

Low Voltage Power Circuit Breakers

Magnum Low Voltage Power Circuit Breakers for Global Application

Magnum™ Low Voltage Power Circuit Breakers enable comprehensive solutions to meet and exceed the unique and wide-ranging requirements of today's global power distribution systems. This powerful circuit breaker offering is designed for ultimate custom configuration and application flexibility, with the needs of the power distribution equipment user and the electrical equipment manufacturer in mind.

Three Product Families

Magnum consists of three product families; each provides specific ratings features and approvals to optimize performance when applied in power distribution equipment and custom enclosures:

Magnum DS Low Voltage Power Circuit Breakers for ANSI Rated Switchgear Applications

- Up to 635 Vac.
- 200 to 6000 A continuous.
- 42 to 200 kA interrupting.



Magnum DS Low Voltage Power Circuit Breaker Family ANSI Rated for Switchgear Applications

Magnum SB Low Voltage Insulated Case Circuit Breakers for Switchboard Applications

- Up to 635 Vac.
- 200 to 5000 A continuous.
- 50 to 150 kA interrupting.



Magnum SB Low Voltage Insulated Case Circuit Breaker Family UL Rated for Switchboard Applications

Magnum IEC Air Circuit Breakers for IEC Rated Switchboards

- Up to 690 Vac.
- 200 to 6300 A continuous.
- 40 to 100 kA I_{cu}/I_{cs} .



Magnum IEC Low Voltage Air Circuit Breaker Family

Features, Benefits and Functions

- **200 kA interruption ratings** with current limiting performance and low current let-through to reduce damaging energy to downstream equipment at high fault levels.
- **Withstand ratings up to 100 kA** to maximize system coordination and selectivity.
- **Three physical frame sizes** (Narrow, Standard and Double) to promote breaker application in compact modular enclosures.
- **Continuous current ratings from 800 to 6300 A** with 100% rating at 40°C and no derating on most ratings up to 50°C.
- **Fixed breaker mounting configurations** with horizontal and optional vertical and front connected terminal connections.
- **Drawout breaker mounting configurations** with cassette and optional safety shutters.
- **3- and 4-pole breaker configurations.**
- **Through-the-door design** for human interface with the breaker compartment door closed.
- **Two-step stored energy mechanism** for manually and electrical operated breakers.
- **Digitrip RMS Trip Unit family** with four models, each providing increasing levels of features:
 - **Basic to advanced programmable overcurrent protection** with communications, power metering and power quality
 - **New Arcflash Reduction Maintenance Switch™** setting (enabled locally or remotely) to reduce arc flash potential on downstream circuits during maintenance operations
- **Field installable accessories** (UL® approved) common across the breaker frames and designed to be easily installed in the field to service or modify the breaker at the point of use.
- **Secondary terminal contacts** mounted at the top front of the breaker and away from the primary voltage areas for improved safety and access. Finger-proof terminal blocks accommodate ring-tongue or spade type terminals as standard.



Through-the-Door Design for Human Interface with the Breaker Compartment Door Closed



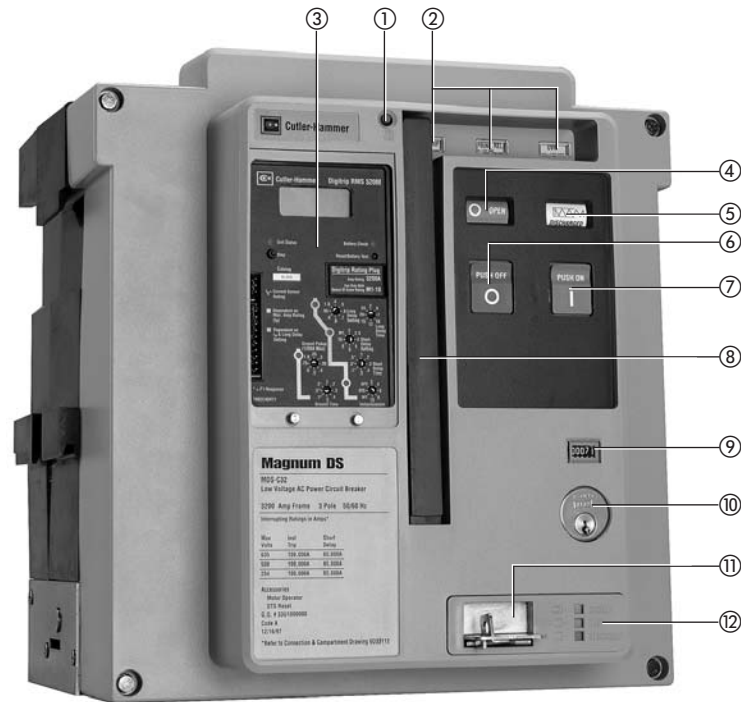
High Technology Microprocessor-Based Digitrip RMS 1150+ Trip Units are Available With Advanced Features Like Programmable Overcurrent Settings, Power Metering, Power Quality and Communications

Low Voltage Power Circuit Breakers

Breaker Features on Front Cover

The controls and indicators are functionally grouped on the breaker faceplate to optimize the human interface, visibility, and ease of use. For maximum safety, a modern, through-the-door design permits access to the breaker levering system, trip unit, controls and indicators with the door closed.

- ① Mechanical Trip Flag Pop-out Indicator (Optional) — Red
- ② Accessory Viewing Windows for:
 - Shunt Trip Attachment (STA)
 - Spring Release Device (SR)
 - Undervoltage Release (UVR) Device or Second STA
- ③ Digitrip RMS Trip Unit (Model 520M Shown) Protected by Clear Cover
- ④ Contact Status Indicators:
 - OPEN — Green
 - CLOSED — Red
- ⑤ Spring Status Indicators:
 - Charged — Yellow
 - Discharged — White
- ⑥ Push OFF (Open) Pushbutton — Red
- ⑦ Push ON (Close) Pushbutton — Green
- ⑧ Manual Spring Charging Handle for Manually Charging the Stored Energy Springs
- ⑨ Mechanical Operations Counter (Optional)
- ⑩ Key Off Lock (Optional)
- ⑪ Padlockable Levering Device Shutter for Drawout Breakers
- ⑫ Color-Coded Position Indicator for Drawout Breakers:
 - CONNECT — Red
 - TEST — Yellow
 - DISCONNECT — Green



Magnum DS Drawout Breaker



Accessory Viewing Windows Visibly Confirm the Breaker Shunt Trip, Spring Release, and UVR Installation and Their Control Voltage Rating



Drawout Breaker Levering Can be Accomplished With the Compartment Door Closed Without the Need for a Special Levering Tool

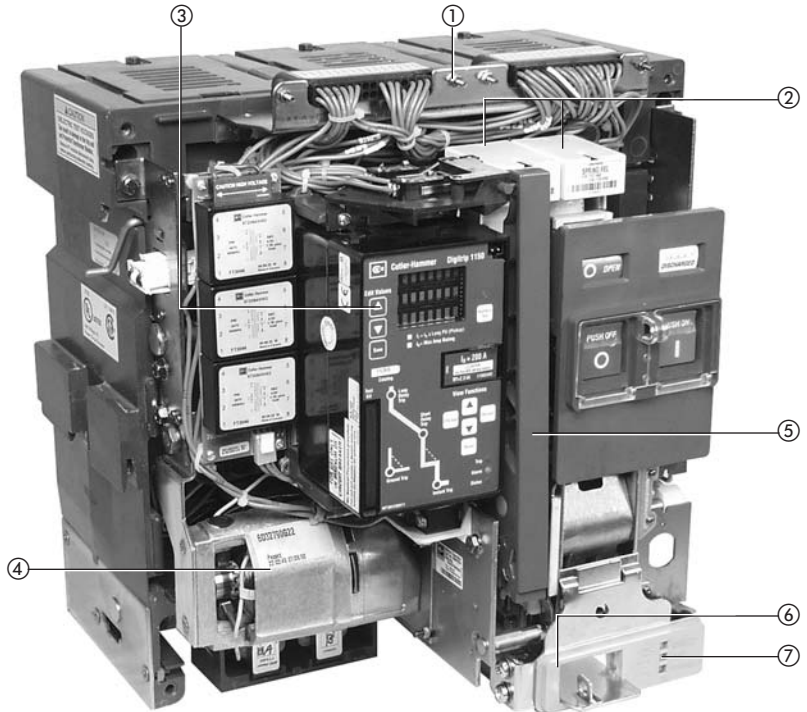


Through-the-Door Design for Human Interface with the Breaker Compartment Door Closed, for Example, Manually Charging the Stored Energy Springs

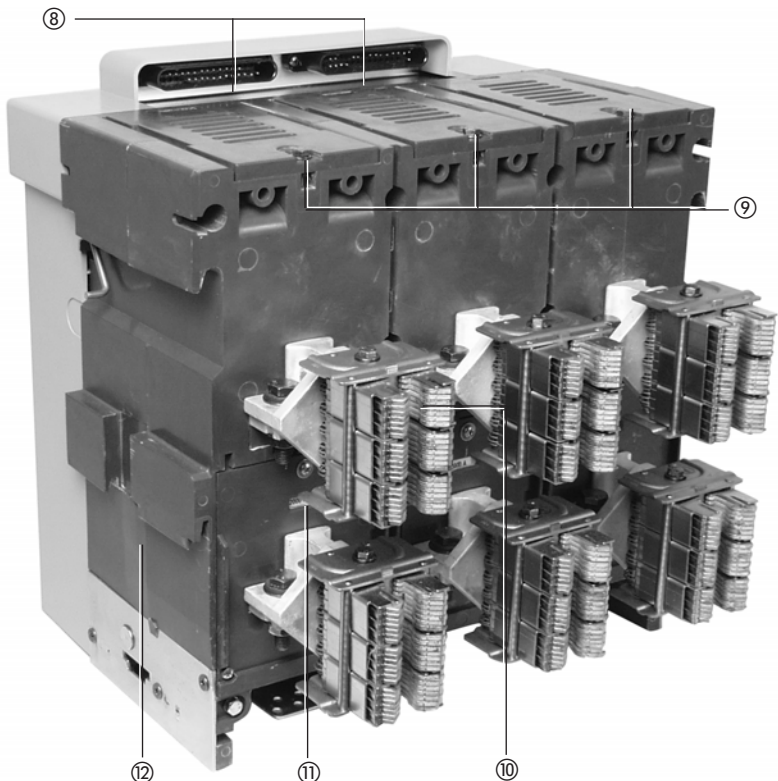
Breaker Internal Features

Magnum is designed for ease of access for inspection, modification and maintenance at the point of use. The breaker front cover is easily removed with four captive bolts, revealing the modular internal breaker features.

- ① Secondary Terminal Points for Internal Breaker Wiring Connections
- ② Breaker Accessory Mounting Deck with Three Positions for Mounting:
 - Shunt Trip Attachment (STA)
 - Spring Release Device (SR)
 - Undervoltage Release (UVR) Device or Second STA
- ③ Digitrip RMS Trip Unit (Model 1150+ Shown)
- ④ Spring Charging Motor (Optional) for Electrically Charging the Stored Energy Springs
- ⑤ Manual Spring Charging Handle for Manually Charging the Stored Energy Springs
- ⑥ Padlockable Levering Device Shutter for Drawout Breakers
- ⑦ Color-Coded Position Indicator for Drawout Breakers:
 - CONNECT — Red
 - TEST — Yellow
 - DISCONNECT — Green
- ⑧ Secondary Contact Blocks for Connection to External Cell Control Wiring
- ⑨ Removable Arc Chute Covers for Easy Access to Breaker Main Contacts
- ⑩ Primary Finger Cluster Disconnecting Contacts for Drawout Breaker are Mounted on the Breaker Element (Not in the Breaker Compartment) for Ease of Access for Inspection and Maintenance
- ⑪ Current Sensor Viewing Windows to View and Confirm Breaker Sensor Rating
- ⑫ Rigid Frame Housing (Thermoset Composite Resin) Providing Increased Strength and Durability



Magnum Drawout Breaker Front View With Front Cover Removed Showing Easy Access to the Breaker Internal Devices



Magnum Drawout Breaker Rear View Showing Primary Disconnecting Finger Clusters Mounted on the Breaker for Ease of Inspection

Low Voltage Power Circuit Breakers

Magnum DS Low Voltage Power Circuit Breakers

Magnum DS is a true UL 1066 listed low voltage power circuit breaker family, designed for the highest performance requirements of switchgear and specialty enclosure applications.

- Magnum DS Low Voltage Power Circuit Breakers have short time withstand and interruption ratings up to 100 kA at 635 Vac with continuous current ratings up to 6000 amperes to maximize system coordination and selectivity.
- Magnum MDSX Current Limiting Power Circuit Breakers have 200 kA interrupting ratings at 480 Vac with continuous current ratings up to 5000 amperes.
- Magnum MDSL Current Limiting Power Circuit Breakers have 200 kA interrupting ratings at 600 Vac with continuous current ratings up to 2000 amperes.

UL and ANSI Test Certifications

Magnum DS meets or exceeds the applicable ANSI, NEMA®, UL and CSA® standards, including:

- ANSI C37.13 (Low Voltage ac Power Circuit Breakers Used in Enclosures).
- ANSI C37.16 (Preferred Ratings, Related Requirements, and Application Recommendations for Low Voltage Power Circuit Breakers and ac Power Circuit Breakers).
- ANSI C37.17 (Trip Devices for ac and General Purpose dc Low Voltage Power Circuit Breakers).
- ANSI C37.50 (Test Procedures for Low Voltage ac Power Circuit Breakers Used in Enclosures).
- UL 1066 (Standard for Low Voltage ac and dc Power Circuit Breakers Used in Enclosures).
- NEMA SG3 (This standard adopts ANSI C37.16 in its entirety).

Comprehensive Enclosure Solutions

Magnum DS has proven performance in Eaton manufactured switchgear and switchboards with the following test certifications:

- UL 1558 (Certified Magnum DS Low Voltage Metal-Enclosed Switchgear).
- UL 891 (Certified Pow-R-Line C Low Voltage Switchboards).
- UL 1008 Standard for Transfer Switch Equipment.
- UL, CSA 22.2.31 Low Voltage Assemblies.

Approvals

- UL listed: Magnum DS Breaker UL File No. E52096 and Cassette UL File No. E204565.

ABS (American Bureau of Shipping)
Type Listed Certificate Number
04-HS422844A-DUB.

Magnum DS, MDSL and MDSX Circuit Breakers



Magnum DS Low Voltage Power Circuit Breakers have high withstand ratings from 42 kA to 100 kA to provide for maximum system coordination and selectivity.



The new Magnum MDSL Current Limiting Power Circuit Breakers have integral current limiters to provide interrupting ratings of 200 kA at 600 Vac.



The new Magnum MDSX Current Limiting Power Circuit Breakers have fast opening contacts to provide interrupting ratings up to 200 kA at 480 Vac without fuses.

Magnum DS Switchgear Class UL 1066



Magnum DS Low Voltage Power Circuit Breaker Family ANSI Rated for Switchgear Applications

Table 13-1. Magnum DS Switchgear Class UL 1066 Low Voltage Power Circuit Breakers

Frame Amperes	Breaker Type	Frame Type	rms Symmetrical Current Ratings kA 50/60 Hz ①			Short Time Withstand Rating	Fixed Internal Instantaneous Trip	Available Current Sensor & Rating Plugs for Digitrip RMS Trip Unit (Establishes Breaker I _n rating)
			Interrupting at 254 Vac	Interrupting at 508 Vac	Interrupting at 635 Vac			
800	MDN-408	Narrow	42	42	42	42	—	200, 250, 300, 400, 600, 800
	MDN-508	Narrow	50	50	50	50	—	
	MDN-608	Narrow	65	65	65	65	—	
	MDN-C08	Narrow	100	100	65	20	18 x I _n	
	MDS-408	Standard	42	42	42	42	—	
	MDS-608	Standard	65	65	65	65	—	
	MDS-808	Standard	85	85	85	85	—	
	MDS-C08	Standard	100	100	100	85	85	
MDS-L08 ②	Standard	200	200	200	—	—		
MDS-X08 ③	Standard	200	200	④	30	30		
1600	MDN-416	Narrow	42	42	42	42	—	200, 250, 300, 400, 600, 800, 1000, 1200, 1600
	MDN-516	Narrow	50	50	50	50	—	
	MDN-616	Narrow	65	65	65	65	—	
	MDN-C16	Narrow	100	100	65	30	18 x I _n	
	MDS-616	Standard	65	65	65	65	—	
	MDS-816	Standard	85	85	85	85	—	
	MDS-C16	Standard	100	100	100	85	85	
	MDS-L16 ②	Standard	200	200	200	—	—	
MDS-X16 ③	Standard	200	200	④	30	30		
2000	MDN-620	Narrow	65	65	65	65	—	200, 250, 300, 400, 600, 800, 1000, 1200, 1600, 2000
	MDN-C20	Narrow	100	100	65	35	18 x I _n	
	MDS-620	Standard	65	65	65	65	—	
	MDS-820	Standard	85	85	85	85	—	
	MDS-C20	Standard	100	100	100	85	85	
	MDS-L20 ②	Standard	200	200	200	—	—	
MDS-X20 ③	Standard	200	200	④	30	30		
3200	MDS-632	Standard	65	65	65	65	—	200, 250, 300, 400, 600, 800, 1000, 1200, 1600, 2000, 2500, 3000, 3200
	MDS-832	Standard	85	85	85	85	—	
	MDS-C32	Standard	100	100	100	85	85	
	MDS-X32 ③	Double	200	200	④	50	50	
4000	MDS-840	Double	85	85	85	85	—	2000, 2500, 3200, 4000
	MDS-C40	Double	100	100	100	100	—	
	MDS-X40 ③	Double	200	200	④	50	50	
5000	MDS-850	Double	85	85	85	85	—	2500, 3200, 4000, 5000
	MDS-C50	Double	100	100	100	100	—	
	MDS-X50 ③⑤	Double	200	200	④	50	50	
6000	MDS-C60 ⑤	Double	100	100	100	100	—	3200, 4000, 5000, 6000

① Interrupting ratings shown based on breaker equipped with integral Digitrip RMS Trip Unit. Interruption ratings for non-automatic breakers are equal to the published Short Time Withstand Rating. These interruption ratings are based on the standard duty cycle consisting of an open operation, a 15-second interval and a close-open operation, in succession, with delayed tripping in case of short-delay devices. The standard duty cycle for short time ratings consists of maintaining the rated current for two periods of 1/2 seconds each, with a 15-second interval of zero current between the two periods.

② Magnum MDSL Current Limiting Power Circuit Breaker With Integral Current Limiters. Current Limiter selected determines short time and fixed instantaneous trip rating. Maximum voltage rating is 600 Vac.

③ Magnum MDSX Current Limiting Power Circuit Breaker With Fast Opening Contacts.

④ Product to be tested. Contact Eaton for product rating.

⑤ Breaker applied in a tested fan-cooled enclosure.