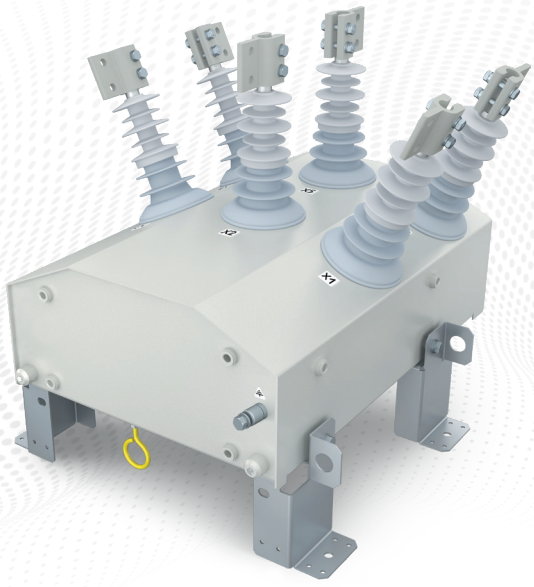
MAGVATECH

FAST PRECISE RELIABLE

PRODUCT CATALOGUE



magvatech.com

MAGVATECH

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Magvatech is a group of companies that specializes in the development and manufacture of innovative switchgear products for indoor and outdoor applications in medium voltage (MV) smart grids.

Magvatech conducts extensive research aimed at developing new switching and control technologies, with a primary focus on resolving customer problems not met by current products on the market.

MAGVATECH

FAST PRECISE RELIABLE

ADVANTAGES

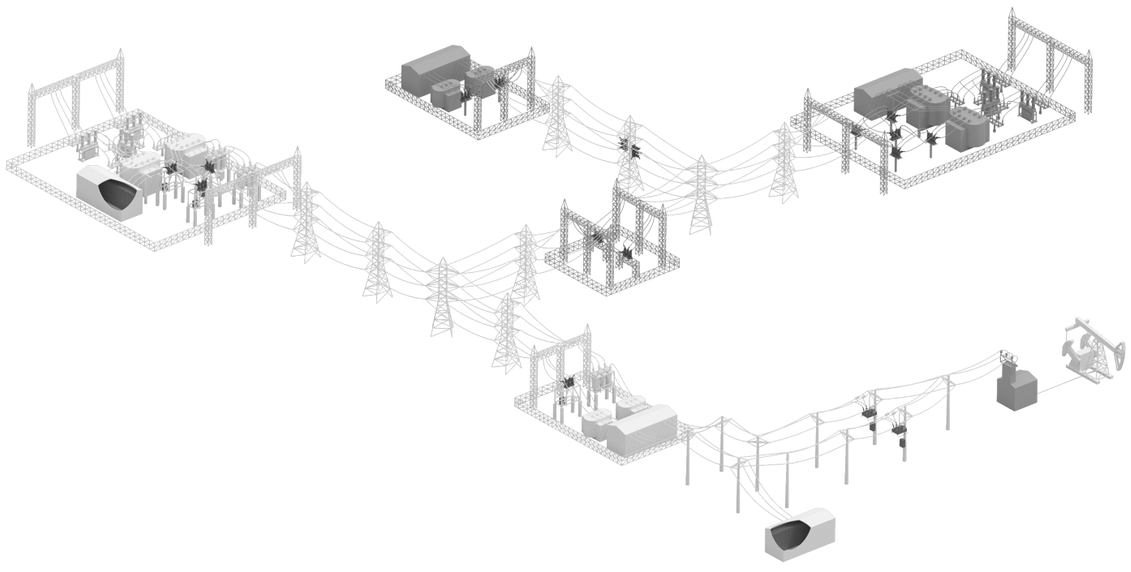
MAINTENANCE FREE

MOST COMPACT DIMENSIONS AND WEIGHT

HIGH OPERATIONAL SPEED

EASE OF USE AND OPERATOR'S SAFETY

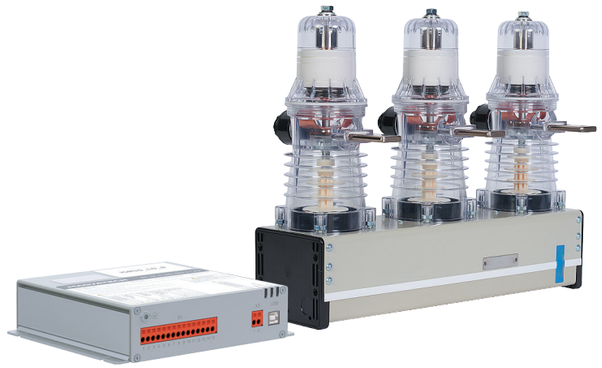
ENVIRONMENTAL SAFETY



PRODUCT CATALOGUE

VACUUM CIRCUIT BREAKERS

High performance vacuum circuit breakers for compact switchgear designs, existing plant refurbishment/retrofit programs and special applications.



AUTOMATIC CIRCUIT RECLOSERS

Automatic circuit recloser for substation automation, distributed generation and important load connections. Suitable for ring, radial and meshed overhead lines. A core element of contemporary smart grid networks.

OUR WORLDWIDE PROJECTS

Magvatech offers solutions that ensure reliable power system operation in more than 100 countries.

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MAGVATECH COVERAGE MAP

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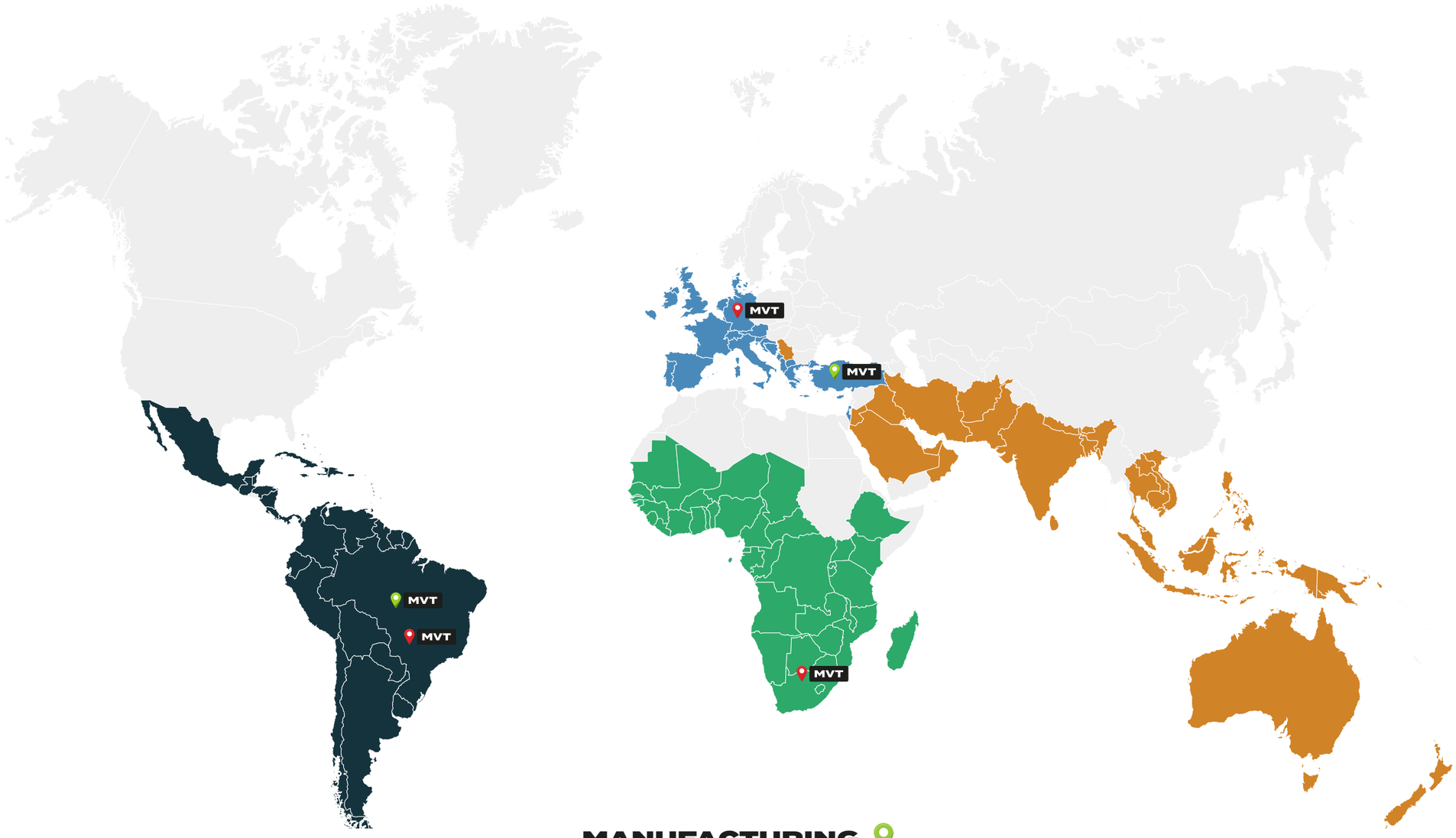

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Vacuum Circuit Breakers

VCB15/25

SIMPLICITY IS PERFECTION

Gears, springs, bearings, levers and other rotating parts are the most often causes of conventional circuit breaker failure. Luckily Magvatech breakers are better than conventional.

Magvatech has simplified its breaker design — completely removing all components prone to failure. As the result VCB has 20 times the reliability of conventional circuit breakers and furthermore doesn”t require any maintenance in service.

VCB has
20 times
the reliability
of conventional
circuit breakers

30,000
close
open operations

ANY SPATIAL ORIENTATION	LIGHTEST IN THE WORLD
MOST COMPACT DIMENSIONS	CONTINUOUS SELF-SUPERVISION
MAINTENANCE FREE	SINGLE PHASE OPTION

YOUR SWITCHGEAR, DEFINED AND DESIGNED IN ACCORDANCE WITH YOUR VISION

You know your switchgear best; you know how to optimize its design and how it should operate. That's why the Magvatech c VCB series circuit breaker is so revolutionary — because it puts the design control in your hands. With the smallest dimensions on the market and ANY circuit breaker orientation, you are free to optimize your switchgear design, define how to make primary and secondary connections, and lay your secondary circuits. That means you can guarantee the optimal use of space and convenient access to the control elements without having the need to compromise on something. Want even higher flexibility? Weighing just 33 kg, the Magvatech's circuit breaker is the smallest and lightest circuit breaker in the world. Impress your customers with unique switchgear designs no-one else can copy.

APPLICATION

OEM SOLUTIONS & VCBS FOR RETROFIT

Magvatech cooperates with switchgear manufacturers and retrofit solutions providers worldwide.

Its VCBs are versatile and easy-to-use for both new and existing switchgear panel designs, as well as for retrofit solutions and various custom applications.

SPECIAL APPLICATION CIRCUIT BREAKERS

FAST TRANSFER SWITCHES

With transfer times as fast as 2 cycles.
Such quick operational times allow very sensitive loads to operate without interruption in the case of a main power source loss. The fast transfer switch solution:
– Eliminates costly downtime,
– Reduces production equipment stress,
– Ensures quick return on investment.

ARC FLASH MITIGATION

With interruption in one period.
That quick interruption time:
– Increases operational safety,
– Reduces switchgear restoration time and loss of productivity,
– Reduces costly downtime,
– Limits switchgear damage and repair costs.

FAULT CURRENT LIMITER

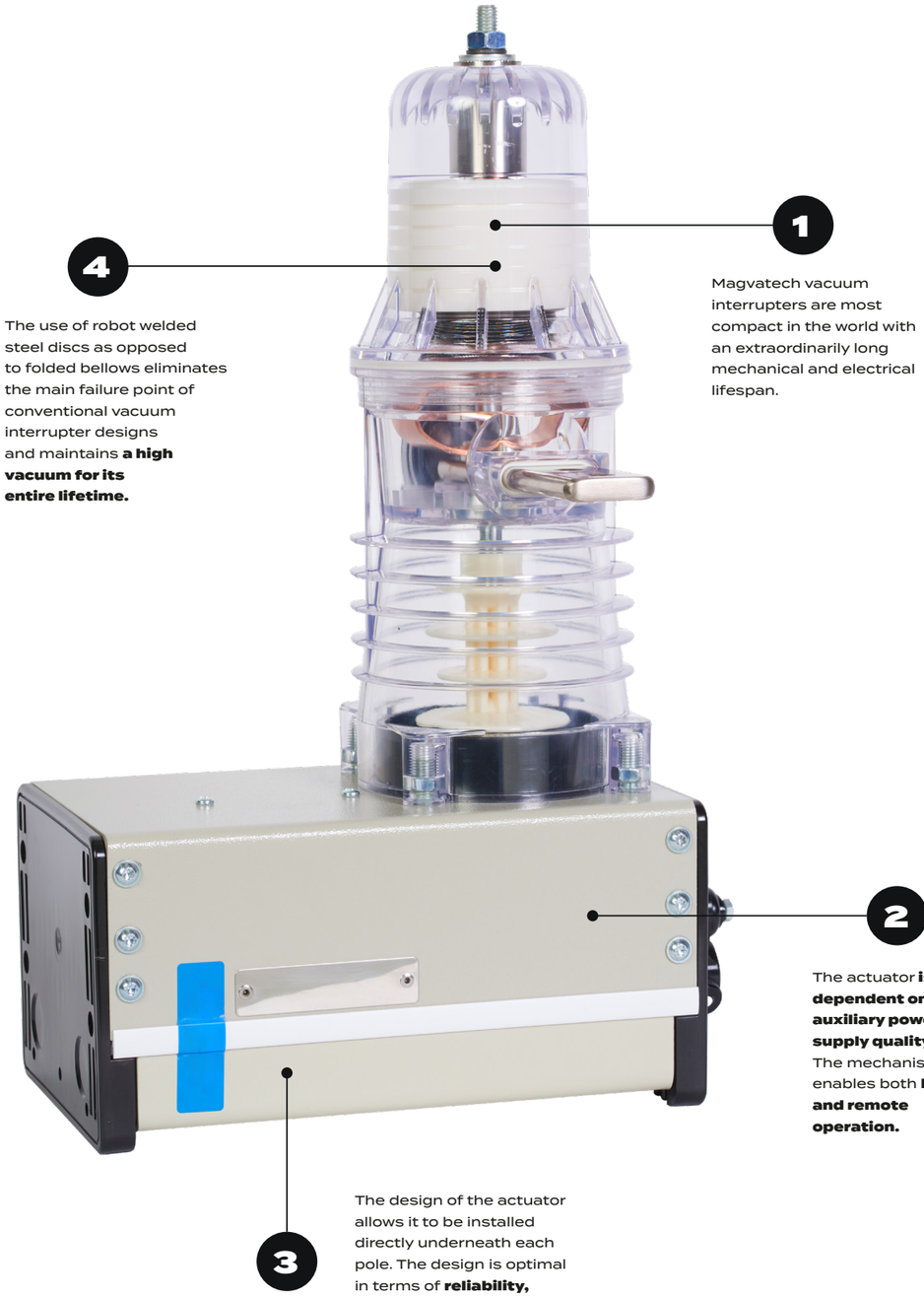
Sub period interruption time limits short circuit current effectively by quickly disconnecting distributed generation sources from the grid.
– Allows more distributed generation, to be connected to the grid,
– Limits fault current,
– No operational losses,
– Enables automatic distributed, generation sources reconnection.

SINGLE PHASE CIRCUIT BREAKERS

Magvatech’s circuit breakers are the perfect match for applications like transformers or generators with a neutral earthing, server rooms and point on wave switching.

The circuit breakers weigh less than 14 kg, meaning they can be installed quickly and cost effectively even in the smallest designs.

Design and Operation



4

The use of robot welded steel discs as opposed to folded bellows eliminates the main failure point of conventional vacuum interrupter designs and maintains **a high vacuum for its entire lifetime.**

1

Magvatech vacuum interrupters are most compact in the world with an extraordinarily long mechanical and electrical lifespan.

2

The actuator **is not dependent on the auxiliary power supply quality.** The mechanism enables both **local and remote operation.**

3

The design of the actuator allows it to be installed directly underneath each pole. The design is optimal in terms of **reliability, dimensions, weight and ease of installation.**

MAGVATECH
FAST PRECISE RELIABLE

CONTROL MODULE CM_16

The Control Module is an intelligent circuit breaker driver that provides energy for circuit breaker operation. It controls and optimises main contacts movement in the manner that prolongs circuit breaker life and continuously monitors circuit breaker trip and close circuits.

CONTINUOUS SELF-SUPERVISION

Vacuum circuit breakers equipped with the CM16 control module continuously monitor and control switching modules, functional wiring and auxiliary power supply quality. The CM16 eliminates the necessity of additional trip and close coils, charging mechanisms and all related wiring supervision. The whole trip and close circuit supervision comes in a single package with any Magvatech VCB. The CM16 allows the user to forget about scheduled trips and close wiring inspections — as in the event of malfunction a notification will be sent to the operator using one of the inbuilt output relays and indicated by LEDs inbuilt into the control module.

LOW POWER CONSUMPTION

Vacuum circuit breakers equipped with the CM16 control module need less than 42 W — just 10% of what the best alternatives available on the market need! Such low power consumption finally solves the problem of auxiliary power supply — a much less powerful source and UPS can now provide substation auxiliary equipment with the required power.

EASE OF USE AND ROBUSTNESS

CM16 type control modules are connected with the circuit breaker they control and supervise by means of simple wires. This allows the CM installation to be located at any position convenient for the OEM, system integrator or end-user location. Very compact dimensions and low weight further simplify the process. The CM16 has a robust design, enclosed in an aluminium housing.

5

The energy for switching operations is stored in the Control Module (CM). This reduces **the auxiliary power supply needs to 1/10 of a conventional circuit breaker** and enables significant savings on Substation UPS and auxiliary equipment.

6

Embedded intelligence —The CM's **continuous self-supervision** function monitors control, switching modules, functional wiring and auxiliary power supply quality. In the event of malfunction, a notification will be sent to the operator and indicated by inbuilt LEDs.

7

The CM can be conveniently installed at a distance from the circuit breaker and connected by means of flexible leads. It significantly simplifies the installation and allows the CM to be installed with other low voltage devices.

MAINTENANCE FREE | CONTINUOUS SELF-SUPERVISION | MOST RELIABLE | MOST COMPACT DIMENSIONS AND WEIGHT | THE FASTEST ON THE MARKET

LOW DUTY

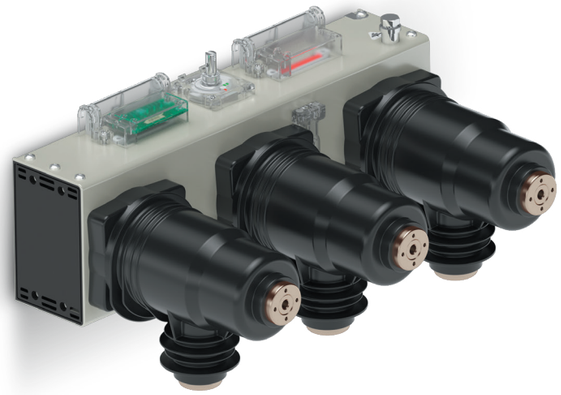
LD series vacuum circuit breakers for rated continuous current up to 800 A. Available in three-phase and single phase configurations and for rated voltages up to 24 kV.

SINGLE PHASE VACUUM CIRCUIT BREAKER

Magvatech's circuit breakers are the perfect match for applications like transformers or generators with a neutral earthing, server rooms and point on wave switching.

MAINTENANCE FREE | CONTINUOUS SELF-SUPERVISION | MOST RELIABLE | MOST COMPACT DIMENSIONS AND WEIGHT | THE FASTEST ON THE MARKET

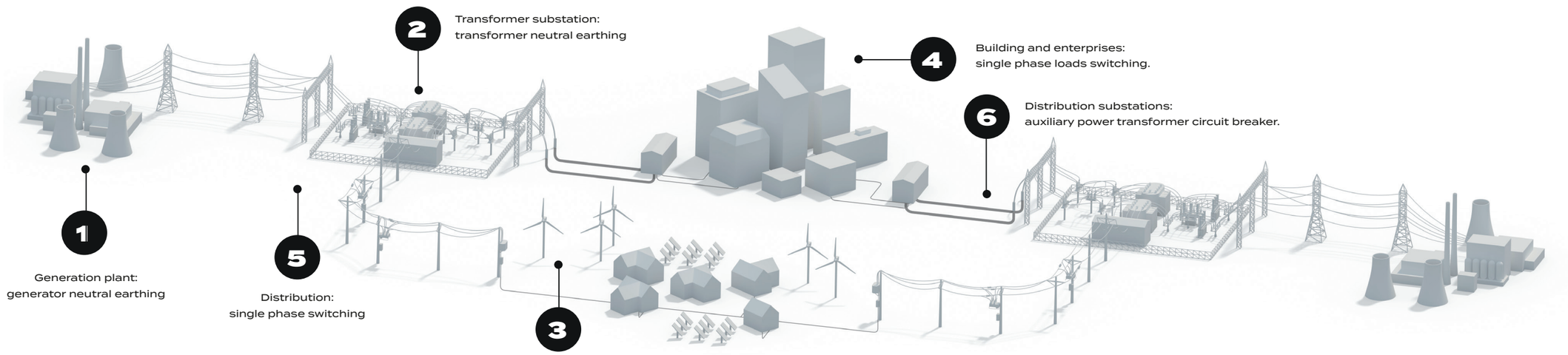
MEDIUM DUTY



A brand new vacuum three-phase and single-phase circuit breakers type for rated continuous currents up to 1250 A and rated voltages up to 17.5 kV with extraordinarily small size and weight.

Using the same single-axis design philosophy as the LD series, the MD series brings even more innovation in a compact package. At a height of only 35 cm, and as narrow as the LD type, the MD circuit breaker handles currents as high as 1250 A continuous and 31.5 kA short-time and interrupting. Together with any spatial orientation capability, the MD series circuit breaker is second to none in terms of switchgear design optimization and mounting simplicity.

APPLICATION:



MAINTENANCE FREE | CONTINUOUS SELF-SUPERVISION | MOST RELIABLE | MOST COMPACT DIMENSIONS AND WEIGHT | THE FASTEST ON THE MARKET

SHELL SERIES

Shell vacuum circuit breakers are designed for applications with high rated continuous currents up to 2500 A and voltages up to 25 kV.

The exceptional shell-type design insulates the phases from each other, with multiple mounting points incorporated to allow for installation in flexible orientations (vertical or inverted). It is not only robust and durable to high ratings but it is also the fastest circuit breaker on the market with an ability of sub-period current interruption.

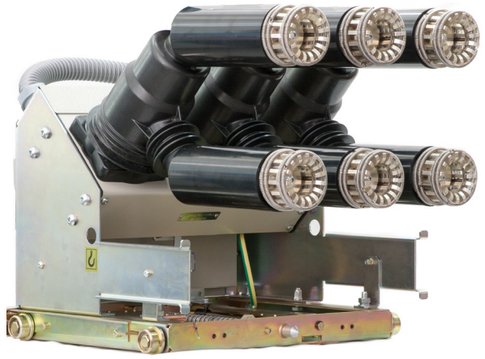
HIGH DUTY

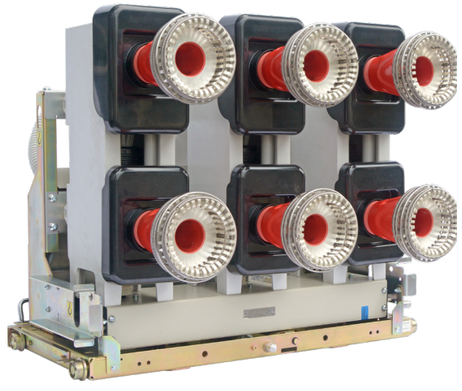
The Shell series simplifies interlocking functionality using an integrated manual trip lever at the rear to block the unit both electrically and mechanically.
High Duty series breakers are the most endurant across our product range and designed for rated continious currents up to 3150 A. HD finally brings all advantages of the best secondary distribution circuit breakers by Magvatech to a primary distribution class. Never before VCBs with such high ratings were so compact and applicable for the most confined panels.

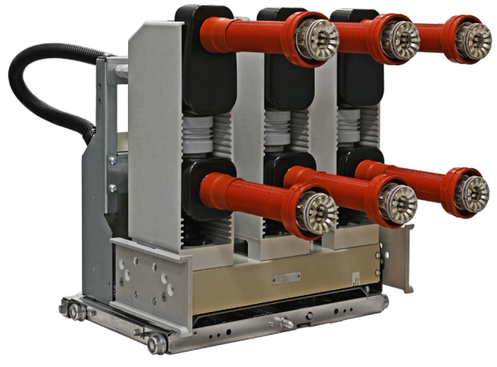
MAINTENANCE FREE | CONTINUOUS SELF-SUPERVISION | MOST RELIABLE | MOST COMPACT DIMENSIONS AND WEIGHT | THE FASTEST ON THE MARKET

DRAW-OUT UNITS

Medium duty and High Duty vacuum circuit breakers are now also available in withdrawble design with rack-in cassette, guide-arms and tulip contacts. Magvatech draw-out units are fully compatable with industry standard interfaces. The personel safety is brought to a maximum level with embedded mechanical and electrical interlocking.







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VACUUM CIRCUIT BREAKERS

TECHNICAL PARAMETERS

Specification

VCB15 LD SERIES
Technical Parameters

VCB15_LD1

VCB15_LD3

PARAMETER	VCB15_LD1	VCB15_LD3
Rated voltage (Ur)	17.5 kV	
Rated normal current (Ir)	800 A	
Rated power frequency withstand voltage (Ud)	42 kV	
Rated lightning impulse withstand voltage (peak) (Up)	95 kV	
Rated short-circuit breaking current (Isc)	25 kA [1)]	
Rated peak withstand current (Ip)	65 kA	
Rated short-time withstand current (Ik)	25 kA	
Rated duration of short circuit (tk)	3 s	
Rated frequency (fr)	50/60 Hz	
Mechanical life (CO-cycles)	50,000	
Maximum number of CO-cycles per hour	60	
Operating cycles, rated–short circuit breaking current	100	
Closing time	≤ 70 ms [2)]	
Opening time	≤ 35 ms [2)]	
Break time	≤ 45 ms [2)]	
Rated operating sequence at rated normal current	O-0.3s-CO-10s-CO-10s-CO [3)]	
Rated operating sequence at rated short-circuit breaking current	O-0.3s-CO-15s-CO	
Resistance of main circuit	≤ 40 µOhm	
Weight (depending on Phase centre distance)	34–36 kg	13 kg
Package dimensions, not more than (LxWxH), mm	330x645x550	290x645x550
Weight of CM	1 kg	
Overall dimensions of CM, mm	190x165x45	
Altitude above sea level	1000 m [4)]	
Relative humidity in 24 hours	≤ 95%	
Relative humidity over 1 month	≤ 90%	
Temperature range	-25°C ... +55°C	
Degree of protection according to IEC 60529	IP40	
Type of driving mechanism	Monostable magnetic actuator	
Number of available auxiliary contacts	6 NO + 6 NC	2 NO + 2 NC

1) At 40% d.c. component.

2) Smaller timing on request.

3) The number of sequential Close-Trip operations with a 10 second interval should not exceed 10. The number of Close-Trip operations should not exceed 60 per hour. Sequence of 10s Close-Trip operations can be repeated only after 260 s pause.

4) Up to an installation altitude of 1000 m above sea level. Above 1000m, the external insulation measurement of the ISM must be increased by the atmospheric correction factor Ka according to IEC 62271-1 compared to the insulation measurement at sea level. The maximum allowed altitude is 2000 m above sea level.

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VCB15 MD SERIES

Technical Parameters

VCB15_MD1

VCB15_MD3

PARAMETER	VCB15_MD1	VCB15_MD3
Rated voltage (Ur)	17.5 kV	
Rated normal current (Ir)	1250 A	
Rated power frequency withstand voltage (Ud)	38 kV	
Rated lightning impulse withstand voltage (peak) (Up)	95 kV [1]	
Rated short-circuit breaking current (Isc)	31.5 kA [2]	
Rated peak withstand current (Ip)	82 kA	
Rated short-time withstand current (Ik)	31.5 kA	
Rated duration of short circuit (tk)	3 s	
Rated frequency (fr)	50/60 Hz	
Mechanical life (CO-cycles)	30,000	50,000
Maximum number of CO-cycles per hour	60	
Operating cycles, rated–short circuit breaking current	50	
Closing time	≤ 60 ms [3]	
Opening time	≤ 35 ms [3]	
Break time	≤ 45 ms [3]	
Rated operating sequence at rated normal current	O-0.3s-CO-10s-CO-10s-CO [4]	
Rated operating sequence at rated short-circuit breaking current	O-0.3s-CO-15s-CO	
Resistance of main circuit	≤ 17 µOhm	
Weight (depending on Phase centre distance)	33–35 kg	13 kg
Package dimensions, not more than (LxWxH), mm	315x760x490	315x300x190
Weight of CM	1 kg	
Overall dimensions of CM, mm	190x165x45	
Altitude above sea level	1000 m [5]	
Relative humidity in 24 hours	≤ 95%	
Relative humidity over 1 month	≤ 90%	
Temperature range	-25°C ... +55°C	
Degree of protection according to IEC 60529	IP40	
Type of driving mechanism	Monostable magnetic actuator	
Number of available auxiliary contacts	6 NO + 6 NC	2 NO + 2 NC

1) Parameter valid only when ISM is used with insulation kit. For details see dimensional drawings and accessory information (on request).

2) At 40% d.c. component.

3) Smaller timing on request.

4) The number of sequential Close-Trip operations with a 10 second interval should not exceed 10. The number of Close-Trip operations should not exceed 60 per hour. Sequence of 10s Close-Trip operations can be repeated only after 260 s pause.

5) Up to an installation altitude of 1000 m above sea level. Above 1000m, the external insulation measurement of the ISM must be increased by the atmospheric correction factor Ka according to IEC 62271-1 compared to the insulation measurement at sea level. The maximum allowed altitude is 2000 m above sea level.

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VCB15 HD SERIES

Technical Parameters

VCB15_HD1

PARAMETER	VCB15_HD1
Rated voltage (Ur)	17.5 kV
Rated normal current (Ir)	2500 A [1] 3150 A [2]
Rated power frequency withstand voltage (Ud)	38 kV
Rated lightning impulse withstand voltage (peak) (Up)	95 kV
Rated short-circuit breaking current (Isc)	31.5 kA [3]
Rated peak withstand current (Ip)	82 kA
Rated short-time withstand current (Ik)	31.5 kA
Rated duration of short circuit (tk)	3 s
Rated frequency (fr)	50/60 Hz
Mechanical life (CO-cycles)	30,000
Maximum number of CO-cycles per hour	60
Operating cycles, rated–short circuit breaking current	50
Closing time	≤ 60 ms [4]
Opening time	≤ 35 ms [4]
Break time	≤ 45 ms [4]
Rated operating sequence at rated normal current	O-0.3s-CO-10s-CO-10s-CO [5]
Rated operating sequence at rated short-circuit breaking current	O-0.3s-CO-15s-CO
Resistance of main circuit	≤ 15 µOhm
Weight (depending on Phase centre distance)	70–72 kg
Package dimensions, not more than (LxWxH), mm	330x830x680
Weight of CM	1 kg
Overall dimensions of CM, mm	190x165x45
Altitude above sea level	1000 m [6]
Relative humidity in 24 hours	≤ 95%
Relative humidity over 1 month	≤ 90%
Temperature range	-25°C ... +55°C
Degree of protection according to IEC 60529	IP40
Type of driving mechanism	Monostable magnetic actuator
Number of available auxiliary contacts	6 NO + 6 NC

1) Rating for metal enclosed switchgear with limited ventilation. Temperature rise type test at 2500 A in Cradle was successfully passed in KEMA.

2) 3150 A – for PCD 275 mm.

3) At 40% d.c. component.

4) Smaller timing on request.

5) The number of sequential Close-Trip operations with a 10 second interval should not exceed 10. The number of Close-Trip operations should not exceed 60 per hour. Sequence of 10s Close-Trip operations can be repeated only after 260 s pause.

6) Up to an installation altitude of 1000 m above sea level. Above 1000m, the external insulation measurement of the ISM must be increased by the atmospheric correction factor Ka according to IEC 62271-1 compared to the insulation measurement at sea level. The maximum allowed altitude is 2000 m above sea level.

VCB25 LD SERIES
Technical Parameters

VCB25_LD1

VCB25_LD3

PARAMETER	VCB25_LD1	VCB25_LD3
Rated voltage (Ur)	24 kV	
Rated normal current (Ir)	800 A	
Rated power frequency withstand voltage (Ud)	50 kV	
Rated lightning impulse withstand voltage (peak) (Up)	125 kV	
Rated short-circuit breaking current (Isc)	20 kA [1]	
Rated peak withstand current (Ip)	52 kA	
Rated short-time withstand current (Ik)	20 kA	
Rated duration of short circuit (tk)	3 s	
Rated frequency (fr)	50/60 Hz	
Mechanical life (CO-cycles)	30,000	
Maximum number of CO-cycles per hour	60	
Operating cycles, rated–short circuit breaking current	50	
Closing time	≤ 60 ms [2]	
Opening time	≤ 35 ms [2]	
Break time	≤ 45 ms [2]	
Rated operating sequence at rated normal current	O-0.3s-CO-10s-CO-10s-CO [3]	
Rated operating sequence at rated short-circuit breaking current	O-0.3s-CO-15s-CO	
Resistance of main circuit	≤ 40 µOhm	
Weight (depending on Phase centre distance)	35–38 kg	14 kg
Package dimensions, not more than (LxWxH), mm	290x775x550	290x645x550
Weight of CM	1 kg	
Overall dimensions of CM, mm	190x165x45	
Altitude above sea level	1000 m [4]	
Relative humidity in 24 hours	≤ 95%	
Relative humidity over 1 month	≤ 90%	
Temperature range	-25°C ... +55°C	
Degree of protection according to IEC 60529	IP40	
Type of driving mechanism	Monostable magnetic actuator	
Number of available auxiliary contacts	6 NO + 6 NC	2 NO + 2 NC

1) At 34 % d.c. component.

2) Smaller timing on request.

3) The number of sequential Close-Trip operations with a 10 second interval should not exceed 10. The number of Close-Trip operations should not exceed 60 per hour. Sequence of 10s Close-Trip operations can be repeated only after 260 s pause.

4) Up to an installation altitude of 1000 m above sea level. Above 1000m, the external insulation measurement of the ISM must be increased by the atmospheric correction factor Ka according to IEC 62271-1 compared to the insulation measurement at sea level. The maximum allowed altitude is 2000 m above sea level.

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VCB25 SHELL SERIES
Technical Parameters

VCB25_Shell2

PARAMETER	VCB25_SHELL2
Rated voltage (Ur)	24 kV
Rated normal current (Ir)	2500 A
Rated power frequency withstand voltage (Ud)	50 kV
Rated lightning impulse withstand voltage (peak) (Up)	125 kV
Rated short-circuit breaking current (Isc)	25 kA [1]
Rated peak withstand current (Ip)	65 kA
Rated short-time withstand current (Ik)	25 kA
Rated duration of short circuit (tk)	3 s
Rated frequency (fr)	50/60 Hz
Mechanical life (CO-cycles)	30,000
Maximum number of CO-cycles per hour	60
Operating cycles, rated–short circuit breaking current	25
Closing time	≤ 60 ms [2]
Opening time	≤ 35 ms [2]
Break time	≤ 45 ms [2]
Rated operating sequence at rated normal current	O-0.3s-CO-10s-CO-10s-CO [3]
Rated operating sequence at rated short-circuit breaking current	O-0.3s-CO-15s-CO
Resistance of main circuit	≤ 17 µOhm
Weight (depending on Phase centre distance)	53–55 kg
Package dimensions, not more than (LxWxH), mm	328x825x874
Weight of CM	1 kg
Overall dimensions of CM, mm	190x165x45
Altitude above sea level	1000 m [4]
Relative humidity in 24 hours	≤ 95%
Relative humidity over 1 month	≤ 90%
Temperature range	-25°C ... +55°C
Degree of protection according to IEC 60529	IP40
Type of driving mechanism	Monostable magnetic actuator
Number of available auxiliary contacts	6 NO + 6 NC

1) At 34 % d.c. component.

2) Smaller timing on request.

3) The number of sequential Close-Trip operations with a 10 second interval should not exceed 10. The number of Close-Trip operations should not exceed 60 per hour. Sequence of 10s Close-Trip operations can be repeated only after 260 s pause.

4) Up to an installation altitude of 1000 m above sea level. Above 1000m, the external insulation measurement of the ISM must be increased by the atmospheric correction factor Ka according to IEC 62271-1 compared to the insulation measurement at sea level. The maximum allowed altitude is 2000 m above sea level.

MAGVATECH

FAST PRECISE RELIABLE

WITHDRAWABLE VACUUM CIRCUIT BREAKERS

TECHNICAL PARAMETERS

WITHDRAWABLE VCB15 MD SERIES
Technical Parameters

VCB15_MD1_16D

PARAMETER	VCB15_MD1_16D	
Rated voltage (Ur)	17.5 kV	
Phase centre distance (PCD), mm	150	210
Rated normal current (Ir)	1250 A	
Rated power frequency withstand voltage (Ud)	38 kV	
Rated lightning impulse withstand voltage (peak) (Up)	95 kV	
Rated short-circuit breaking current (Isc)	31.5 kA [1]	
Rated peak withstand current (Ip)	82 kA	
Rated short-time withstand current (Ik)	31.5 kA	
Rated duration of short circuit (tk)	3 s	
Rated frequency (fr)	50/60 Hz	
Mechanical life (CO-cycles)	30,000	
Number of operated-isolated operations	500 cycles	
Maximum number of CO-cycles per hour	60	
Operating cycles, rated–short circuit breaking current	50	
Closing time	≤ 60 ms [2]	
Opening time	≤ 35 ms [2]	
Break time	≤ 45 ms [2]	
Rated operating sequence at rated normal current	O-0.3s-CO-10s-CO-10s-CO [3]	
Rated operating sequence at rated short-circuit breaking current	O-0.3s-CO-15s-CO	
Resistance of main circuit	≤ 31 μOhm	
Weight (depending on Phase centre distance)	72–88 kg	
Minimum overall dimensions (L_{min}xW_{min}xH_{min}), mm	677x535x515	
Maximum overall dimensions (L_{max}xW_{max}xH_{max} [4]), mm	677x682x630	
Weight of CM	1 kg	
Overall dimensions of CM (LxWxH), mm	165x190x45	
Altitude above sea level	1000 m [5]	
Relative humidity in 24 hours	≤ 95%	
Relative humidity over 1 month	≤ 90%	
Temperature range	-25°C ... +55°C	
Degree of protection according to IEC 60529	IP40	
Type of driving mechanism	Monostable magnetic actuator	
Number of available auxiliary contacts of ISM (DOU)	6 NO + 6 NC (5 NO + 5 NC)	

1) At 40% DC component.

2) Smaller timing on request.

3) The number of sequential Close-Trip operations with a 10 second interval should not exceed 10. The number of Close-Trip operations should not exceed 60 per hour. Sequence of 10s Close-Trip operations can be repeated only after 260 s pause.

4) Maximum size with IP2X front cover.

5) Up to an installation altitude of 1000 m above sea level. Above 1000m, the external insulation measurement of the ISM must be increased by the atmospheric correction factor Ka according to IEC 62271-1 compared to the insulation measurement at sea level. The maximum allowed altitude is 2000 m above sea level.

WITHDRAWABLE VCB15 HD SERIES
Technical Parameters

VCB15_HD1_16D

PARAMETER	VCB15_HD1_16D	
Rated voltage (Ur)	17.5 kV	
Phase centre distance (PCD), mm	210/275	275
Rated normal current (Ir)	2500 A [1]	3150 A
Rated power frequency withstand voltage (Ud)	38 kV	
Rated lightning impulse withstand voltage (peak) (Up)	95 kV	
Rated short-circuit breaking current (Isc)	31.5 kA [2]	
Rated peak withstand current (Ip)	82 kA	
Rated short-time withstand current (Ik)	31.5 kA	
Rated duration of short circuit (tk)	3 s	
Rated frequency (fr)	50/60 Hz	
Mechanical life (CO-cycles)	30,000	
Number of operated-isolated operations	500 cycles	
Maximum number of CO-cycles per hour	60	
Operating cycles, rated–short circuit breaking current	50	
Closing time	≤ 60 ms [3]	
Opening time	≤ 35 ms [3]	
Break time	≤ 45 ms [3]	
Rated operating sequence at rated normal current	O-0.3s-CO-10s-CO-10s-CO [4]	
Rated operating sequence at rated short-circuit breaking current	O-0.3s-CO-15s-CO	
Resistance of main circuit	≤ 25 µOhm	≤ 20 µOhm
Weight (depending on Phase centre distance)	128–165 kg	
Minimum overall dimensions (L_{min}xW_{min}xH_{min}), mm	656.5x682x704	
Maximum overall dimensions (L_{max}xW_{max}xH_{max} [5]), mm	656.5x882x742	
Weight of CM	1 kg	
Overall dimensions of CM (LxWxH), mm	165x190x45	
Altitude above sea level	1000 m [6]	
Relative humidity in 24 hours	≤ 95%	
Relative humidity over 1 month	≤ 90%	
Temperature range	-25°C ... +55°C	
Degree of protection according to IEC 60529	IP40	
Type of driving mechanism	Monostable magnetic actuator	
Number of available auxiliary contacts of ISM (DOU)	6 NO + 6 NC (5 NO + 5 NC)	

1) The rating depends on the metal-enclosed switchgear ventilation. Temperature rise type test at 2500 A in Cradle was successfully passed in KEMA.

2) At 40% DC component.

3) Smaller timing on request.

4) The number of sequential Close-Trip operations with a 10 second interval should not exceed 10. The number of Close-Trip operations should not exceed 60 per hour. Sequence of 10s Close-Trip operations can be repeated only after 260 s pause.

5) Maximum size with IP2X front cover.

6) Up to an installation altitude of 1000 m above sea level. Above 1000m, the external insulation measurement of the ISM must be increased by the atmospheric correction factor Ka according to IEC 62271-1 compared to the insulation measurement at sea level. The maximum allowed altitude is 2000 m above sea level.

WITHDRAWABLE VCB25 SHELL SERIES
Technical Parameters

VCB25_Shell2_16D

PARAMETER	VCB25_SHELL2_16D	
Rated voltage (Ur)	24 kV	
Phase centre distance (PCD), mm	210/275	275
Rated normal current (Ir)	630 A 1250 A	2500 A
Rated power frequency withstand voltage (Ud)	60 kV	
Rated lightning impulse withstand voltage (peak) (Up)	125 kV	
Rated short-circuit breaking current (Isc)	25 kA [1]	
Rated peak withstand current (Ip)	65 kA	
Rated short-time withstand current (Ik)	25 kA	
Rated duration of short circuit (tk)	3 s	
Rated frequency (fr)	50/60 Hz	
Mechanical life (CO-cycles)	30,000	
Number of operated-isolated operations	500 cycles	
Maximum number of CO-cycles per hour	60	
Operating cycles, rated–short circuit breaking current	50	
Closing time	≤ 60 ms [2]	
Opening time	≤ 35 ms [2]	
Break time	≤ 45 ms [2]	
Rated operating sequence at rated normal current	O-0.3s-CO-10s-CO-10s-CO [3]	
Rated operating sequence at rated short-circuit breaking current	O-0.3s-CO-15s-CO	
Resistance of main circuit	≤ 35 µOhm [4]	≤ 22 µOhm
Weight (depending on Phase centre distance)	101–190 kg	
Minimum overall dimensions (L_{min}xW_{min}xH_{min}), mm	803.5x682x692	
Maximum overall dimensions (L_{max}xW_{max}xH_{max} [5]), mm	813.5x882x817	
Weight of CM	1 kg	
Overall dimensions of CM (LxWxH), mm	165x190x45	
Altitude above sea level	1000 m [6]	
Relative humidity in 24 hours	≤ 95%	
Relative humidity over 1 month	≤ 90%	
Temperature range	-25°C ... +55°C	
Degree of protection according to IEC 60529	IP40	
Type of driving mechanism	Monostable magnetic actuator	
Number of available auxiliary contacts of ISM (DOU)	6 NO + 6 NC (5 NO + 5 NC)	

1) At 34 % DC component.

2) Smaller timing on request.

3) The number of sequential Close-Trip operations with a 10 second interval should not exceed 10. The number of Close-Trip operations should not exceed 60 per hour. Sequence of 10s Close-Trip operations can be repeated only after 260 s pause.

4) ≤ 35 µOhm (for Ir 630 A); ≤ 30 µOhm (for Ir 1250 A).

5) Maximum size with IP2X front cover.

6) Up to an installation altitude of 1000 m above sea level. Above 1000m, the external insulation measurement of the ISM must be increased by the atmospheric correction factor Ka according to IEC 62271-1 compared to the insulation measurement at sea level. The maximum allowed altitude is 2000 m above sea level.

CONTROL MODULE
Technical Parameters

PARAMETER	VALUE
CM REACTION TIMES	
Preparation time for the operation of the CM after switching on the auxiliary power supply	≤ 15 s
Preparation time for the close operation of the CM after a previous close operation	≤ 10 s
Preparation time for the trip operation of the CM after switching on the auxiliary power supply	≤ 0.1 s
Trip capability after failure of the auxiliary power supply	≥ 60 s [1)]
CM SUPPLY VOLTAGE	
Rated range of supply voltage of CM_16_1(Par1_60.2_Par2Par3_Par4_Par5) [4)]	24V to 60V DC
Rated range of supply voltage of CM_16_1(Par1_220.2_Par3_Par4_Par5) [4)]	110V to 220V AC/DC
Operating range (80–120%) of CM_16_1(Par1_60.2_Par3_Par4_Par5) [4)]	19V to 72V DC
Operating range (80–120%) of CM_16_1(Par1_220.2_Par3_Par4_Par5) [4)]	85V to 265V AC/DC
POWER CONSUMPTION OF CM	
Charging the close and trip capacitors of CM_16_1(Par1_60.2_Par3_Par4_Par5) [4)]	≤ 25 W
Charging the close and trip capacitors of CM_16_1(Par1_220.2_Par3_Par4_Par5) [4)]	≤ 42 W AC [2)] ≤ 37 W DC
Permanent power consumption (standby) of CM_16_1(Par1_60.2_Par3_Par4_Par5) [4)]	≤ 5 W
Permanent power consumption (standby) of CM_16_1(Par1_220.2_Par3_Par4_Par5) [4)]	≤ 7 W AC [3)] ≤ 5 W DC
Inrush current of CM_16_1(Par1_60.2_Par3_Par4_Par5) [4)] with discharged capacitors	≤ 120 A
Inrush current of CM_16_1(Par1_220.2_Par3_Par4_Par5) [4)] with discharged capacitors	≤ 18 A
Inrush time constant of CM_16_1(Par1_60.2_Par3_Par4_Par5) [4)] with discharged capacitors	≤ 0.5 ms
Inrush time constant of CM_16_1(Par1_220.2_Par3_Par4_Par5) [4)] with discharged capacitors	≤ 4 ms
DESIGN, SWITCHING CAPACITY OF CM INBUILT RELAYS	
Number of relays in CM	3
Number of available contacts for one relay	1 NO + 1 NC with common point
Rated voltage	240 V
Rated current AC	16 A
Maximum breaking power AC	4000 VA
Maximum switching current 250V DC	0.35 A
Maximum switching current 125V DC	0.45 A
Maximum switching current 48V DC	1.3 A
Maximum switching current 24V DC	12 A
Switching time	5 ms
“CLOSE” AND “TRIP” DRY CONTACTS INPUTS OF CM	
Output voltage	≥ 30 V
Contacts closed current	≥ 50 mA
Steady state current	≥ 5 mA

1) In case of Dry contacts “Close” and “Trip” are open.
2) At Cos j >0.66.
3) At Cos j >0.33.
4) "Par1", "Par3", "Par4" and "Par5" are listed on page 37.

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FAST PRECISE RELIABLE

CONTROL MODULE
EMC Parameters

PARAMETER	APPLICABLE STANDARD	RATED VALUE
ELECTROMAGNETIC COMPATIBILITY (EMC) REQUIREMENTS1)		
Electrostatic discharge	IEC 60255-26 IEC 61000-4-2	8 kV contact 15 kV air
Radiated EM field Immunity	IEC 60255-26 IEC 61000-4-3	80 MHz – 3 GHz Sweep & spot AM 1 kHz 80% 10 V/m
Fast transient burst Immunity	IEC 60255-26 IEC62271-1 IEC 61000-4-4	4 kV common mode
Surge Immunity	IEC 60255-26 IEC 61000-4-5	4 kV common mode 2 kV differential mode
Conducted disturbance induced by Radio frequency fields	IEC 60255-26 IEC 61000-4-6	150 kHz – 80 MHz AM 1 kHz 80% 10 V
Power Frequency Magnetic Field	IEC 60255-26 IEC 61000-4-8	100 A/m continuously 1000 A/m 1 sec
Pulse Magnetic Field	IEC 61000-4-9	1000 A/m
100 kHz Damped Oscillatory Magnetic Field	IEC 61000-4-10	100 A/m
1 MHz damped oscillatory magnetic field	IEC 61000-4-10	100 A/m
AC Voltage Dips and Interruptions	IEC 60255-26 IEC 61000-4-11	ΔU 30% 1 period ΔU 60% 50 periods ΔU 100% 5 periods ΔU 100% 50 periods
Power Frequency Disturbance Voltage	IEC 60255-26 IEC 61000-4-16	300 V common mode 150 V differential mode [2)]
100 kHz and 1 MHz Damped Oscillatory Wave Immunity	IEC 60255-26 IEC 62271-1 IEC 61000-4-18	2.5 kV common mode 1 kV differential mode
Ripple on DC Power Supply	IEC 60255-26 I IEC 61000-4-27	10% of Supply voltage, 100 Hz
DC Voltage Dips and Interruptions	IEC 60255-26 IEC 62271-100 IEC 61000-4-29	ΔU 30% 2 sec ΔU 60% 2 sec ΔU 100% 0.3 sec ±20% 10 sec

1) Cable from electronic relay to connector block should be shielded and the case grounded near the connector. The total length of unshielded wires from connector block to CM WAGO connector should not exceed 200 mm. Electromagnetic compatibility requirements are not applicable for the CM USB port as this port is used only for CM programming during production and not used under service conditions.
2) Test influence is not applicable for CM “Close” and “Trip” dry contacts.

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FAST PRECISE RELIABLE

VACUUM CIRCUIT BREAKERS

SELECTION GUIDE

CIRCUIT BREAKER SELECTION GUIDE

THREE PHASE
LOW DUTY CIRCUIT BREAKERS

VCB15_LD1

VCB15_LD1_16.F		Par1	Par2	Par3	Par4	Par5	Par6	Par7	Par8	Par9
Customization	Without customization	1								
	Without customization; 1NO+1NC aux contacts	2								
	Without customization; group package (12pcs)	3								
	Without customization; PD testing	4								
Rated voltage	17.5 kV		1							
	17.5 kV (Capacitive)		2							
Rated short circuit breaking current	25 kA			1						
Rated normal current	800 A				1					
Phase center distance	150 mm					1				
	180 mm					2				
	210 mm					3				
Main low terminal design	One main lower terminal						1			
	Two main lower terminal for PCD 150 mm (Continuous bus bars)						2			
CM settings	Basic circuit breaker functionality							1		
	Without CM							2		
Rated auxiliary supply voltage	24-60 V DC								1	
	110-220 V AC/DC								2	
	Without CM								3	
Language	English									1
	Spanish									2
	Portuguese									3

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SINGLE PHASE
LOW DUTY CIRCUIT BREAKER

VCB15_LD3

VCB15_LD3_16.F		Par1	Par2	Par3	Par4	Par5	Par6	Par7	Par8	Par9
Customization	Without customization	1								
Rated voltage	17.5 kV		1							
Rated short circuit breaking current	25 kA			1						
Rated normal current	800 A				1					
Phase center distance	Not applicable					1				
Main low terminal design	One main lower terminal						1			
CM settings	Basic circuit breaker functionality Without CM							1 2		
Rated auxiliary supply voltage	24–60 V DC 110–220 V AC/DC Without CM								1 2 3	
Language	English Spanish Portuguese									1 2 3

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THREE PHASE
MEDIUM DUTY CIRCUIT BREAKER

VCB15_MD1

VCB15_MD1_16.F		Par1	Par2	Par3	Par4	Par5	Par6	Par7	Par8	Par9
Customization	Without customization	1								
Rated voltage	17.5 kV		1							
Rated short circuit breaking current	31.5 kA			1						
Rated normal current	1250 A				1					
Phase center distance	150 mm 210 mm 275 mm					1 2 3				
Main low terminal design	One main lower terminal						1			
CM settings	Basic circuit breaker functionality Without CM							1 2		
Rated auxiliary supply voltage	24–60 V DC 110–220 V AC/DC Without CM								1 2 3	
Language	English Spanish Portuguese									1 2 3

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SINGLE PHASE
MEDIUM DUTY CIRCUIT BREAKER

VCB15_MD3

VCB15_MD3_16.F		Par1	Par2	Par3	Par4	Par5	Par6	Par7	Par8	Par9
Customization	Without customization	1								
Rated voltage	17.5 kV		1							
Rated short circuit breaking current	31.5 kA			1						
Rated normal current	1250 A				1					
Phase center distance	Not applicable					1				
Main low terminal design	One main lower terminal						1			
CM settings	Basic circuit breaker functionality Without CM							1 2		
Rated auxiliary supply voltage	24-60 V DC 110-220 V AC/DC Without CM								1 2 3	
Language	English Spanish Portuguese									1 2 3

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THREE PHASE
HIGH DUTY CIRCUIT BREAKER

VCB15_HD1

VCB15_HD1_16.F		Par1	Par2	Par3	Par4	Par5	Par6	Par7	Par8	Par9
Customization	Without customization	1								
Rated voltage	17.5 kV		1							
Rated short circuit breaking current	31.5 kA			1						
Rated normal current	2500 A 3150 A				1 2					
Phase center distance	210 mm 275 mm					1 2				
Main low terminal design	One main lower terminal						1			
CM settings	Basic circuit breaker functionality Without CM							1 2		
Rated auxiliary supply voltage	24-60 V DC 110-220 V AC/DC Without CM								1 2 3	
Language	English Spanish Portuguese									1 2 3

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THREE PHASE
LOW DUTY CIRCUIT BREAKERS

VCB25_LD1

VCB25_LD1_16.F		Par1	Par2	Par3	Par4	Par5	Par6	Par7	Par8	Par9
Customization	Without customization	1								
Rated voltage	17.5 kV 24 kV		1 2							
Rated short circuit breaking current	16 kA 20 kA			1 2						
Rated normal current	800 A				1					
Phase center distance	210 mm 275 mm					1 2				
Main low terminal design	One main lower terminal						1			
CM settings	Basic circuit breaker functionality Without CM							1 2		
Rated auxiliary supply voltage	24-60 V DC 110-220 V AC/DC Without CM								1 2 3	
Language	English Spanish Portuguese									1 2 3

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SINGLE PHASE
LOW DUTY CIRCUIT BREAKER

VCB25_LD3

VCB25_LD3_16.F		Par1	Par2	Par3	Par4	Par5	Par6	Par7	Par8	Par9
Customization	Without customization	1								
Rated voltage	24 kV		1							
Rated short circuit breaking cur-rent	16 kA 20 kA			1 2						
Rated normal current	800 A				1					
Phase center distance	Not applicable					1				
Main low terminal design	One main lower terminal						1			
CM settings	Basic circuit breaker functionality Without CM							1 2		
Rated auxiliary supply voltage	24-60 V DC 110-220 V AC/DC Without CM								1 2 3	
Language	English Spanish Portuguese									1 2 3

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THREE PHASE SHELL CIRCUIT BREAKER

VCB25_Shell2

VCB25_SHELL2_16.F		Par1	Par2	Par3	Par4	Par5	Par6	Par7	Par8	Par9
Customization	Without customization	1								
Rated voltage	24 kV		1							
Rated short circuit breaking current	25 kA			1						
Rated normal current	2000 A 2500 A				1 2					
Phase center distance	210 mm 275 mm					1 2				
Main low terminal design	One main lower terminal						1			
CM settings	Basic circuit breaker functionality Without CM							1 2		
Rated auxiliary supply voltage	24-60 V DC 110-220 V AC/DC Without CM								1 2 3	
Language	English Spanish Portuguese									1 2 3

CONTROL MODULE

CM_16_1

CM_16_1		Par1	Par2	Par3	Par4	Par5
Language	English Spanish Portuguese	EN ES PT				
Rated supply voltage and CM hardware version	24-60 V DC , version 2 110-220 V AC/DC, version 2		60.2 220.2			
Firmware functionality	Basic circuit breaker functionality Fast switching functionality Basic circuit breaker functionality with increased "Open" command recognition time			1 2 3		
ISM driver firmware used in CM and protection setting [1]	ISM15_LD_1 and without protection ISM15_LD_3 and without protection ISM15_MD_1 and without protection ISM15_MD_3 and without protection ISM15_HD_1 and without protection ISM25_Shell2 and without protection ISM25_LD_1 and without protection ISM25_LD_3 and without protection				15LD1-000 15LD3-000 15MD1-000 15MD3-000 15HD1-000 25Shell2-000 25LD1-000 25LD3-000	
Factory configurable settings	Relay 1 - Switching module position functionality; Relay 2 - Ready functionality; Relay 3 - Malfunction or Loss of auxiliary supply functionality; Trip by dry contacts close; Close by dry contacts close;					A.A
	Relay 1 - Disable; Relay 2 - Ready functionality; Relay 3 - Ready functionality Trip by dry contacts close; Close by dry contacts close;					A.B
	Relay 1 - Ready functionality; Relay 2 - Ready functionality; Relay 3 - Ready functionality Trip by dry contacts close; Close by dry contacts close;					A.C

1) This parameter describes the ISM type(s) that the CM can control. To optimize the operation of each ISM, corresponding settings are used in the CM firmware. Usage of CM with incorrect type of ISM can lead to a mismatch of declared parameters of VCB.

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FAST PRECISE RELIABLE

DRAW-OUT UNITS

SELECTION GUIDE

DRAW-OUT UNITS SELECTION GUIDE

DRAW-OUT UNIT
WITH MEDIUM DUTY CIRCUIT BREAKER

VCB15_MD1

VCB15_MD1_16D		Par1	Par2	Par3	Par4	Par5	Par6	Par7	Par8	Par9	Par10	Par11	Par12
Customization	Without customization	1											
	With IP2X front cover without slots	2											
Rated voltage	17.5 kV		2										
Rated short circuit current	31.5 kA			1									
Rated normal current	1250 A				1								
	800 A				2								
Phase center distance	150 mm					1							
	210 mm					2							
Terminal center distance	205 mm	1											
Lower terminal height	260 mm	1											
CM settings	Basic circuit breaker functionality		1										
	Without CM		2										
Rated auxiliary supply voltage	24-60 V DC			1									
	110-220 V AC/DC			2									
	Without CM			3									
Auxiliary circuits plug	Plastic plug				1								
	Metal plug				2								
Optional interlock	Without optional interlocks					1							
	Interlock against VCB rack in\out without auxiliary voltage - 220 V AC/DC					2							
	Mechanical interlock that prevents disconnection of auxiliary circuits plug with end switch actuator					3							
	Mechanical interlock that prevents disconnection of auxiliary circuits plug with end switch actuator AND Interlock against VCB rack in\out without auxiliary voltage - 220 V AC/DC					4							
Language	English						1						
	Spanish						2						
	Portuguese						3						

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MAGVATECH
FAST PRECISE RELIABLE

DRAW-OUT UNIT
WITH HIGH DUTY CIRCUIT BREAKER

VCB15_HD1

VCB15_HD1_16D		Par1	Par2	Par3	Par4	Par5	Par6	Par7	Par8	Par9	Par10	Par11	Par12
Customization	Without customization	1											
	With IP2X front cover without slots	2											
Rated voltage	17.5 kV		2										
Rated short circuit current	31.5 kA			1									
Rated normal current	2500 A				1								
	3150 A				2								
Phase center distance	210 mm					1							
	275 mm					2							
Terminal center distance	310 mm						1						
Lower terminal height	280 mm							1					
CM settings	Basic circuit breaker functionality								1				
	Without CM								2				
Rated auxiliary supply voltage	24-60 V DC									1			
	110-220 V AC/ DC									2			
	Without CM									3			
Auxiliary circuits plug	Plastic plug										1		
	Metal plug										2		
Optional interlock	Without optional interlocks											1	
	Interlock against VCB rack in\out without auxiliary voltage - 220 V AC/DC											2	
	Mechanical interlock that prevents disconnection of auxiliary circuits plug with end switch actuator											3	
	Mechanical interlock that prevents disconnection of auxiliary circuits plug with end switch actuator AND Interlock against VCB rack in\out without auxiliary voltage - 220 V AC/DC											4	
Language	English												1
	Spanish												2
	Portuguese												3

CONTACT YOUR NEAREST SALES REPRESENTATIVES TO CHOOSE THE OPTION SUITABLE FOR YOU

DRAW-OUT UNIT
WITH SHELL CIRCUIT BREAKER

VCB25_Shell2

VCB25_SHELL2_16D		Par1	Par2	Par3	Par4	Par5	Par6	Par7	Par8	Par9	Par10	Par11	Par12
Customization	Without customization	1											
	With IP2X front cover without closts	2											
	With motorized DOU cassette	3											
	With motorized DOU cassette and IP2X front cover without closts	4											
Rated voltage	24 kV		1										
Rated short circuit current	25 kA			1									
Rated normal current	630 A				1								
	1250 A				2								
	2500 A				3								
Phase center distance	210 mm					1							
	275 mm					2							
Terminal center distance	310 mm						1						
Lower terminal height	325 mm							1					
	345 mm							2					
CM settings	Basic circuit breaker functionality								1				
	Without CM								2				
Rated auxiliary sup-ply voltage	24-60 V DC									1			
	110-220 V AC/DC									2			
	Without CM									3			
Auxiliary circuits plug	Plastic plug										1		
	Metal plug										2		
Optional interlock	Without optional interlocks											1	
	Interlock against VCB rack in\out without auxiliary voltage - 220 V AC/DC											2	
	Mechanical interlock that prevents disconnection of auxiliary circuits plug with end switch actuator											3	
	Mechanical interlock that prevents disconnection of auxiliary circuits plug with end switch actuator AND Interlock against VCB rack in\out without auxiliary voltage - 220 V AC/DC											4	
Language	English												1
	Spanish												2
	Portuguese												3

CONTACT YOUR NEAREST SALES REPRESENTATIVES TO CHOOSE THE OPTION SUITABLE FOR YOU

MAGVATECH

FAST PRECISE RELIABLE

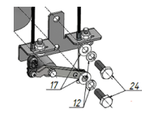
VCB ACCESSORIES AND SPARE PARTS

MANUAL GENERATOR

The manual generator is used to charge the CM_16_1 in cases where the main auxiliary power supply is not available

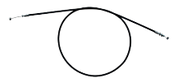
INTERLOCKING KITS

The kit attaches to the ISM Interlocking shaft and serves as a manual trip / lockout accessory



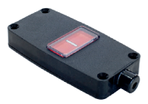
RELEASE AND INDICATION CABLES

The flexible release and indication cables are used for interlocks or ISM position indicator connection to the ISM



POSITION INDICATOR

The position indicator used together with CBcomp_RelCable_1 to indicate the ISM main circuit position



MOUNTING KIT

The kit is used with the ISM15_HD_1 only. The kit attaches to the ISM required mounting points to provide 95 kV BIL

CONNECTOR

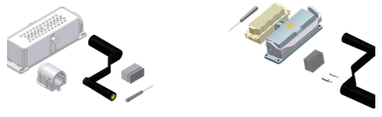
The kit is used to provide Switchgear fixed contact counterpart for DOU main circuits connection

INSULATION KITS

The insulation kits provide compliance with declared BIL level (125 kV / 95 kV)

CONNECTOR

The kit is used to provide Switchgear fixed contact counterpart for DOU main circuits connection



DRAW-OUT UNIT INTERLOCKING KIT

The kit is used to provide Switchgear fixed contact counterpart for DOU main circuits connection

INDOOR SWITCHING MODULE AND CONTROL MODULE

The kit is used to provide Switchgear fixed contact counterpart for DOU main circuits connection

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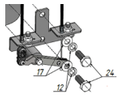
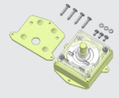
FIXED TYPE VCB ACCESSORIES/SPARE PARTS		APPLICABILITY PER UNIT							
		VCB15					VCB25		
		LD1	LD3	MD1	MD3	HD1	LD1	LD3	SHELL2
MANUAL GENERATOR 	CBunit_ ManGen_1 for CM_16_1(Par1_220.2_ Par3_Par4_Par5) [1] CBunit_ ManGen_2 for CM_16_1(Par1_60.2_ Par3_Par4_Par5) [1]	• •	• •	• •	• •	• •	• •	• •	• •
INTERLOCKING KIT 	CBkit_Interlock_1 [2]	•	•[3]				•	•[3]	
INTERLOCKING KIT 	CBkit_Interlock_LD(0_0_1) [4][5]	•					•		
INTERLOCKING KIT 	CBkit_Interlock_8 [5]								
INTERLOCKING KIT 	CBkit_Interlock_3(Par1) [6] (rotary switch type)			•	•	•			•

1) "Par1", "Par3", "Par4" and "Par5" are listed on page 37.
2) The kit attaches to the ISM synchronizing shaft and serves as an interface for various manual trip / indication / lockout accessories.
3) Accessory or spare part is installed or included in the delivery.
4) This kit allows to attach a position indicator (CBkit_PosInd_1).
5) The kit attaches to the ISM Interlocking shaft and serves as an interface for manual trip / lockout accessories CBkit_Interlock_3/4/5 connection.
6) "Par1" is the cable length of 1000mm, 1500mm or 2000mm (other length on request).

FIXED TYPE VCB ACCESSORIES/SPARE PARTS		APPLICABILITY PER UNIT							
		VCB15					VCB25		
		LD1	LD3	MD1	MD3	HD1	LD1	LD3	SHELL2
INTERLOCKING KIT 	CBkit_Interlock_4 (Par1_EN) [1] (key switch type)			•	•	•			•
INTERLOCKING KIT 	CBkit_Interlock_5 (Par1) [1] (push button type)			•	•	•			•
RELEASE CABLE	CBcomp_ RelCable_3(Par1) [2] Relcable is included in the CBkit_Interlock_3/4/5 package			•[3]	•[3]	•[3]			•[3]
INDICATION CABLE 	CBcomp_ IndCable_1(Par1) [4]			•[3]	•[3]	•[3]			•[3]
POSITION INDICATOR 	CBkit_PosInd_1			•[3]	•[4]	•[3]			•[3]

1) "Par1" is the cable length of 1000mm or 2000m (other length on request).
2) "Par1" is the length of 500mm, 1000mm, 1500 or 2000mm (other length on request).
3) Accessory or spare part is installed or included in the delivery.
4) "Par1" is the length of 500mm, 1000mm, or 1500 (other length on request).

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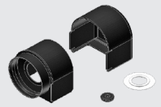
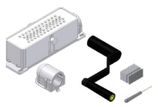
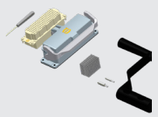
FIXED TYPE VCB ACCESSORIES/SPARE PARTS		APPLICABILITY PER UNIT							
		VCB15					VCB25		
		LD1	LD3	MD1	MD3	HD1	LD1	LD3	SHELL2
MOUNTING KIT 	CBmount_ISM15_1					•			
INSULATION KIT 	CBkit_Ins_3						•	•[3]	
INSULATION KIT 	CBkit_Ins_4 (Par1) [1]			•	•				
ISM AND CM 	ISM15_XX [2]	•[3]	•[3]	•[3]	•[3]	•[3]			
	ISM25_XX [2]						•[3]	•[3]	•[3]
	CM_16_1	•[3]	•[3]	•[3]	•[3]	•[3]	•[3]	•[3]	•[3]

1) "Par1" is the bus bars type. "Par1" equals 1 - 40x10 mm (single or double bars) or "Par1" equals 2 - 80x10 mm (single bars).
2) ISM and CM are selected in accordance with the Circuit breaker version – approach local sales contact for assistance.
3) Accessory or spare part is installed or included in the delivery.

DRAW-OUT UNIT ACCESSORIES/SPARE PARTS		VCB25		
		MD1_D	HD1_D	SHELL2_D
MANUAL GENERATOR 	CBunit_ ManGen_1 for CM_16_1 (Par1_220.2_Par3_Par4_Par5) [1]	·	·	·
	CBunit_ ManGen_2 for CM_16_1 (Par1_60.2_Par3_Par4_Par5) [1]	·	·	·
Connector 	SGkit_Connector_1(Par1_Par2) [2]	·	·	·
Plug 	CBkit_Plug_1(Plastic plug) [3]	·	·	·
Plug 	CBkit_Plug_1(Metal plug) [4]	·	·	·
Interlocking kit 	CBkit_Interlock_6(Par1) [5]	·	·	·
ISM and CM 	ISM15_XX [6]	·[7]	·[7]	
	ISM25_XX [6]			·[7]
	CM_16_1	·[7]	·[7]	·[7]

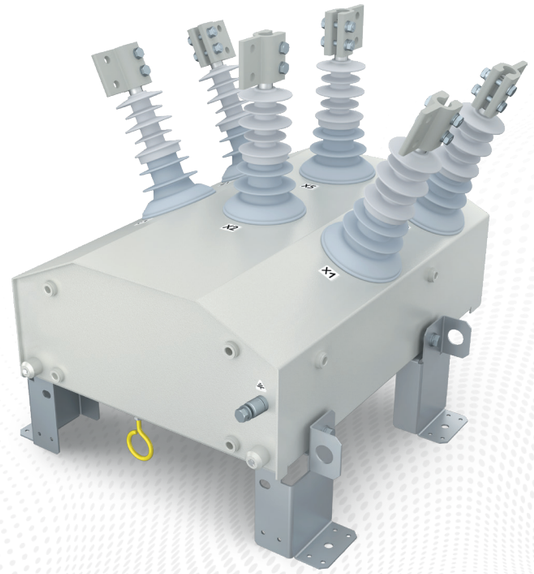
1) "Par1", "Par3", "Par4" and "Par5" are listed on page 37.
2) "Par1" is the rated voltage of 17.5 kV or 24 kV. "Par2" is the rated normal current of 1250 A, 2000 A or 3150 A
3) Plastic plug has 58 pins.
4) Metal plug has 72 or 108 pins.
5) "Par1" - rated supply voltage 220 V AC/DC.
6) ISM and CM are selected in accordance with the Circuit breaker version – approach local sales contact for assistance.
7) Accessory or spare part is installed or included in the delivery.

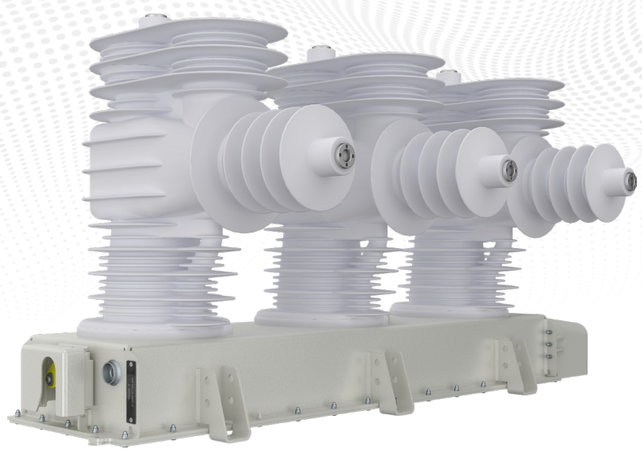
Automatic Circuit Reclosers

Rec15/25/35

Designed and built to last, the Magvatech recloser combines the best of the Magvatech vacuum circuit breaker's features:

- innovative insulation materials,
- high precision sensors
- and sophisticated numerical control.





FROM **-40°C** TO **+55°C**

30.000
C-O operations
with rated current
or
200
operations
with full short-circuit
breaking current

APPLICATION AREAS

FEEDER AUTOMATION

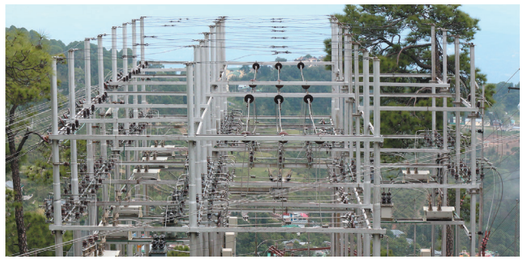
RADIAL LINE RECLOSER
When a recloser is installed on a radial feeder it automatically clears transient faults and isolates permanent faults. More than one recloser can be installed on a feeder to isolate faults selectively and ensure fewer customers are affected.

LOOP RECLOSER
A loop recloser further improves the reliability of a power supply by automatically

- Isolating faulty sections
- Reconfigures the network to minimize the amount of customers without power supply

Loop reclosers are the best option to maximize reliability performance indicators of your distribution network.

SUBSTATION AUTOMATION



The Magvatech recloser can be used to quickly build a cost-effective unmanned structure mounted outdoor substation. Providing full protection and automation functionality required at the substation.

DISTRIBUTED GENERATION

The Magvatech recloser is perfectly suited as the intertie between the distributed generation site and the utility grid. Magvatech 's experience with solar and other renewables has led to a variety of solutions that address the nuances of renewable generation requirements.

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DESIGN AND OPERATION

The recloser protects the network against overcurrent, earth faults, over- and under-voltage, over- and under-frequency, current and voltage imbalances, and many other problems. The control box has an embedded RTU that provides communication with SCADA over various communication protocols: DNP3, Modbus, IEC-104.

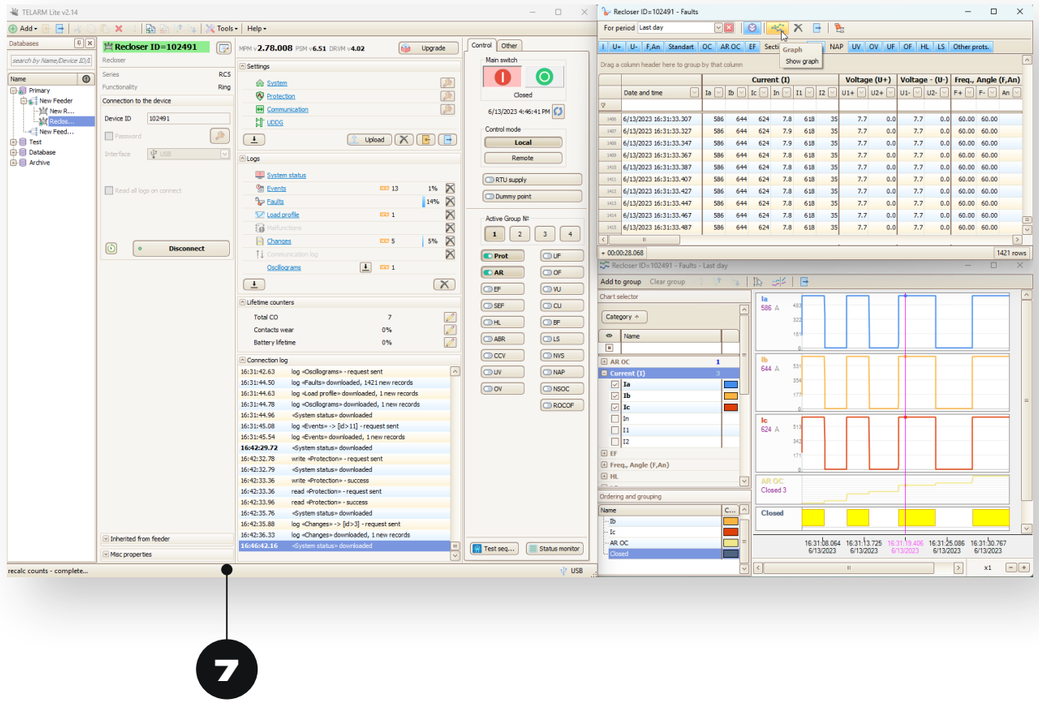
Each of the six bushings are made of UV stable, hydrophobic polymer, that guarantees reliable performance in heavily polluted areas.

Mechanical trip hook for OSM manual operation. For **superior linesman safety**, the hook in the downwards position electrically isolates the actuator's circuit to prevent the possibility of any unintended recloser operation.

The air insulated, **corrosion-resistant** tank incorporates a solidly insulated circuit breaker, sensors and auxiliary mechanisms.

The 6x current and 6x voltage high accuracy sensors. Voltage sensors allow measurements to be taken from either side of the recloser.

The control cubicle has an inbuilt large battery and smart battery charger to improve battery life. The battery allows 48 hrs of operation with no auxiliary power supply present.



7

TELARM*® user software allows local and remote device control and configuration, downloading loads, fault and load profiles and oscillogram. TELARM® is the first recloser software that allows automatic protection settings coordination, various failure modes simulation, devices configuration and remote control in single package!

BEST VALUE FOR THE MONEY

With a maintenance-free design rated to perform 30,000 open and close operations, Magvatech reclosers keep expenses to a minimum over their entire lifespan. They are installed on typical overhead feeders, significantly improving a network's key performance indicators and their use results in a quick return on investment.

SOPHISTICATED CONTROL AND PROTECTION

From various faults, including: short circuits, earth faults, high impedance earth faults, broken wires, islanding, incorrect tap changer operations, network overload and over- or under-generation. The embedded RTU and metering ensures the reclosers are SCADA-ready with no additional expenses.

REMOTE ENGINEERING

Remote engineering is a proprietary remote control and monitoring system that works in parallel with an existing SCADA system, acting as a back-up method of controlling and monitoring reclosers. With remote engineering, you can enjoy advanced capabilities beyond traditional SCADA systems, including remote access to system logs, fault and load profiles, and the remotely change all recloser settings. Additionally, it empowers you to conveniently update firmware remotely, ensuring seamless upgrades and enhanced functionality without physical access to the reclosers.

REZIP PROTECTION AND AUTOMATION ALGORITHM

Rezip algorithm allows to automate various networks where traditional time and current grading is impossible. It can be used in very long feeders, ring schemes and highly meshed networks. Any number of Rezip reclosers can be connected in series.

*Telecommunication Automated Relay Manager

MAGVATECH

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RECLOSER CONTROL — RC5

PROTECTION
The recloser protects against overcurrent, earth faults, over- and under-voltage, over- and under-frequency, current and voltage imbalances and many other problems.

MEASUREMENTS
The recloser can measure phase, neutral and sequence currents, phase-to-phase and sequence voltages and three-phase active and reactive power and energy. Key measurement data can be logged.

COMMUNICATIONS
The control cubicle has various communication interfaces and can be connected with any third party modem via RS-232/RS-485 or the Ethernet using various communication protocols, including Modbus, DNP3 and IEC-104.

LARGE BATTERY
48hrs operation battery, charged by smart battery charger and maintenance free for up to 10 years.

MONITORING
Highly comprehensive, remotely accessible separate log files for load and fault profiles, events, malfunctions, lifetime and change messages.

CONTROL CUBICLE
• The recloser control cubicle is made from lightweight powder-coated anodized aluminum,
• The control panel has a graphical LCD for clear event indication, comprising six-lines of 40-characters.

USER SOFTWARE
• The Telecommunication Automated Relay Manager (TELARM) is designed for the specific needs of electricity distribution networks. It allows:
• Downloading of logs, profiles, oscillograms, settings, etc.
• Uploading protection, communication and systems settings,
• Recording of logs (event, malfunction, communication etc) and detailed fault profiling,
• The customising of a control signal map for a customer's SCADA applications.

* please consult local representative for additional information on these services.

RECLOSER CONTROL CUBICLE
Protection and automation functions

FUNCTION	ANSI FUNCTION CODE
Overcurrent	50/51
Earth Fault	50N/51N
Sensitive Earth Fault	50/51SEF
Auto-Reclose (4 shots)	79
Automatic Backfeed Restoration	ABR
Undervoltage	27
Voltage unbalance	47
Current unbalance	46
Underfrequency	81U
Hot Line (live line)	
Overvoltage	59
Overfrequency	81O
Cold Load Pickup restrain	
Inrush filter	68
Switch on to fault	50 SOTF
Lockout	86
Close Condition Verifier	
Sectionalizer functionality	
Fault locator	
User defined logic	PSL
Controller self-supervision	
Circuit breaker supervision	

COMMUNICATION			
Interfaces		Protocols	
RS-232	Ethernet	IEC 60870-5-104	Modbus
RS-485	USB	DNP3	TELARM® Protocol
Wi-Fi	Optic fiber		
GPRS			

SPECIFICATION

RECLOSER
Technical Parameters

PARAMETER	REC15	REC25	REC35
Rated maximum voltage (Ur)	15.5 kV	27 kV	38 kV
Rated continuous current (Ir)	800 A	800 A	1250 A
Rated short-duration powerfrequency withstand voltage (Ud), 1 min dry	50 kV	60 kV	70 kV
Rated short-duration powerfrequency withstand voltage, 10 sec wet	45 kV	50 kV	70 kV
Rated lightning impulse withstand voltage (peak) (Up)	110 kV	125 (150) kV*	170 kV
Rated short-circuit breaking current (Isc)	16 kA	12.5 kA	16 kA
Rated peak withstand current (Ip)	41.6 kA	32.5 kA	52 kA
Rated short-time withstand current (Ik)	16 kA	12.5 kA	20 kA
Rated duration of short circuit (tk)	4 s	4 s	4 s
Rated cable-charging current switching	10 A	25 A	40 A
Rated line-charging current switching	2 A	5 A	5 A
Rated frequency (fr)	50/60 Hz		
Mechanical life (CO cycles)	30,000		
Operating cycles, rated current (CO cycles)	30,000		
Electrical endurance, breaking current (O-CO cycles)	50		
Closing time, not more than	77 ms		82 ms
Opening time for overcurrent protection according to IEC 62271-111/C37.60, not more than (at I>2xIp)	43 ms		
Clearing time for overcurrent protection according to IEC 62271-111/C37.60, not more than (at I>2xIp)	51 ms		
Rated operating sequence	O-0.1s-CO-2s-CO-2s-CO		
Main circuit resistance	< 85 µOhm	< 95 µOhm	< 40 µOhm
Weight	68 kg	72 kg	95 kg
Altitude	2000 m (derating according to ANSI C37.60 applied above 1000 m)		
Solar radiation	≤ 1.1 kW/m²		
Temperature range	-40 °C ... +55 °C		
Degree of protection	IP 66		
Pollution level	very heavy (as per IEC 60815)		

POWER SUPPLY CHARACTERISTICS

PARAMETER	VALUE
Supply voltage range, V	85 ÷ 265 AC, 110 ÷ 220 DC**
Rated power consumption, VA, not more	40
Maximum power consumption, VA, not more	75
Duration of operation without auxiliary supply, hours	48

* Across the vacuum gap, value in brackets - closed contacts
** Note that additional DC circuit breakers are required.

ACCESSORIES

POLE MOUNTING KITS

Hot-dip galvanized steel mounting kits for Rec15/25/35 frontal and lateral pole installation. Mounting kits are applicable for all types of wooden, concrete or metal single poles and H-pole structures. Kits include accessories for control cubicle pole mounting and up to two voltage transformers installation

SUBSTATION MOUNTING KIT

Hot-dip galvanized steel mounting kit for Rec15/25/35 installation at outdoor substation. It can be installed at newly erected substation or as a retrofit to old outdoor circuit breakers

PRIMARY LINE CONNECTORS

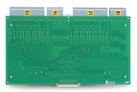
A wide range of terminals to provide a reliable primary line connection. Two-hole, four-hole and clamp type aerials options are available

BIRD GUARDS

Custom designed bird guards to provide a protection against wildlife and aggressive environment

POWER CABLES AND EARTHING ACCESSORIES

Common type wires and terminals to provide a connection between auxiliary VT and RC5 and to organize earthing scheme



INPUT/OUTPUT MODULES

The RC5 can be supplied with an IOM on request to provide control and indication functions. IOM has 12 galvanically isolated digital inputs and 12 digital outputs with normally open and normally closed contacts

INTERFACE TEST SETS

Custom designed tools for primary and secondary injection testing of Rec15/25/35 protection and automation functions

VOLTAGE TRANSFORMERS

Two-pole and single-pole auxiliary voltage transformers intended to supply control cubicle with low voltage

INTERFACE BOX

OSM–RC Interface Box is required to connect OSM switching modules with conventional CTs to RC5 series control cubicles

BATTERIES

Rechargeable battery to provide the RC5 with backup auxiliary power when the main auxiliary power source is not present

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AUTOMATIC CIRCUIT RECLOSERS

SELECTION GUIDE

Parametric Rec15

Selection Guide

REC15_AL1_5P	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P12	P13	P14	P15	P16	P17	P18	P19	P20

PARAMETER	PARAMETER DESCRIPTION	APPLICABLE OPTIONS	CODE
P1	Customization	No customization	1
		Other – Contact Magvatech representative	...
P2	OSM type	15 kV OSM with Rogowski coils as current sensors and 220V actuator coil, version 5	1
P3	Language	According to Customization parameter value – contact Magvatech representative	1
		English RC stickers, RC/OSM nameplates	2
		Portuguese RC stickers, RC/OSM nameplates	3
		English RC stickers	4
		Portuguese RC stickers	5
		Spanish RC stickers	6
		Spanish RC stickers, RC/OSM nameplates	7
		Without language properties	8
P4	Controller type	Basic RC5 with DRVM-04 + PSM-02A(1) and MPM-04M(3) based RCM. Aluminum housing	1
		Basic RC5 with DRVM-04 + PSM-02A(1) and MPM-04E(1) based RCM. Aluminum housing	2
P5	Firmware version	Factory default firmware	1
P6	OSM mounting kit	Legs + Phase marking	1
		Legs + Phase marking + MK10 holders + SAholders	2
		Legs + Phase marking + MK10 holders + SAholders + 18mmMpart	3
		Legs + Phase marking + MK10 holders + SAholders + 22mmMpart	4
		Legs + Phase marking + MK10 holders + SAholders + 22mmMpart + M20FastenersThrough	5
		Legs + Phase marking + MK10 holders + SAholders + 18mmMpart + OSMPolePressKit500	6
		Legs + Phase marking + MK10 holders + SAholders + 22mmMpart + OSMPolePressKit700	7
		Legs + Phase marking + MK10 holders + SAholders + 18mmMpart + M16fasteners + OSMPolePressKit500 with studsM16	8
		Legs + Phase marking + MK10 holders + SAholders + 22mmMpart + M20fasteners + OSMPolePressKit700 with studsM20	9
		Substation mounting kit	A
		Legs + Phase marking + MK10 holders + SAholders + 18mmMpart + M16FastenersThrough	B
P7	AT mounting kit	No auxiliary transformer mounting kit	1
		Kit for CRVT installation + fasteners	2
		Kit for CRVT installation + fasteners + VTPolePressKit500 with studs M16	5
		Kit for CRVT installation + fasteners + VTPolePressKit700 with studs M20	6
		Kit for CRVT installation on substation mounting kit	9

PARAMETER	PARAMETER DESCRIPTION	APPLICABLE OPTIONS	CODE
P8	Control cable	Umbilical 5m for OSM15/25_Al1 (42-pin) and RC5_4 (32-pin) with protective conduit	1
		Umbilical 7m for OSM15/25_Al1 (42-pin) and RC5_4 (32-pin) with protective conduit	2
		Umbilical 12m for OSM15/25_Al1 (42-pin) and RC5_4 (32-pin) with protective conduit	3
		Umbilical 20m for OSM15/25_Al1 (42-pin) and RC5_4 (32-pin) with protective conduit	4
		No control cable provided	5
		Umbilical 5m for OSM15/25_Al1 (42-pin) and RC5_4 (32-pin)	6
		Umbilical 7m for OSM15/25_Al1 (42-pin) and RC5_4 (32-pin)	7
		Umbilical 12m for OSM15/25_Al1 (42-pin) and RC5_4 (32-pin)	8
		Umbilical 20m for OSM15/25_Al1 (42-pin) and RC5_4 (32-pin)	9
P9	Primary connector type	No connection provisions	1
		NEMA2 type connector kit	2
		Clamp type connector kit with bird guards	5
		NEMA2 type connector kit with bird guards	6
P10	Earthing accessories	No earthing accessories	1
		According to Customization parameter value – contact Magvatech representative	2
		2x cross pressure terminals: 25-70mm² earthing wire, 13mm hole diameter	3
P11	Power cable	No power cable	1
		According to Customization parameter value	2
		5m 2core 1.5mm² cable, 6mm ring lug at VT side, crimp sleeve lug at RC side	3
		7m 2core 1.5mm² cable, 6mm ring lug at VT side, crimp sleeve lug at RC side	4
		12m 2core 1.5mm² cable, 6mm ring lug at VT side, crimp sleeve lug at RC side	5
		20m 2core 1.5mm² cable, 6mm ring lug at VT side, crimp sleeve lug at RC side	6
		2 cables: 5m 2core 1.5mm² cable, 6mm ring lug at VT side, crimp sleeve lug at RC side	7
		2 cables: 7m 2core 1.5mm² cable, 6mm ring lug at VT side, crimp sleeve lug at RC side	8
		2 cables: 12m 2core 1.5mm² cable, 6mm ring lug at VT side, crimp sleeve lug at RC side	9
		2 cables: 20m 2core 1.5mm² cable, 6mm ring lug at VT side, crimp sleeve lug at RC side	A
		5m 3core 2.5mm² cable, 6mm ring lug at VT side, crimp sleeve lug at RC side	D
		7m 3core 2.5mm² cable, 6mm ring lug at VT side, crimp sleeve lug at RC side	E
		12m 3core 2.5mm² cable, 6mm ring lug at VT side, crimp sleeve lug at RC side	F
		20m 3core 2.5mm2 cable, 6mm ring lug at VT side, crimp sleeve lug at RC side	G
		5m 3core 2.5mm² cable, 6mm ring lug at VT side, CNLinko YM20 connector at RC side	H
		7m 3core 2.5mm² cable, 6mm ring lug at VT side, CNLinko YM20 connector at RC side	J
		12m 3core 2.5mm² cable, 6mm ring lug at VT side, CNLinko YM20 connector at RC side	K
		20m 3core 2.5mm² cable, 6mm ring lug at VT side, CNLinko YM20 connector at RC side	L

PARAMETER	PARAMETER DESCRIPTION	APPLICABLE OPTIONS	CODE
P12	RC mounting kit	No RC mounting kit	1
		According to Customization parameter value	2
		OSMPolePressKit800/M16 studs + M20 bolt	3
		Universal RC MK for substation mounting kit	4
		OSMPolePressKit500/M16 studs + M20 bolt	5
		M20 studs for RC through-pole mounting	6
		M16 studs for RC through-pole mounting	7
P13	Battery type	No battery	1
		Battery-ready kit	2
		Operating temperature above -25C	5
		Operating temperature above -40C	3
		Operating temperature above -15C	4
		Operating temperature above -0C	6
P14	Input-output module	No input-output module	1
		60V input-output module	2
		220V input-output module	3
P15	Ethernet	No optional ethernet interface	1
		Wired optional ethernet module	2
		Optical Ethernet module	3
P16	Local wireless access	No local wireless access	1
		WiFi module and associated wiring	2
P17	Power outlet	Socket wiring (included to RC5.4)	1
		Socket wiring + blank socket plate	2
		EU socket + socket wiring + associated plate	3
		NBR socket + socket wiring + associated plate	4
		Without power outlet properties	5
		According to Customization parameter value – contact Magvatech representative	6
P18	Cabinet light	No cabinet light	1
		LED strip	2
P19	Internal door additional equipment	No internal door additional equipment	1
		According to Customization parameter value– contact Magvatech representative	2
		Plate without cutouts	3
		Kit of class C LVSA with In=10kA for AC1 power input	4
		Kit of class C LVSA with In=10kA for AC1 power input	5

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PARAMETER	PARAMETER DESCRIPTION	APPLICABLE OPTIONS	CODE
P20	Bottom interface plate	No bottom interface plate	1
		According to Customization parameter value – contact Magvatech representative	2
		Blank plate	3
		Bottom plate with 2 glands for d = 4.5-10 mm	4
		Bottom plate with 2 glands for d = 4.5-10 mm and WiFi provision	5
		Bottom plate with 2 CNLinko YM20 3pin male receptacles for auxiliary power supply	6
		Bottom plate with 2 CNLinko YM20 3pin male receptacles for auxiliary power supply and WiFi provision	7
		Bottom plate with 1 CNLinko YM20 2pin male receptacles for auxiliary power supply	8

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Parametric Rec25

Selection Guide

REC25_AL1_5P	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P12	P13	P14	P15	P16	P17	P18	P19	P20

PARAMETER	PARAMETER DESCRIPTION	APPLICABLE OPTIONS	CODE
P1	Customization	No customization	1
		Other – Contact Magvatech representative	...
P2	OSM type	25kV OSM with Rogowski coils as current sensors and 220V actuator coil, version 5	1
		25kV OSM with Rogowski coils as current sensors and 220V actuator coil, version 7 (with increased 3IO measurement accuracy)	2
P3	Language	According to Customization parameter value – contact Magvatech representative	1
		English RC stickers, RC/OSM nameplates	2
		Pogtuguese RC stickers, RC/OSM nameplates	3
		English RC stickers	4
		Portuguese RC stickers	5
		Spanish RC stickers	6
		Spanish RC stickers, RC/OSM nameplates	7
		Without language properties	8
P4	Controller type	Basic RC5 with DRVM-04 + PSM-02A(1) and MPM-04M(3) based RCM. Aluminum housing	1
		Basic RC5 with DRVM-04 + PSM-02A(1) and MPM-04E(1) based RCM. Aluminum housing	2
P5	Firmware version	Factory default firmware	1
		Other – Contact Magvatech representative	...
P6	OSM mounting kit	Legs + Phase marking	1
		Legs + Phase marking + MK10 holders + SAholders	2
		Legs + Phase marking + MK10 holders + SAholders + 18mmMpart	3
		Legs + Phase marking + MK10 holders + SAholders + 22mmMpart	4
		Legs + Phase marking + MK10 holders + SAholders + 22mmMpart + M20FastenersThrough	5
		Legs + Phase marking + MK10 holders + SAholders + 18mmMpart + OSMPolePressKit500	6
		Legs + Phase marking + MK10 holders + SAholders + 22mmMpart + OSMPolePressKit700	7
		Legs + Phase marking + MK10 holders + SAholders + 18mmMpart + M16fasteners + OSMPolePressKit500 with studsM16	8
		Legs + Phase marking + MK10 holders + SAholders + 22mmMpart + M20fasteners + OSMPolePressKit700 with studsM20	9
		Substation mounting kit	A
		Legs + Phase marking + MK10 holders + SAholders + 18mmMpart + M16FastenersThrough	B
P7	AT mounting kit	No auxiliary transformer mounting kit	1
		Kit for CRVT installation + fasteners	2
		Kit for CRVT installation + fasteners + VTPolePressKit500 with studs M16	5

PARAMETER	PARAMETER DESCRIPTION	APPLICABLE OPTIONS	CODE
P7	AT mounting kit	Kit for CRVT installation + fasteners + VTPolePressKit700 with studs M20	6
		Kit for CRVT installation on substation mounting kit	9
P8	Control cable	Umbilical 5m for OSM15/25_Al1 (42-pin) and RC5_4 (32-pin) with protective conduit	1
		Umbilical 7m for OSM15/25_Al1 (42-pin) and RC5_4 (32-pin) with protective conduit	2
		Umbilical 12m for OSM15/25_Al1 (42-pin) and RC5_4 (32-pin) with protective conduit	3
		Umbilical 20m for OSM15/25_Al1 (42-pin) and RC5_4 (32-pin) with protective conduit	4
		No control cable provided	5
		Umbilical 5m for OSM15/25_Al1 (42-pin) and RC5_4 (32-pin) without protective conduit	6
		Umbilical 7m for OSM15/25_Al1 (42-pin) and RC5_4 (32-pin) without protective conduit	7
		Umbilical 12m for OSM15/25_Al1 (42-pin) and RC5_4 (32-pin) without protective conduit	8
		Umbilical 20m for OSM15/25_Al1 (42-pin) and RC5_4 (32-pin) without protective conduit	9
P9	Primary connector type	No connection provisions	1
		NEMA2 type connector kit	2
		Clamp type connector kit with bird guards	5
		NEMA2 type connector kit with bird guards	6
P10	Earthing accessories	No earthing accessories	1
		According to Customization parameter value	2
		2x cross pressure terminals: 25-70mm² earthing wire, 13mm hole diameter	3
P11	Power cable	No power cable	1
		According to Customization parameter value – contact Magvatech representative	2
		5m 2core 1.5mm² cable, 6mm ring lug at VT side, crimp sleeve lug at RC side	3
		7m 2core 1.5mm² cable, 6mm ring lug at VT side, crimp sleeve lug at RC side	4
		12m 2core 1.5mm² cable, 6mm ring lug at VT side, crimp sleeve lug at RC side	5
		20m 2core 1.5mm² cable, 6mm ring lug at VT side, crimp sleeve lug at RC side	6
		2 cables: 5m 2core 1.5mm² cable, 6mm ring lug at VT side, crimp sleeve lug at RC side	7
		2 cables: 7m 2core 1.5mm² cable, 6mm ring lug at VT side, crimp sleeve lug at RC side	8
		2 cables: 12m 2core 1.5mm² cable, 6mm ring lug at VT side, crimp sleeve lug at RC side	9
		2 cables: 20m 2core 1.5mm² cable, 6mm ring lug at VT side, crimp sleeve lug at RC side	A
		5m 3core 2.5mm² cable, 6mm ring lug at VT side, crimp sleeve lug at RC side	D
		7m 3core 2.5mm² cable, 6mm ring lug at VT side, crimp sleeve lug at RC side	E
		12m 3core 2.5mm² cable, 6mm ring lug at VT side, crimp sleeve lug at RC side	F
		20m 3core 2.5mm² cable, 6mm ring lug at VT side, crimp sleeve lug at RC side	G
		5m 3core 2.5mm² cable, 6mm ring lug at VT side, CNLinko YM20 connector at RC side	H
		7m 3core 2.5mm² cable, 6mm ring lug at VT side, CNLinko YM20 connector at RC side	J

PARAMETER	PARAMETER DESCRIPTION	APPLICABLE OPTIONS	CODE
P11	Power cable	12m 3core 2.5mm² cable, 6mm ring lug at VT side, CNLinko YM20 connector at RC side	K
		20m 3core 2.5mm² cable, 6mm ring lug at VT side, CNLinko YM20 connector at RC side	L
P12	RC mounting kit	No RC mounting kit	1
		According to Customization parameter value	2
		OSMPolePressKit800/M16 studs + M20 bolt	3
		Universal RC MK for substation mounting kit	4
		OSMPolePressKit500/M16 studs + M20 bolt	5
		M20 studs for RC through-pole mounting	6
		M16 studs for RC through-pole mounting	7
P13	Battery type	No battery	1
		Battery-ready kit	2
		Operating temperature above -25C	5
		Operating temperature above -40C	3
		Operating temperature above -15C	4
		Operating temperature above -0C	6
P14	Input-output module	No input-output module	1
		60V input-output module	2
		220V input-output module	3
P15	Ethernet	No optional ethernet interface	1
		Wired optional ethernet module	2
		Optical ethernet module	3
P16	Local wireless access	No local wireless access	1
		Wi-Fi module and associated wiring	2
P17	Power outlet	Socket wiring (included to RC5.4)	1
		Socket wiring + blank socket plate	2
		EU socket + socket wiring + associated plate	3
		NBR socket + socket wiring + associated plate	4
		Without power outlet properties	5
		According to Customization parameter value	6
P18	Cabinet light	No cabinet light	1
		LED strip	2
P19	Internal door additional equipment	No internal door additional equipment	1
		According to Customization parameter value	2
		Both door plates without cutouts	3
		Kit of class C LVSA with In=10 kA for AC1 power input	4
		Kit of class C LVSA with In=10 kA for AC1 power input for LATAM	5
		Kit of class C LVSA with In=10 kA for AC1 power input	6

PARAMETER	PARAMETER DESCRIPTION	APPLICABLE OPTIONS	CODE
P20	Bottom interface plate	No bottom interface plate	1
		According to Customization parameter value	2
		Blank plate	3
		Bottom plate with 2 glands for d = 4.5-10 mm	4
		Bottom plate with 2 glands for d = 4.5-10 mm and WiFi provision	5
		Bottom plate with 2 CNLinko YM20 3pin male receptacles for auxiliary power supply	6
		Bottom plate with 2 CNLinko YM20 3pin male receptacles for auxiliary power supply and WiFi provision	7
		Bottom plate with 1 CNLinko YM20 2pin male receptacles for auxiliary power supply	8

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Parametric Rec35

Selection Guide

REC35_SMART5_5P	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P12	P13	P14	P15	P16	P17	P18	P19	P20

PARAMETER	PARAMETER DESCRIPTION	APPLICABLE OPTIONS	CODE
P1	Customization	No customization	1
		Other – Contact Magvatech representative	...
P2	OSM type	Three-phase 35kV module with voltage sensor of 70 mV/kV, Rogowski coils and 220V actuator coil, version 1	1
		Three-phase 35kV 1250A module with voltage sensor of 30 mV/kV, Rogowski coil 2 V/kA, Zero sequence current sensor 2 V/kA based on three Rogowski coils and 220V actuator coil, version 1	2
P3	Language	English RC stickers	1
		Portuguese RC stickers	2
		Spanish RC stickers	3
		English RC stickers, OSM/RC nameplates	4
		Portuguese RC stickers, OSM/RC nameplates	5
		Spanish RC stickers, OSM/RC nameplates	6
		According to Customization parameter value	7
		Without language properties	8
P4	Controller type	Basic RC5 with DRVM-04 + PSM-02A(1) and MPM-04M(3) based RCM. Aluminum housing	1
		Basic RC5 with DRVM-04 + PSM-02A(1) and MPM-04E(1) based RCM. Aluminum housing	2
P5	Firmware version	Factory-default firmware version	1
P6	OSM mounting kit	Clamp-ready mounting kit for universal installation	6
		Around-pole mounting kit with 500mm U-profiles for universal installation	7
		Around-pole mounting kit with 700mm U-profiles for universal installation	8
		Through-pole mounting kit with M16 studs for universal installation	9
		Through-pole mounting kit with M20 studs for universal installation	A
		Substation mounting kit	B
P7	AT mounting kit	No auxiliary transformer mounting kits	1
		1x cast resin transformer holder for universal installation	4
		2x cast resin transformer holders for universal installation	5
		Kit for CRVT installation on substation mounting kit	6

PARAMETER	PARAMETER DESCRIPTION	APPLICABLE OPTIONS	CODE
P8	Control cable	Umbilical 5m for OSM15/25_Al1 (42-pin) and RC5_4 (32-pin) with protective conduit	1
		Umbilical 7m for OSM15/25_Al1 (42-pin) and RC5_4 (32-pin) with protective conduit	2
		Umbilical 12m for OSM15/25_Al1 (42-pin) and RC5_4 (32-pin) with protective conduit	3
		Umbilical 20m for OSM15/25_Al1 (42-pin) and RC5_4 (32-pin) with protective conduit	4
		No control cable provided	5
		Umbilical 5m for OSM15/25_Al1 (42-pin) and RC5_4 (32-pin) without protective conduit	6
		Umbilical 7m for OSM15/25_Al1 (42-pin) and RC5_4 (32-pin) without protective conduit	7
		Umbilical 12m for OSM15/25_Al1 (42-pin) and RC5_4 (32-pin) without protective conduit	8
		Umbilical 20m for OSM15/25_Al1 (42-pin) and RC5_4 (32-pin) without protective conduit	9
P9	Primary connector type	No additional connectors	1
		NEMA2 bended (125/145 degrees) bus aluminium connectors	2
		NEMA2 bended (125/145 degrees) bus aluminium connectors with bird protection	3
P10	Earthing accessories	No earthing accessories	1
		According to Customization parameter value	2
		2x cross-pressure terminals: 25-70 mm² earthing wire, 13 mm hole diameter	3
P11	Power cable	No power cable	1
		According to customization parameter value - Contact Magvatech representative	2
		5m 2core 1.5mm² cable, 6mm ring lug at VT side, crimp sleeve lug at RC side	3
		7m 2core 1.5mm² cable, 6mm ring lug at VT side, crimp sleeve lug at RC side	4
		12m 2core 1.5mm² cable, 6mm ring lug at VT side, crimp sleeve lug at RC side	5
		20m 2core 1.5mm² cable, 6mm ring lug at VT side, crimp sleeve lug at RC side	6
		2 cables: 5m 2core 1.5mm² cable, 6mm ring lug at VT side, crimp sleeve lug at RC side	7
		2 cables: 7m 2core 1.5mm² cable, 6mm ring lug at VT side, crimp sleeve lug at RC side	8
		2 cables: 12m 2core 1.5mm² cable, 6mm ring lug at VT side, crimp sleeve lug at RC side	9
		2 cables: 20m 2core 1.5mm² cable, 6mm ring lug at VT side, crimp sleeve lug at RC side	A
		5m 3core 2.5mm² cable, 6mm ring lug at VT side, crimp sleeve lug at RC side	D
		7m 3core 2.5mm² cable, 6mm ring lug at VT side, crimp sleeve lug at RC side	E
		12m 3core 2.5mm² cable, 6mm ring lug at VT side, crimp sleeve lug at RC side	F
		20m 3core 2.5mm² cable, 6mm ring lug at VT side, crimp sleeve lug at RC side	G
		5m 3core 2.5mm² cable, 6mm ring lug at VT side, CNLinko YM20 connector at RC side	H
		7m 3core 2.5mm² cable, 6mm ring lug at VT side, CNLinko YM20 connector at RC side	J
		12m 3core 2.5mm² cable, 6mm ring lug at VT side, CNLinko YM20 connector at RC side	K
		20m 3core 2.5mm² cable, 6mm ring lug at VT side, CNLinko YM20 connector at RC side	L
P12	RC mounting kit	No RC mounting kit	1
		According to Customization parameter value	2
		M20 studs for through-hole RC mounting	3
		500mm U-profiles for around-pole RC mounting	4
		800mm U-profiles for around-pole RC mounting	5
		Universal RC MK for substation mounting kit	6
		M16 studs for through-hole RC mounting	7

PARAMETER	PARAMETER DESCRIPTION	APPLICABLE OPTIONS	CODE
P13	Battery type	No battery	1
		Battery wiring	2
		Opearing temperature above -15C	3
		Opearing temperature above -25C	4
		Opearing temperature above -40C	5
		Opearing temperature above 0C	6
P14	Input-output module	No input-output module	1
		60V input-output module	2
		220V input-output module	3
P15	Ethernet	No optional ethernet interface	1
		Wired optional ethernet interface	2
		Optical ethernet interface	3
P16	Local wireless access	No local wireless access	1
		Wi-Fi module and associated wiring	2
P17	Power outlet	Socket wiring (included to RC5.4)	1
		According to Customization parameter value	2
		Socket wiring + blank socket plate	3
		NBR socket plate, wiring	4
		Without power outlet properties	5
		EU socket, associated plate, wiring	6
P18	Cabinet light	No cabinet light	1
		LED strip	2
P19	Internal door additional equipment	No additional equipment, door cutout	1
		According to Customization parameter value	2
		Blank plate for IDAE door cutout	3
		Kit of class C LVSA with In=10 kA for AC1 power input	4
		Kit of class C LVSA with In=10 kA for AC1 power input for LATAM	5
		Kit of class C LVSA with In=10 kA for AC1 power input	6
P20	Bottom interface plate	No bottom interface plate	1
		According to Customization parameter value	2
		Blank plate for bottom cutout	3
		Bottom plate with 2 glands for d = 4.5-10mm	4
		Bottom plate with 2 glands for d = 4.5-10mm, Wi-Fi/BT provision	5
		Bottom plate with 2 CNLinko YM20 3-pin male receptacles for auxiliary power supply	6
		Bottom plate with 2 CNLinko YM20 3-pin male receptacles for auxiliary power supply, Wi-Fi/BT provision	7
		Bottom plate with 1 CNLinko YM20 2pin male receptacles for auxiliary power supply	8

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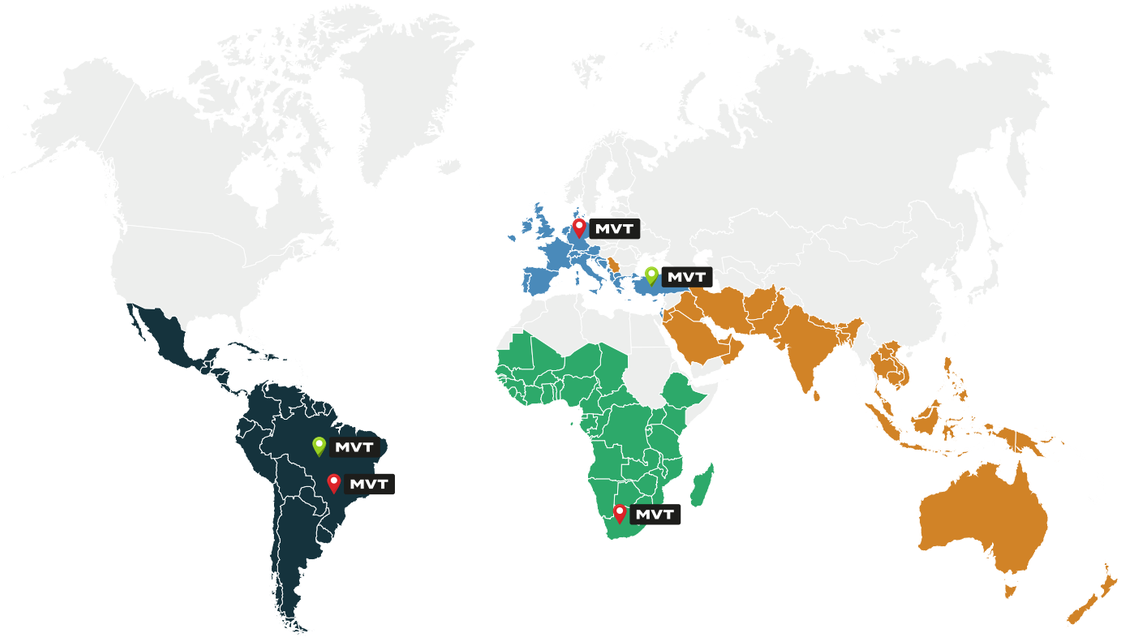

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