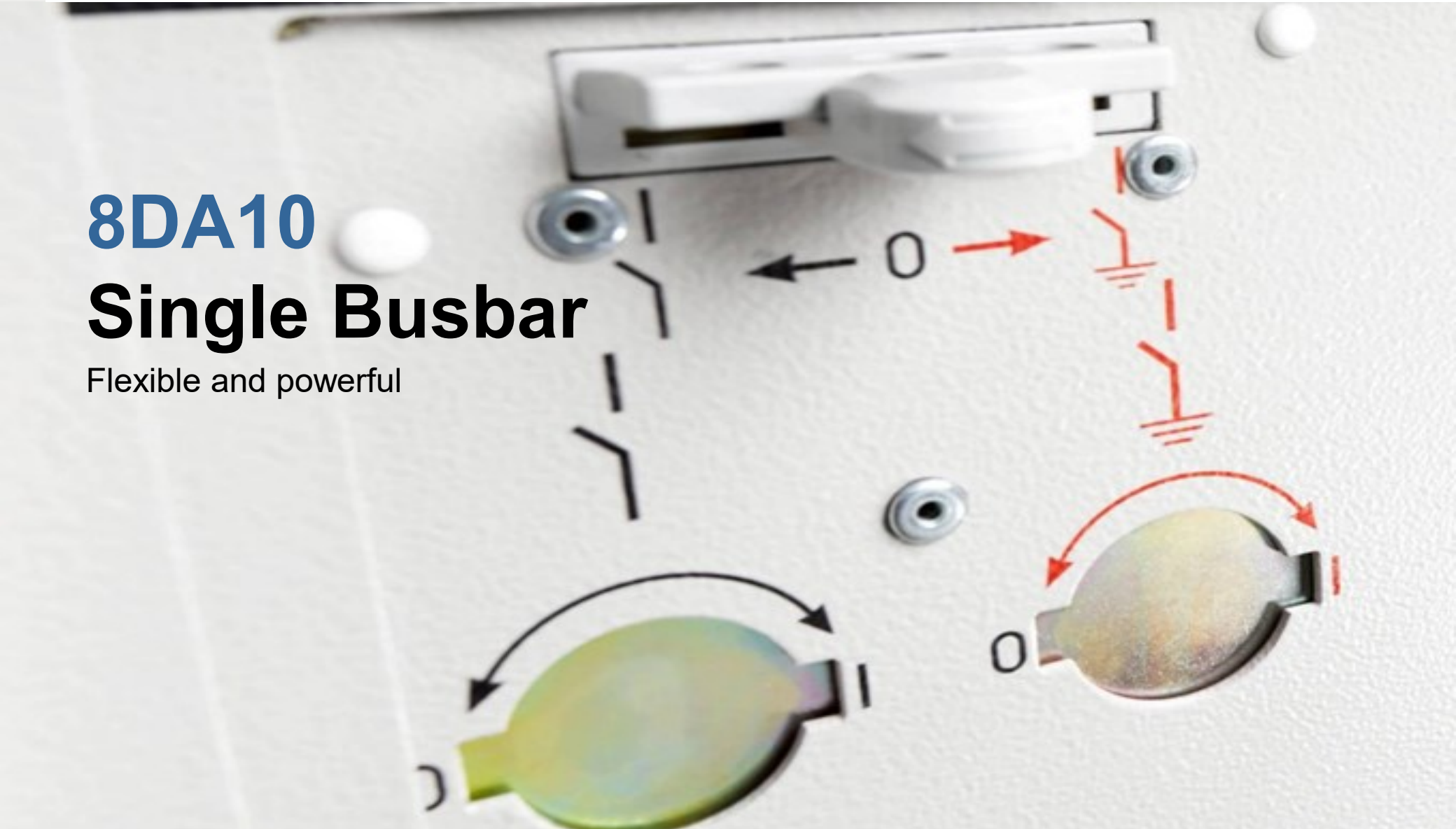
SIEMENS

8DA10

Single Busbar

Flexible and powerful



Welcome!

Content

- Technical features and general information
- Technical Data
- Typical Overview, fixtures and fittings
- Panel Desgin
  - Circuit-breaker Panel
  - Busbar
  - Operation
  - Metering
  - Low-Voltage Compartment
  - Cable Connection
  - Feeder Earthing, Cable Testing
  - Interlocks
- Classification according to IEC 62 271-200
- Customer‘s Benefit

Technical Features

- Up to 40,5 kV, 40 kA (3s), 5000 A busbar, 2500 A feeder
- Metal-enclosed
- Single-busbar System (8DA10)
- Double-busbar System (8DB10)
- Gas-insulated
- Hermetically enclosed
- Factory-assembled, type-tested switchgear according IEC 62 271-200

General Information

- Market introduction in March 1982
- Worldwide successful operation
- The gas-insulated circuit-breaker switchgear for application in nearly all branches like

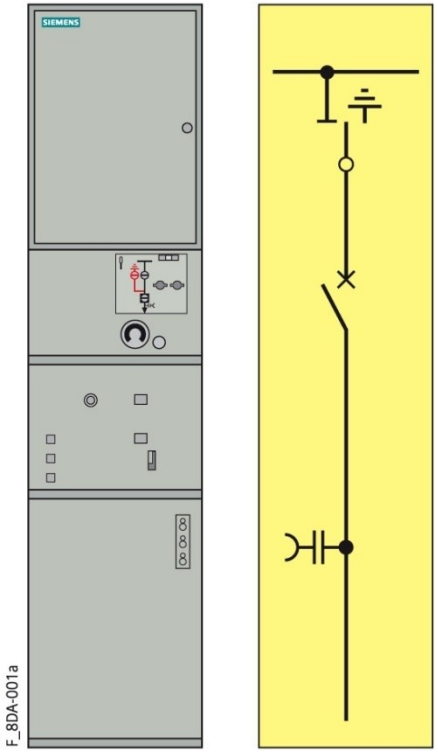
Airports & Ports	Automotive	Buildings
Cement Industries	Chemicals & Pharma	Mining
Oil & Gas	Paper Industries	Steel & Aluminium
Utilities	Transportation & Railways	

- More than 76,000 panels 8DA/B (issue October 2013) delivered
- Our experiences are based on more than 162,000 delivered panels for gas-insulated circuit-breaker switchgear (primary distribution level)

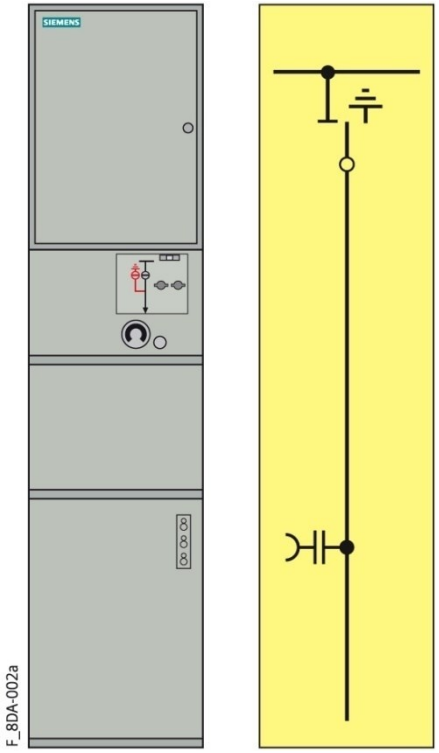
Technical Data 8DA10

Rated voltage		kV	12	24	36	40,5
Rated frequency		Hz	50/60	50/60	50/60	50/60
Rated short-duration power-frequency withstand voltage		kV	20	50	70	85
Rated lightning impulse withstand voltage		kV	75	125	170	185
Rated peak withstand current		kA	100	100	100	100
Rated short-circuit making current		kA	100	100	100	100
Rated short-time withstand current, 3 s		kA	40	40	40	40
Rated short-circuit breaking current		kA	40	40	40	40
Rated normal current of busbar		A	5000	5000	5000	5000
Rated normal current of feeder		A	2500	2500	2500	2500
Degree of protection	Primary part		IP65	IP65	IP65	IP65
	Secondary part		IP3XD	IP3XD	IP3XD	IP3XD
Dimensions						
Width		mm	600	600	600	600
Depth		mm	1625	1625	1625	1625
Height (Standard)		mm	2350	2350	2350	2350

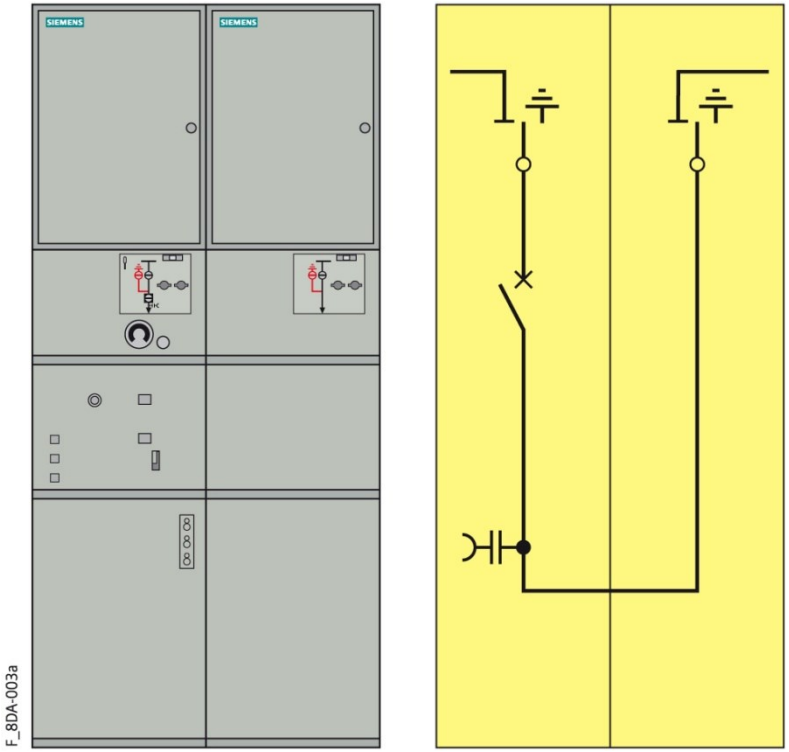
Typical Overview



Circuit-breaker Panel

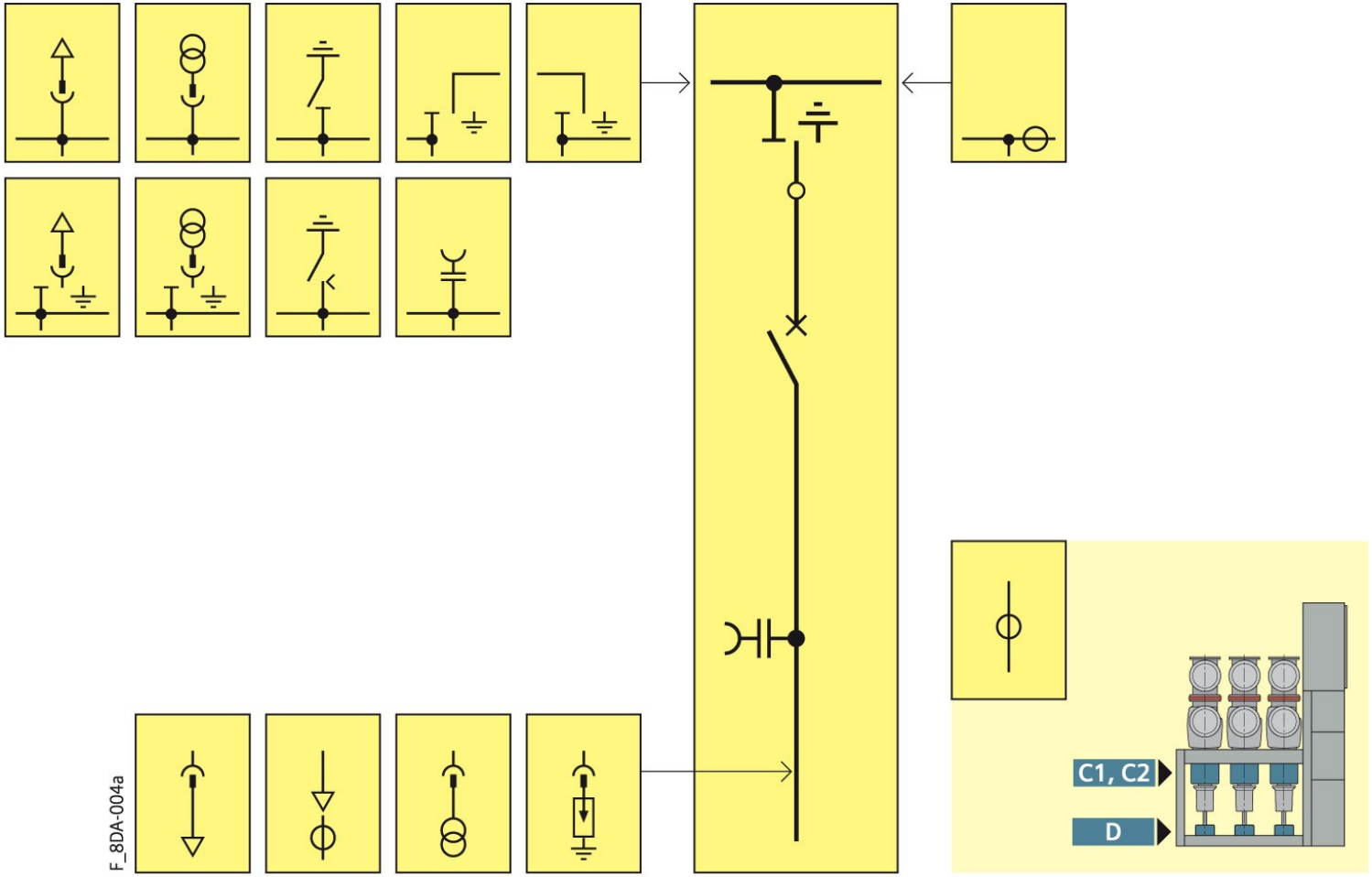


Disconnector Panel

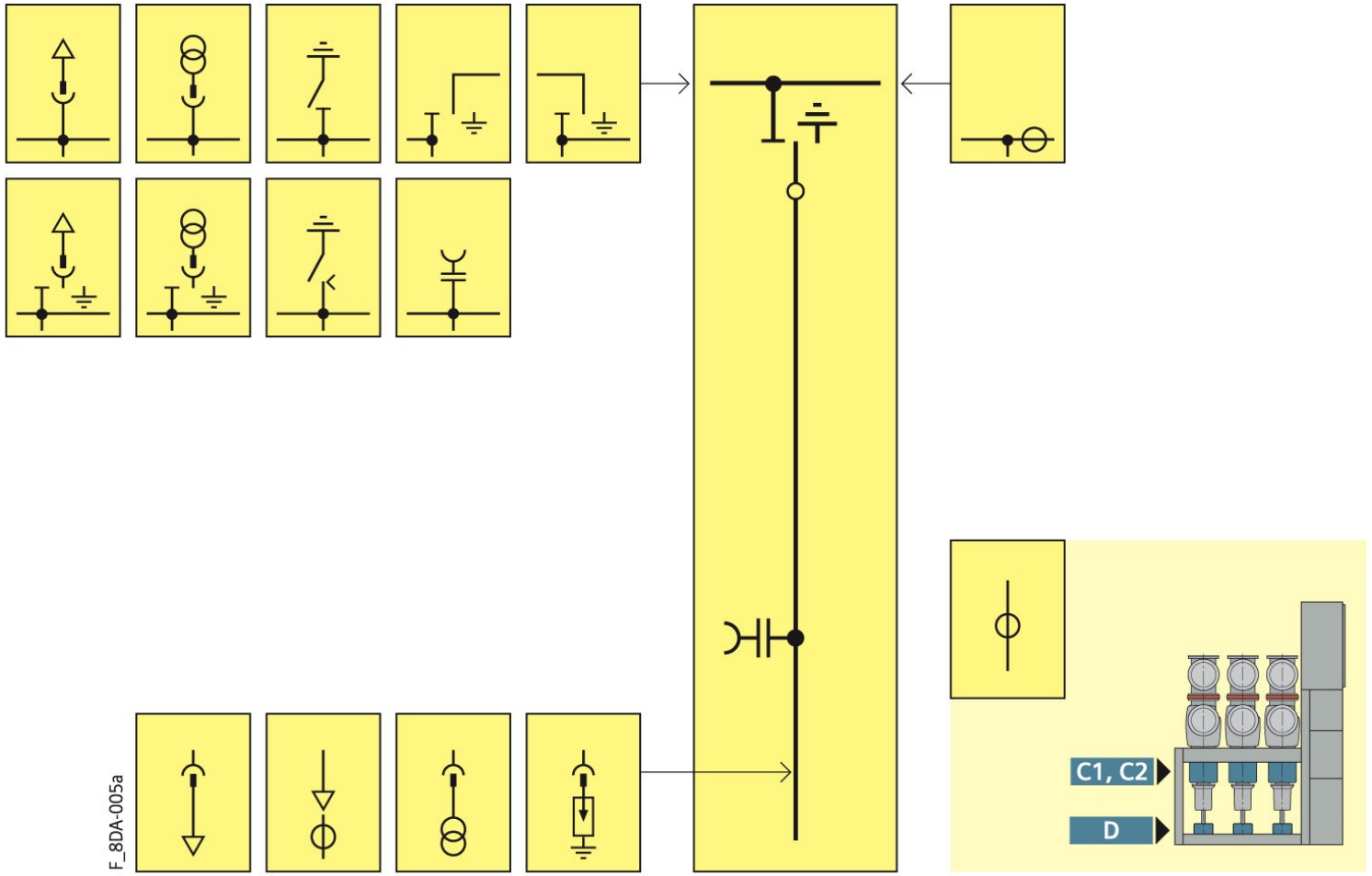


Bus Sectionalizer

Fixtures and Fittings
Circuit-breaker Panel

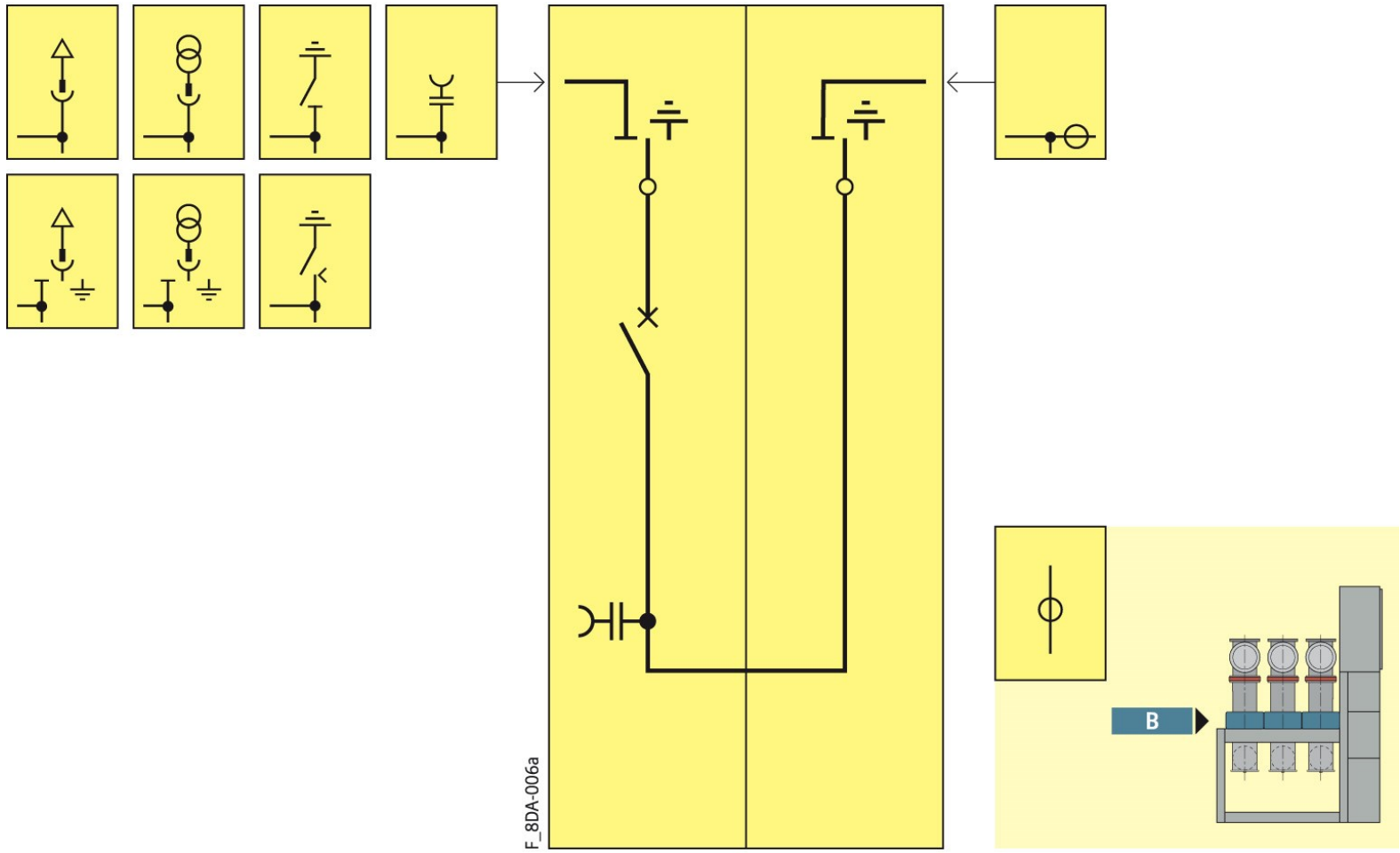


Fixtures and Fittings
Disconnector Panel

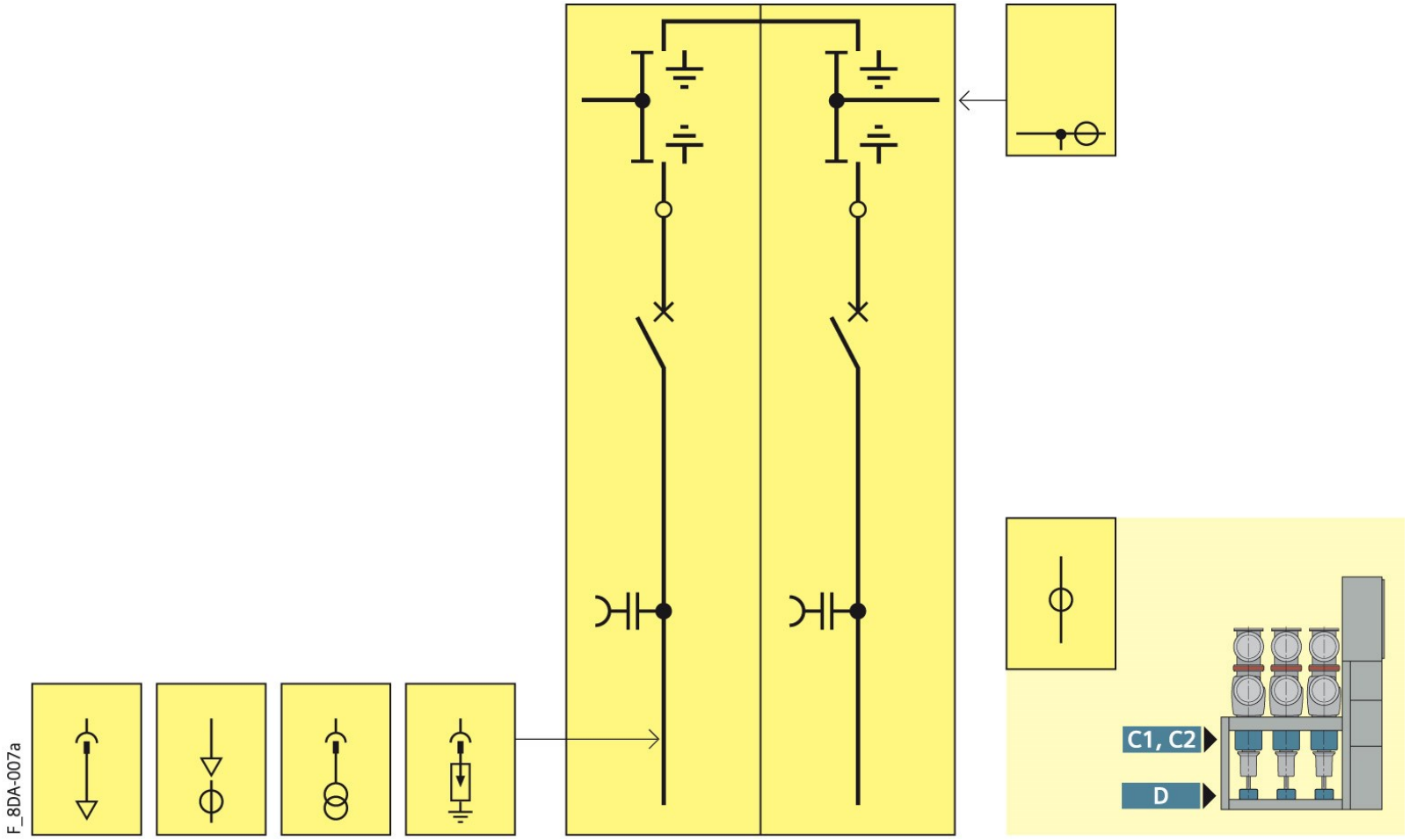


Fixtures and Fittings
Bus Sectionalizer

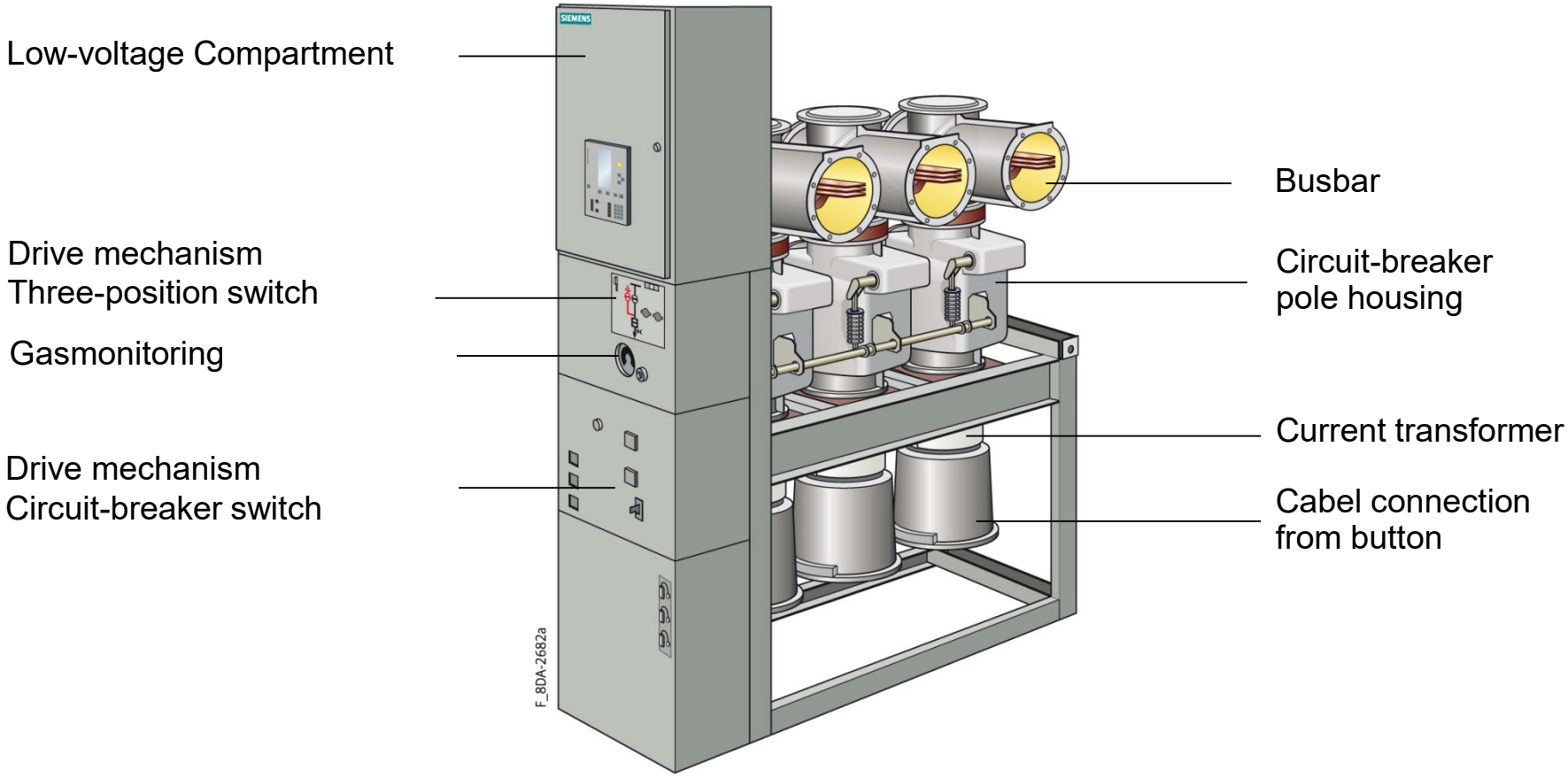
SIEMENS



Fixtures and Fittings
Bus Sectionalizer without additonal required space



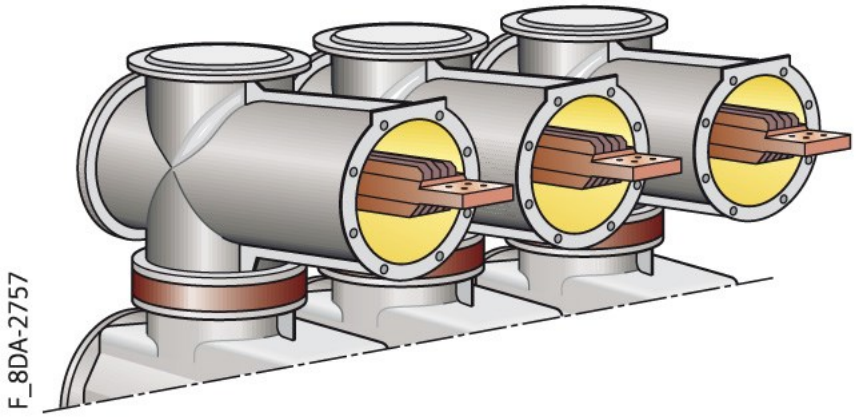
Circuit-breaker Panel



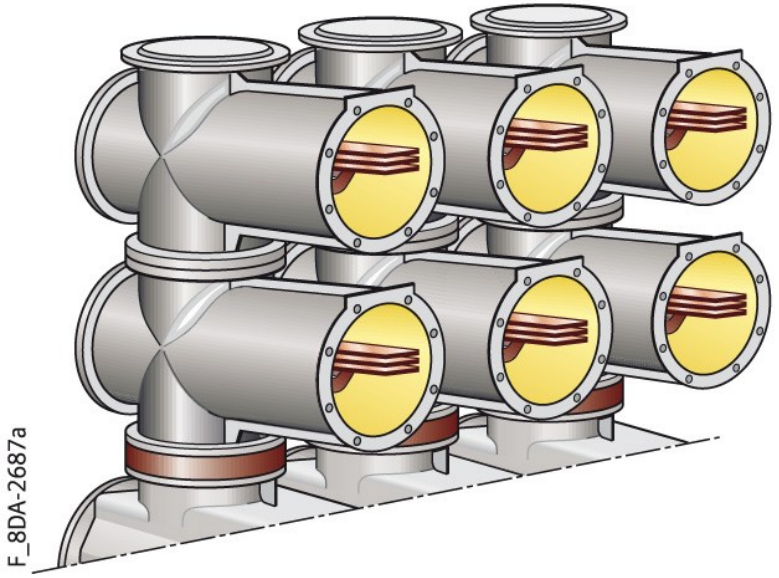
Busbar rated current up to 5000A

Example 8DA10

Busbar up to 4000 A



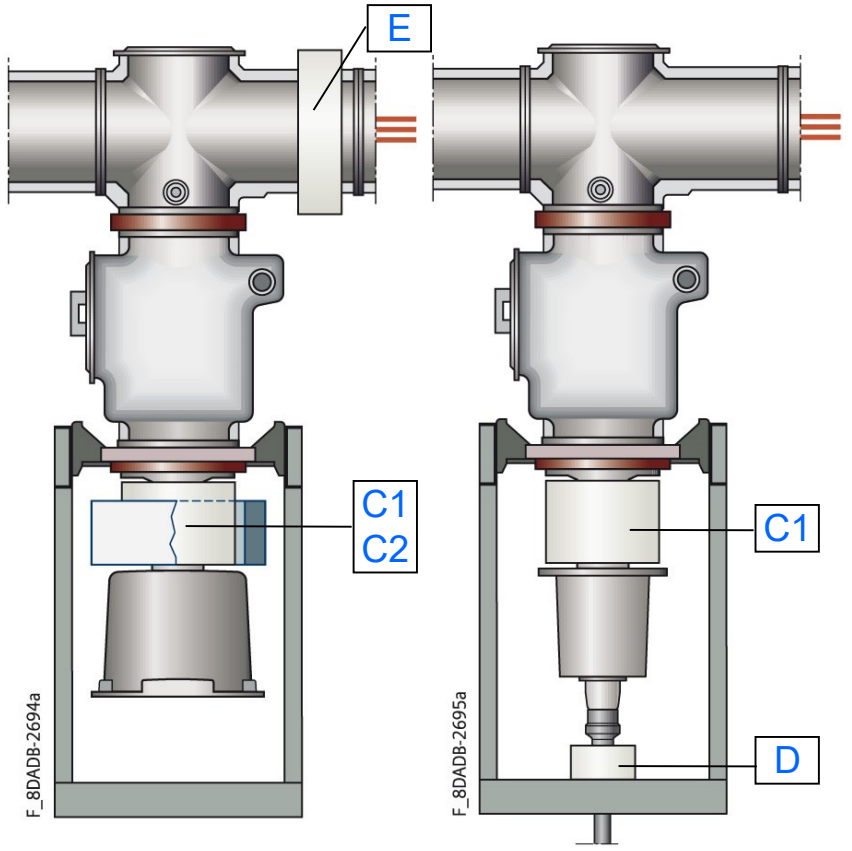
Busbar 5000 A



Current Measurement

Ring-core current transformers

- Main circuit as primary part without dielectric and thermal problems
- Secondary part accessible outside the enclosure without danger
- Free of dielectrically stressed cast-resin parts



Current transformer
Fitted at busbar

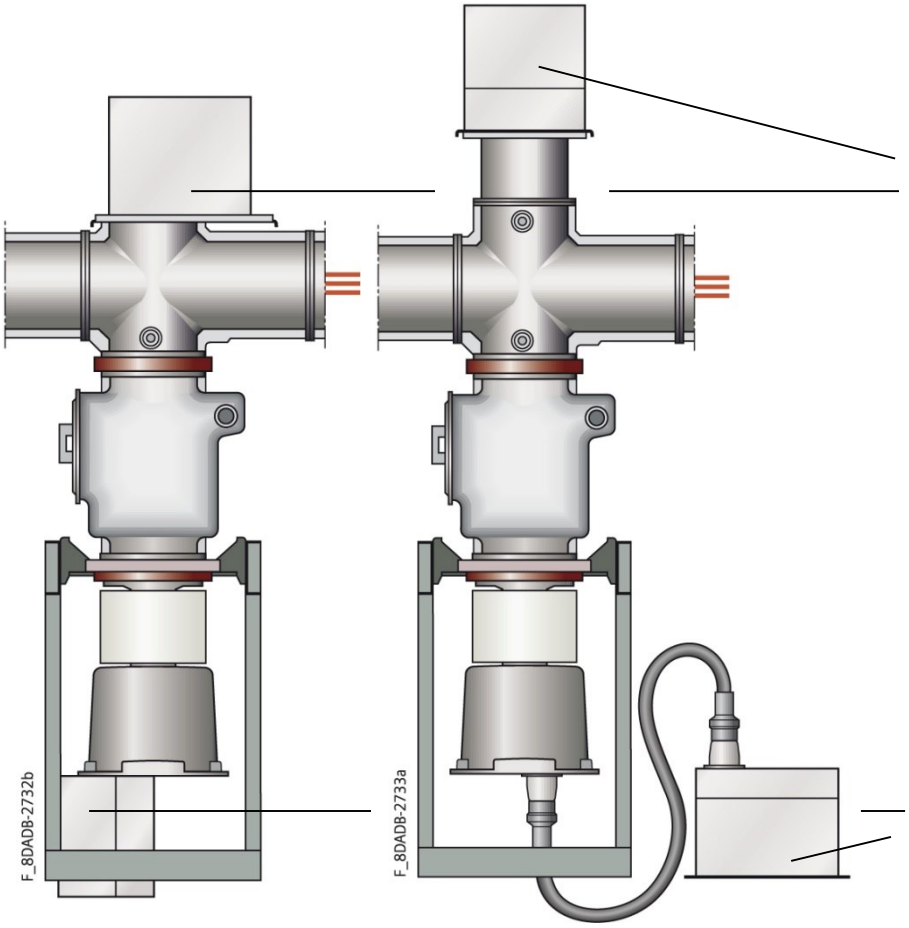
Current transformer
Fitted at cable
housing

Current transformer
Fitted at cable

Voltage Measurement

Voltage transformer

- Single-pole insulated
- Metal-enclosed
- Plug-in type
- At the busbar:
  Surge-proof for 80 % U_P
  repeat test with connected transformer

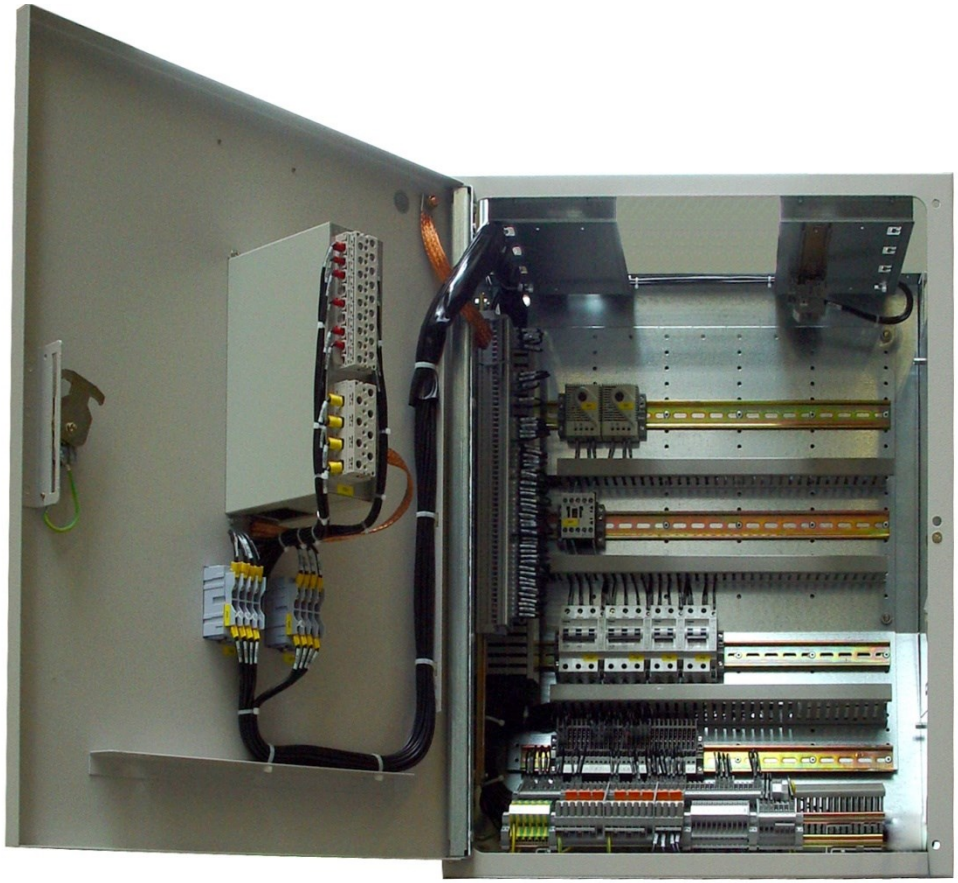


Voltage Transformer Fitted at busbar Type 4MT3 Type 4MU4

Voltage Transformer Fitted at cabel housing Type 4MT7 Type 4MU3

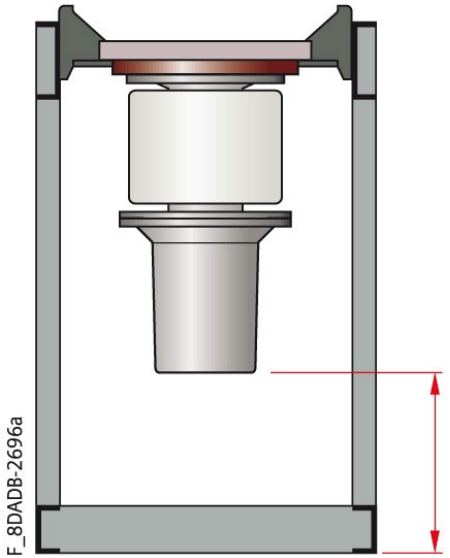
Low-Voltage Compartment

- Height: 850 mm
  1200 mm (option)
- Removable, bus wires and control cables plugged in (via 6 or 10-pole coded module plug connectors)
- Panel control via conventional control devices or digital bay controller
- Customer-specific equipment (protection, control, metering, annunciation)
- Wiring in H07VK, optionally also heat-resistant and halogen-free

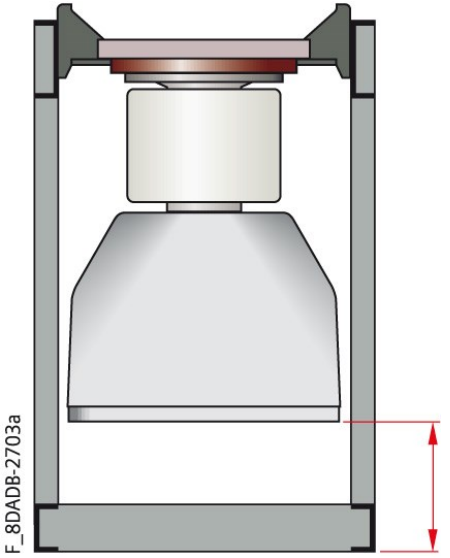


Panel Connection – Inside Cone according to IEC 50 181

- Maintenance-free due to inside cone plug-in system
- For connection type sizes 2, 3 und 4 (depending on cable cross section)
- 1 to 6 cables possible per phase
- Cable connection with different connection types / sizes realisable
- Plug-in voltage transformer and surge arrester realisable

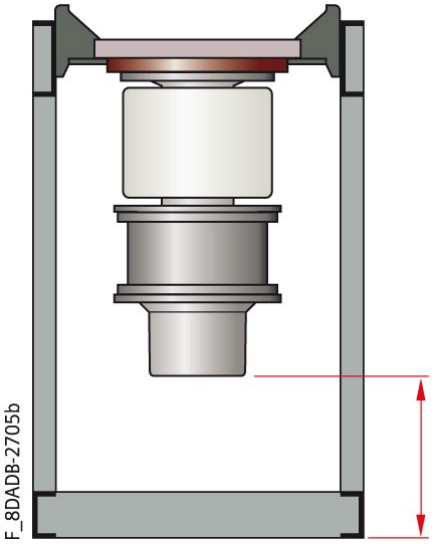


Single cable connection



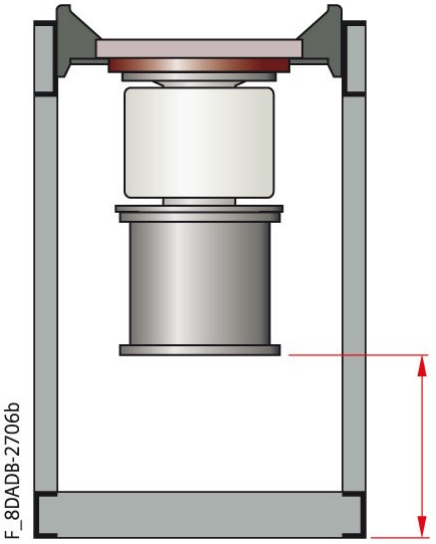
Multiple cable connection

Fully Insulated Bar Connections



Fully insulated bar

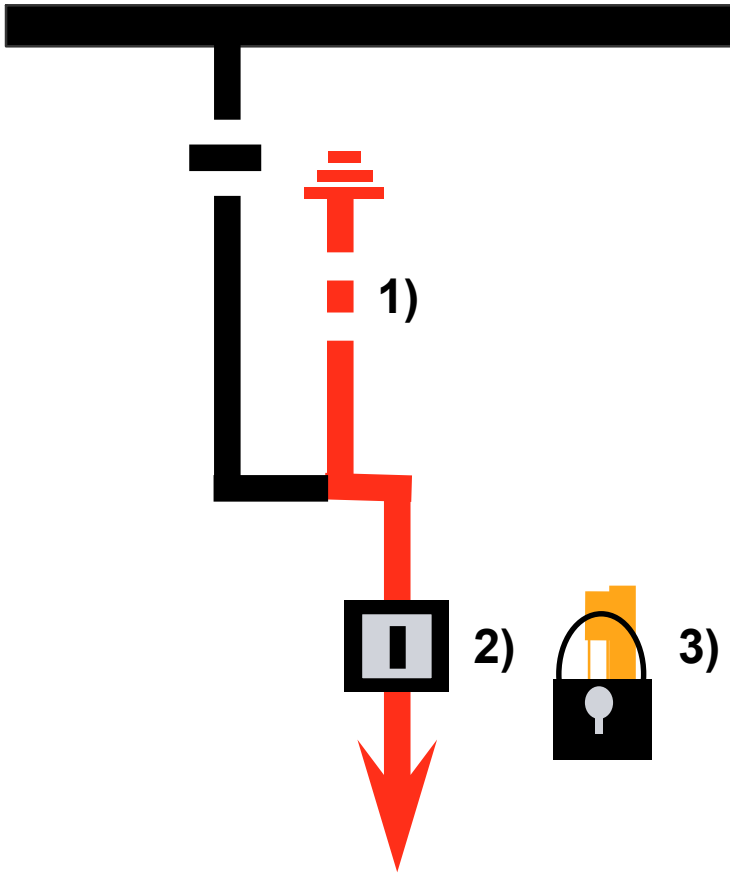
for rated normal current up to 2500 A



Gas-insulated bar

for rated normal current up to 2500 A

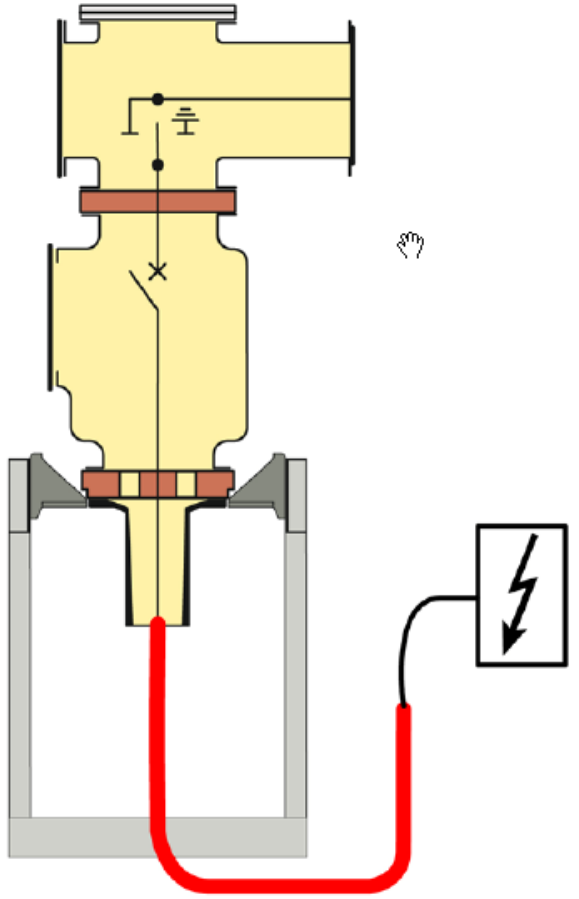
Cable Earthing with the Circuit-Breaker



1) Close three-position switch / Earthed position
   - Earthing prepared
   - Electrical OFF-signals are suppressed
2) Close circuit-breaker switch / ON position
   - Outgoing / Feeder earthed
3) Secure switch position “Outgoing/Feeder earthed with padlock
   - Circuit-breaker is blocked mechanically
   - Signal: Outgoing / Feeder earthed (option)

Cable testing

- Cable test with DC voltage or AC voltage 0.1 Hz
- Three-position switch and circuit-breaker in OFF position
- Cable fault location with lightning impulse voltage
- Full operating voltage at the busbar



Interlocks (Selection)

Interlocks are designed according to IEC 62 271-200

Standard interlocks

- Three-position disconnector against circuit-breaker – mechanical
- Disconnector against earthing switch (within three-position disconnector) – mechanical
- Locking device at the circuit-breaker switch
- Locking device at the three-position disconnector switch

Additional interlocks

- Electromagnetic interlock at the three-position switch / disconnector switch
- Electromagnetic interlock at the three-position switch / earthing switch

Classification according to IEC 62 271-200

Partition Class:	**PM**
Loss of Service Continuity Category:	**LSC 2**
Accessibility of Compartments:	
▪ Busbar compartment:	tool-based
▪ Switching device compartment:	tool-based
▪ Low-voltage compartment:	tool-based
▪ Cable compartment:	tool-based
Internal arc classification:	**IAC A FLR 40 kA 1 s**

Customer's Benefit

- Security of Operation, Reliability
- Personal Safety
- Environmental Independence
- Compactness
- Maintenance-free Design for Devices
- Economy, Ecology

Security of Operation, Reliability

Our solution

Hermetically enclosed system

Current transformers outside the gas compartments

Metal-enclosed voltage transformers plugged in from outside

Hermetically enclosed busbar system

Modular design

Minimum use of insulating material

Type and routine tests, quality management

NC production processes

Your benefit

Two and three-phase short circuits not possible because of single-phase encapsulation

Independent of the environment, maintenance-free,
no condensation, no oxidation

Fast transformer replacement possible

No dielectric and dynamic stress for current transformers

Restriction of failure by compartment

Reduced fire load

MTBF (> 3,000 years at the moment)

Personal Safety

Our solution

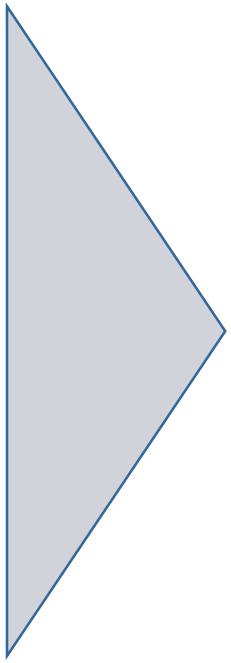
Hermetically enclosed system

Internal arc classified according to IEC 62 271-200 for 1 s

Logical mechanical interlocks

Capacitive voltage detection system

Make-proof earthing through the circuit-breaker



Your benefit

Touching of live parts excluded, extremely high degree of protection of the primary part

Accidental opening of vessel excluded

Access to switching devices not required due to maintenance-free design

Maloperation excluded

Verification of safe isolation from supply without opening the enclosure

Environmental Independence

Our solution

Hermetically encapsulation

Hermetically enclosed pressure system

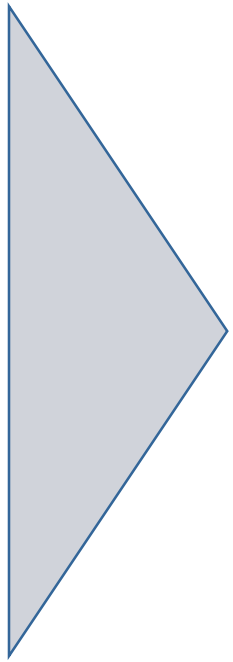
Maintenance-free switching devices and operating mechanisms,

no adjustment and lubrication

Hermetically enclosed busbar system

Enclosed cable plugs,

screened, independent of the environment



Your benefit

Insensitive to aggressive environments (salt water, tropical areas, dust, humidity, chemical pollutants),
no oxidation of contacts and bolted joints,
no condensation,
no pollution layers on insulators,
no resinifying grease

Continuous insulation quality

No ingress of foreign bodies, small animals

Independent of site altitude

Compactness

Our solution

SF_6-insulation,
compact construction

Combined disconnector and earthing switch,
compact switch design

SIPROTEC bay controller: Digital control, interlocking and protection system,
compact secondary systems with high functional density

Your benefit

Minimum space requirements,
building volume saved, efficient use of existing rooms, reduced volume for new constructions, compact design reduces transport and installation costs to a minimum

Economic use of space in urban areas,
installation in conurbation, load centres to minimise transmission losses

Maintenance-free Design for Devices

Our solution

Hermetically enclosed pressure system

Maintenance-free switching devices and operating mechanisms,
no adjustment and lubrication

Hermetically enclosed busbar system

Enclosed cable plugs,
screened, independent of the environment

Your benefit

Maximum reliability of supply and availability,
no shutdowns for maintenance

Sealed for lifetime
(according IEC 62 271-200)

Low maintenance costs,
minimized operational costs

Highly economic investment

Economy, Ecology

Our solution

Maintenance-free switchgear

Compact construction

Economic production

SF_6 only used in hermetically sealed pressure system

100 % SF_6-recycling by means of special tools

Identified, recyclable insulating material

Listing of all materials used

Your benefit

Minimized operator expenses, high availability

Reduced transport costs

Minimum requirements regarding the building

Minimized transmission losses by installation in load centres

Reliable, calculable disposal

Thanks for your attention.

8DA10, the gas-insulated switchgear up to

40,5 kV, 40 kA (3 s), 5000 A busbar, 2500 A feeder