DF-2

AIS for application in the mines

High Mine Line



BUILT TO LAST!

SGC

DF-2, a modular concept combining all medium voltage functions.

DF-2'S MODULAR DESIGN ALLOWS YOU TO CREATE RATIONAL, ECONOMICAL & CUSTOM-MADE COMBINATIONS OF MEDIUM VOLTAGE CUBICLES (WITH A RATED VOLTAGE OF 12, 17,5 OR 24 KV)

SGC

SwitchGear Company

THE SPECIALIST IN MEDIUM VOLTAGE SWITCHGEAR

www.switchgearcompany.eu - info@switchgearcompany.eu

TABLE OF CONTENTS

1. OVERVIEW

1.1. DF-2 DESIGN PHILOSOPHY AND APPLICATIONS ..... p. 4
1.2. MODULAR TYPE DF-2 ..... p. 4
1.3. APPLICATION ..... p. 6
1.4. SF_6 INSULATION ..... p. 8
1.5. STANDARDS ..... p. 8
1.6. INTERNAL ARC RESISTANCE ..... p. 9

2. COMPARTMENTS

2.1. ARCHITECTURE ..... p. 10
2.2. SWITCHGEAR COMPARTMENT ..... p. 10
2.3. BUSBAR COMPARTMENT ..... p. 10
2.4. CABLE COMPARTMENT ..... p. 10
2.5 LOW-VOLTAGE COMPARTMENT ..... p. 11

3. DF-2 MODULES RANGE

3.1. TECHNICAL SPECIFICATIONS ..... p. 12
3.2. EXTENSIVE SPECIFICATIONS ..... p. 14
3.3. MODULES - SPECIFICATIONS & DIMENSIONS ..... p. 15
- DF-A ..... p. 16
- DF-P ..... p. 18
- DF-D/EDN ..... p. 20
- DF-LK ..... p. 22

4. PRODUCTION PROCESS

4.1. PRODUCTION PROCESS OF THE DF-2 CUBICLES IN LANDEGEM ..... p. 26

SGC - SwitchGear Company • Moorstraat 24 • B-9850 Landegem • Belgium
Tel. +32 (0)9/321.91.12 • www.switchgearcompany.eu • info@switchgearcompany.eu


C
01
D
E
SIEMENS

1. OVERVIEW

1.1. DF-2 DESIGN PHILOSOPHY AND APPLICATIONS

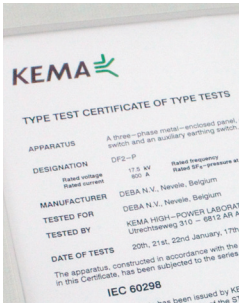
SGC nv SwitchGear Company is
a fast-growing Belgian company
that invests considerable time and energy in Research & Development to serve customers even better.

User-friendliness, safety and care
for the environment were the main drive for developing SGC nv SwitchGear Company's switchgear.

Over time SGC - SwitchGear Company has developed the **"DF-2", a modular** concept which **combines all medium voltage functions**. It allows SGC - SwitchGear Company to provide **"made-to-measure" solutions** for all your medium voltage needs.

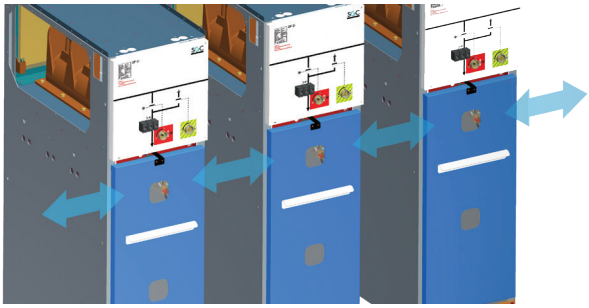
wide range of applications and can be used worldwide in many industries. DF-2 cubicles can be used with distribution and dispersion switchgear, electrical substations and medium voltage engines, wind generators, cogeneration, and much more.

The DF-2-concept provides a solution for all your needs and demands: it can replace obsolete installations and extend existing installations, and it is also perfectly suitable for entirely new constructions.



1.2. MODULAR TYPE DF-2

The DF-2 cubicles and associated switchgear offer a



The DF-2 system is a modular concept based on the "building blocks" principle, which means that cubicles are produced in series. As a result, the modular DF-2 concept meets the highest technical standards in a rational, economically sound way. The combination of cubicles is unlimited. Very complex diagrams of distribution and transformer switchgear can be compiled through this extensive spectrum of possibilities.

The cubicle dimensions are very dense since the switching occurs in an SF6 insulation medium. The semi-compact cubicles are particularly beneficial if the available space should pose a problem or if economical factors play an important role.

Cubicles also contain all functional interlocks which allows for effortless application, according to all current standards, and which allows installation in consumer work spaces. As a result, capacity loss will be minimal. Additionally, the cubicles have been fitted with a system for pressure release which shields the user from the consequences of an internal arc.



“A modular concept combining all medium voltage functions...”

1.3. APPLICATION

Power stations produce energy that is transported at voltage levels of 500 kV and above. High-voltage Transformer Stations are provided to reduce the voltage and adapt them to sub-transmission and distribution levels according to the operating levels in Distribution Centres and Medium Voltage Transformer Substations. In Transformer Substations the medium voltage (2400V to 24000V) is then transformed into low voltage or user level medium voltage for pump and fan motor loads (2400V, 4160V and 6600V).

Distribution Centres feed a medium-voltage network to distribute power to step-down transformer substations or medium-voltage loads. Transformer Substations feed a low voltage network or a medium voltage load system. The cubicles of SGC - Switchgear Company nv are typically used to supply distribution networks for operators, manufacturing industries, petrochemical distilleries, underground and surface mines, military installations, mineral processing and refining plants as well as residential neighbourhoods, hospitals and hotels. A medium voltage distribution centre must provide 5 essential functions:

1. SAFETY: protection for operating personnel with regard to indirect contact, indirect contact and electrical arc. Capacity for the execution of maintenance services in a safe manner and minimising isolation and blocking manoeuvre execution times.

2. POWER SUPPLY: the utility provider's grid is branched off to allow switching.

3. PROTECTION: the installation is secured by suitable electrical protection: Load Break Switch - Fuse or Medium Voltage Circuit Breaker.

4. MEASUREMENT: the energy consumption is measured on the high-voltage, or low-voltage side.

5. TRANSFORMATION: medium voltage is transformed into low-voltage (690 V-400 V-231 V).



MEDIUM VOLTAGE SWITCHGEAR

High Mine Line especially designed for application in the mines

Medium Voltage (MV) Distribution Centres located on or near the coast, inside mines, at high altitudes or in other aggressive environments (extremely low or high temperatures, humidity, acidic environment, high altitudes, atmosphere saturated with combustion gases) are exposed to heavy pollution which causes accelerated ageing of insulating materials. These conditions affect the insulation level and the functioning of mechanical parts and accelerate gas leakage. Our standard product called DF-2/DF-2+ (with Arc Killer) is always manufactured in accordance with IEC 61271-304 and IEC 60932-4. This additional non-mandatory IEC requirement for standard material means that severe climatic conditions method A level 2. SGC decided to raise its own quality standard and produce all its equipment with this normative certification which provides the customer with a higher level of reliability than the rest of the competing products on the world market. Certified heat and condensation cycle tests: 4-hour cycle 30°C, humidity 80% and 4-hour cycle 50°C, humidity 95%. In addition, the designs are guaranteed for operating altitudes of 5000 m above sea level, high temperature and humidity. Duration of test cycle: 9 days.

Modular design of mine autonomous substation

The High Mine Line has been designed in such a way that Maintenance and Engineering teams can, with a few simple steps, define the training and Specify the equipment required for the early commissioning, upgrade, repowering or relocation of a mine substation.

For the selection of the type of cubicle to be used, the designer must define:

Voltage level
Supply: Power, single or double
Type of busbar: Single or split and rated current
Local loads: Less than 800 MkVA, or greater than 800 kVA
Remote loads: Power to be supplied

Auxiliary Services cubicle for mine networks with voltage fluctuations of 30%.

The High Mine Line's DF2 AUX cubicle provides power supply for the formation loads in order to guarantee operation at mains voltages with the fluctuations occurring in mines of +/- 30%. The integrated UPS system provides operation of the protection systems for 1 hour (depending on the formation) and does not require external power supply as it is directly linked to the formation's Medium Voltage Busbars. In the case of installations with remote monitoring, they are also dimensioned to feed the communications system allowing the recording of faults and loss of power in the monitored sectors. The power cubicle is provided with a watertight battery cubicle as required by the regulations of our mining customers.

1.4. . SF_6 INSULATION

SF_6 stands for sulphur hexafluoride, which is a clear and odourless, inert, non-toxic and nonflammable gas. It is extremely stable, especially due to the six covalent connections of the molecule. SF_6 has a molecular mass of 146.05, 5 times heavier than air, which makes it one of the heaviest gasses. It can be obtained in cylinders anywhere in the world and is used extensively in different sectors such as the petrochemical field, the nuclear sector, and in electron microscopy. SF_6 is even found in double glazing.

For over 30 years SF_6 gas has proven to be superior as an insulation and interruption medium in high (HV) and medium voltage (MV) installations. One of the physical characteristics of SF_6 is that the gas neutralises electrons. Its insulating property makes SF_6 especially important for medium and high-voltage switchgear, switches and transformers. In MV and HV installations, it is extremely important that the cables and switchgear are well insulated to avoid electrical arcs or short-circuits. There is even an additional advantage: SF_6 gas acts as a space saver since it requires less space than air for switching purposes.

SGC nv SwitchGear Company's RV 44 load break switch is filled with SF_6 gas. Switches are "sealed for life" and require minimal maintenance. When it comes to recycling electrical components, current regulations require recuperation of components containing gas after their lifecycle ends. The recuperation of SF_6 products is regulated by law and executed by specialized companies according to a strict schedule. SGC nv SwitchGear Company will be available at all times to help you with this specific problem.



SF_6 filling and sealing station

1.5. STANDARDS

The DF-2 system has been certified according to IEC (International Electrotechnical Commission) standards:

The whole concept conforms to ISO procedures, certificates and even with ISO 9001 guidelines. Cubicle testing is carried out in accordance with IEC regulation and selfenforced quality requirements.

"All cubicles are built according to IEC 62271-200"

SPECIAL OPTION: 1250 A

All cubicles can be supplied in a 1250 A design (according to IEC 62271-103 class E1), with a 1250 A busbar set.

1.6. INTERNAL ARC RESISTANCE

A short-circuit or another malfunction can create an internal arc. An internal arc in a classic MV cubicle, could severely damage the installation and possibly injure the operator and electrocute him or her.

The DF-2 is designed to resist internal arcs, protecting both the operator and the installation. Through a strategic pressure release system, the internal arc is restricted to the compartment where it originated and it does not propagate towards the operator or to other compartments.

The anti-arc kit of DF-2 cubicles is specifically designed to minimize the consequences of an internal arc. By default all provided cubicles are fitted on the rear side with overpressure valves pointing downward.

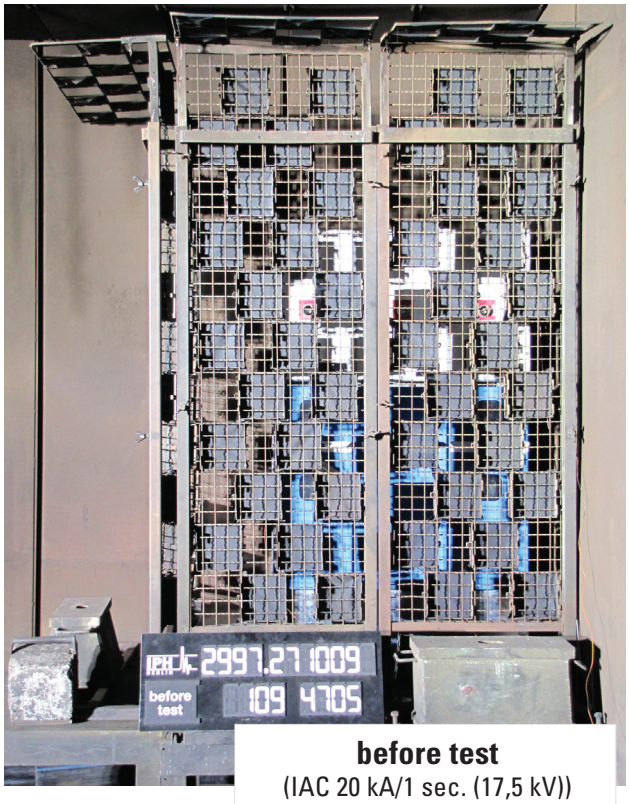
The four valves are equally spaced among the total height of the cubicles: The upper valve is for the busbar and the three other valves protect both the cable compartment and the equipment compartment. The cubicle roof is fitted lengthwise over a depth of 100 mm.

Upon delivery, two reinforced side plates will be supplied in order to close the cabin completely, both to the left and right sides against the wall. As a result, an expansion space is created across the total height and width of the cabin.

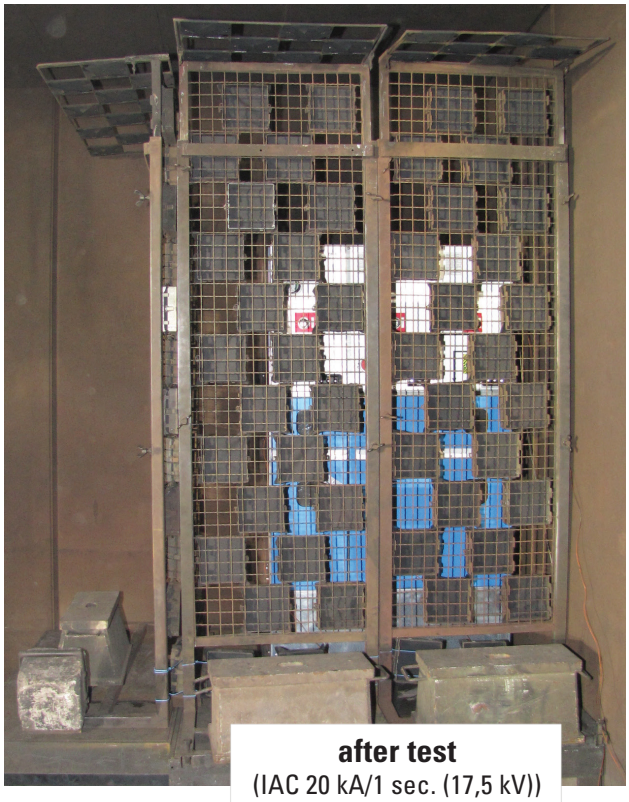
For applications in accessible concrete outdoor cabins, the anti-arc kit allows gasses to be diverted to the basement area. There is an exhaust opening in the floor panel along the side of the wall specifically for this purpose.

DF-2 cubicles were tested at Kema IAC (AFL) for 16kA/1s. at a rated voltage of 17.5 kV/24 kV according to IEC 62271-200, appendix A and met the 5 criteria.

Consequently, all SGC nv SwitchGear Company cubicles are internal arc resistant.



before test
(IAC 20 kA/1 sec. (17,5 kV))



after test
(IAC 20 kA/1 sec. (17,5 kV))

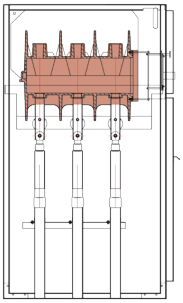
The various tests were always in accordance with IAC (AFL) for 16kA/1s. according to IEC 62271-200

2. COMPARTMENTS

2.1. DESIGN

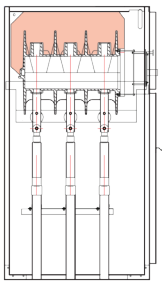
The High Mine Line has been designed with the objective of being able to mount Distribution Centre assemblies and Transformer Stations directly inside high mines. On this basis, the control cubicles have been integrated with doors fitted with large transparent viewers that allow monitoring of the operating status without opening the door and maintain the IP 44 protection rating (higher than Nema 4) of the design and which has been tested to IP/IEC. Depending on the cubicle type, a common compartment for Command and Protection or separate Command and Protection compartments are available.

2.2. SWITCHGEAR COMPARTMENT



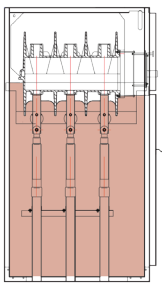
In this compartment, the SF6-filled RV44 load break switch of the "sealed for life" type, acts as the physical separation between the busbar set and the cable compartment. The switch has two functions: it connects or interrupts the electrical current between the high voltage cables and the busbar.

2.3. BUSBAR COMPARTMENT



The busbar compartment is located in the upper part of the cubicle and behind the low-voltage compartment. The modular busbar set is manufactured from specially provided electrolyte F25 copper of 60 x 10 mm with n = 5 mm (800 A). Several cubicles are connected through the bar set compartments. Hexagonal bolts connect the busbars to the upper contact surfaces of the RV44 load break switch.

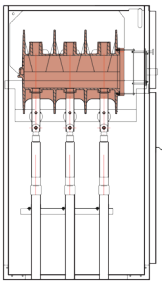
2.4. CABLE / CIRCUIT BREAKER / FUSE COMPARTMENT



This compartment is located behind the interlocked, removable door of the DF-2 cubicle. This part of the field receives the cable(s) and contains the necessary equipment to connect the cable(s). The earthing switch is installed below the load break switch on the right side, ensuring a "visible earthing" when the earthing switch is closed. In a DF-A cubicle, the cables are connected to the contact points below the RV44 load break switch. The cables of the DF-P cubicles are connected to the lower fuse base side. This type of cubicle also has an additional auxiliary earthing switch to divert any residual current. DF-D types have the earthing switches located in the cable compartment below. The removable door, the sectional floor panels, which house the necessary conductive rubber for the cables, and the cable supports, all simplify the cable connection.

2.5. LOW-VOLTAGE COMPARTMENT

The drive mechanism that controls the RV44 load break switch and the earthing switch EM20 is fitted with the synoptic diagram and is located behind the front panel. Several accessories, such as the auxiliary contacts, switch-on or switch-off coils, and minimum voltage relays, are also located in this compartment. Any engine control with the necessary electrical switchgear, a control and clamp strip are also installed in this compartment. The compartment can be accessed very easily by removing the front panel.





3. DF-2 MODULES RANGE

3.1. TECHNICAL SPECIFICATIONS

Rated Voltage	kV	12	17,5	24
Impulse withstand voltage 1.2 / 50 µs				
-To earth and between phases	kV	75	95	125
-Over the insulated distance	kV	85	110	145
Power frequency withstand voltage:				
-To earth and between phases	kV	28	38	50
-Over the insulated distance	kV	32	45	60
Rated frequency	Hz	50/60	50/60	50/60
Rated current	A	800/1250(*)	800/1250(*)	630/800
Rated short-time current 1-2-3 s	kA	25	25	20
Rated peak value of the current	kA	63	63	50
Breaking capacity RV44 (Class E3)				
-Mainly active load	A	800/1250(*)	800/1250(*)	630/800
-Closed loop	A	800	800	630/800
-Load cable charging	A	18	18	18
-Making current	kA	63	63	50
-Earth fault	A	100	100	100
-Earth fault cable charging	A	30	30	30
Internal arc 1 s.	kA	16/20(**)	16/20(**)	16/20(**)
Degree of protection	1000	IP4X		
Mechanical durability c/o	1000			
Standards	IEC 62271-100, IEC 62271-1, 62271-102, -103, -105, 62271-200 y IEC 61243-5			
Certificates	KEMA/IPH			

(*) According to IEC 62271-103, Class E1
(**) Option arc-killer



3.2. EXTENSIVE SPECIFICATIONS

Cubicles consist of 2 mm galvanized steel plates. By opting for this particular plate size, the cubicles are able to withstand internal arcs effortlessly, both in the cable compartment as well as in the busbar compartment.

A lot of detail went into the functional design to ensure that, in the event of an internal malfunction, no bursts of flames can move between plating surfaces, the door or between cubicles.

Possible internal arcs are also guaranteed to be restricted to the compartment where they originated.

The roof of the cubicle can be easily dismantled to provide smooth access to the busbar during installation and/or maintenance activities. The copper busbar is manufactured to resist the current, which results in minimum heating at the contact points.

The user-friendly construction of the drive mechanisms easily allows for optional features to be installed at a later stage. Optional features can even be installed without taking the cubicle out of service.

SGC - SwitchGear Company's countless years of experience resulted in a cable compartment as comfortable and as functional as possible. Thanks to the removable door, the operator has maximum access to the connection points. This is crucial when (dis)assembling cables and fuses, and during maintenance work. Moreover, it will save time and lead to less industrial accidents.

All connection points and fuse holders have been manufactured from rounded materials to make connecting parts as easy and as safe as possible. The earthing copper has been neatly stored behind folded panels and in no way affects the connection activities.

The high voltage cables can be supported by cable supports and the connection point in every type of cubicle is located high enough to install the terminals in the cubicle.

Manual operation of the cubicles requires minimal switch force. The clean and neat synoptic diagram provides a clear and safe overview of the different positions of the various parts of the cubicle.

The accessories (such as floor panels and busbars) are stored in boxes and ensure easy assembling of the cubicles. The cubicles and their corresponding parts can be equipped with a wide range of optional features on request, in order to offer expert solutions to your needs.

"The cubicles can be equipped with a wide range of optional features..."



OTHER OPTIONS & DIMENSIONS?

Please consult us for options and dimensions other than those mentioned in this catalogue.

3.3. MODULES - SPECIFICATIONS & DIMENSIONS

DF-A Incoming cubicle or cable field with load break switch RV44 and interlocked earthing switch. p. 16

DF-P Protection cubicle with load break switch/fuse combination. p. 18

DF-D/EDN Protection cubicle with vacuum circuit breaker with block current transformers and seperate relay of any make. p. 20

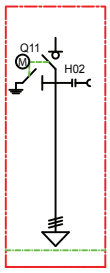
DF-LK Busbar coupling cubicle. p. 22

DF-K Cable cubicle. p. 24

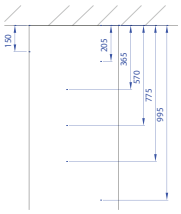


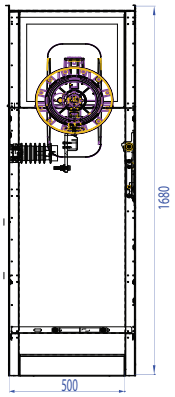
DF-A

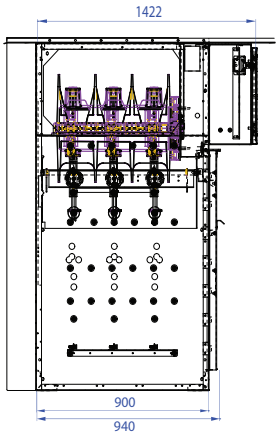
Incoming cubicle or cable field with load break switch RV44 and interlocked earthing switch.











350

Standard Equipment

- Triple-phase load break switch RV44, class E3 according to IEC 62271-103, SF_6 insulation
- Interlocked earthing switch with making capacity up to 63 kA
- Cable support
- Door interlock
- Insulators with capacitive device for VDS (Voltage Detection System)
- Low-voltage compartment
- Floor panels

Cubicle Options

- Set of auxiliary contacts on load break switch
- Set of auxiliary contacts on earthing switch
- Key interlock on load break switch
- Key interlock on earthingswitch
- Key interlock on both
- No door interlock
- Motor operation: 24-48-110 V - AC/DC of 220 V AC
- Short-circuit indicator (to be specified by the customer when the order is placed)
- Voltage indicators: VDS - LRM (*) - HR (**) (to be confirmed at order)
- Cubicle base: 200 mm, 300 mm or 400 mm height (Other dimensions on request)
- Button press control
- Remote control

(*) Low resistance measurement
(**) High resistance measurement

APPLICATION

Supply cable connection.

SPECIFICATIONS & DIMENSIONS

Rated Voltage	kV	12	17,5	24
Rated current	A	800/1250	800/1250	630/800
Short-term current	kA	25	25	20
Time of the short duration of current	s	1	1	1
Width	mm	500	500	500
Depth	mm	1050	1050	1050
Height	mm	1700	1700	1700
Height between ground and end socket	mm	945	945	835
Height between ground and cable support	mm	445	445	445
Weight	kg	350	350	400



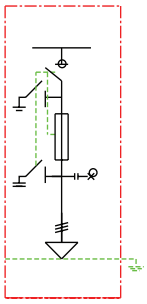

VOLCAN
Unidad Andaychagua
Estación Transformadora Z330
U330.1
REMOTE
LOCAL
LBS ON
LBS OFF
DF-2

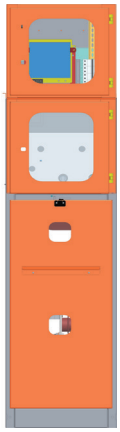

VOLCAN
Unidad Andaychagua
Estación Transformadora Z330
U330.1
REMOTE
LOCAL
LBS ON
LBS OFF
DF-2

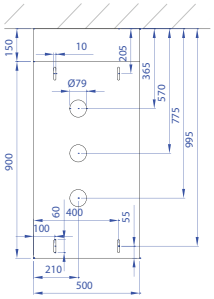
DF-P

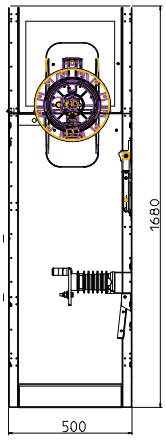
Protection cubicle with load break switch/fuse combination.

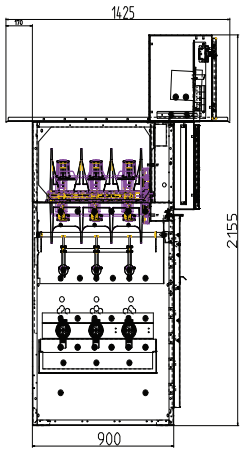
400











Standard Equipment

- Triple-phase load break switch RV44, class E3 according to IEC 62271-105, SF_6 insulation
- Double earthing switch with mutual interlock
- Socket for HRC fuses:
  - e = 292 mm DIN 10 at 17.5 kV
  - e = 442 mm DIN 20 at 24 kV
  - UTE
- Triple-pole fuse trip
- Switch-off mechanism through hitting bolt
- Door interlock
- Insulators with capacitive device for VDS (Voltage Detection System)
- Low-voltage compartment
- Floor panels

Cubicle Options

- Set of auxiliary contacts on load break switch
- Set of auxiliary contacts on earthing switch
- Key interlock on load break switch
- Key interlock on the earthing switch
- Key interlock on both
- Shunt trip (*)
- Under voltage release (*)
- Closing release (*)
- Motor operation (*)
- HRC fuses and/or spare fuses
- Contact “fuse blown”
- Automatic recloser
- Voltage indicators VDS - LRM (**) - HR (***)

(to be confirmed at order)

- Cubicle base: 200 mm, 300 mm or 400 mm height (other dimensions on demand)
- Button press control
- Remote control

(*) Available voltages: 24 V AC/DC, 48 V AC/DC, 110 V AC/DC, 220 V AC

(**) Low resistance measurement

(***) High resistance measurement

APPLICATION

Transformer protection and MV-equipment protection.

SPECIFICATIONS & DIMENSIONS

Rated Voltage	kV	12	17,5	24
Rated current	A	800/1250(*)	800/1250(*)	630/800
Short-term current	kA	25	25	20
Time of the short duration of current	s	1	1	1
Width	mm	500	500	500
Depth	mm	1050	1050	1050
Height	mm	1700	1700	1700
Height between ground and end socket	mm	460	460	415
Fuse size	mm	292 (DIN)	292 (DIN)	442 (DIN)/UTE
Weight	kg	400	400	430

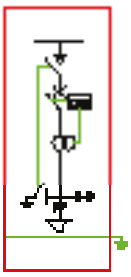
(*) Max In through fusecontacts: 63A



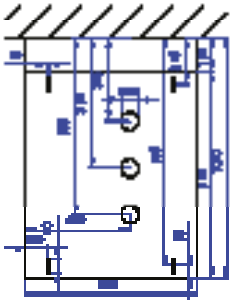


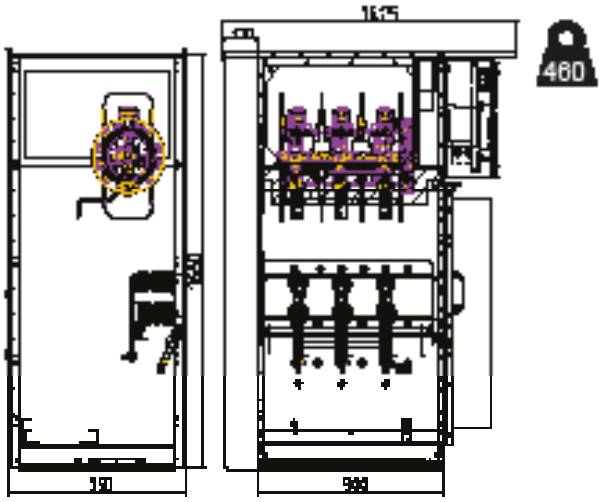
DF-D/EDN

Protection cubicle with vacuum circuit breaker with block current transformers and separate relay of any make.









Standard Equipment

- Triple-phase load break switch RV44, class E3 according to IEC 62271-103, SF_6 insulation
- Vacuum circuit breaker
- Interlocked earthing switch with rated making capacity up to 63 kA downstream of the capacity switch
- Cable support
- Door interlock
- Insulators with capacitive device for VDS (Voltage Detection System)
- Voltage indicators VDS - LRM (*) - HR (**) (to be confirmed at order)
- Switch counter
- LV compartment accessible by door
- Floor panels
- Base for 3 current transformers block type

Cubicle Options

- Protection relay (to be specified by the customer)
- Current transformer (to be specified by the customer)
- Set of auxiliary contacts on the load break switch
- Set of auxiliary contacts on the earthing switch
- Key interlock on load break switch
- Key interlock on earthing switch
- Key interlock on both
- No door interlock
- Motor operation on load break switch: 24-48-110 V AC/DC & 220 V AC
- Earthing connections upwards from the circuit breaker
- Cubicle base: 200 mm, 300 mm or 400 mm height (other dimensions on demand)
- Button press control on switch-disconnector
- Remote control on switch-disconnector
- Torus current transformer

(*) Low resistance measurement
(**) High resistance measurement

APPLICATION

Protection of feeders with circuit breaker, transformer and MVequipment protection.

SPECIFICATIONS & DIMENSIONS

Rated Voltage	kV	12	17,5	24
Rated current	A	800/1250	800/1250	630/800
Short-term current	kA	25	25	20
Time of the short duration of current	s	1	1	1
Width	mm	750	750	750
Depth	mm	1050	1050	1050
Height	mm	1700	1700	1700
Height between ground and socket	mm	445	445	445
Weight	kg	460	460	460

Options on the circuit breaker

- Motor operation (*)
- Closing release
- Shunt trip 1-2 (*)
- Delayed/ direct Under voltage release (*)
- Set of auxiliary contacts from 1-6
- Fault contact on the relay
- Supply for test protective relay (battery block)
- Automatic recloser
- Remote control on circuit breaker
- Key interlock with load break switch and with earthing switch
- Indication lamps
- Pushbuttons close-open

Specifications to be indicated for circuit-breaker VA-2/VAS-2:
Short-circuit capacity, rated current, rated voltage and capacity to be secured

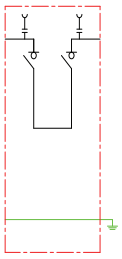
(*) Available voltages: 24 V AC/DC, 48 V AC/DC, 110 V AC/DC, 220 V AC

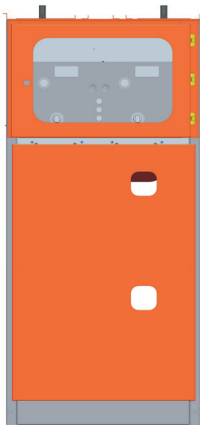

MEVOCO
MEVOCO
MEVOCO

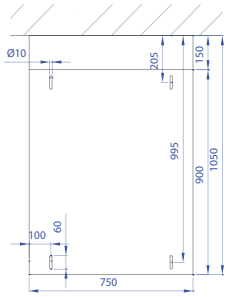

MEVOCO
MEVOCO

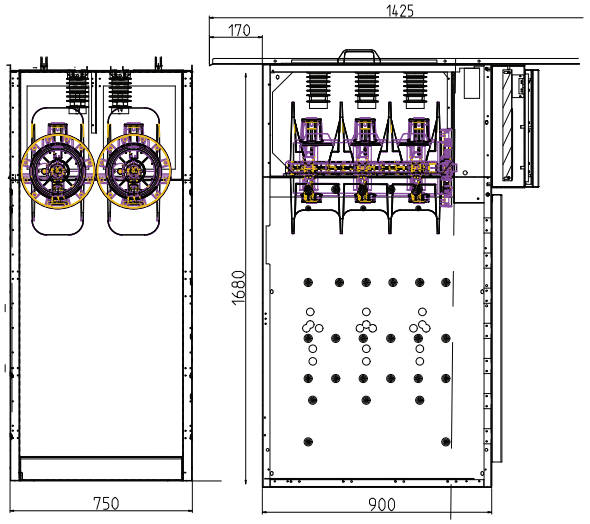
DF-LK

Busbar coupling cubicle.









245

Standard Equipment

- 2 triple-phase load break switch RV44, class E3 according to IEC 62271-103, SF_6 insulation
- Door interlock
- Low-voltage compartment
- Insulators with capacitive device for VDS (Voltage Detection System)
- Floor panels

Cubicle Options

- Holder for capacitive voltage indicators load break switch 1 and/or 2
- Set of auxiliary contacts on load break switch 1 and/or 2
- Key interlock on load break switch 1 and/or 2
- Key interlock on earthing switch
- Mechanical interlock between the load break switches
- No door interlock
- Motor operation on load break switch 1 and/or 2: 24-48-110 V AC/DC & 220 V AC
- Earthing switch
- Earthing connections on load break switch 1 and/or 2
- Earthing connections outside of cubicle
- Capacitive voltage indicators load break switch 1 and/or 2
- Cubicle base: 200 mm, 300 mm or 400 mm height (other dimensions on demand)
- Button press control on load break switch 1 and/or 2
- Remote control on load break switch 1 and/or 2
- Current transformers

APPLICATION

Coupling between two parts of the MV-panel

SPECIFICATIONS & DIMENSIONS

Rated Voltage	kV	12	17,5	24
Rated current	A	800/1250	800/1250	630/800
Short-term current	kA	25	25	20
Time of the short duration of current	s	1	1	1
Width	mm	750	750	750
Depth	mm	1050	1050	1050
Height	mm	1700	1700	1700
Weight	kg	245	245	245

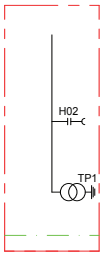
OTHER OPTIONS & DIMENSIONS?

Please consult us for options and dimensions other than those mentioned in this catalogue.

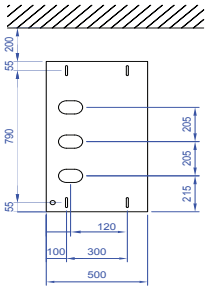


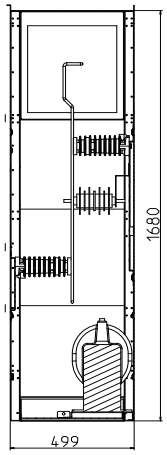
DF-K

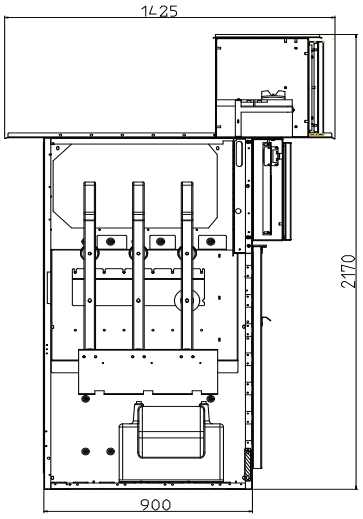
Cable Cubicle.











(*)
55

Options

- Holder for capacitive voltage indicators
- Capacitive voltage indicators
- Short-circuit detectors (to be specified by the customer when ordering)
- Earthing switch (see type 3 & 4 p. 55)
- Set of auxiliary contacts on earthing switch
- Key interlock on earthing switch
- Earthing ball clamps
- Current transformers in the busbar
- Voltage transformers with of without protection in the busbar
- Cubicle base: 200 mm, 300 mm of 400 mm height (other dimensions on demand)
- Floor panels
- Door interlock
- Arc-killer



APPLICATION

Cubicles of the DF-2 type equipped to bring in a supply cable. However, a DF-K cubicle can also contain a busbar and can be used as rising cubicle of the rail set.

Possible connections:
Type 1: Bottom in - top left out,
Type 2: Bottom in - top right out

SPECIFICATIONS & DIMENSIONS

Rated Voltage	kV	12	17,5	24
Rated current	A	800/1250	800/1250	800/1250
Short-term current	kA	25	25	20
Time of the short duration of current	s	1	1	1
Width	mm	M	M	M
Depth	mm	1050	1050	1050
Height	mm	M	M	M
Weight (*)	kg	55	55	55

(*) weight without equipment / **M** stands for **Made to measure**

OTHER OPTIONS & DIMENSIONS?

Please consult us for options and dimensions other than those mentioned in this catalogue.



4. PRODUCTION PROCESS

4.1. PRODUCTION PROCESS OF THE DF-2 CUBICLES AT LANDEGE

The DF-2 system is the result of a combination of modern design technologies and economical, ergonomic and environmentally friendly production processes.

It all starts in the design department where your drawings will be *customized via CAD applications*. As soon as the drawings are approved, production can start. SGC - SwitchGear Company's steel plate department works with the most modern machinery, programmed by a CAD/CAM system.

The automated laser, punch and pleating section can truly be considered unique. Two ultra-fast punch-corner cutting scissor machines are each provided with an automatic loading and sorting system which sorts and saves the items.

The numerous possibilities of the matrixes and plate feeders ensure that the cubicles can be uniformly produced as 100% user-friendly.

After the laser and punch processing, several panels are pleated on the fully automatic pleating bank, sorted and possibly moved on to a CNC-operated welding robot. This machine welds the fitting bolts and corners of the door panels and other parts.

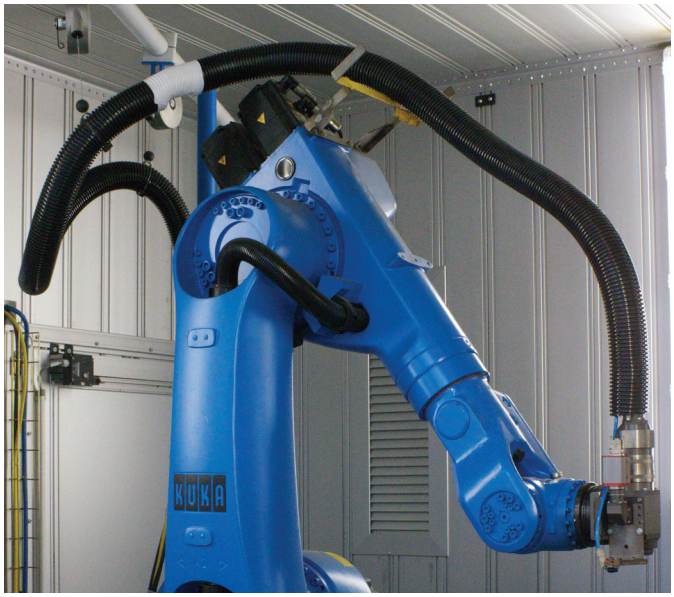
The doors are now subjected to a complete process where they are degreased, stained, phosphated, passivated and given an additional rinse with demineralised water.

They are automatically sprayed with polyester powder in a powder spray cabin, after which they are heated in an oven at 200°C.

The complete cubicle structure has been constructed out of high-quality galvanized plates, it is resistant to corrosion and **has a long life span.**



"DF-2: modern technology & ergonomic, eco-friendly production processes..."



In the assembly hall the specialized units are first preassembled. This division allows us to devote the necessary care to obtaining a perfect balance with, and a correct assembly of the various components. In the next stage the cubicles are assembled. This stage is subject to strict assembly procedures.

After assembly, all cubicles undergo an extremely thorough control. The electrical tests include resistance measurements on the RV44 load break switch and EM20 earthing switch. The cubicle is subjected to a voltage test of 50 kV / 1 min. The most striking test is the one where the closing speed of the load break switch and earthing switch is measured. One can even check the post-vibration of the electrical points during switching on a digital screen. The mechanical tests are used to check all fitting material, and to examine the correct positions of parts and interlocks.

Right before being dispatched the cubicles will undergo a final control; this is where custom, optional features will be installed and checked separately.

The cubicle is now ready for dispatch ... to a happy and satisfied customer!





"Our cubicles are resistant to corrosion and have a long life span..."



SGC - SwitchGear Company nv.

Medium voltage switchgear, built to last.

SGC - SwitchGear Company nv has been supplying reliable products for electrical distribution for more than 40 years. Innovative ideas and environmental care are the driving forces behind SGC - SwitchGear Company. The development of complete solutions consists of a minimum number of components, all of which have an exceptional life span. SGC - SwitchGear Company nv stands for exceptional quality and superior customer care. Your desired specifications and deadlines are our main concern.

An exclusive factory and highly automated production lines are key factors in our "state of the art" components and systems. It enables us to develop the DF-2, DF-3, DR-6/DT-6 , DI-2, SI-2, AF-6, DW-2, GI-2 and N2 Blue to the highest quality standards. When it comes to delivery times, prices and products SGC - SwitchGear Company nv delivers.

SGC
SwitchGear Company

SGC - SwitchGear Company nv
Moorstraat 24
9850 Landegem
Belgium
+32 (0)9/321.91.12
www.switchgearcompany.eu
info@switchgearcompany.eu
Follow SGC on:

Get impressed.
Visit our showroom virtually

THE SPECIALIST IN MEDIUM VOLTAGE SWITCHGEAR

DW610323