

CORPORATE PROFILE

Innovative Power Engineering at its best!



Hughes Power System is a Swedish manufacturer of environmentally friendly equipment for electrification and automation of mass transport and electrical distribution systems. Very high quality standards together with innovative approach result in an advanced range of products, aiming to improve network quality by minimizing the number and duration of faults.

Our products portfolio includes:

- Reclosers
- Vacuum interrupter switches
- Disconnectors
- Motor drives
- Voltage transformers
- D/C power supplies

ABOUT US

With its more than 30 years expertise in research, development, manufacturing, marketing and sales the company operates in many countries through cooperation with local partners. We are very proud to be a part of the energy industry, a part of the group of professionals all over the world whose mission is to provide electricity to consumers. That mission inspires us to look constantly for new innovative solutions and maintain the high quality and performance of our products. By creating great quality products we honour passionate people that are trying to make a difference today.

Majority of Hughes Power System's products are designed and built in Sweden.

CORPORATE VALUES

OUR VISION

As we move towards our goal of being a world class advanced technological company in electrical utility products, we guarantee our commitment to the well known Swedish standards of reliability, safety and quality.

OUR MISSION

Elegant, innovative solutions at affordable price!

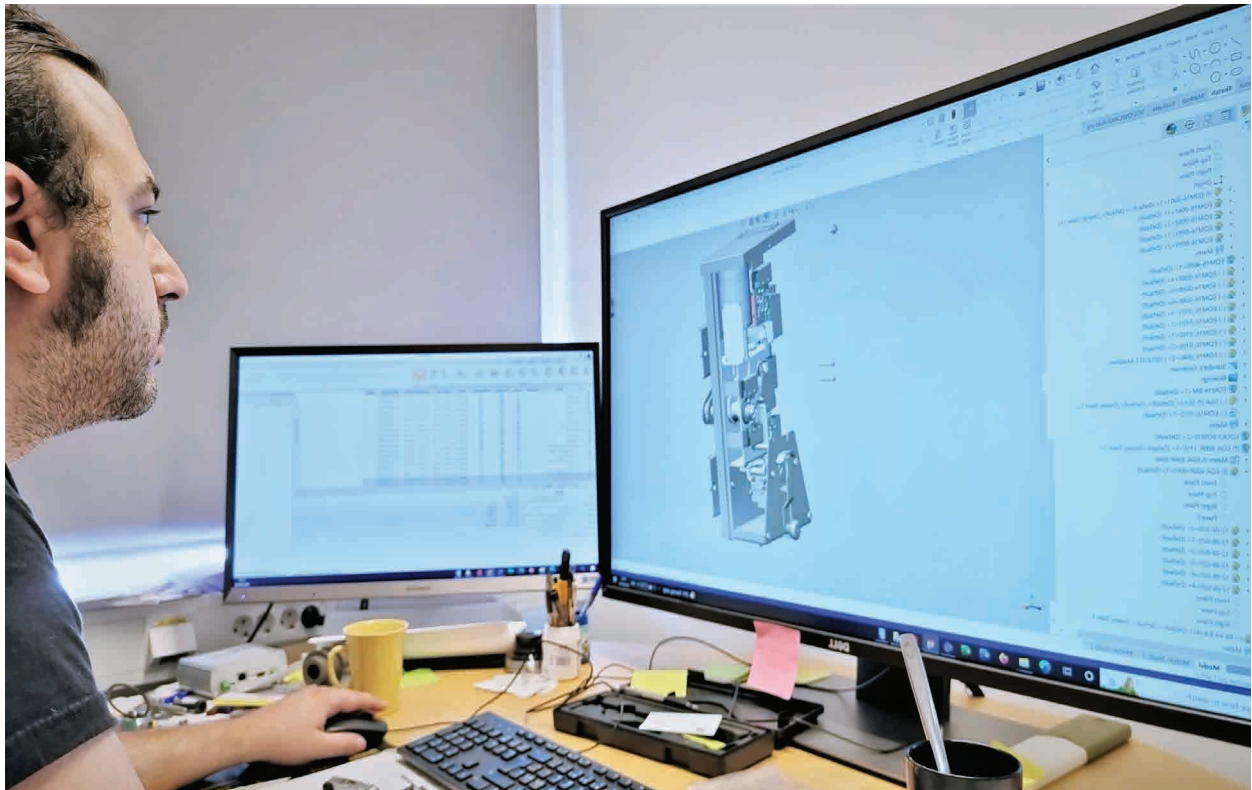
OUR SLOGAN

Innovative Power Engineering at its best!



COMPANY PROFILE

PRODUCTION FACILITIES AND PROCESSES



3D modelling of Hughes products

PRODUCT DEVELOPMENT

Every great idea starts in the R&D team.

Our engineers build mechanical, electrical and electronic designs, that include 3D modeling and FEM methods analysis.

The first level of prototyping is made in 3D printers. When this stage is approved, the second level of prototyping is performed in our production facilities using real materials and components.

The final stage is prototype testing, performed in different climate chambers, electrical high power laboratory, as well as in EMC and PD testing in Faraday cage chambers.



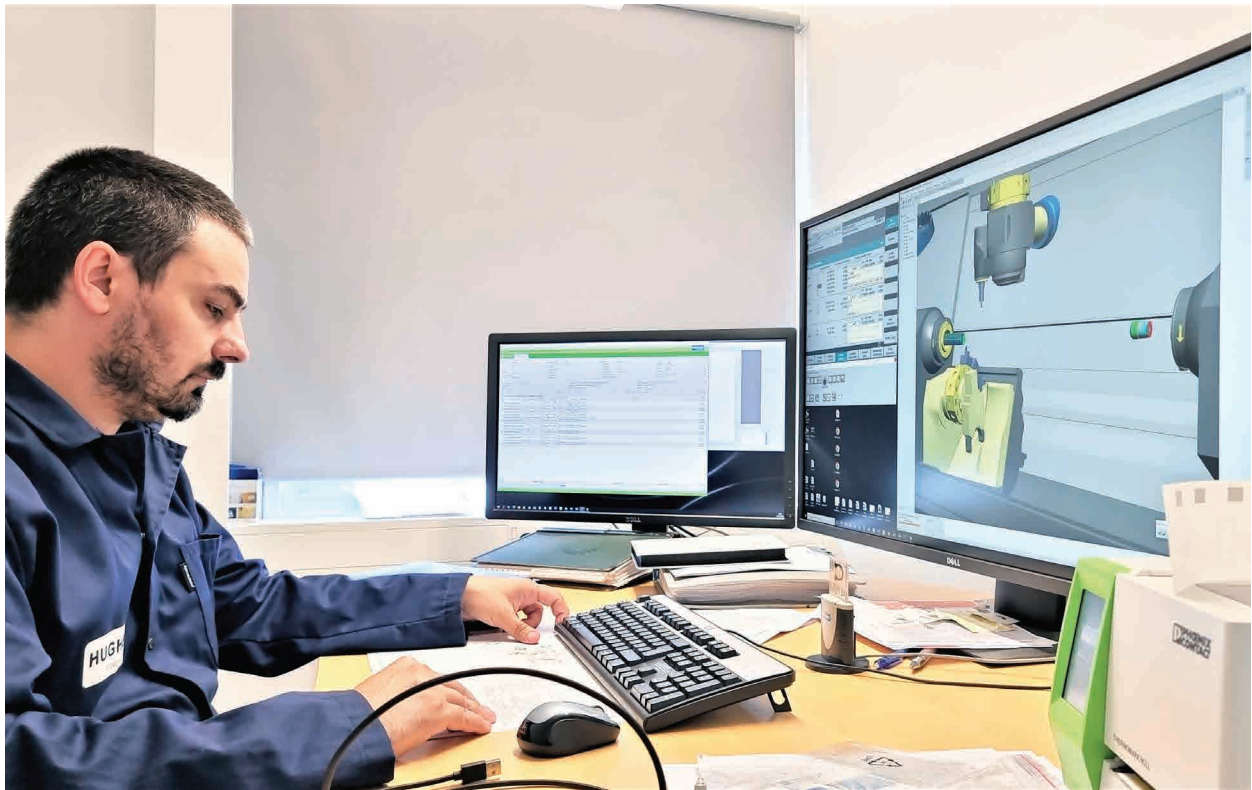
Multi spindle lathe with automatic magazine



8 axes 170t automatic press brake for processing sheet metal parts

COMPANY PROFILE

PRODUCTION FACILITIES AND PROCESSES



Hughes production automation system and machines program simulation

PRODUCTION

Before the production starts, the order is analysed to derive the materials and processes needed to do the job.

Hughes factory automation system manages everything from sourcing the best suitable materials and suppliers, production processes to the final products approval before delivery.

Majority of the products are made from easily recyclable and environmentally friendly materials.

Digitalization, automation and robotization of Hughes production processes for parts manufacturing and assemblies guaranty very high level of uniform quality.



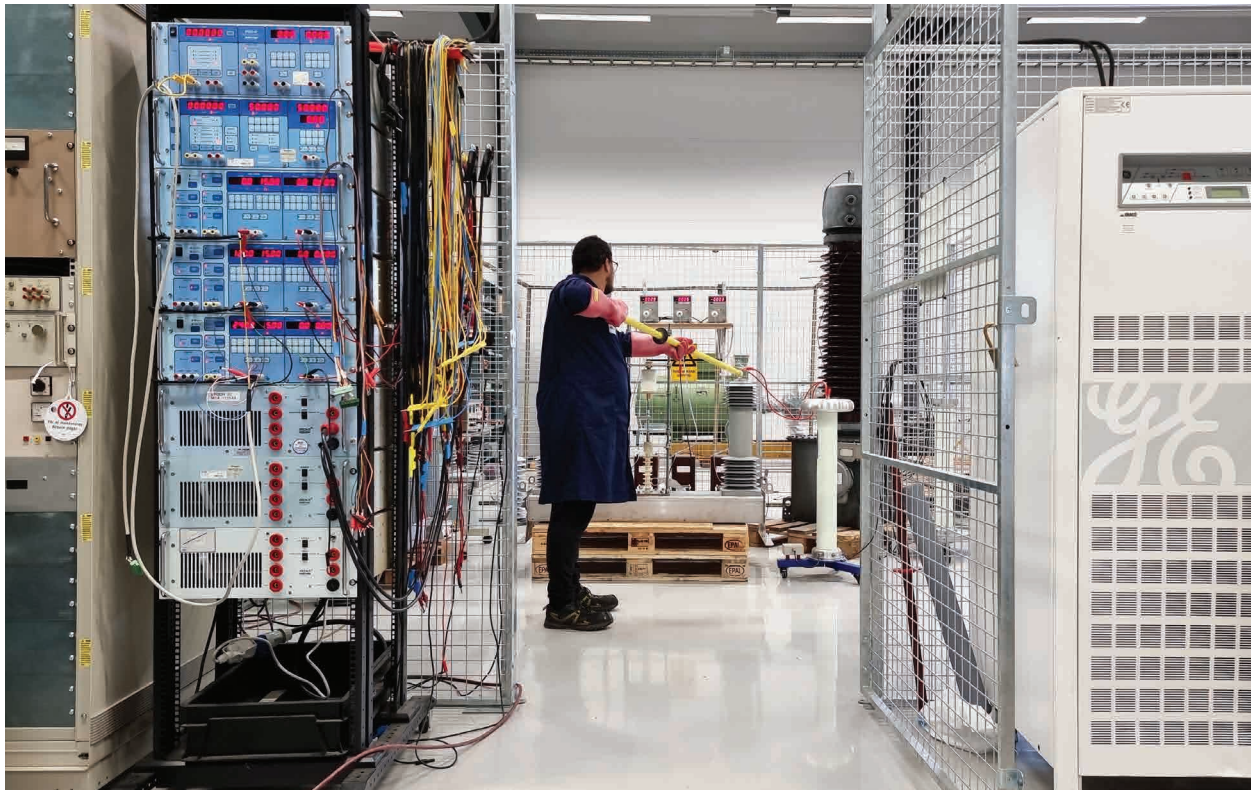
Multi spindle lathe with 5 axes milling capabilities



Laser cutting of stainless steel parts

COMPANY PROFILE

PRODUCTION FACILITIES AND PROCESSES



Testing of a switch in electric medium voltage test cell

TESTING AND QUALITY CERTIFICATION

Hughes testing facilities include:

- electrical testing laboratory;
- medium voltage electrical test cells;
- different climate chambers with temperature range - 80°C to + 180°C;
- mechanical testing facilities;
- Faraday cage chambers;
- metal x-ray diagnostics;
- high speed camera and thermal photo lab;

Internal factory audit of quality and test routines follows Hughes ISO 9000 standards.



Temperature testing of a switch in the climate chamber, - 80°C to + 180°C



Production sample test of a mechanical part

COMPANY PROFILE

PRODUCTION FACILITIES AND PROCESSES



Customer service centre: online product training and project support

SHIPPING AND CUSTOMER SUPPORT

To ensure full customer satisfaction Hughes guarantees full product life cycle support.

This includes the following steps:

- fast delivery;
- commissioning;
- product training;
- technical support;
- marketing and sales support;



Multi loading docks for smoother and faster operations



Hughes automation system for orders management

PRODUCTS

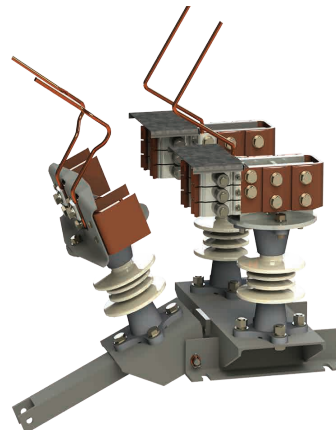
DISCONNECTOR FOR RAILWAYS AND TRAMS



RABS2S-15 disconnector



RABS1S-15 disconnector



Tram disconnector

DESCRIPTION

RABS series of disconnectors were especially developed for railway, light rail and tram applications.

The models range for railways includes 1 pole, 1+1 pole and 2 poles versions for DC 750 – 3500 V, 16.7 and 50 Hz in a range from 15 to 25 kV.

The tram DC version is made with 1 pole.

The mechanical parts are made of the highest-grade stainless steel, qualified hot dip galvanizing and nickel-plated high-grade copper to prevent from corrosion.

Together with our existing motor drives it provides a complete solution for automation and remote control of the railway and tram electrical networks.

DISCONNECTORS FOR TRAINS	
1-pole	1x2-pole, 2-pole
15 or 25 kV	15 or 25 kV
16.7 or 50 Hz	16.7 or 50 Hz
1600A line current	1600 A line current

DISCONNECTORS FOR TRAM LIGHT RAIL
1-pole
750 – 3500 VDC
2500 - 4500 A line current
optional Integrated ground switch

MOTOR DRIVE FOR RAILWAYS



EOA600 motor drive



EOA600 installation



EOA600 padlocked

DESCRIPTION

The EOA600 railway motor operating drive, characterized by its innovative design, is a complete solution from a pole to SCADA system.

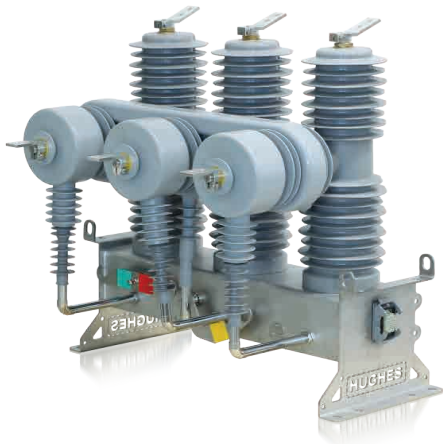
The unit is intended for control of disconnectors / earth switches with or without load break heads. The motor drive is easy to install and has built-in all functions for SCADA integration. The unit has an built in bi-stable remote blocking unit for extra personal safety for the repair crew. The main mechanism has a built in regenerative break function for high speed operation from unlock-operate-lock.

The motor drive can be directly applied on most 0.5 to 25 kV DC/AC single or double (AT or BT system), gang operated 3-phase disconnectors. The unit has a complete interface to SCADA system with multiple dry contacts. Optional built in 4G-LAN-Fiber RTU is available.

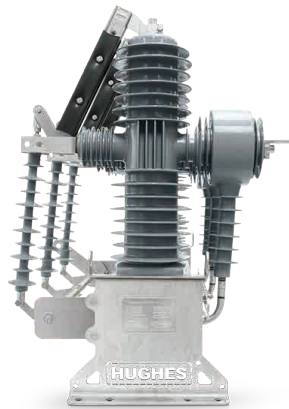
TECHNICAL DATA	
Dimensions	615 x 275 x 185 mm (HxWxD);
Operating Temperature	-50 ... +60 ° C ;
Enclosure	P54, stainless steel, optional GRP;
Heating	optional 35 W PTC element, thermostat on at 5 ° C off at 15 °C;
Power supply motor mechanism	24 / 110 / 230 VAC/DC 250 W motor;
Power supply remote blocking	24 VDC 10W;
Stroke	50 - 240 mm depending on type of lever arm;
Operational speed motor mechanism	1.5 sec;
Operational speed remote blocking	1 sec;
Control power	400 Nm (100 mm stroke), 1100 Nm stall point;

PRODUCTS

RECLOSERS FOR OVERHEAD LINES



ACR241 VCB switch for 24/27kV with core balance and current transformers



ACR240 VCB, 24/27 kV with built-in disconnector



R200 protection relay cabinet

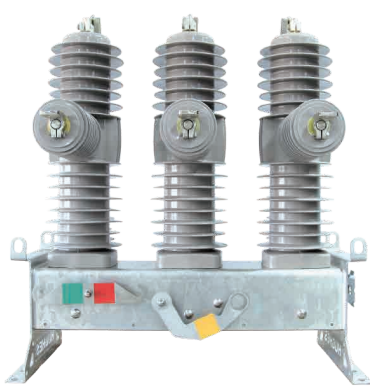
DESCRIPTION

The ACR series of Automatic Circuit Recloser for 6/15 kV, 24/27 kV and 33/40 kV is clearly the most reliable and safe product of its kind on today's market. The operational energy is stored in 4 steel springs for fast and precise operation, as in a primary switchgear mechanism.

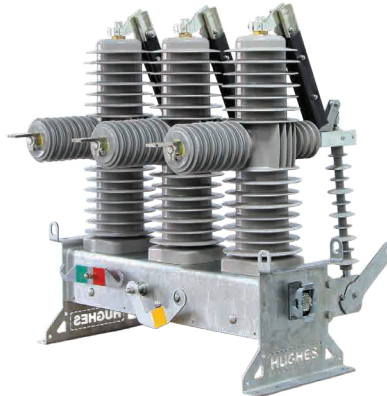
The ACR is solidly insulated with an optional integrated disconnector for extra personal operation safety. It has low weight, most of the parts are made of non magnetic stainless steel with focus on minimizing electrochemical corrosion. The bushings and isolators core are made of epoxy with silicone rubber surface for extra vandal and UV protection.

TECHNICAL DATA	ACR 120	ACR240	ACR 405
Rated maximum voltage	12/15kV	24/27kV	38/40kV
Rated basic impulse level, P>P	110kV	150kV	185kV
Rated basic impulse level, P>E	110kV	125kV	170kV
Power frequency withstand, Dry >1min	50kV	60kV	70kV
Power frequency withstand, Wet >10 sec	45kV	50kV	60kV
Rated continuous current	630A/1250A	630A/1250A	1200A
Rated fault breaking current	20kA/20kA	20kA/20kA	16kA
Rated fault making current	50kA/50kA	50kA/50kA	42kA
Rated fault duration time	3s/3s	3s/3s	3s
Line charging current	5/10A	5/10A	5A
Cable charging current	20/40A	20/40A	40A
Bushing type	Epoxy core with silicone surface		HCEP
Creep distance to ground (disconnector isolator)	400mm	800mm	
Creep distance to ground,(interrupter isolator)	650mm	1250mm	1310mm
Rated operation voltage	85-275 VAC		
Operational sequence, no charge	25ms Open - 50ms Close - 25ms Open		

TIME VOLTAGE SECTIONALIZERS



TVS240 time voltage sectionalizer for 22/27kV with built in disconnector



Control cabinet

DESCRIPTION

Autoself(TM) Time Voltage Sectionalizer TVS is built of the ACR's high performance outdoor vacuum circuit breaker module and high speed TVX electronic sectionalizer module.

The AutoSelf functionality is built on a auto-reclosing cycle count, lockout function and simple time-voltage logic including multiple timers. It can be operated manually via push buttons and a rotate switch. The unit has an optional built in disconnector and can be easily upgraded to a recloser.

TECHNICAL DATA	TVS 120	TVS 240	TVS 405
Rated maximum voltage	12/15kV	24/27kV	38/40kV
Rated basic impulse level, P>P	110kV	150kV	185kV
Rated basic impulse level, P>E	110kV	125kV	170kV
Power frequency withstand, Dry >1min	50kV	60kV	70kV
Power frequency withstand, Wet >10 sec	45kV	50kV	60kV
Rated continuous current	630A/1250A	630A/1250A	1200A
Rated fault breaking current	20kA/25kA	20kA/25kA	16kA
Rated fault making current	50kA/50kA	50kA/50kA	42kA
Rated fault duration time	3s/3s	3s/3s	3s
Line charging current	5/10A	5/10A	5A
Cable charging current	20/40A	20/40A	40A
Bushing type	Epoxy core with silicone surface		HCEP
Creep distance to ground (disconnector isolator)	400mm	800mm	
Creep distance to ground,(interrupter isolator)	650mm	1250mm	1310mm
Rated operation voltage	24-48-110V-230 VDC/VAC		
Operational sequence, no charge	25ms Open - 50ms Close - 25ms Open		

PRODUCTS

INDOOR AND OUTDOOR VACUUM CIRCUIT BREAKER



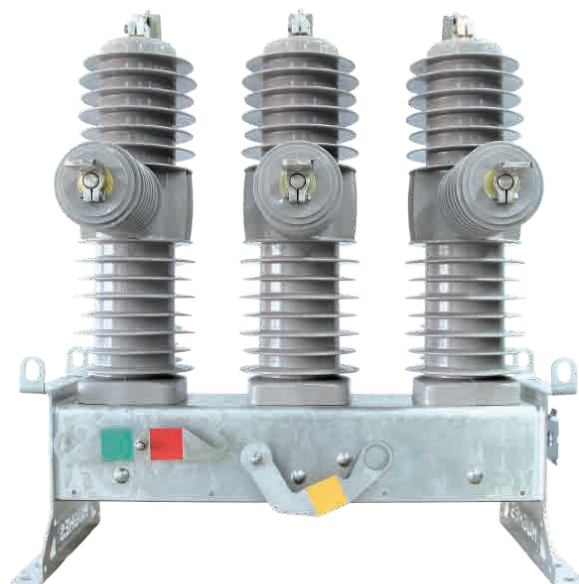
VX4 indoor vacuum circuit breaker switch for 12/24 kV

DESCRIPTION

The VX type of **indoor** circuit breaker series is designed for all standard applications in the medium voltage range. The compact VX type vacuum circuit breakers can be easily integrated not only into all types of switchgears, but also retrofitted into existing switchgears.

The compact design, especially the small depth and width, are the key advantages of the product. The VX type of circuit breaker frame is made of premium class nonmagnetic stainless steel to avoid corrosion and related problems.

The drive mechanism is spring operated for reliable and fast operation. Spring mechanisms always give a very high contact force and that minimizes the risk for contact welding in fault situations.



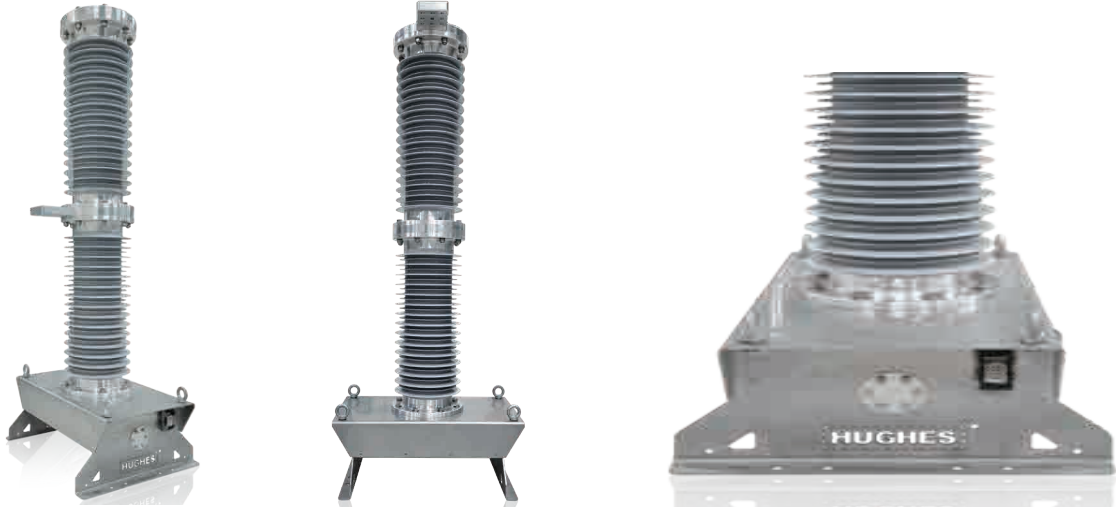
VCB240 outdoor vacuum circuit breaker

DESCRIPTION

The VCB series of **outdoor** vacuum circuit breakers is clearly the most modern, safe and reliable product of its kind on today's market. The drive mechanism operational energy is stored in 4 steel springs. It provides very reliable, fast operation in combination with a very high contact pressure.

- Replaces disconnectors with load break heads;
- Optional integrated disconnector for extra personal safety;
- Unmatchable short circuit capacity;
- Low maintenance;
- Solid insulated - gas free;
- Encapsulated switch point, no risk for bush fire;
- Stainless steel switch frame;
- Easy to install;
- Remote controllable or local operation;

HIGH VOLTAGE VACUUM CIRCUIT BREAKER



OVX720 high voltage vacuum circuit breaker for 72 kV

Bottom view with on - off indicator

DESCRIPTION

Modularized solid insulated high voltage vacuum circuit breaker modules. OVX720 series can be commissioned in single configuration, gang operation in 2 and 3 modules or in zero crossing operation.

TECHNICAL DATA	OVX 721	OVX 722	OVX 723
Type	circuit breaker	circuit breaker	circuit breaker
Rated frequency	50/60 Hz	50/60 Hz	50/60 Hz
Operating voltage (phase to ground)	42 kV	42 kV	
Operation voltage (phase to phase)			72 kV
Rated power frequency withstand voltage (50 Hz/1 min)	140 kV	140 kV	140 kV
Lightning impulse withstand voltage (1.2/50 μ s)	325 kV	325 kV	325 kV
Rated current	2500 A	2500 A	2500 A
Rated short-circuit breaking current	31.5 kA	31.5 kA	31.5 kA
Rated short-circuit making current	80 kA	80 kA	80 kA
Short circuit withstand current	31.5 kA/3 s	31.5 kA/3 s	31.5 kA/3 s
Operation mechanism	Stored energy	Stored energy	Stored energy
Number of poles	1	2	3
Opening time	≤ 17 ms	≤ 22 ms	≤ 22 ms
Closing time	≤ 60 ms	≤ 60 ms	≤ 65 ms
Insulators	Polymeric	Polymeric	Polymeric
Operating class (IEC 62271-100)	E2	E2	E2
Height x Length x With	1990 x 840 x 620 mm per module		
Operation voltage	24 VDC, 110 VDC, 220 VAC		
Drive voltage	24 VDC, 110 VDC, 220 VAC		



Hughes Power System (Sweden) specializes in research, development, manufacturing, marketing and sales of medium voltage outdoor and indoor switchgear products.

The majority of Hughes Power System's products are designed and built in Sweden.

www.hughespowersystem.com

