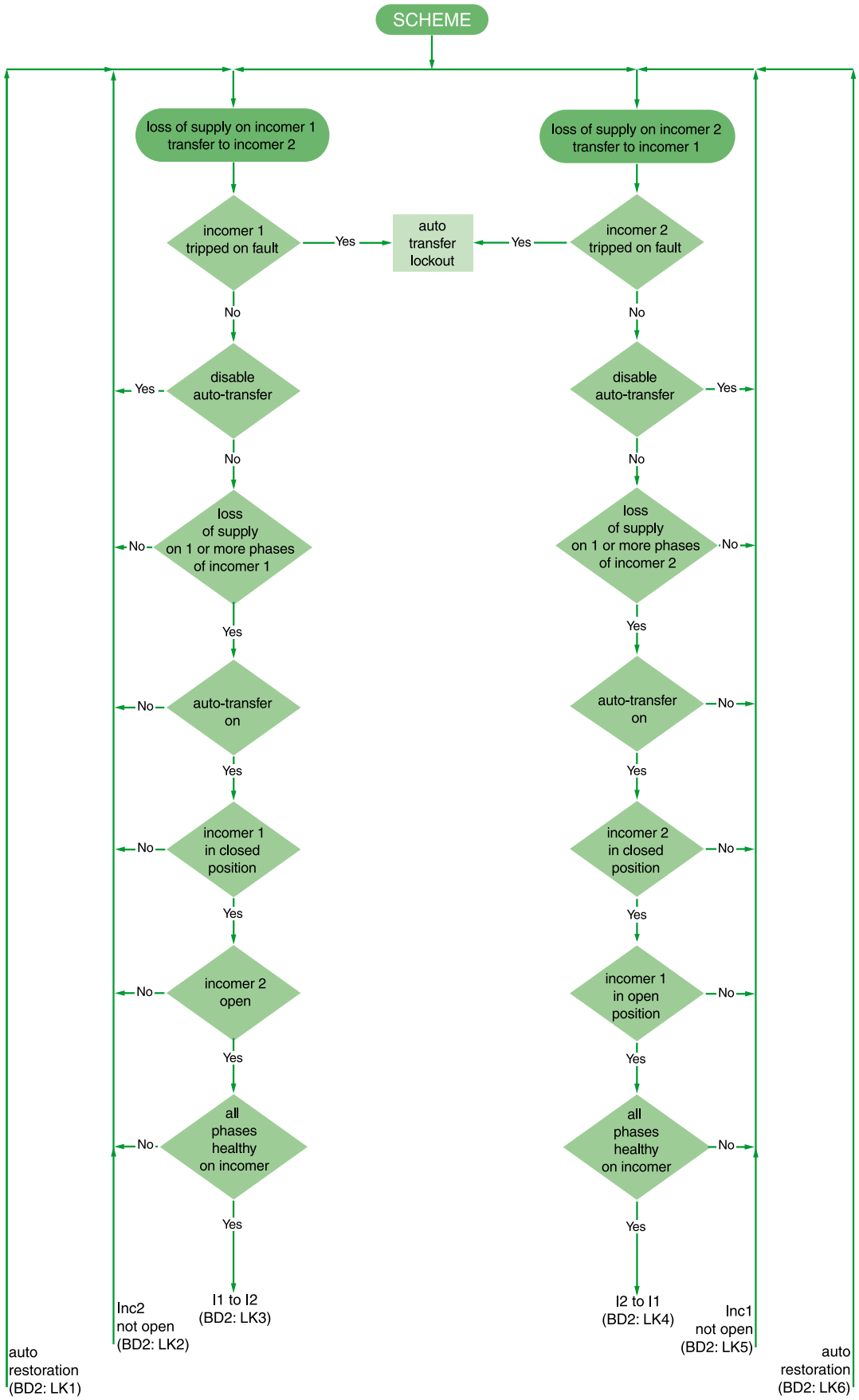
One of the following conditions must be satisfied before reset of the auto changeover scheme is permitted:
- Incomer 1 closed, incomer 2 open, incomer 1 supply healthy
- Incomer 2 closed, incomer 1 open, incomer 2 supply healthy.

Note:
** The time settings used in the auto changeover schemes are recommended settings, however they can be adjusted to suit specific customer requirements at the time of commissioning (time adjustable between 50 ms and 655 s).*

1 out of 2 auto changeover scheme

scheme

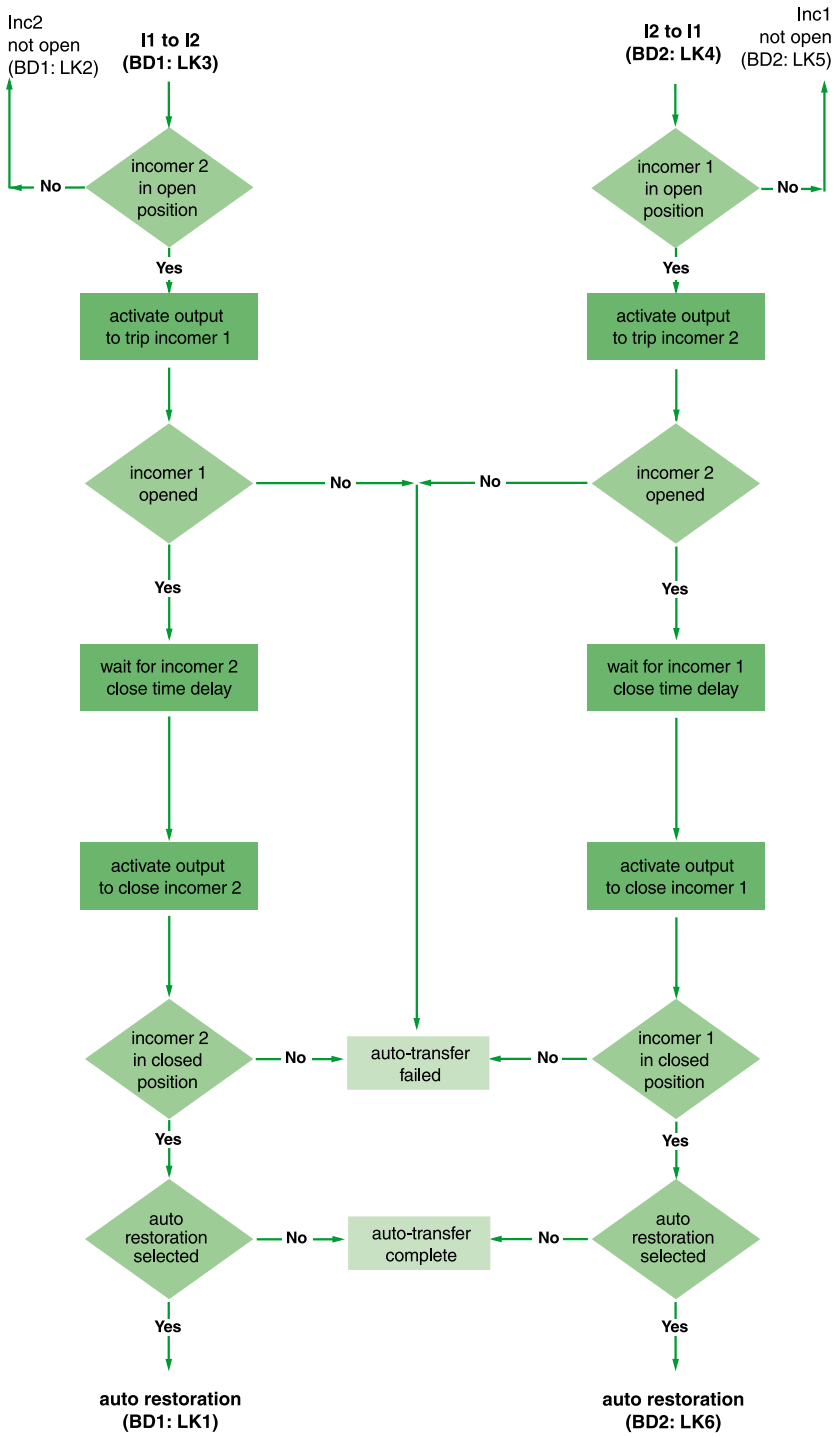
DE58311



1 out of 2 auto changeover scheme

scheme

DE58312



2 out of 3 auto changeover scheme

General description

DE58310

= Start/finish of process

= Decision

= Process

BD = block diagram
LK = link to other diagram

Legend for auto changeover schemes

The following 2 schemes include the control logic for a 2 out of 3 changeover scheme and are fitted to the bus section circuit breaker. This scheme is fully documented and tested. Therefore greatly reducing the overall delivery cycle.

■ Protection and control module P11 - page 65 incorporates all the functionality to control the 2 schemes detailed below:
□ Scheme 1 - one incomer in service, the other incomer on standby and the bus section closed,
□ Scheme 2 - both incomers in service and the bus section open.

Manual or automatic restoration of the setup once supply is restored can be selected.

■ The 2 incomers must be equipped with P8 protection modules that supply the following information to the bus section P11:
□ Incomer position
□ Incomer tripped on fault
□ Undervoltage on incomer
□ Inhibit auto transfer.

■ The following control signals are sent to the two incomers from P11 on the bus section:
□ Trip incomer
□ Close incomer
□ Inhibit incomer closing.

DE60317

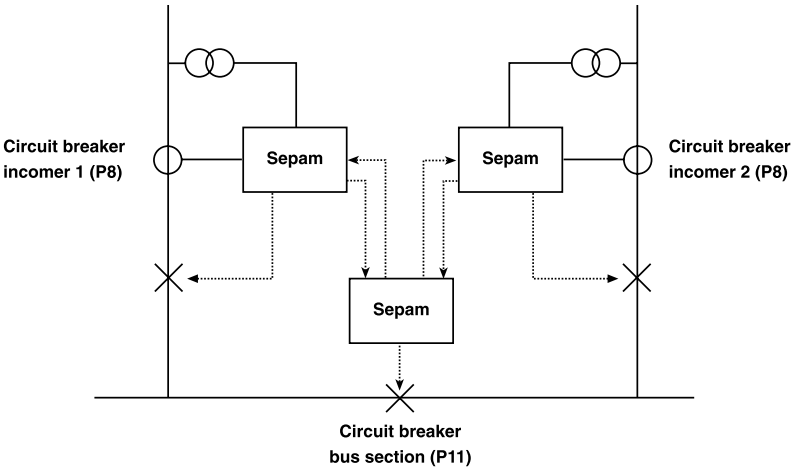


Figure 2: 2 out of 3 auto changeover scheme

2 out of 3 auto changeover scheme

Scheme 1 operation

The normal operating configuration for scheme 1 (KP1 = 0) is either:
- Incomer 1 main supply, Incomer 2 standby supply and the bus section closed
- Incomer 2 main supply, Incomer 1 standby supply and the bus section closed.

When the main supply is lost, providing the standby supply is available, the main supply breaker is tripped and the standby supply breaker is closed. Loss of main supply is detected by an undervoltage condition on one or more phases for a time in excess of 2.5 s*, without the incoming supply protection detecting an overcurrent or earth fault condition.

If the main supply CB does not open or if the standby supply CB does not close further operation is inhibited until the system is manually reconfigured and the auto changeover scheme is reset.

When the transfer is complete and manual restoration has been selected (MP06 = 0) further operation is inhibited until the auto changeover scheme is reset.

If automatic restoration is selected (MP06 = 1) no message is displayed when the transfer is complete. The system will remain in the new configuration unless the supply is lost.

If this occurs the sequence will be reversed by tripping the standby supply CB and closing the main supply CB provided that the main supply has returned (indicated by presence of voltage on all three phases for more than 25 s*).

If both supplies are unavailable the auto changeover scheme is inhibited until one of the supplies returns. Transfer to this supply will then take place.

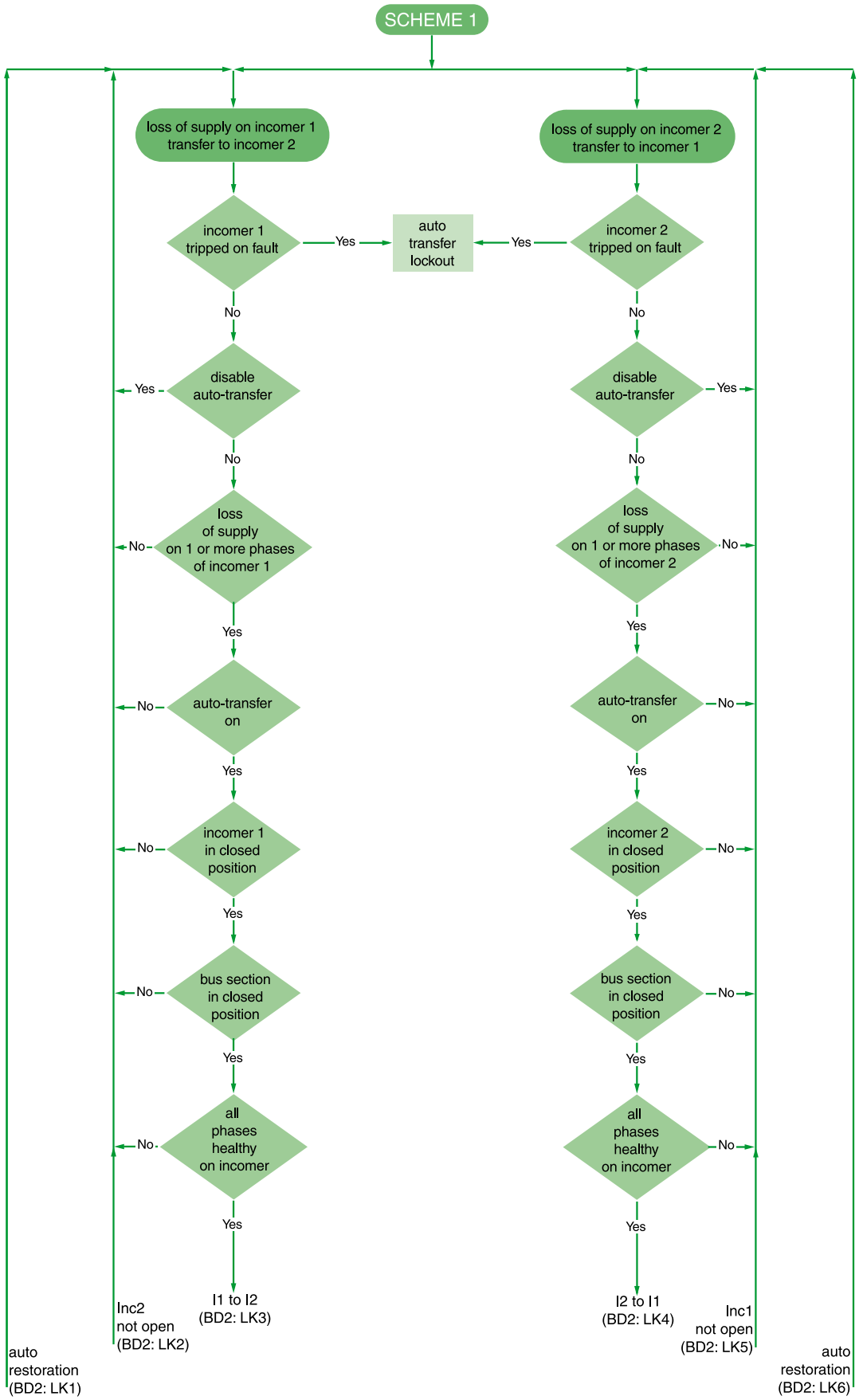
Tripping of either the main supply CB or the standby supply CB due to a fault condition will lock out the auto changeover scheme. Further operation is inhibited until the system is manually reconfigured and the auto changeover scheme is reset.

One of the following conditions must be satisfied before reset of the auto changeover scheme is permitted:
- Incomer 1 closed, Incomer 2 open, Incomer 1 supply healthy and bus section closed
- Incomer 2 closed, Incomer 1 open, Incomer 2 supply healthy and bus section closed.

Note:
** The time settings used in the auto changeover schemes are recommended settings, however they can be adjusted to suit specific customer requirements at the time of commissioning (time adjustable between 50 ms and 655 s).*

2 out of 3 auto changeover scheme
scheme 1

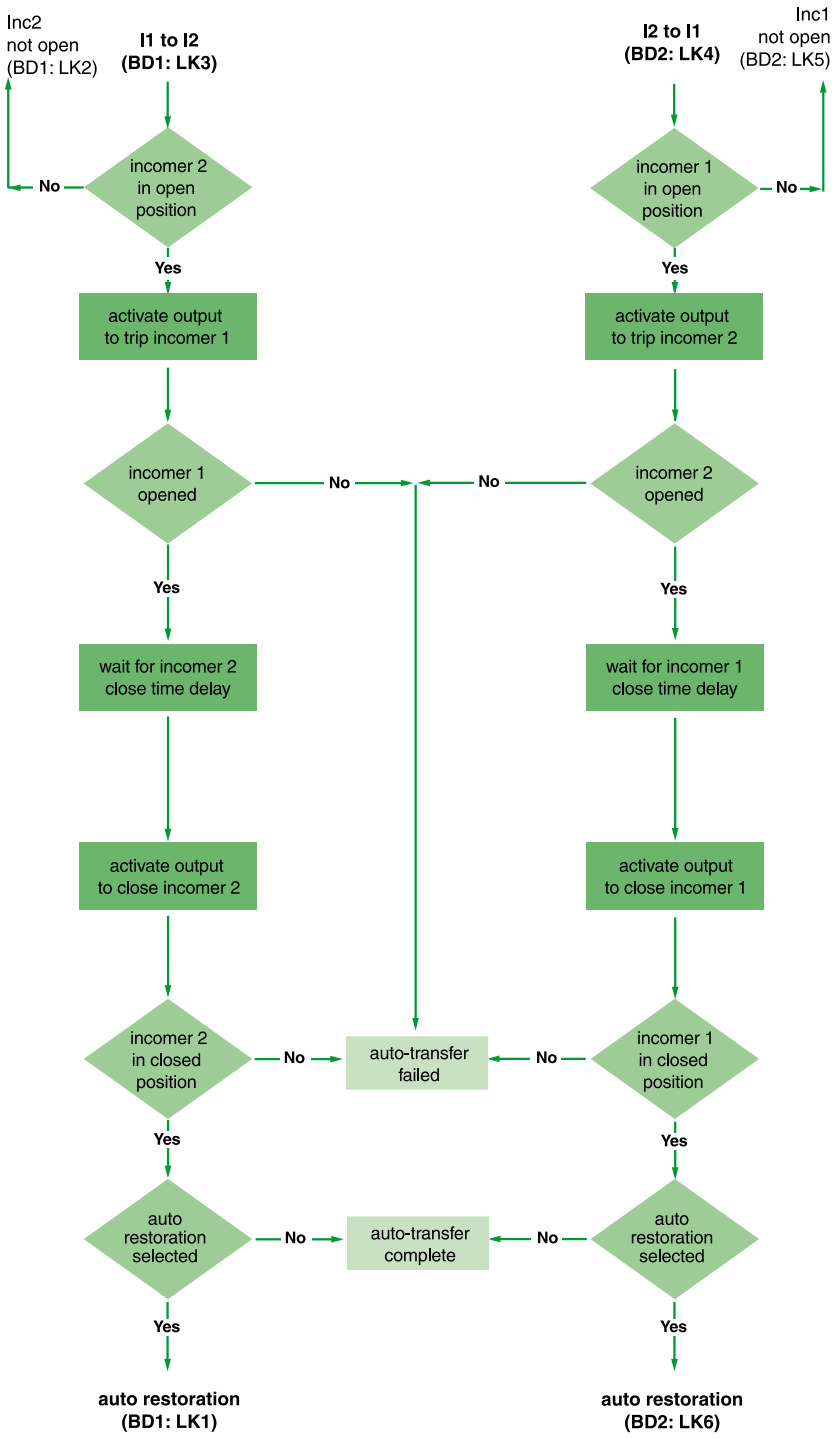
DE58313



2 out of 3 auto changeover scheme

scheme 1

DE58312



2 out of 3 auto changeover scheme

Scheme 2 operation

The normal operating configuration for scheme 2 (MP01 = 1) is:
- Incomer 1 closed, incomer 2 closed and the bus section open.

When Incomer 1 supply is lost, providing incomer 2 supply is available, Incomer 1 breaker is tripped and the bus section breaker is closed.

Loss of main supply is detected by an undervoltage condition on one or more phases for a time in excess of 2.5 s*, without the incoming supply protection detecting an overcurrent or earth fault condition.

If Incomer 1 CB does not open or if the bus section CB does not close further operation is inhibited until the system is manually reconfigured and the auto changeover scheme is reset.

When the transfer is complete and manual restoration has been selected (MP11 = 0) further operation is inhibited until the auto changeover scheme is reset.

If automatic restoration is selected (MP6 = 1) no message is displayed when the transfer is complete. The system will remain in the new configuration until Incomer 1 supply is restored (indicated by presence of voltage on all three phases for more than 25 s*). When this occurs the transfer sequence will be reversed by tripping the bus section and closing Incomer 1.

If incomer 2 supply is lost in normal operating configuration the auto changeover scheme operates in mirror image to the transfer from Incomer 1 to Incomer 2 i.e. providing that Incomer 1 supply is available Incomer 2 is tripped and the bus section is closed etc.

If both supplies are unavailable the auto changeover scheme is inhibited until one of the supplies returns. Transfer to this supply will then take place.

Tripping of either the main supply CB or the standby supply CB due to a fault, operation is inhibited until the system is manually reconfigured and the auto changeover scheme is reset.

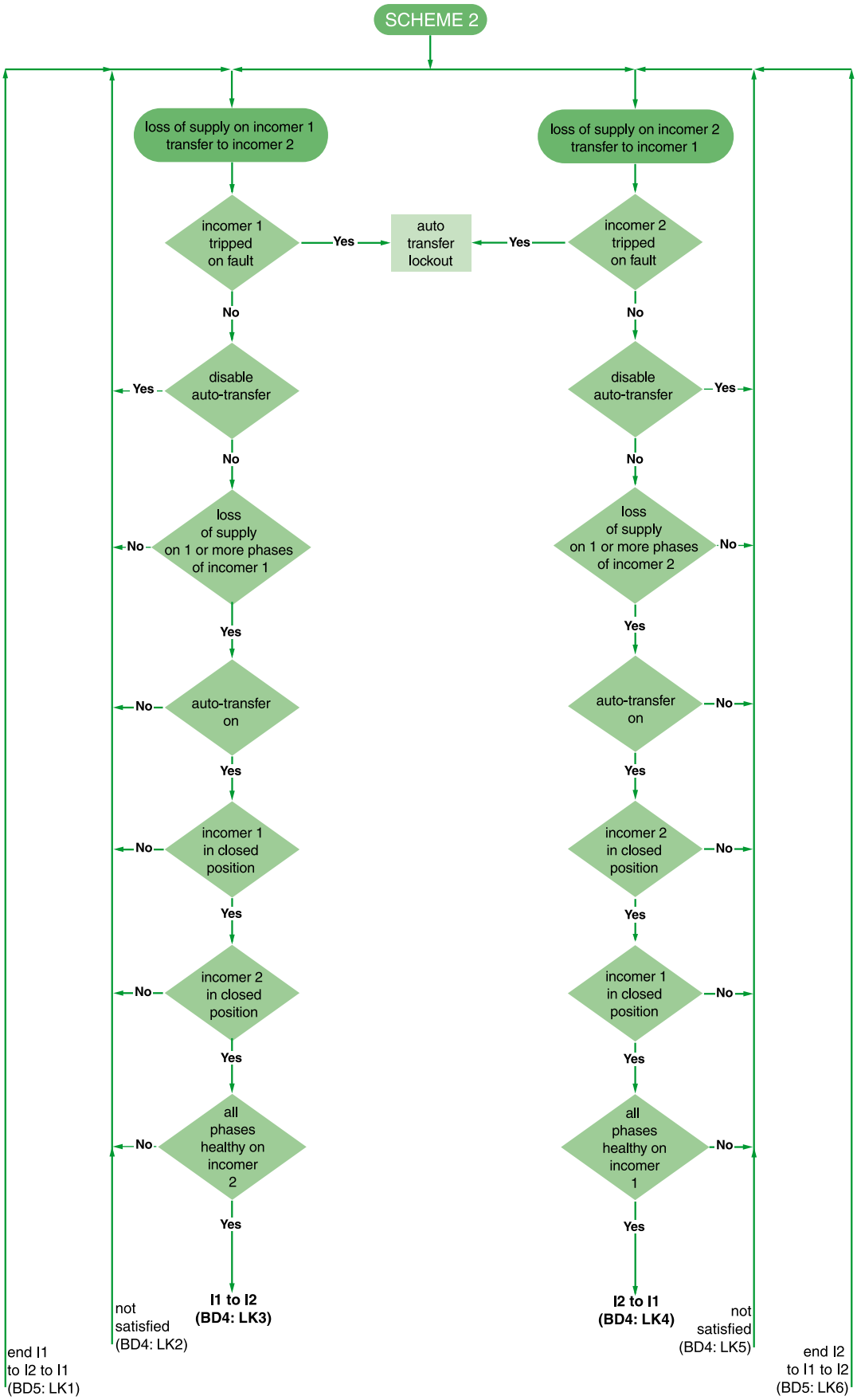
One of the following conditions must be satisfied before reset of the auto changeover scheme is permitted:
- Incomer 1 closed, Incomer 2 closed, Incomer 1 supply healthy, Incomer 2 supply healthy and bus section open. (This is the only configuration which will allow the auto changeover scheme to be reset when manual restoration is selected and the transfer is completed)
- Incomer 1 closed, incomer 2 open, incomer 1 supply healthy and bus section supply closed
- Incomer 2 closed, incomer 1 open, incomer 2 supply healthy and bus section closed.

The auto changeover operation for both schemes is shown in more detail in the flow charts and block diagrams within the control logic section of this document.

Note:
** The time settings used in the auto changeover schemes are recommended settings, however they can be adjusted to suit specific customer requirements at the time of commissioning (time adjustable between 50 ms and 655 s).*

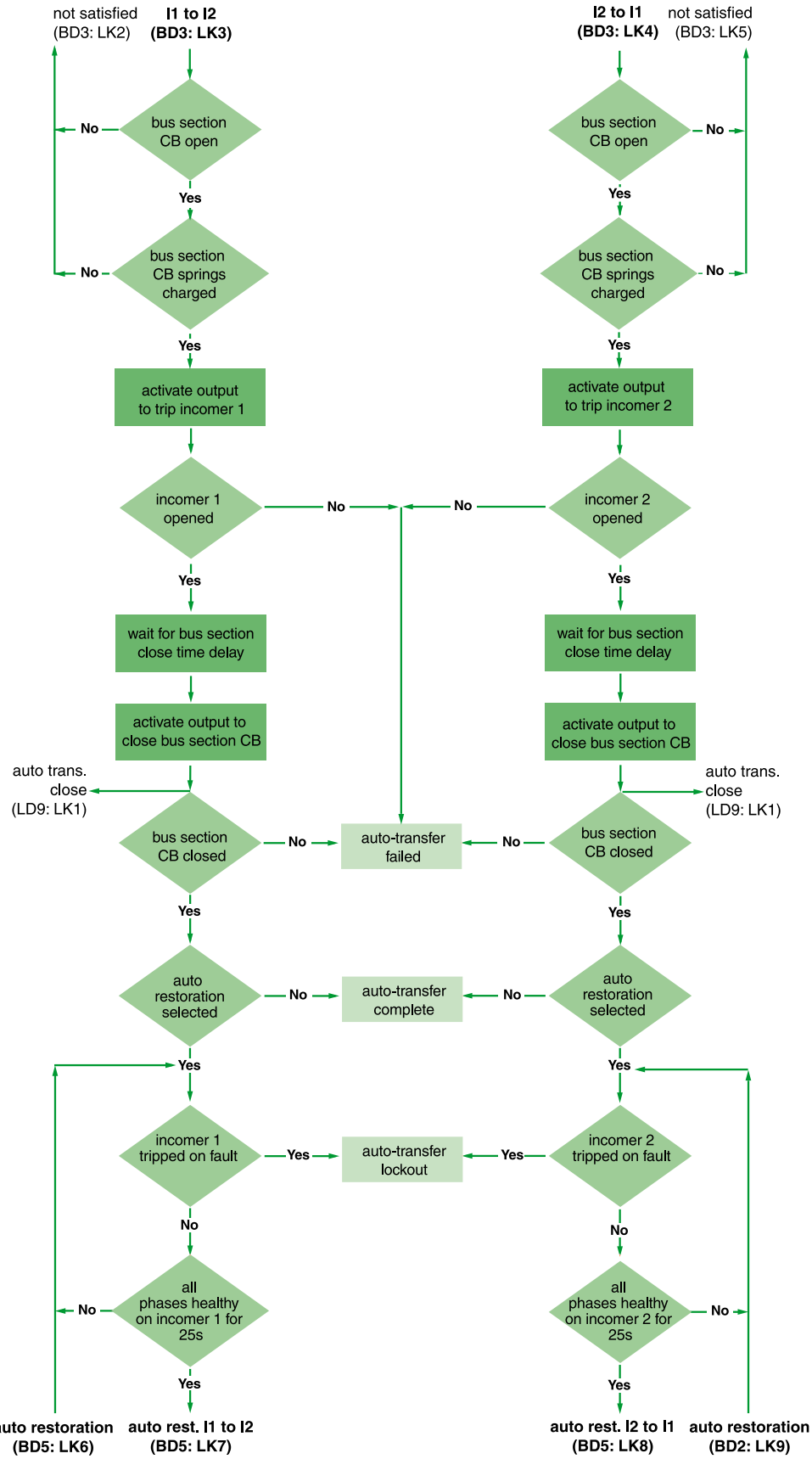
2 out of 3 auto changeover scheme
scheme 2

DE58315



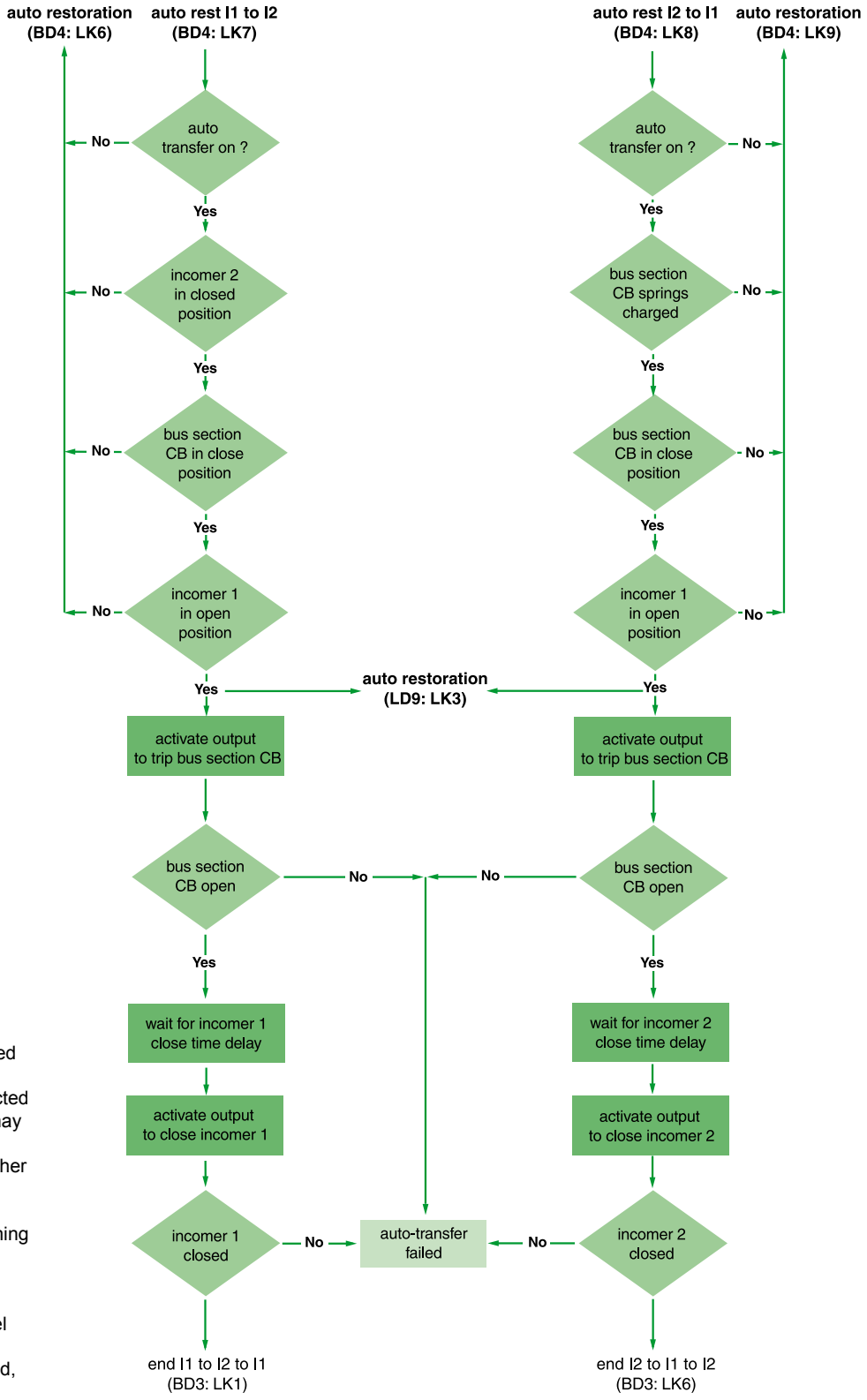
2 out of 3 auto changeover scheme
scheme 2

DE58316



2 out of 3 auto changeover scheme
scheme 2

DE58317



Parallel operation

Under normal operating conditions parallelling of the 2 incoming circuit breakers is not allowed and is prevented by interlocking within the Sepam.
However, if manual restoration is selected and a changeover has taken place it may be desirable to parallel the 2 incomers for a short period of time to avoid a further interruption in supply, when changing back to the original configuration.
This should only be done if the 2 incoming supplies come from the same source switchboard and therefore are in synchronism.
MP12 is used to select whether parallel operation is allowed,
MP12 = 0 parallel operation not allowed,
MP12 = 1 parallel operation allowed.

Installation drawings
Contents

Circuit breaker - bottom entry **106**
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Circuit breaker - top entry **108**
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Bus section circuit breaker module **110**
Drawings Ref: GDVINST-02 and GDVINST-12

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Drawing Ref: GDVINST-08

Bus end cable box - top entry **113**
Drawing Ref: GDVINST-07

Busbar voltage transformer **114**
Drawing Ref: GDVINST-09

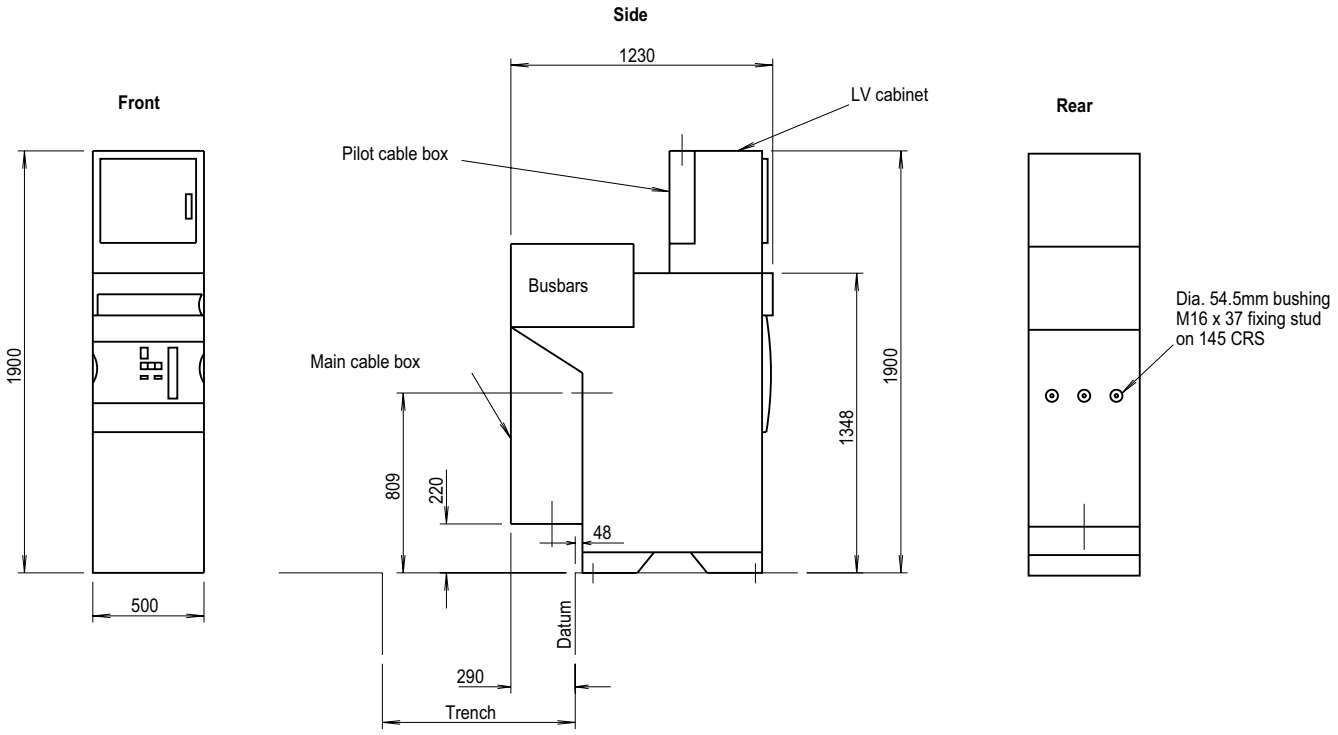
Cabling options **115**
Drawing Ref: GDVINST-05

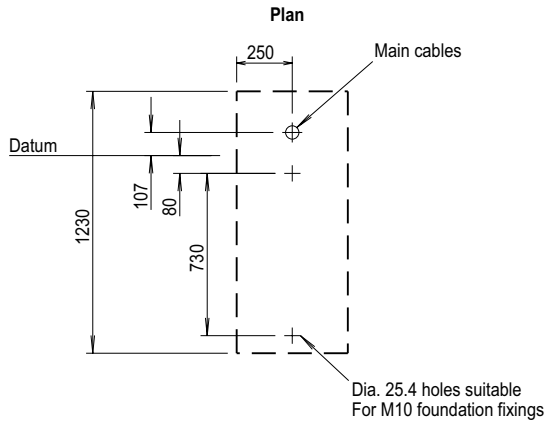
Circuit breaker - bottom entry
Drawing Ref: GDVINST-01

Panel type	Page
VC2	28
VC6	30
VC12	32

All dimensions are in mm

DE58338



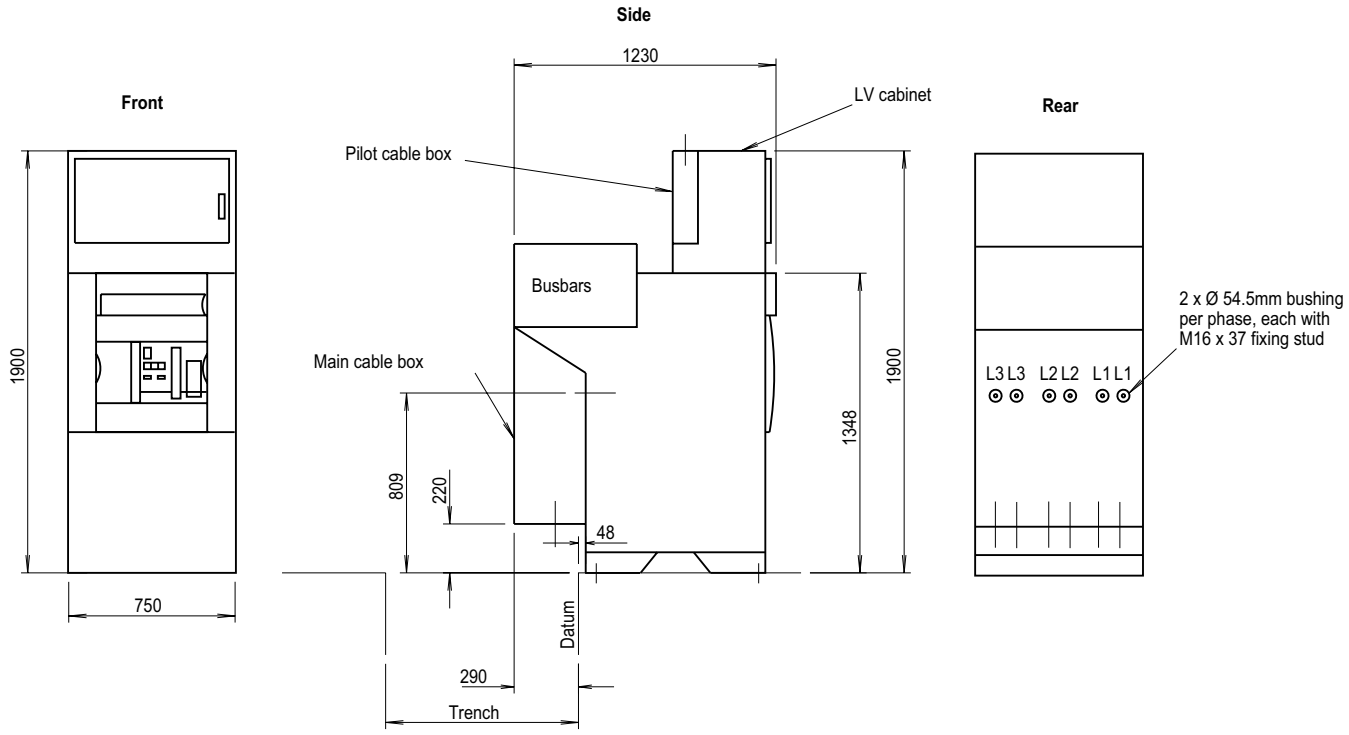


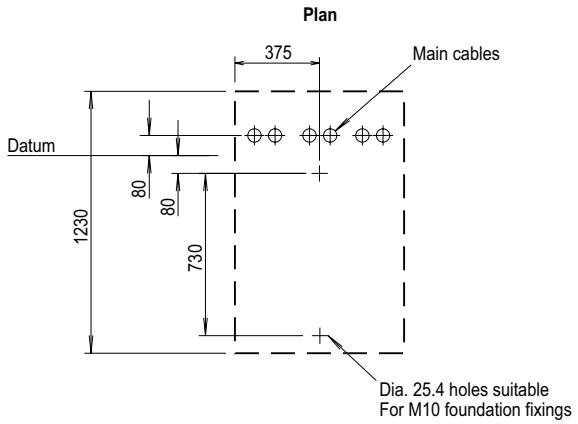
Circuit breaker - bottom entry
Drawing Ref: GDVINST-10

Panel type	Page
VC20	34
VC25	36

All dimensions are in mm

DE58339



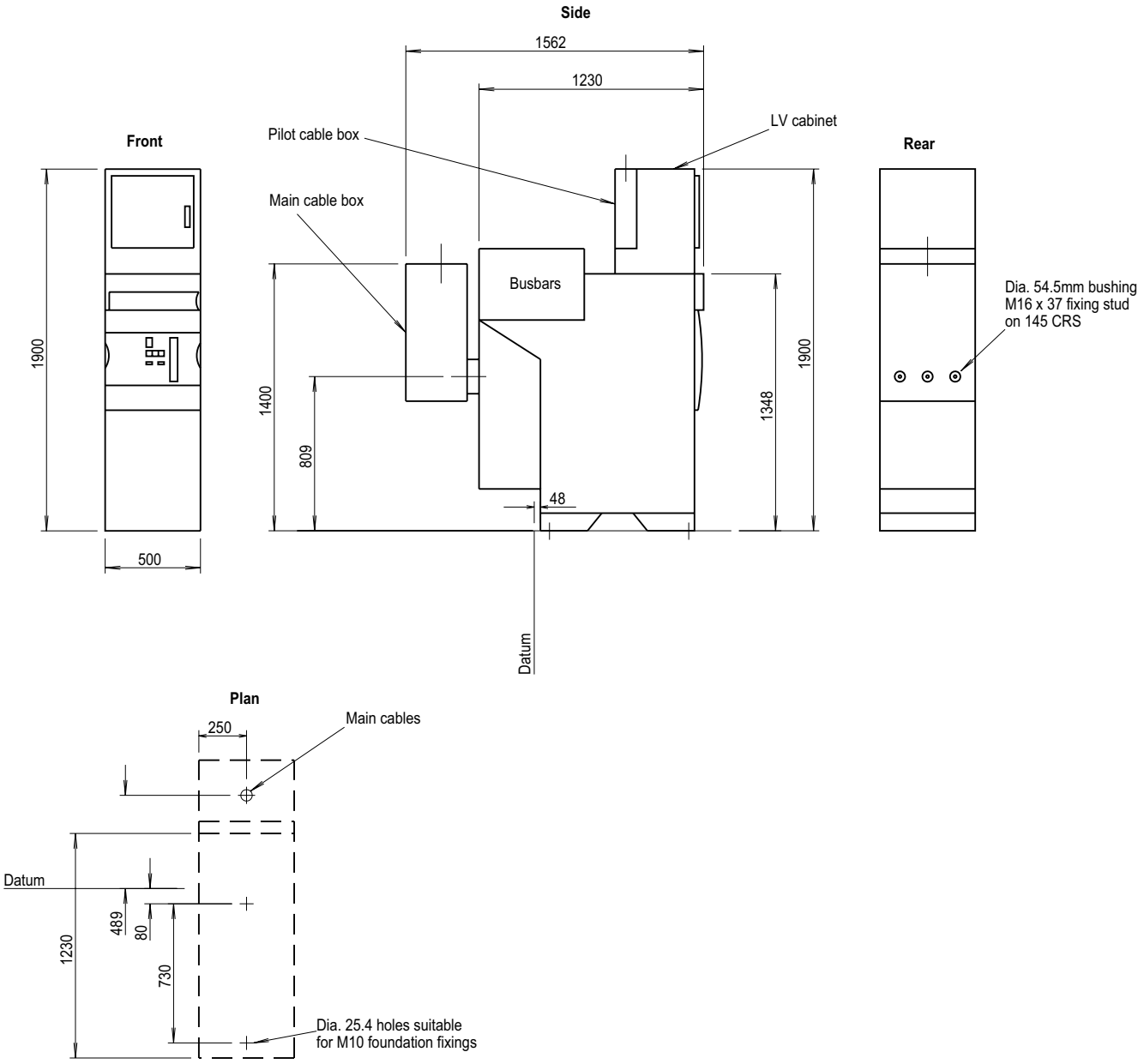


Circuit breaker - top entry
Drawing Ref: GDVINST-04

Panel type	Page
VC2	28
VC6	30
VC12	32

All dimensions are in mm

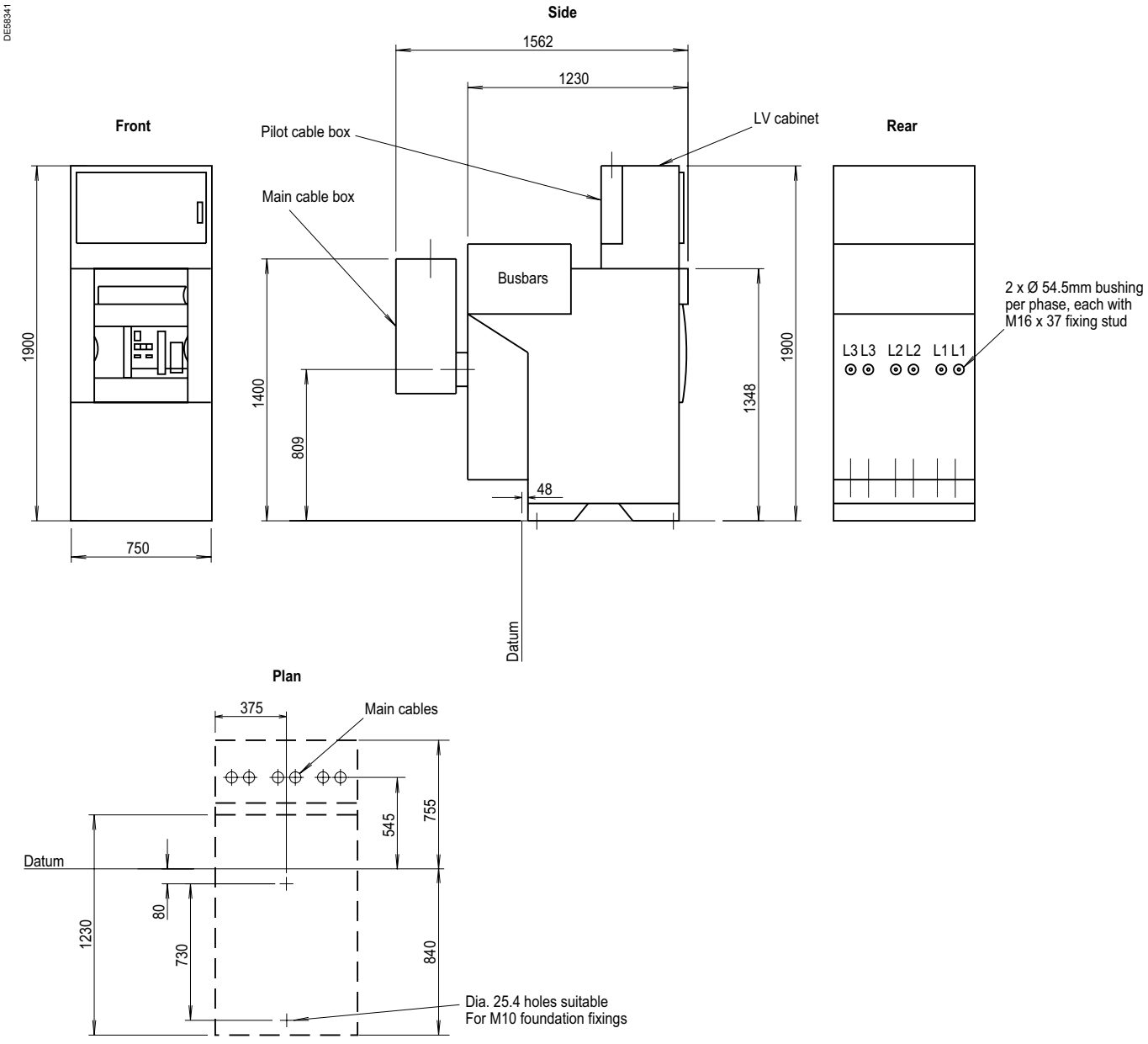
DE58340



Circuit breaker - top entry
Drawing Ref: GDVINST-11

Panel type	Page
VC20	34
VC25	36

All dimensions are in mm



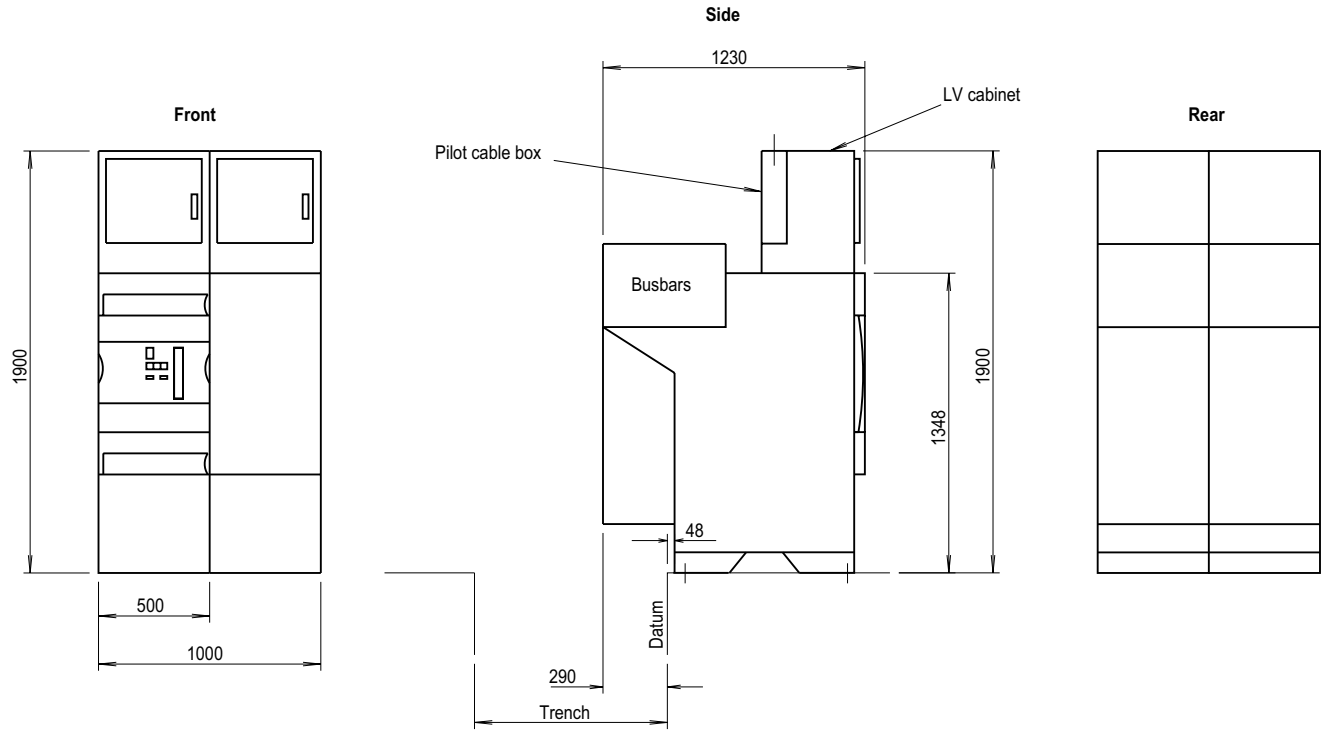
Bus section circuit breaker module

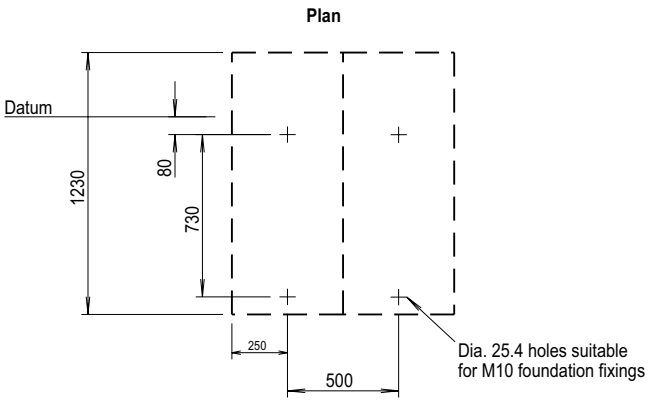
Drawing Ref: GDVINST-02

Panel type	Page
VB6	38
VB12	40

All dimensions are in mm

DE58342





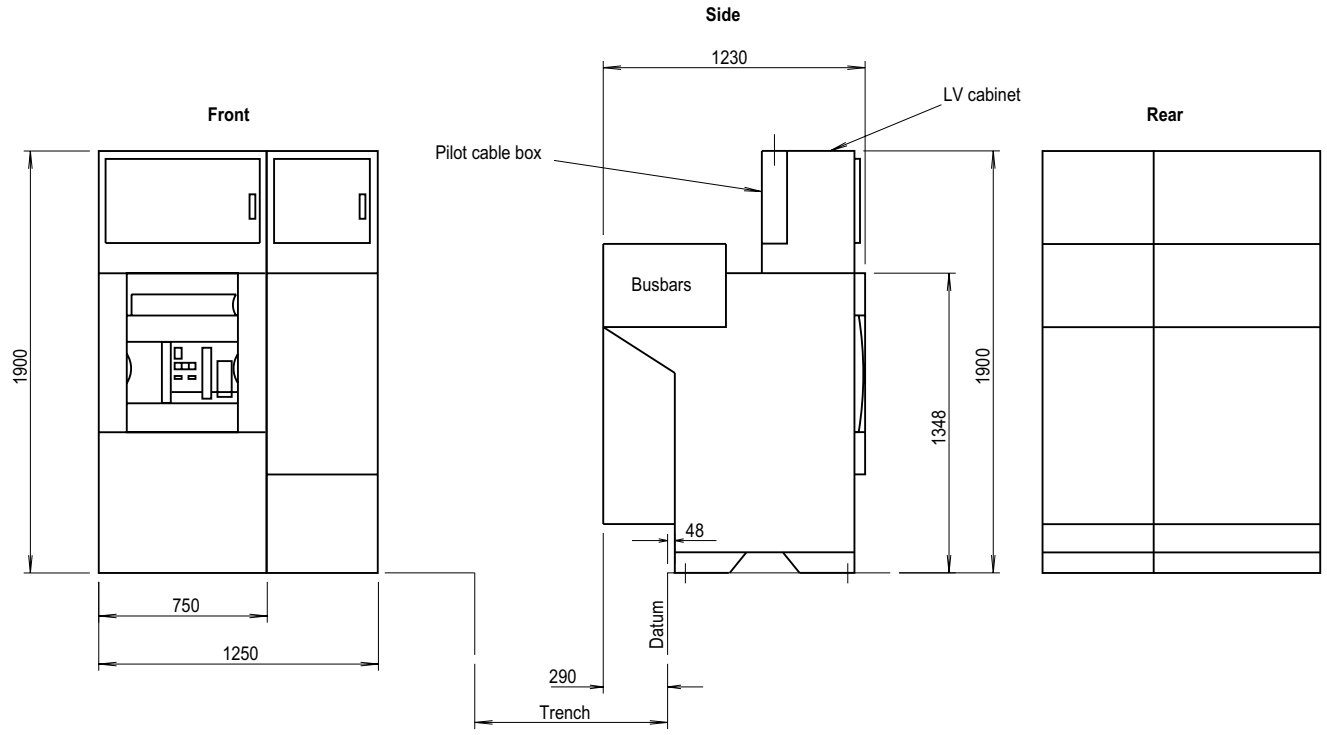
Bus section circuit breaker module

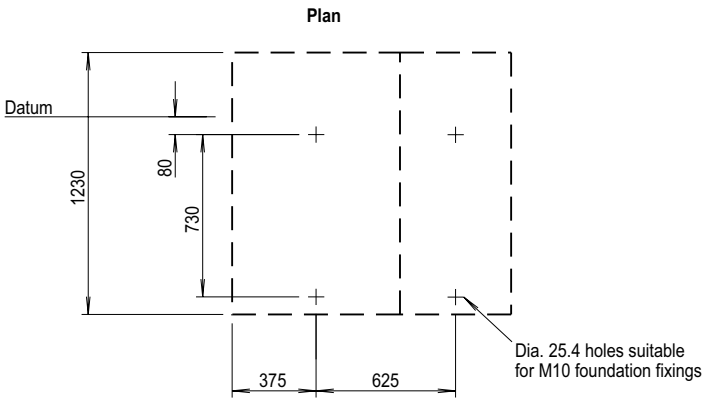
Drawing Ref: GDVINST-12

Panel type	Page
VB20	42
VB25	44

All dimensions are in mm

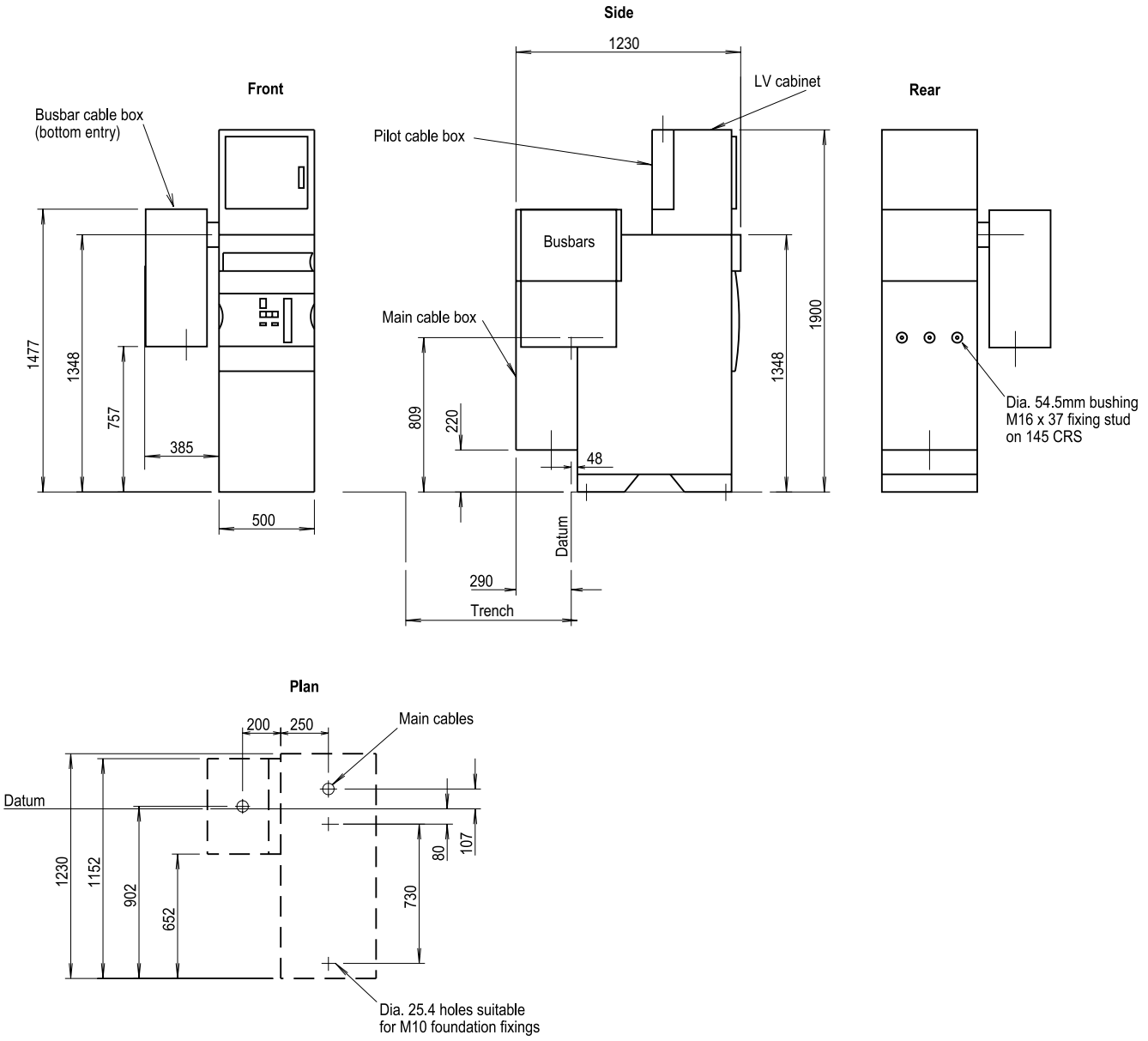
DE58343





Bus end cable box - bottom entry
Drawing Ref: GDVINST-08

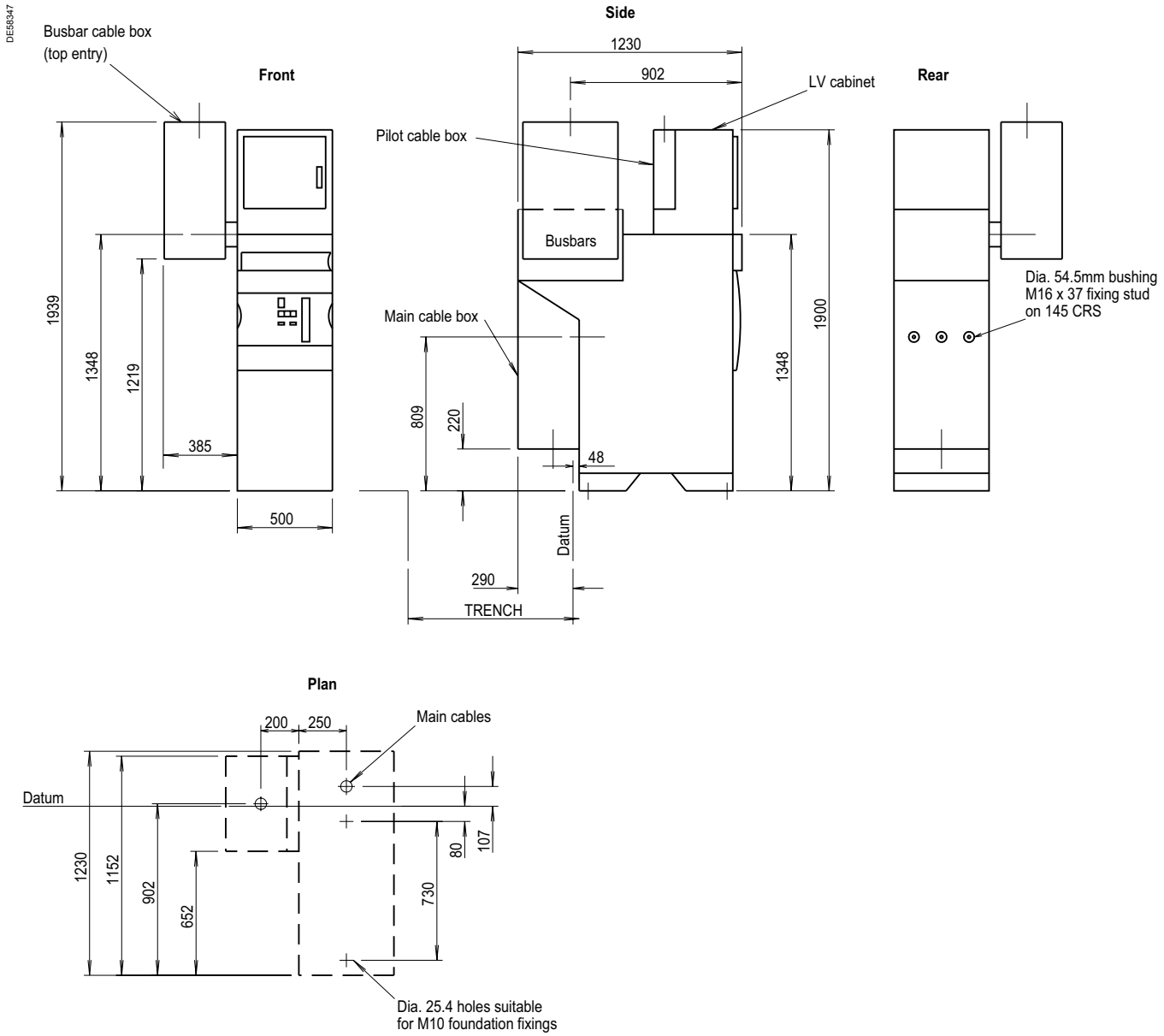
DE58344



All dimensions are in mm

Bus end cable box - top entry

Drawing Ref: GDVINST-07



All dimensions are in mm

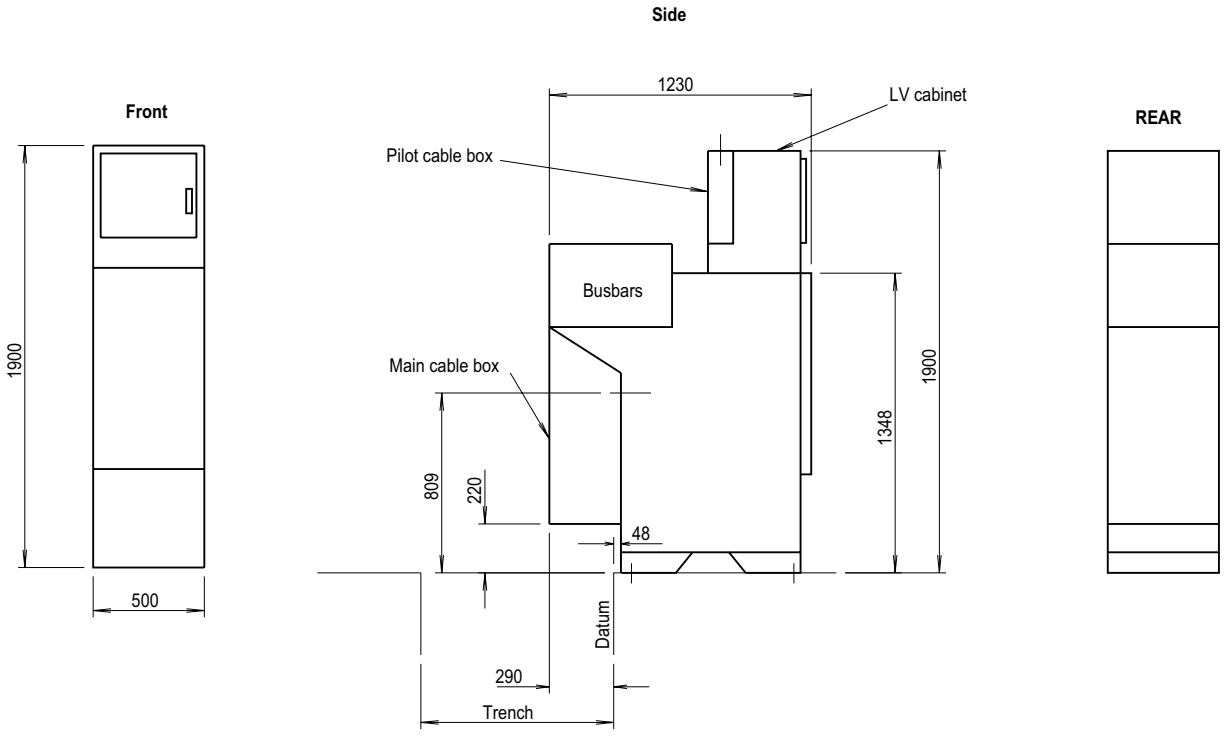
Busbar voltage transformer
Drawing Ref: GDVINST-09

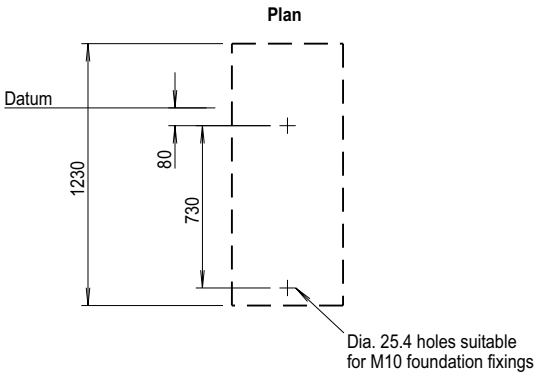
Panel type	Page
BBM	44

All dimensions are in mm

Note:
Dimensions apply to CT or VT only.
Combined CT/VT unit is 1000 mm wide.

DE58349





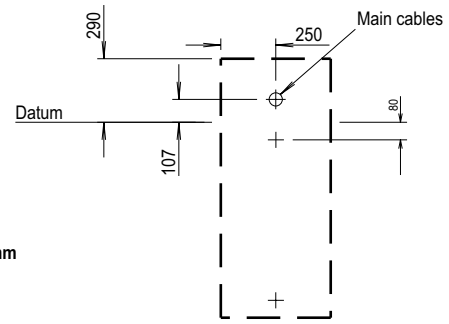
Cabling options
Drawing Ref: GDVINST-05

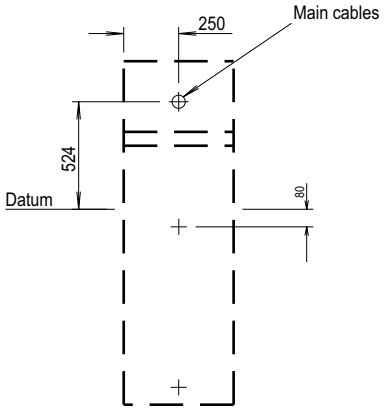
DE58345

Bottom entry cable approach

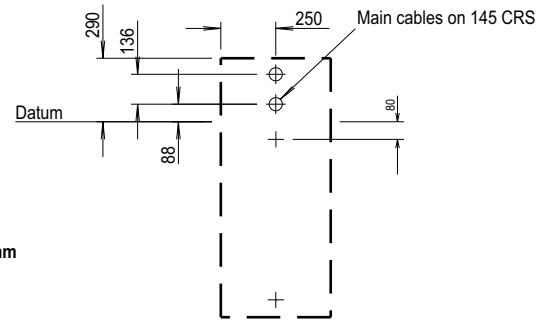
Top entry cable approach

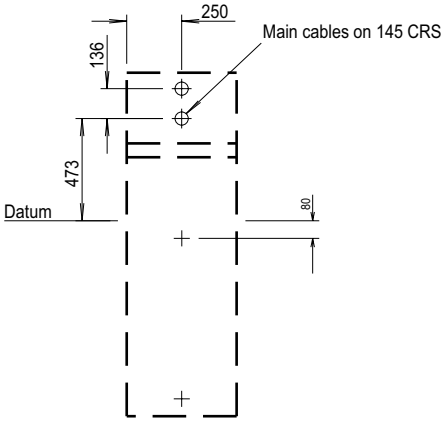
1x3 core up to 300 mm



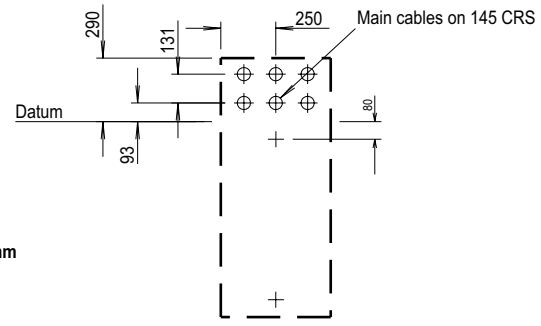


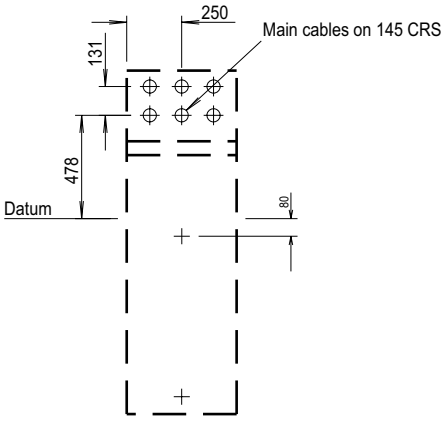
2x3 core up to 300 mm



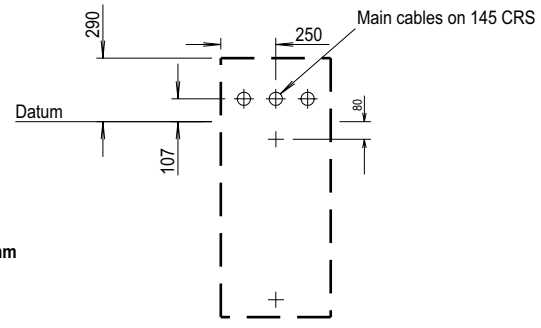


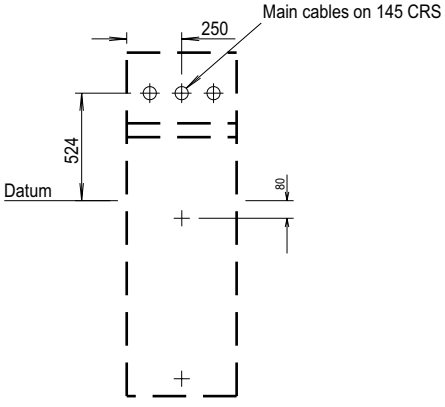
6x1 core up to 630 mm





3x1 core up to 630 mm





All dimensions are in mm

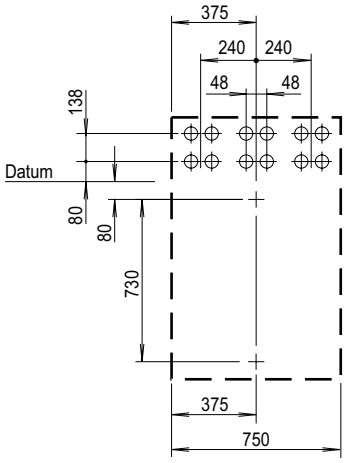
Cabling options
Drawing Ref: GDVINST-05

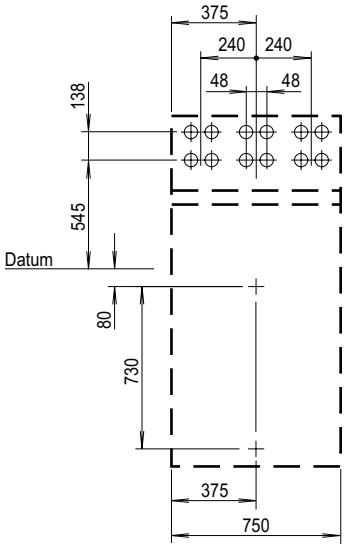
DE58346

Bottom entry cable approach

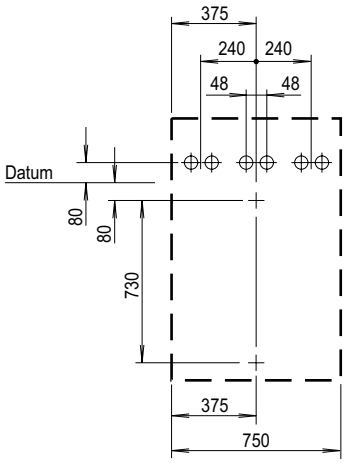
Top entry cable approach

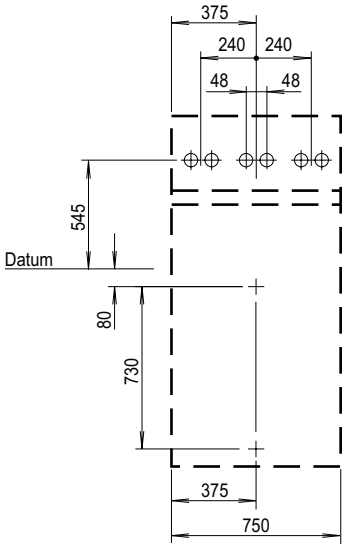
12x1 core up to 630 mm





6x1 core up to 630 mm





All dimensions are in mm

Quotation request form
Contents

This section is designed to assist us in the preparation of a budget quotation to your specific switchboard requirement. However if you have a detailed specification and would like a firm price against its contents please forward it to:

Schneider Electric Limited
Bid Strategy Centre
PO Box 101
LS10 9AD

Fax: 0113 290 3564
E-mail: gb-bidcentre@gb.schneider-electric.com
Tel: 0870 608 8 608

Switchboard details **118**

Unit type **119**

Protection and control module **120**

Order form **121**

Switchboard details

Panel N°	1	2	3	4	5	6	7	8	9	10	11	12	13
Unit details (1)													
Circuit breaker module													
Protection and control module													
Main cable box (2)													
Bottom entry (standard)													
Top entry													
Cable type (eg 1 x 3 core PILC)													
Size in mm^2													
Dyscon terminations required *													
Cable glands required (specify kit number)	Y N	Y N	Y N	N Y	N Y	N Y	N Y	N Y	N Y	N Y	N Y	N Y	Y N
Unit accessories													
Mechanical padlocks*													
Control switch padlocks (please specify quantity)	Y N	Y N	Y N	N Y	N Y	N Y	N Y	N Y	N Y	N Y	N Y	N Y	Y N
Key interlock (earth on key free)*	Y N	Y N	Y N	N Y	N Y	N Y	N Y	N Y	N Y	N Y	N Y	N Y	Y N
Key interlock (main on key trapped)*	Y N	Y N	Y N	N Y	N Y	N Y	N Y	N Y	N Y	N Y	N Y	N Y	Y N

Switchboard accessories	Standard Qty	Optional Qty
Operating handle	1	
Phase sequence indicator	0	
SFT2826 - oscillography analysis on PC (Sepam)	0	
SFT2841 - software to programme Sepam via PC (3)	0	
Tool box	0	

(1) Please refer to section 4 to ensure your selection of circuit breaker module is available with your choice protection and control module.

(2) Not available on bus sections or earthing switches

(3) This item is supplied with switchboards that include Sepam.

** Yes or No, check the appropriate box*

Unit type

Unit module type		Circuit breaker										Bus section									
		VC2		VC6		VC12		VC20		VC25		VB6		VB12		VB20		VB25			
Quantity																					
Ratings																					
Busbar current rating*	630 A	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N		
Busbar current rating*	1250 A	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N		
Busbar current rating*	2500 A	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N		
Service voltage	3.3, 6.6, 11 or 13.8 kV																				
Control voltage	24, 48, 110 V DC or 240 V AC																				
Current transformers																					
Protection Sepam	Ratio	Standard		Standard		Standard		Standard		Standard		Standard		Standard		Standard		Standard			
	Class	Standard		Standard		Standard		Standard		Standard		Standard		Standard		Standard		Standard			
	Burden	Standard		Standard		Standard		Standard		Standard		Standard		Standard		Standard		Standard			
Protection Pilot wire differential* If standard current transformer are not suitable please specify your requirement	Standard	Y	N	Y	N	Y	N	Y	N	Y	N										
	Ratio																				
	Class																				
	Knee point																				
	Resistance																				
Instrumentation* If standard current transformer are not suitable please specify your requirement	Standard	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N		
	Ratio																				
	Class																				
	Burden																				
Metering* If VC6, or VB6 is selected or the standard current transformer are not suitable please specify your requirement	Standard	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N		
	Ratio																				
	Class																				
	Burden																				
Voltage transformers																					
Circuit connected*		Y	N	Y	N	Y	N	Y	N	Y	N										
Connection type	Fused																				
Electrical control																					
Trip coil		Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N		
Close coil		Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N		
Motor mechanism		Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N		
Voltage required (24, 48, 110, 220 V DC or 230 V AC)																					

** Yes or No, check the appropriate box*

Protection and control module

Protection and control module type	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P12	P13	P14	P15	P16	P17	P18
Quantity																		
Measurement																		
Phase current																		
Max demand current																		
Phase voltages																		
kW, kVA, cos																		
kWh, kVARh																		
kWh pulsed output																		
Monitoring and control																		
Trip circuit supervision																		
Lockout relay																		
Intertrip send																		
Intertrip receive																		
Check synchronising																		
Remote emergency trip																		
Logic selectivity (block receive)																		
Current transducer (1 A specify output required)																		
Modbus RS485 serial comms																		
Trip circuit fault alarm contact																		
Interposing trip/close																		
Trip/neutral/close switch																		
Local/remote switch																		
Motor ON/OFF switch																		

Note: *this sheets allows you to select the options that are available on a particular protection and control module.*

Order form

Only one of the boxes (ticked [X] or filled [ ] by the needed value) have to be considered between each horizontal line.
Green box [X] corresponds to none priced functions.

Basic unit cubicle

Quantity [ ]

Rated voltage Ur (kV) [ ]

Impulse rating and short-time withstand **25 kA 3 s, 95 kVbil**

Circuit connected 200 A [ ] 630 A [ ] 1250 A [ ] 2000 A [ ] 2500 A [ ]

Bus section 630 A [ ] 1250 A [ ] 2000 A [ ] 2500 A [ ]

Busbar earthing CB unit [ ]

Metering panel
Busbar current transformer [ ] Busbar voltage transformer [ ]

Options

Circuit breaker only

Motor range (includes auto/off switch)
24 Vdc - 110 Vac/dc [ ] 220 Vdc - 230 Vac [ ]
Shunt trip coil & spring release coil (STC/SRC) [ ]
T/N/C and L/R selector switch [ ]

Cable box (circuit connected panels only) Bottom entry [ ] Top entry [ ]
No Dyscons [ ] 3 x 630 A Dyscons [ ] 6 x 630 A Dyscons [ ]

Switch and circuit breaker

Mechanical key interlock Key free main ON [ ] Key free earth ON [ ]

Switchboard

Busbar rating 630 A [ ] 1250 A [ ] 2500 A [ ]
End panel [ ]

Busbar connected cable box [ ]

Accessories

Pfisterer - Phase comparitor [ ]
Neon indicator and verifier [ ]
SFT2826 - Disturbance viewing software [ ]
SFT2841 - Sepam configurator via PC [ ]

Basic unit and options for protection and control module

	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P12	P13	P14	P15	P16	P17	P18
Select module	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Remote metering current transformers and voltage transformers	☐	☐	☐	☐	☐												☐	
Serial communications RS485	☐	☐	☐		☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐		☐
TCP/IP communication Modbus / IEC61850	☐	☐	☐		☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐		☐
Power meter Specify type	☐			☐	☐												☐	
Current transducer	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Pilot wire relay (can be fitted to P4, P5 and P6 only) Specify type				☐	☐	☐												
Interposing trip/close relay	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

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As a global specialist in energy management with operations in more than 100 countries, Schneider Electric offers integrated solutions across multiple market segments, including leadership positions in energy and infrastructure, industrial processes, building automation and data centres/networks, as well as a broad presence in residential applications.

Focused on making energy safe, reliable, efficient, productive and green, the company's 150,000 plus employees achieved sales of 24 billion euros in 2013, through an active commitment to help individuals and organisations Make the most of their energy[SM].

We are changing our brand names and becoming one Schneider Electric. You'll get the same great quality products, but from one name you can remember and trust. This provides you and your customers with the reassurance associated with Schneider Electric.

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Working as one Schneider Electric makes it clearer that our ranges are highly compatible for integrated solutions.

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