

DR-6/DT-6

COMPACT AND EXTENSIBLE RING MAIN UNIT



DR-6/DT-6

**Compact and/or extensible SF₆ insulated Ring Main Unit
with load break switch or integrated vacuum circuit breaker**

SAFETY, RELIABILITY, VERY COMPACT AND INSENSIBLE TO THE ENVIRONMENT IN THE FIELD OF ELECTRICITY
DISTRIBUTION FROM 6 TO 24 KV.

SGC

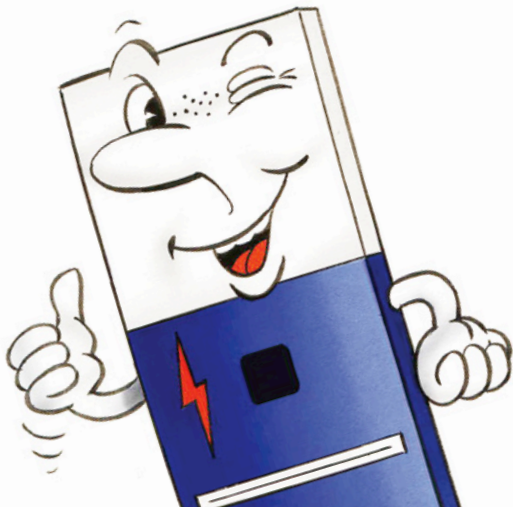
SwitchGear Company

THE SPECIALIST IN MEDIUM VOLTAGE SWITCHGEAR

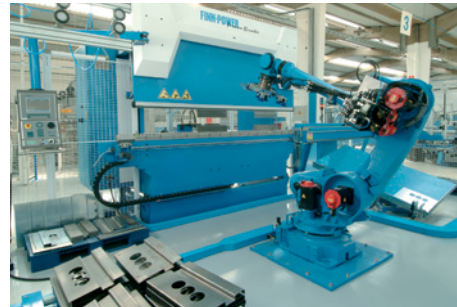
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DR-6/DT-6 DEVELOPMENT AND MANUFACTURING PHILOSOPHY

SGC nv invested important human and financial resources in developing the new SF₆ insulated compact and extensible medium voltage ring main unit for 12, 17,5 and 24 kV . Answering the most severe quality and environmental requirements, the production process of the DR-6/DT-6 range is made with the newest developed laser machinery that was installed for the sole purpose to insure a permanent quality and reliability. The DR-6/DT-6 range was developed and is produced in line with the ISO 9001 requirements. Security, reliability, environmental respect are characterizing the DR-6/DT-6 range of cubicles of which most of the components are recyclable.



Laser welding



Robot Bending cell



Leak detector

DR-6/DT-6 FIELD OF APPLICATION

DR-6/DT-6 switchgears are used in number of applications combining all possible functions, protecting transformers up to 2500 kVA in all concepts of networks. The city distribution, rural distribution, renewable energy applications, small factories, shopping malls or hospitals may be part of the possible field of application of the DR-6/DT-6 range of products.



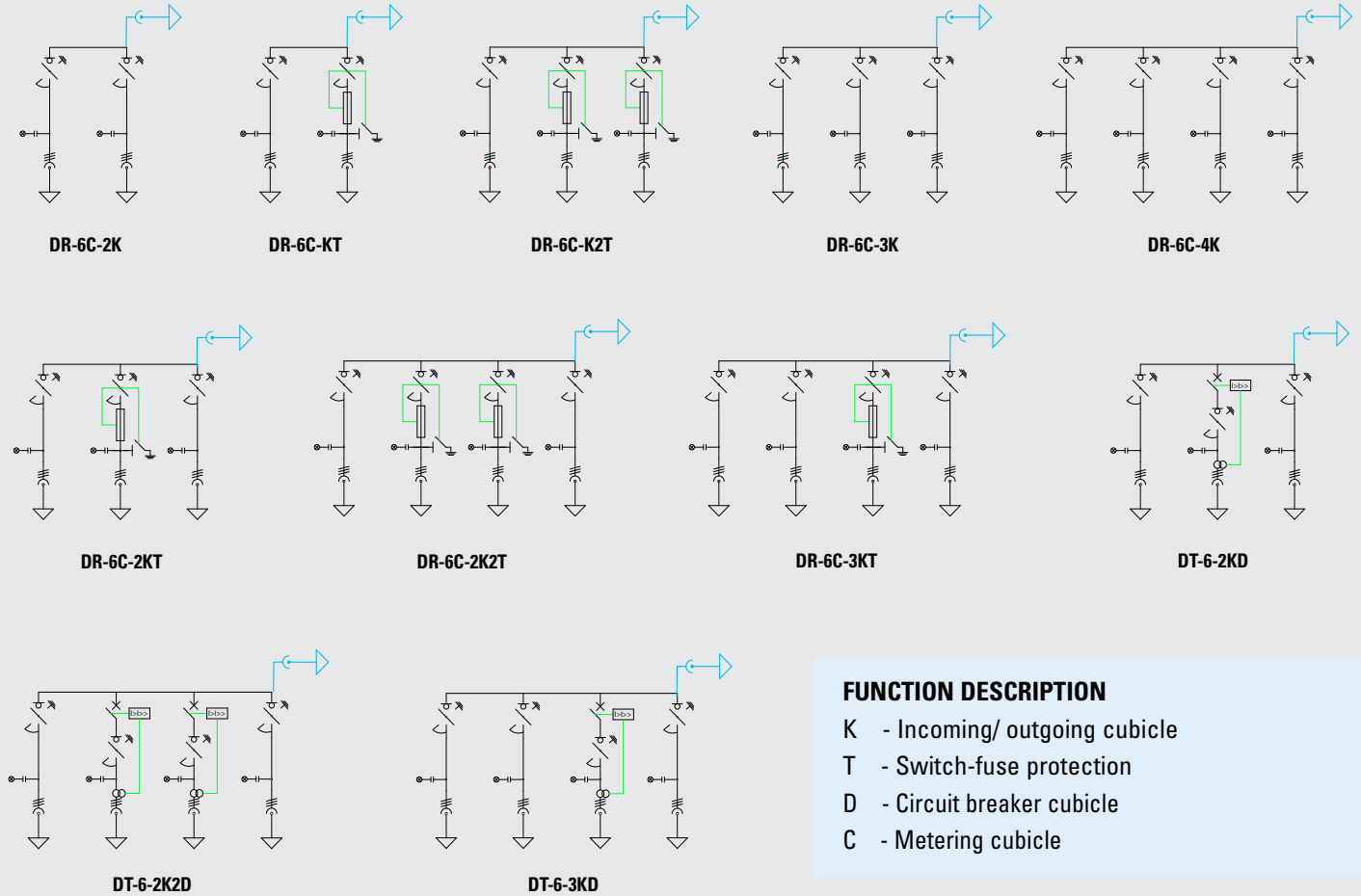
ELECTRICAL CHARACTERISTICS

Rated voltage	kV	12	17.5	24
General specifications				
Impulse withstand voltage 1,2 / 50 µsec.				
To earth and between phases	kV	75	95	125
Over the insulation distance	kV	85	110	145
Power frequency voltage test 1 min.				
To earth and between phases	kV	28	38	50
Over the insulation distance	kV	32	45	60
Rated frequency	Hz	50/60		
Rated current	A	630		400/630
Rated short time current 1 sec.	kA	20	20	12,5/16/20
Rated peak value of the current	kÂ	50	50	40/50
Breaking capacity (IEC 62271-103)		Class E3		
Rated current	A	630	630	400/630
Closed loop	A	630	630	400/630
No load cable	A	30	30	30
Earth leakage fault	A	100	100	100
Internal arc 1 sec. IEC 62271-200 (5 criteria)	kA	20	20	20
Degree of protection				
HV-compartment		IP6X		
LV- and cable compartment		IP4X		
Rated gas pressure at 20°C	Bar	0.5 bar overpressure		
Line Feeder				
Rated current	A	630	630	630
Rated short time current 1 sec.	kA	20	20	12,5/16/20
Rated peak value of the current	kÂ	50	50	31,5/40/50
Number of makings		5		
Transformer feeder				
Rated current	A	200	200	200
Fuse switch				
Short circuit breaking capacity (limited by the fuse)	kA	25	25	16/20
Making capacity	kÂ	63	63	40/50
Circuit breaker				
Short circuit breaking capacity 1 sec.	kA	25	20	25
Making capacity	kÂ	63	50	63



DR-6/DT-6 DIMENSIONS AND DESCRIPTIONS

DR-6C /DR-6E COMPACT - NON EXTENSIBLE / EXTENSIBLE RING MAIN UNITS

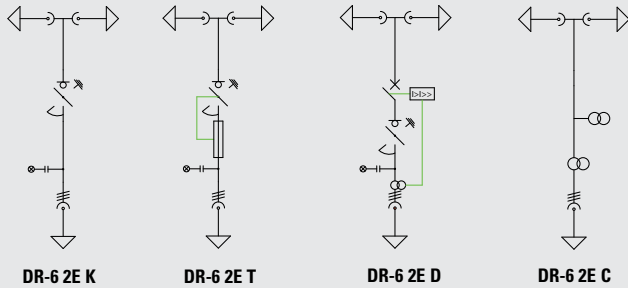


DR-6C/DR-6E COMPACT - NON EXTENSIBLE RING MAIN UNITS

Type	Height	Width	Depth	Weight
DR-6C 2K	1410 mm	600 mm	760 mm	210 kg
DR-6C 2KT	1410 mm	950 mm	760 mm	400 kg
DR-6C 2K2T	1410 mm	1300 mm	760 mm	640 kg
DR-6C 3KT	1410 mm	1250 mm	760 mm	600 kg
DT-6C 2KD	1410 mm	950 mm	760 mm	400 kg
DT-6C 3KD	1410 mm	1250 mm	760 mm	505 kg
DT-6C 2K2D	1410 mm	1300 mm	760 mm	660 kg
DR-6C KT	1410mm	650 mm	760 mm	295 kg
DR-6C K2T	1410mm	1000 mm	760 mm	485 kg
DR-6C 3K	1410mm	900 mm	760 mm	315 kg
DR-6C 4K	1410mm	1200 mm	760 mm	420 kg

The multifunctional units are always extendable in both directions.

DR-6E EXTENSIBLE FUNCTIONAL UNITS



FUNCTION DESCRIPTION

- K - Incoming/ outgoing cubicle
- T - Switch-fuse protection
- D - Circuit breaker cubicle
- C - Metering cubicle

DR-6E EXTENSIBLE FUNCTIONAL UNITS

Type	Height	Width	Depth	Weight
DR-6E K	1460 mm	300 mm	720 mm	1 kg
DR-6E T	1460 mm	350 mm	720 mm	180 kg
DR-6E 2KT	1460 mm	950 mm	720 mm	470 kg
DT-6E D	1460 mm	350 mm	720 mm	210 kg
DT-6E 2KD	1460 mm	950 mm	838 mm	550 kg

The functional units are always extendable to the left or the right of the multifunctional unit.

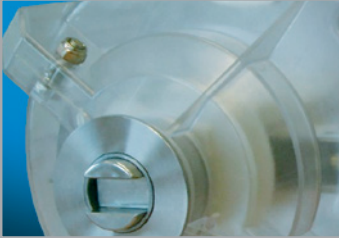
FUSE SELECTION TABLE

Standard	kV	Power of the distribution transformer (kVA)													
		100	125	160	200	250	315	400	500	630	800	1000	1250	1600	2000
UTE	10	16	16	31.5	31.5	31.5	63	63	63	63					
	15	16	16	16	16	16	43	43	43	43	43	63			
	20	16	16	16	16	16	16	43	43	43	43	43	63		
DIN 10	10	16	20	25	25	31.5	40	50	50	63	80	100			
	11	16	20	20	25	25	40	40	50	50	63	80	100		
DIN 20	13.8	10	16	16	20	25	31.5	40	40	50	50	63	100		
	15	10	10	16	20	25	31.5	31.5	40	50	50	63	80	100	
	20	10	10	16	16	20	25	25	31.5	40	40	63	63	80	100
	22	10	10	10	16	16	20	25	31.5	40	40	50	63	80	100

DESCRIPTION OF THE MAIN COMPONENTS

The DR-6/DT-6 range offers a compact , safe, reliable and economical design, free of any possible environmental aggression. Extensions on site are at any time possible without any special tooling nor particular surrounding conditions.

Load break switch



The three position load break switch (ON / OFF / Earth) is in accordance with the IEC requirements. The concept insures a natural interlock of the primary functions of the cubicle. The arc extinction is insured by the SF₆ gas, associated to a short arcing time due to an optimized opening speed of the mechanical drive and a patented arc blowing principle that combines optimal revolution of the gas with perfect electrical contacts. Mevoco's experience in the load break switch RV 44 of the DF-2 range and RV 53 of the DF-3 range finds here a perfect application. It is of the class E3/M1 (E3: 5 making, 100 x CO mainly active load. M1: 1000 mech operations/service position) following IEC 62271-103.

Circuit breaker



The SGC/ISM vacuum circuit breaker (VCB) of the magnetic actuator type uses the latest vacuum interrupter technology. The VCB can only be closed electrically, mechanical closing is not possible (*). The VCB can be opened manually as electrically. The circuit breaker operates through a control module and a self powered digital protection relay RP600, together with the CT allowing the detection of over-current and earth faults failures.

(*) In absence of auxiliary voltage, a hand operated generator can be used.

The fuse holders



The fuse holders are made for HRC fuses of the DIN and UTE type for voltages of 10, 17,5 and 24 kV. A simple intelligent artifice allows the change without any particular tooling. Fuse holders are made from epoxy with a non-losable cover, and a fuse supporting structure firmly fixed to the cover. Earthing on both sides of the fuses is clearly marked on the synoptic diagram. The fuse holder is water tight and tested in accordance with the IEC standards. The access to the fuse holders is facilitated by a simple and logic interlock system allowing the opening of the door only after earthing of the cubicle.

The mechanical drives



Mevoco's mechanical drives have already been subject to intensive tests and usage in the DF-2 range of products. The same design has been implemented in the DR-6/DT-6. The steel used for the drives has been chosen because of their high tensile force, toughness and resistance to bending.

The mechanical drive accommodates both the operating axles (LBS and earth) and the interlocks. The spring type drive is operating independently of the operator and does not allow any function violation. The indicator of the mechanical drive is directly connected with the LBS which assures at any time the real status of the LBS. The forces needed to control the mechanism are low which results in a high user-friendliness. Optional: the drive can be motorized and can receive a number of options, allowing remote control, remote position indication and integration into a SCADA operated network.

Applicable standards

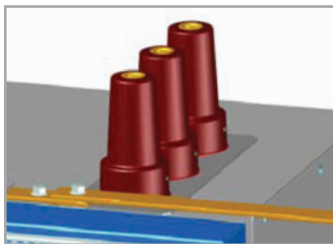
IEC 62271-200	AC metal enclosed switchgear and controlgear above 1kV up to 52 kV
IEC 62271-102	HV AC disconnectors and earthing switches
IEC 62271-105	HV AC Fuse switch combination
IEC 62271-100	HV AC circuit breakers
IEC 62271-1	Common specifications for HV switchgear and controlgear
IEC 61243-5	Voltage detection systems (VDS)

Cable connection



The cables are connected to the cubicles by means of bushings with M16 screwed contacts and for connectors according to EN 50 181 / DIN 50 standards. They may be of the type A / B or C (250, 400 630A). They are defined in function of their applications. The cable compartment size allows one connector per bushing with a maximum of 400 mm² per cable (On request, lightning arrestors can also be accommodated in the cable box as well as two cables per bushing).

The extensibility concept

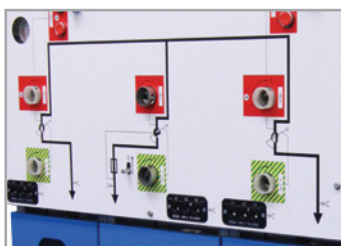


Extensibility of the ring main unit is ensured by top or side placed outer cone or inner cone bushings on the side of the C- type.

An insulated and screened extension device connects the two sets to be extended. Extension requires no special tooling nor special on site condition.

The bushings are directly molded on a stainless steel plate avoiding any risk of leakage caused by mechanical assembly.

The synoptic diagram and the accessories



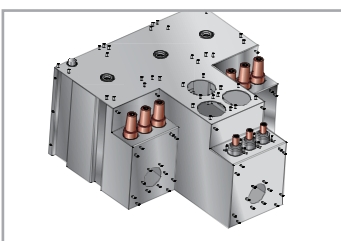
A clear, logic and well understandable synoptic diagram is placed in front of each of the functions. This diagram also supports the voltage detection system (type HRa LRM), showing the presence of the voltage on the cables and allowing the use of phase concordance units. Short circuit indicators can find their place in the LV compartment and the associated ring type CT's in the cable compartment. Complementary accessories can be accommodated in a well designed LV box to be placed on the top of the concerned function(s).

Protection relay



The self powered digital protection relay has a wide range of protection functions, is equipped with 4 outgoing contact points and 2 free programmable outgoing points. The relay functions are easy accessible and programmable with the help of a laptop or with the support of the menu oriented interface. Optional: another type of relay can be built in.

The enclosure



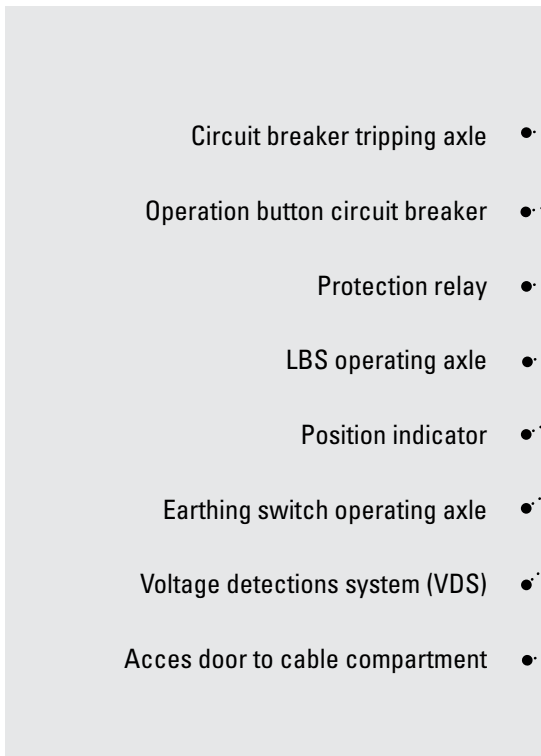
The stainless steel enclosure is manufactured on brand new, up to date machines associating lasercutting, robotised bending and 3-D laser welding. The welded tank is sealed for life and tested under vacuum, in strict conditions with experienced equipment. The enclosure accommodates the life components and is equipped with a rupture disk deviating the overpressure in the unlikely event of an internal fault.

DR-6 DESCRIPTIONS



- LBS operating axle
- Position indicator
- Release switch
- Earthing switch operating axle
- Synoptic diagram
- Voltage detection system
- Acces door to cable compartment

DT-6 DESCRIPTIONS



- Circuit breaker tripping axle
- Operation button circuit breaker
- Protection relay
- LBS operating axle
- Position indicator
- Earthing switch operating axle
- Voltage detections system (VDS)
- Acces door to cable compartment



PRODUCTION PROCESS

PRODUCTION PROCESS OF THE DR-6/DT-6 CUBICLES AT NEVELE

The DR-6/DT-6 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 nv 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.

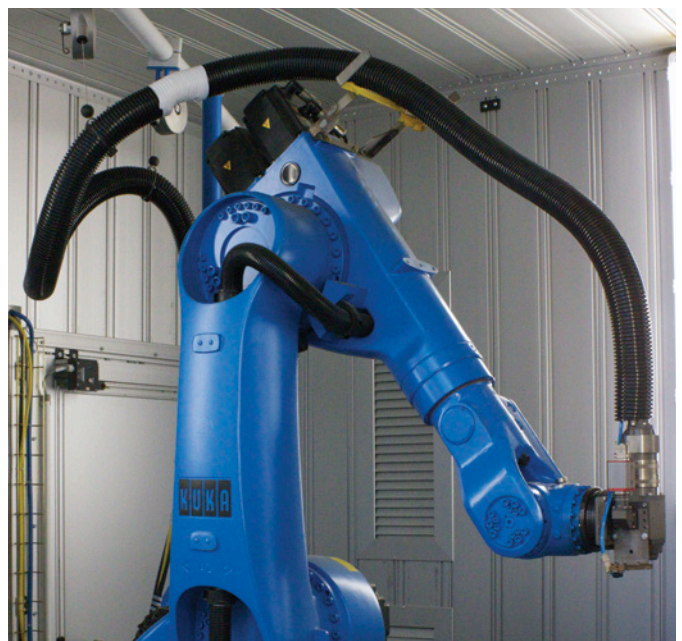
The doors are now subjected to a complete process where they are degreased, stained, phosphated, passivated and given an additional rinse with demineralised water.

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**.



**“DR-6/DT-6:
modern technologie &
ergonomic, eco-friendly
production processes...”**



In the assembly hall the specialized units are first pre-assembled. 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.

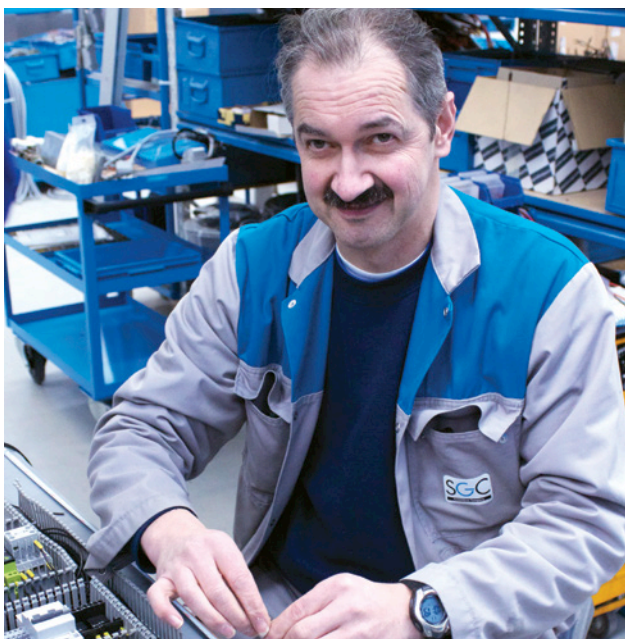
After assembly, all cubicles undergo an extremely thorough control. The electrical tests include resistance measurements on the RV 44 load break switch and EM 20 earthing switch. The cubicle is subjected to a voltage test of 50 kV / 1 min. The most striking test is the one where the closing speed of 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...”



OTHER PRODUCTS BY SGC nv SWITCHGEAR COMPANY

DF-2/DF-2+

Modular and extendible switchgear



DF-3

Our new modular and extendible switchgear.



DW-2

(AIS Metalclad) A family of air-insulated medium voltage switchgear solutions for indoor installations.



DI-2

Compact and/or extensible SF₆ insulated Ring Main Unit, 36 kV



INTERESTED IN OUR PRODUCTS, PRODUCTION PROCESS OR PLANT?

Please contact our Sales Team (sales@switchgearcompany.eu) for a guided tour, information on our products or visit our website www.switchgearcompany.eu





SGC nv SwitchGear Company.

Medium-voltage switchgear, built to last.

SGC nv SwitchGear Company has been supplying reliable products for electrical distribution for more than 30 years. Innovative ideas and environmental care are the driving forces behind SGC nv SwitchGear Company. The development of complete solutions consists of a minimum number of components, all of which have an exceptional life span. SGC nv SwitchGear Company 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, DR-6/DT-6, DF-3 and DW-2 to the highest quality standards. When it comes to delivery times, prices and products SGC nv SwitchGear Company delivers.



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