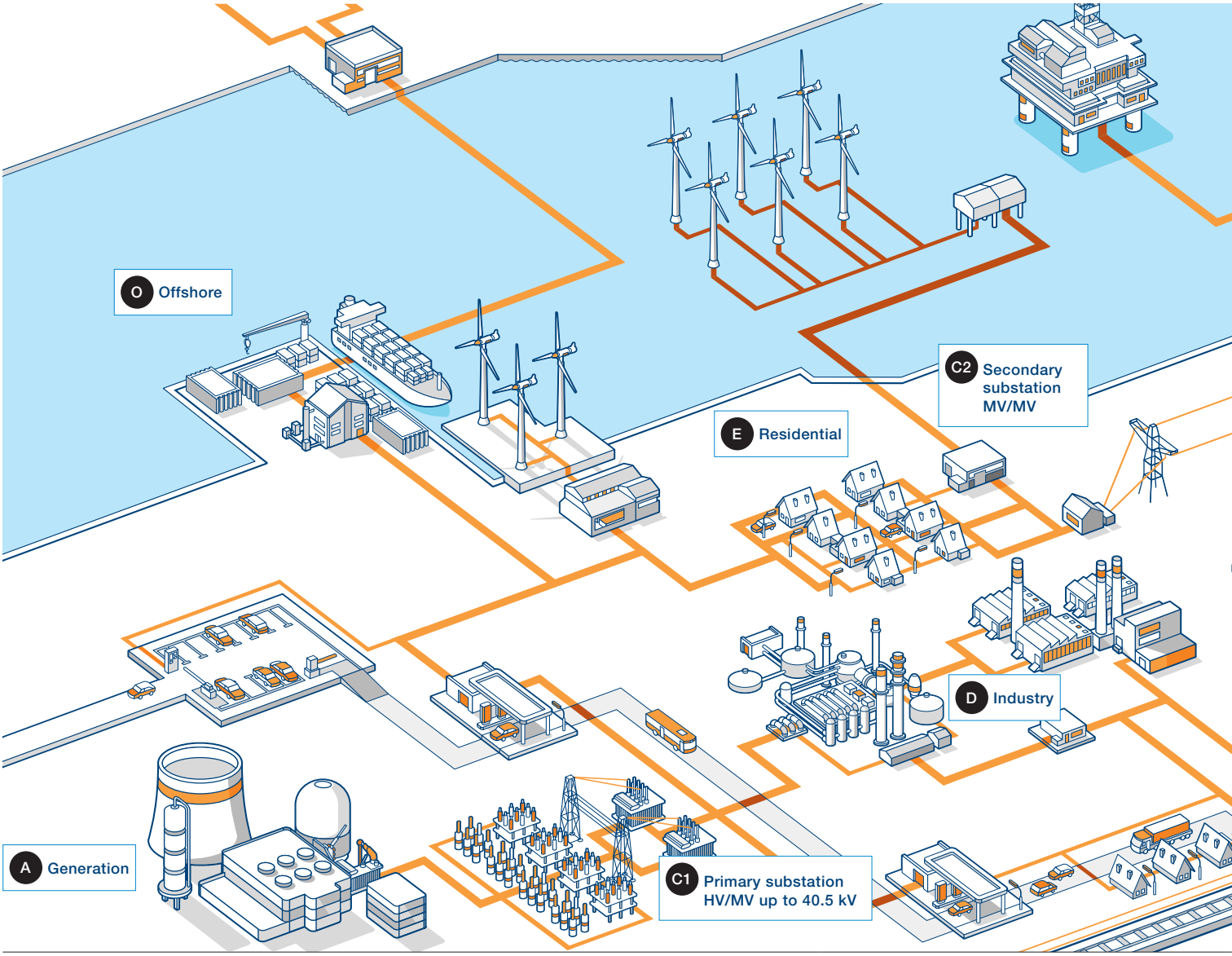
Safe and reliable distribution network
ABB portfolio for medium-voltage indoor applications

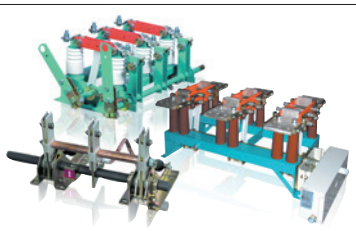
Power and productivity
for a better world™

Complete solution for indoor applications
ABB's products provides safe, reliable and smart technologies for the medium-voltage distribution networks

Medium-voltage products play a pivotal role in the distribution part and embedded generation of the power value chain, facilitating the "last mile" connect that brings electricity to billions of users around the world.
ABB's comprehensive medium-voltage portfolio for indoor applications serves customers with the most reliable, efficient, safe and sustainable technologies, that allows a much higher value package solution for specific customer needs.



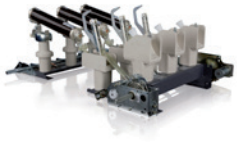
The majority of ABB's indoor apparatus range supports the whole power value chain across all businesses (A, B, C1, C2, D, E, F



Indoor disconnectors and earthing switches

Ultra-Fast Earthing Switch

Indoor instrument transformers



Indoor switch disconnectors
(C1, D, E)

Indoor gas insulated switches
(C1, C2, D, E, F, G)

Circuit-breaker + Switch
(C2, D, F, G)

Fuses
(C2, E, F)

Railway -breakers
(H)

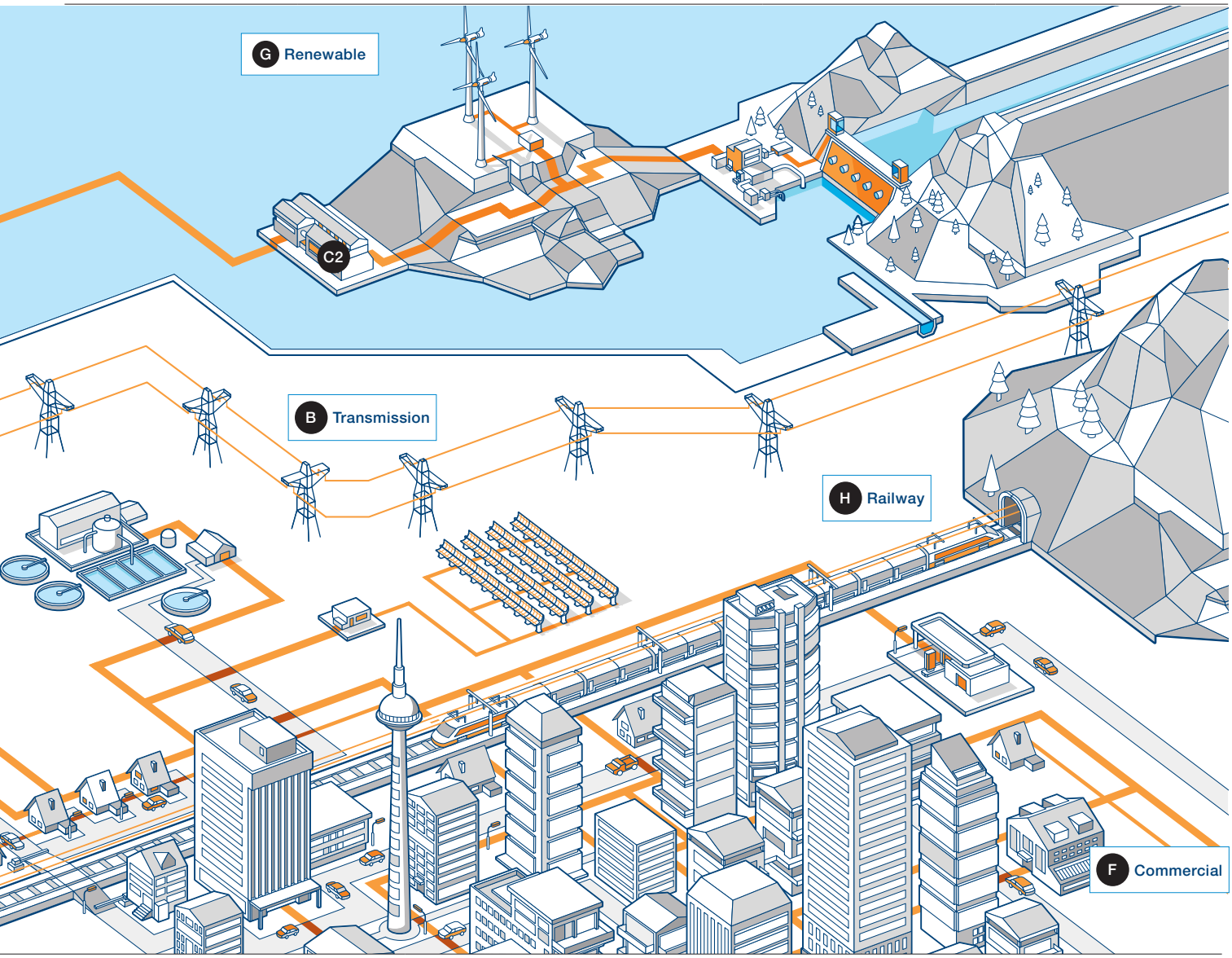
Indoor circuit-breakers
(A, C1, C2, D, G, O)

Capacitor switches
(B, C1, D, G)

Generator circuit-breakers
(A, D)

Enclosures & kits
(A, C1, D)

Contactors
(D)



F, G, H)

Vacuum interrupters

Embedded Poles

Shaping a stronger and reliable distribution ne
ABB portfolio for medium-voltage indoor appl






Main function	Vacuum Interrupters	Embedded Poles	Circuit-Breakers / IEC indoor	Circuit-Breakers / ANSI indoor	Circuit-Breakers / Railway	Generator Circuit-Breakers	Contacto
Model	VS# / VG#	PT# / P# / OP#	VD4; VM1; Vmax; HD4	ADVAC; AMVAC; VM1; Vmax; Vmax/A	G-Series	VD4-G, ADVAC-G	VSC
Applicable Standard	IEC, ANSI, GB	IEC, ANSI, GB	IEC (GB; GOST)	ANSI; UL	IEC; ANSI; GB; GOST	IEC; ANSI	IEC
Maximum Rated Voltage	40.5 kV	40.5 kV	40.5 kV	27 kV	27.5 kV	15 kV	12 kV
Maximum Rated Current	4000 A	4000 A	4000 A	3000 A	2500 A	4000 A	400 A
Maximum short-cuircuit current rating	63 kA	50 kA	63 kA	63 kA	31.5 kA	63 kA	6 kA
Applications	Providing reliable electrical interruption technology for: - Indoor/outdoor circuit-breakers (CBs) & switches - Contactors - Switch disconnectors - Ring main units	Key component containing vacuum interrupter technology for: - Indoor/Outdoor CBs - Contactors - Reclosers	Primary and secondary distribution protection, CBs from ABB are available for original equipment manufacturers (OEM) to incorporate in their own installations or for use in repair, retrofit and upgrade projects.	Primary distribution protection, CBs from ABB are available for OEM to incorporate in their own installations or for use in repair, retrofit and upgrade projects.	Vacuum CBs designed to cover single-phase applications for the railway power supply and applying a combination of a maintenance-free vacuum interrupter, magnetic actuator and electronic controller.	Generation protection and control (generators, xfmrs), CBs from ABB are available for OEM to incorporate in their own installations or for use in repair, retrofit and upgrade projects.	Suitable f alternatin used to c requiring operation frequentl
Technology	Vacuum interruption	Vacuum interruption with solid dielectric insulation	Vacuum or gas interruption / Solid dielectric insulation / Front or lateral lineup / Spring or magnetic mechanism	Vacuum interruption / Solid dielectric insulation / Front lineup / Spring or magnetic mechanism	Vacuum interruption / Magnetic mechanism	Vacuum interruption / Spring mechanism	Vacuum i magnetic
Main features	- Compact and robust design - Reliability and long life from state-of-the-art manufacturing processes - Silicone moulding for maximum external dielectric strength - Most frequently used switching technology worldwide for medium voltage - Eco-eficient and maintenance-free - Proven with over 2 million products in service	- High dielectric strength without any further external precautions - Optimum protection of the vacuum interrupter from moisture, dust and external damage - Suitable for all conceivable climatic conditions and site altitudes - Easy assembly on circuit-breakers - Maintenance-free - Efficient increase in dielectric strength without use of greenhouse gases	- The world's most successful range of MV vacuum and SF_6 gas circuit-breakers - Full engineering and technical support - Proven reputation for reliability, performance and long life - Products tailored for local markets - Short lead times - Fast response - Vacuum interrupters (VIs) embedded or assembled in the poles - Embedded Poles protect interrupter from impacts, dust deposits and humidity	- The ANSI most successful range of MV vacuum CBs - Full engineering and technical support - Proven reputation for reliability, performance and long life - Products tailored for local markets - Short lead times - Fast response - Embedded Poles protect interrupter from impacts, dust deposits and humidity	The GSx family (GSH II and GSR II) includes a suitable range of vacuum circuit-breaker designed to cover single-phase applications for the railway power supply	- The world's most compact MV vacuum generator CB - Full engineering and technical support - Type tested in accordance to the specific, global dual logo IEC/IEEE standard - Proven reputation for reliability, performance and long life - Products tailored for local markets - Short lead times - Fast response - Vacuum interrupters assembled in the poles	- Bistable magnet - SCO or single c comma electric latching - Limited consum - Compa - Specifi switchi - Up to 1 operati - Mainter - Fixed a version

Applications	Vacuum Interrupters	Embedded Poles	Circuit-Breakers / IEC indoor	Circuit-Breakers / ANSI indoor	Circuit-Breakers / Railways	Generator Circuit-Breakers
Primary Distribution Panel builders			■	■	■	■
Secondary Distribution Panel builders	■		■	■	■	
CSS manufacturers			■	■	■	
MECB manufacturers			■	■		
Power transformers			■	■	■	■
Distribution transformers			■	■	■	
MV Apparatus (CBs, Contactors, etc)	■	■				
Capacitors			■	■		
Generators			■	■	■	■
MV motors			■	■	■	■

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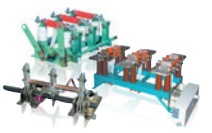

rs	Enclosures & Kits	Air Insulated Switch Disconnector	Gas Insulated Switch Disconnector	Indoor & Outdoor Fuses	Circuit-Breaker + Switch	Indoor Disconnectors & Earthing Switches
	PB family; Advance; L-Frame, ReliaGear ND	NAL/F; VersaRupter; C4; AM	GSec	CEF/CMF/CLC/CIL/CXP/ COL/CXLP	HySec	OJ/OW/EK6
	IEC; ANSI; UL	IEC; ANSI; GOST; CSA; UL	IEC; GB	IEC/ANSI	IEC	IEC
	40.5/27 kV	36/38 kV	24 kV	40.5 kV	24 kV	40.5 kV
	4000 A	1250 A	800 A	315 A	630 A	6000 A
	63 kA	40 kA	25 kA	63 kA (Breaking)	21 kA	50 kA (EK6); 80 kA (OJ/OW)
or operating in g current, normally ontrol loads a high number of s or to be switched y.	Preassembled units designed to house ABB apparatus and suitable to develop arc proof switchgears and to design switchgear retrofits or upgrades.	Line switch disconnectors with or without fuses for: - Cable sectionalizer and transformer switch - Motor switch (with motor fuse CMF) - Switchig of capacitor banks - Local manufactured panels - Switch cubicles - Compact substation (kiosk) - Utility and industrial application	Three-position gas-insulated switch-disconnector for: - Secondary distribution switchgear - Feeders, transformer protection and ring networks - Incoming/outgoing panels with circuit-breakers or in combination with fuses	- Protection of distribution transformers, motors, capacitor banks against overload currents - Back-up, general purpose and full range fuses - Suitable for voltage transformers, contactors, compact switchgear and ring main units	Multifunction apparatus including circuit-breaker, line disconnector and earthing switch suitable for secondary distribution switchgears	- Closing and opening of electrical systems with a visible and safe isolating gap, for primary and secondary switchgears with vertical and horizontal operation - Earthing of switchgear panels for primary distribution systems
nterruption with actuation	not applicable	Air insulated	Gas insulated	Overload spot / Thermal striker	Vacuum interruption / Gas insulation	Air insulation
e permanent t actuator DCO function: or double nd operated with al or mechanical g function power nption ct dimensions c Vls for motor ng ,000,000 ons nance-free nd withdrawable s	- Compact dimensions - Limited weight - With or without earthing switch with making capacity - Upgrade obsolete switchgear to new standards - Availability of interlocks - With or without cable compartment - Cassette type or floor rolling	- Modular principle for wide range of functionality - Safe switching combination between disconnector and current limiting fuse - Dual arc extinguishing system, ensuring efficient load current interruption - Unique design enables high switching capacity - Highest electrical performance in the market - UL listed	- Three-position SF_6-insulated switch-disconnector (Line-Open-Earth) - Metallic Partition - Interlocks to prevent incorrect operation - Separate operating seats for isolation and earthing operations - Applicable in combination with fuses and circuit-breakers - Wide range of "plug and play" accessories - Compactness: only 375 mm wide - Maintenance free with sealed for life technology - Up to 5,000 close-open operations - Integrated capacitive dividers for voltage presence indicator system	- Unified voltage ratings for more application flexibility - Integrated striker pin with temperature control unit to prevent overheating in installation place - Overload spots control internal arc initiation and determine outstanding temperature performance - Graved fuse data for long term fuse recognition, - Low power losses & high current limitation extends insulation life time - High energy capability individual capacitor fuse	- Safe: mechanical interlocks circuit-breaker-line disconnector-earthing switch-panel door - Long lasting: 10,000 CO operations - Simple: CB, isolator and interlock functions in one single apparatus - Compact: fitting panels wide 500 mm - C2 class for capacitive switching	- Snap-action operating mechanism independent of operator - Flexibility with a pre-assembled active part and corresponding earthing contacts supplied loose - Compact design with minimum space required - Manual or motor operation available

	Contactors	Enclosures & Kits	Air Insulated Switch Disconnector	Gas insulated Switch Disconnector	Indoor & Outdoor Fuses	Circuit-Breaker + Switch	Indoor Disconnectors & Earthing Switches
	■	■	■		■		■
	■		■	■	■	■	
	■		■		■		■
	■		■		■		
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World-class quality, reliability and efficiency
Indoor medium-voltage instrument transformers and sensors

The indoor instrument transformers family includes more than 100 products types for indoor applications in medium voltage systems. The instrument transformers are cast in epoxy resin. ABB instrument transformers are manufactured according to the latest standard like IEC, ANSI, GB, GOST, BS, VDE, AS, CSN and others.



	Current transformers (CTs)	Voltage transformers (VTs)	Cable current transformers:
	CTs are designed as single-or-multi turn transformers, with one transformer ratio, or with the possibility to have primary or secondary reconnectable ratio. The quantity of cores depends on the combination of parameters. Capacitive divider can be built in as an option for voltage indication.	VTs are designed as single pole or double pole VT and upon request could be manufactured reconnectable version. Single pole VTs can be equipped with fuse which is integral part of primary winding. The transformer can be mounted in any position.	Cable current transformers include a wide range of dimensions and designs which could be manufactured as a single or multi-ratio type. The primary conductor of such CT is either an insulated cable or a busbar, which provides insulation for the application voltage.
Maximum Rated Voltage	up to 40.5 kV	up to 40.5 kV	0.72 or 1.2 kV
Maximum Rated Current	up to 3200 A	-	up to 10,000 A
Secondary I/U	5 A or 1 A	100:V3 V; 110:V3; 120:V3 /100:3; 110:3; 120:3 V - 100 ; 110; 120; 230 V	5 A or 1 A
Frequency	50 or 60 Hz	50 or 60 Hz	50 or 60 Hz
Ith/Idyn	up to 100 kA/1s; up to 250 kA	-	up to 100 kA/1s; up to 250 kA
Accuracy class	0.2; 0.2 s; 0.5; 0.5 s; 1; 3 - 5P; 10P	0.2; 0.5; 1 - 3P; 6P	0.2; 0.2 s; 0.5; 0.5 s; 1; 3 - 5P; 10P
Feature	up to 6 cores + capacitive divider, wide range of dimension designs	over voltage factor: single pole VT 1,9x Un /8 h; double pole VT 1.2x Un/continuously	inner diameter for ring CT from 33 mm up to 500 mm; up to 3 cores

Instrument transformers are used in a wide range of applications

Switchgear	Machines	Substations & Capacitor banks	Transformers
Primary switchgear	Motors	Substations	Power transformers
Secondary switchgear	Generators	Compact secondary substations	Distribution transformers
Air insulated	MV drives	Capacitor banks	Dry type transformers
Gas insulated	Generator circuit-breakers	Metal enclosed capacitor banks	

Indoor medium-voltage sensors

ABB sensors offer a state-of-the-art solution of providing the current and voltage signals which are needed for the protection and measurement of medium voltage power systems. The product portfolio has more than 17 product families and 52 different product variants. The output signal is linear over the whole measuring range. Our sensors open up numerous advantages and benefits for their users such as fast and easy design process, quick delivery time, minimized cost during the life cycle, flexibility, safety and reliability and are able to cover various applications from primary to secondary air and gas insulated switchgear.



	Current sensors	Voltage sensors	Combined sensors
Maximum Rated primary current or voltage	up to 4000 A	up to 40.5 kV	up to 3200 A & up to 40.5 kV
Rated transformation ratio	80;250;500;1600 A / 150(180) mV at 50(60) Hz	1:10,000	80;250;500;1600 A / 150(180) mV at 50(60) Hz 1: 10 000
Accuracy class	up to 0.5/5P630	up to 0.5/3P	up to 0.5/5P630 & 0.5/3P
Sensor principle	Rogowski coil	Resistive or capacitive dividers	Rogowski coil Resistive or capacitive dividers

Medium-voltage sensors are compatible with ABB Relay products. The relay product family offers wide range of protection relays. Examples being RIO 600, REF/J/M 601, REF/M/D/C 615, REF/M 620.

Success from innovation

Technology and innovation are at the core of ABB's medium-voltage product offering

Product benefits	Application
	
UFES The Ultra-Fast Earthing Switch (UFES) is extinguishing the internal arc in less than 4 ms after detection! - High effectiveness: No damages caused by an internal arc! UFES is maximizing the safety for personnel, while saving the equipment and thus the availability of the power distribution - Enhanced planning possibilities: More flexibility for the design of arc protection concepts for switchgear and environment - Reliability: Devices based on know-how gained from decades of experience with the ABB vacuum interrupter and I_S-limiter technology	UFES technology is designed for active internal arc protection for new or installed switchgear. It prevents the severe thermal and mechanical impacts connected with an internal arc fault. UFES is available for ABB switchgear, for customized ABB Service retrofit solutions or simply as an OEM kit.
	
I_S-limiter Capable of detecting and limiting a short-circuit current during the first current rise. - No tripping based on inrush-, charging and starting-currents - Eco-efficient due to minimization of electrical losses and refurbishment of tripped inserts - Engineered according to customers' application - Various contruction possibilities available in form of loose components, fixed and truck mounted panels	I_S-limiter solves short-circuit current problems in electrical networks and is suitable for: - System upgrades without replacing existing electrical equipment such as circuit-breakers, busbars and cable systems - Extension of existing switchgear / connection of busbars - Integration of distributed power generation to limit the contribution to the system (cogeneration) - Minimization of copper losses and voltage drop by bypassing a reactor coil
	
VT Guard Pro/VT Guard Pro-D Advanced security device that protects indoor medium voltage inductive voltage transformers against ferroresonant oscillations. Ferroresonant oscillations may be initiated by transient events (such as switching operations) and can arise in ungrounded power networks or in the networks where is not directly grounded neutral point. VT Guard Pro–D has extended functions that allow self-diagnosis and enable possibility of cooperation with superior system.	VT Guard PRO is designed to be used in open-delta connection of three single-phase voltage transformers. VT Guard PRO fully replace dumping resistor and save space in customer application.
	
DS1 capacitor switch The switch, fully dry air insulated, is able to perform operations on capacitor banks without causing any transient voltage or inrush current and eliminating the probability of prestrike and restrike occurrence. This is possible thanks to the coupling between the integrated control unit and diodes technology. DS1 can perform up to 50,000 close-open operations.	DS1 is mainly designed for indoor capacitor banks up to 17.5 kV and 630 A. Transient-free switching provides highest network reliability and extends capacitors life.

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