

# Molded Case Circuit Breakers



# sentron<sup>TM</sup> SERIES



**SIEMENS**

Global network of innovation

# A Solutions Oriented Circuit Protection Family



## 15 to 2000A Thermal Magnetic Line

- Fixed or interchangeable trip units
- **CE** marked with IEC interrupting ratings
- Motor circuit protectors from 1-800 Amps
- 100% rated, 400Hz, 50C available
- Naval UL489 supplement SB available
- Full line current limiting without fuses
- Full line of 250V - 500V DC ratings

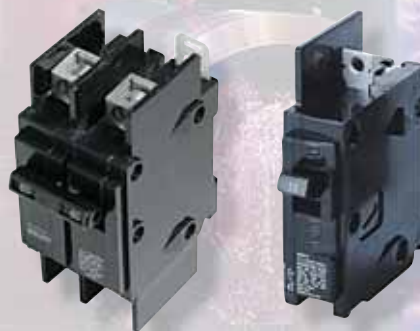


## 2000-3200A MCCB

- Full function trip with communications capability
- Highest amperage MCCB on the market
- Highest interrupting ratings on the market
- Standard cause of trip indication
- Field installable ground fault alarm/trip module
- Field installable ammeter/monitoring module
- 100% ratings available

## 240V Specialty Breakers

- The 240V QJ breaker is ideally suited for OEM and residential applications from 60-225A at up to 100KA. Add the walking beam interlock and it becomes an ideal solution for your standby power applications.
- The BQXD breaker with its integral DIN rail clip and other mounting accessories make it ideal for HVAC and control panel application. It is available in 1 and 2 pole configurations through 60A at 10KA.



# Competitive Advantages To Reduce Your Installed Cost

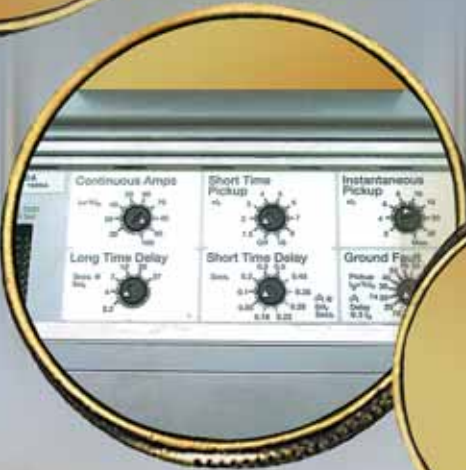


UL listed field installable accessories in all Sentron frames allow for changes on the fly without going to the factory

CE marked  
UL breakers with  
IEC 60947-2 ratings  
let you serve all  
markets with  
one design



Sensitrip III™ breakers are adjustable without the need for rating plugs



The Sensitrip Ammeter saves on CTs, wiring and installation costs



Siemens offers thermal mag as a cost saving option and DC solution through 2000A



Interchangeable trip units reduce inventory and allow for retro-fits (sealed available for reverse feed)





Breaker Type		CQD	ED4		ED6		FD				JD				
Amps		15 - 100	15 - 125		15 - 125		70 - 250				200 - 400				
Volts		480Y/277	480		600		600				600				
Poles		1,2,3	1,2,3		1,2,3		2,3				2,3				
UL Interrupting Rating ①		CQD	ED	HED	ED	HHED	CED	FD	HFD	HHFD	CFD	JD	HJD	HHJD	CJD
	240V	65	65	100	65	100	200	65	100	200	200	65	100	200	200
	480/277V	14	—	—	—	—	—	—	—	—	—	—	—	—	—
	480V	—	18	42	25	65	200	35	65	100	200	35	65	100	150
	600V	—	—	—	18	25	100	22	25	25	100	25	35	50	100
250V DC (2 P)	14	30	30	30	—	30	30	30	—	30	30	30	—	30	
IEC (Icu) Interrupt Rating		3VF2 (IEC Only) ②	ED	HED	ED	HHED	CED	FD	HFD	HHFD	CFD	JD	HJD	HHJD	CJD
	220/240V	65	65	—	65	—	200	65	100	200	—	65	100	200	—
	380/415V	18	18	—	35	—	200	35	65	100	—	40	65	100	—
	500V	—	—	—	18	—	—	20	42	65	—	30	42	65	—
Thermal Magnetic Trip	Fixed	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Interchangeable							✓	✓	✓	✓	✓	✓	✓	✓
	Magnetic Only MCP				✓		✓	✓			✓	✓			✓
	Molded Case Switch		✓		✓		✓	✓	✓		✓	✓	✓		✓
	Electronic Trip								✓			✓	✓		✓
Dim.	2 (1) Pole	Height	4.5"	6.3"	6.3"	6.5"	9.6"	9.5"	9.5"	9.5"	14.2"	11"	11"	11"	17.8"
		Width	2" (1P 1")	2" (1P 1")	2" (1P 1")	2" (1P 1")	2" (1P 1")	4.5"	4.5"	4.5"	4.5"	7.5"	7.5"	7.5"	7.5"
		Depth	2.9"	4"	4"	4"	4"	4"	4"	4"	4"	4"	4"	4"	4"
	3 Pole	Height	4.5"	6.3"	6.3"	6.5"	9.6"	9.5"	9.5"	9.5"	14.2"	11"	11"	11"	17.8"
		Width	3"	3"	3"	3"	3"	—	4.5"	4.5"	4.5"	7.5"	7.5"	7.5"	7.5"
		Depth	2.9"	4"	4"	4"	4"	4"	4"	4"	4"	4"	4"	4"	4"
Internal Accessories and Modifications		Shunt Trip Auxiliary Switch Alarm Switch	Undervoltage Trip Shunt Trip Auxiliary Switch Alarm Switch Ground Fault Sensing Relay Kit UL489 Supp. SB (Naval Use) 50C or 400Hz Calibration	Undervoltage Trip Shunt Trip Auxiliary Switch Alarm Switch Ground Fault Sensing Relay Kit UL489 Supp. SB (Naval Use) 50C or 400Hz Calibration	Gold Plated Auxiliary Switch (PLC) Undervoltage Trip Shunt Trip Auxiliary Switch Alarm Switch UL489 Supp. SB (Naval Use) 50C or 400Hz Calibration	Gold Plated Auxiliary Switch (PLC) Undervoltage Trip Shunt Trip Auxiliary Switch Alarm Switch UL489 Supp. SB (Naval Use) Sensitrip Ammeter Zone Interlocking & Communications 50C or 400Hz Calibration									
		Padlocking Device Handle Blocking Device	Control Wire Taps Padlocking Device Handle Blocking Device	Control Wire Taps Padlocking Device Handle Blocking Device	Control Wire Taps Padlocking Device Handle Blocking Device	Control Wire Taps Padlocking Device Handle Blocking Device									
		Standard Depth Rotary Operator	Standard Depth Rotary Operator	Variable Depth Rotary Operator	Standard Depth Rotary Operator	Standard Depth Rotary Operator									
		Variable Depth Cable Operator	Variable Depth Cable Operator	Fixed Depth Flange Mounted Operator	Variable Depth Cable Operator	Variable Depth Cable Operator									
		Motor Operator Door Latch Kit	Motor Operator Door Latch Kit Operator Auxiliary Switch	Motor Operator Door Latch Kit Operator Auxiliary Switch	Motor Operator Door Latch Kit Operator Auxiliary Switch	Motor Operator Door Latch Kit Operator Auxiliary Switch									
Mounting Accessories		Integral DIN Rail Clip Face-Mounting Plates	Plug-In Mounting Assemblies Rear-Connecting Studs	Plug-In Mounting Assemblies Rear-Connecting Studs	Plug-in Mounting Assemblies Rear-Connecting Studs	Plug-in Mounting Assemblies Rear-Connecting Studs									

① Consult Siemens for interrupting ratings at other voltages, including 500Vdc. The SHTD 690V Icu rating is 65 kA.

② CQD breakers are **CE** marked through 30A. 3VF2 are **CE** marked through 100A.



LD

LMD

MD

ND

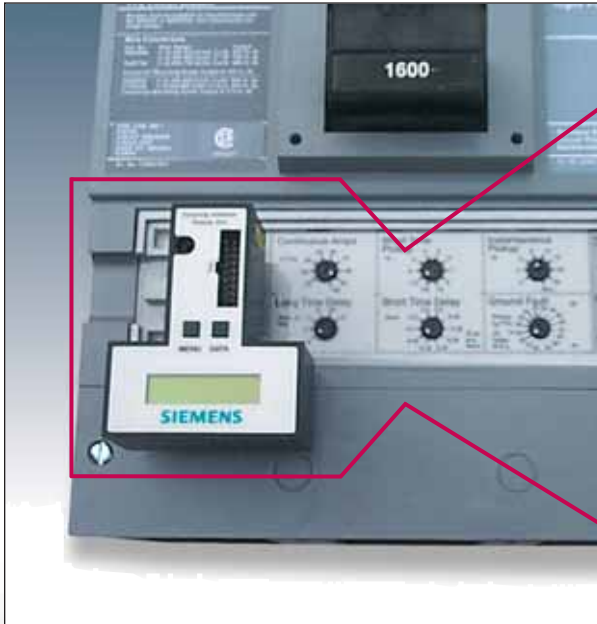
PD

RD

STD

250 - 600				500 - 800			500 - 800			800 - 1200			1200 - 1600			1600 - 2000		2000 - 3200		
600				600			600			600			600			600		600		
2,3				2,3			2,3			2,3			3			3		3		
LD	HLD	HHLD	CLD	LMD	HLMD	MD	HMD	CMD	ND	HND	CND	PD	HPD	CPD	RD	HRD	STD	SHTD	SHHTD	
65	100	200	200	65	100	65	100	200	65	100	200	65	100	200	65	100	85	150	200	
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
35	65	100	150	50	65	50	65	100	50	65	100	50	65	100	50	65	65	100	150	
25	35	50	100	25	50	25	50	65	25	50	65	25	50	65	25	50	50	85	100	
30	30	—	30	30	30	30	30	30	30	30	30	30	30	30	30	30	—	—	—	
LD	HLD	HHLD	CLD	LMD	HLMD	MD	HMD	CMD	ND	HND	CND	PD	HPD	CPD	RD	HRD	STD	SHTD	SHHTD	
65	100	200	—	65	100	65	100	200	65	100	200	65	100	200	65	100	—	—	—	
40	65	100	—	40	65	40	65	100	40	65	100	40	65	100	40	65	—	100	—	
30	42	65	—	30	42	30	42	65	30	42	65	30	42	65	30	42	—	65 <sup>①</sup>	—	
✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
11"	11"	11"	17.8"	16"	16"	16"	16"	16"	16"	16"	16"	—	—	—	—	—	—	—	—	
7.5"	7.5"	7.5"	7.5"	7.5"	7.5"	9"	9"	9"	9"	9"	9"	—	—	—	—	—	—	—	—	
4"	4"	4"	4"	4.5"	4.5"	6.2"	6.2"	6.2"	6.2"	6.2"	6.2"	—	—	—	—	—	—	—	—	
11"	11"	11"	17.8"	16"	16"	16"	16"	16"	16"	16"	16"	16"	16"	16"	16"	16"	20.5"	20.5"	20.5"	
7.5"	7.5"	7.5"	7.5"	7.5"	7.5"	9"	9"	9"	9"	9"	9"	9"	9"	9"	9"	9"	15.5"	15.5"	15.5"	
4"	4"	4"	4"	4.5"	4.5"	6.2"	6.2"	6.2"	6.2"	6.2"	6.2"	6.2"	6.2"	6.2"	6.2"	6.2"	12.5"	12.5"	12.5"	
Gold Plated Auxiliary Switch (PLC)				Gold Plated Aux. Switch (PLC)			Gold Plated Auxiliary Switch (PLC)			Gold Plated Auxiliary Switch (PLC)			Gold Plated Auxiliary Switch (PLC)			Remote Indicator Panel				
Undervoltage Trip				Undervoltage Trip			Undervoltage Trip			Undervoltage Trip			Undervoltage Trip			Undervoltage Trip				
Shunt Trip				Shunt Trip			Shunt Trip			Shunt Trip			Shunt Trip			Shunt Trip				
Auxiliary Switch				Auxiliary Switch			Auxiliary Switch			Auxiliary Switch			Auxiliary Switch			Auxiliary Switch				
Alarm Switch				Alarm Switch			Alarm Switch			Alarm Switch			Alarm Switch			Alarm Switch				
UL489 Supp. SB (Naval Use)				50C or 400Hz Calibration			UL489 Supp. SB (Naval Use)			UL489 Supp. SB (Naval Use)			UL489 Supp. SB (Naval Use)			UL489 Supp. SB (Naval Use)				
Sensitrip Ammeter				50C or 400Hz Calibration			Sensitrip Ammeter			Sensitrip Ammeter			Sensitrip Ammeter			Sensitrip Ammeter				
Zone Interlocking & Communications				50C or 400Hz Calibration			Zone Interlocking & Communications			Zone Interlocking & Communications			Zone Interlocking & Communications			Zone Interlocking & Communications				
50C or 400Hz Calibration				50C or 400Hz Calibration			50C or 400Hz Calibration			50C or 400Hz Calibration			50C or 400Hz Calibration			50C or 400Hz Calibration				
Control Wire Taps				Control Wire Taps			Control Wire Taps			Padlocking Device			Padlocking Device			Padlocking Device		Padlocking Device		
Padlocking Device				Padlocking Device			Padlocking Device			Handle Blocking Device			Handle Extension			Handle Extension		Handle Extension		
Handle Blocking Device				Handle Blocking Device			Handle Blocking Device			Handle Extension			Mechanical Interlock			Mechanical Interlock		Mechanical Interlock		
Mechanical Interlock				Mechanical Interlock			Handle Extension			Standard Depth Rotary Operator			Standard Depth Rotary Operator			Standard Depth Rotary Operator		Key Interlocks		
Standard Depth Rotary Operator				Mechanical Interlock			Mechanical Interlock			Standard Depth Rotary Operator			Variable Depth Rotary Operator			Variable Depth Rotary Operator		Variable Depth Rotary Operator		
Variable Depth Rotary Operator				Standard Depth Rotary Operator			Standard Depth Rotary Operator			Variable Depth Rotary Operator			Variable Depth Cable Operator			Variable Depth Cable Operator		Variable Depth Cable Operator		
Variable Depth Cable Operator				Variable Depth Rotary Operator			Variable Depth Rotary Operator			Variable Depth Cable Operator			Motor Operator			Motor Operator		Motor Operator		
Motor Operator				Variable Depth Cable Operator			Variable Depth Cable Operator			Motor Operator			Door Latch Kit			Door Latch Kit		Door Latch Kit		
Door Latch Kit				Motor Operator			Motor Operator			Door Latch Kit			Operator Auxiliary Switch			Operator Auxiliary Switch		Operator Auxiliary Switch		
Operator Auxiliary Switch				Operator Auxiliary Switch			Operator Auxiliary Switch			Operator Auxiliary Switch			Operator Auxiliary Switch			Operator Auxiliary Switch		Operator Auxiliary Switch		
Plug-In Mounting Assemblies				Plug-In Mounting Assemblies			Plug-In Mounting Assemblies			Plug-In Mounting Assemblies			Mounting Block			Mounting Block		Rear-Connectors		
Rear-Connecting Studs				Rear-Connecting Studs			Rear-Connecting Studs			Rear-Connecting Studs			Mounting Block			Mounting Block		Rear-Connectors		

# Backed by Siemens Innovation and Technology

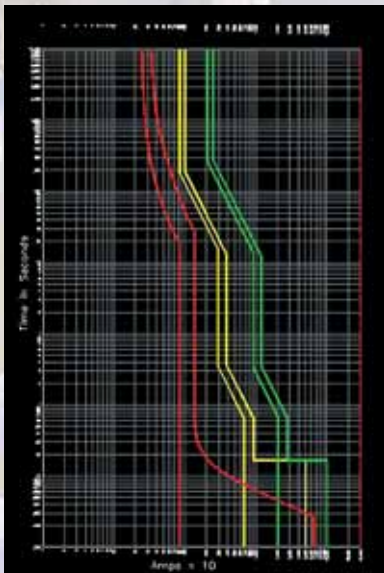


## 200-1600A Sensitrip III™ Trip Units

- Exclusive adjustable current rating without the need for rating plugs
- LI, LSI, LIG, LSIG trip functions
- Microprocessor based RMS sensing
- Electronic trip, electronic trip with metering, electronic trip with metering and communications
- 100% ratings and current limiting available

## Sensitrip Ammeter

- Saves on CTs and wiring
- Direct plug-in or panel mounting
- Trip unit powered with battery back-up
- Current metering displays
  - RMS phase
  - Demand
  - Unbalance
  - Average
  - Ground
- Impending trip indication
- Time stamped trip log (last 5)
- Max current metering log
  - Phase
  - Ground
  - Average
  - Demand



## Application Tools

- Breaker drawings on CAD
- Time current curve and series coordination software
- Specifications on disk
- Individual breaker frame instruction guides
- Speedfax Catalog/CD-ROM
- Application Guide/CD-ROM
- World Wide Web product support

# Modularity To Support All Your Application Needs

## Handle Mechanisms and Operators



Max-Flex™  
UL & IEC



Variable and Fixed Depth  
Rotary UL & IEC



Fixed  
Depth Flange



Motor Operator

## External and Termination Accessories



Handle Lock

Handle Block



Control Wire Taps



Standard Ring  
Terminal Provision



Plug Ins



Rear Connectors



Walking Beam Interlock



Mechanical Lugs



Compression Lugs

## Internal Accessories



- Auxiliary Switch
- Low Power (PLC) Gold Plated Aux Sw.
- Shunt Trip
- Bell Alarm
- Under Voltage Release

## Ground Fault Kit



- Field installable
- For use on any 1,2 or 3P ED frame breaker
- 5 or 30mA application
- Kit includes CTs, 24 inch leads, and mounting equipment

# Molded Case Circuit Breakers – Typical Specifications

## General Specifications

Molded case circuit breakers shall provide circuit overcurrent protection with inverse time and instantaneous tripping characteristics and shall be Siemens Sentron, Sensitrip or approved equal.

All circuit breakers shall be listed by Underwriters' Laboratories, Inc., conform to applicable requirements of NEMA Standard Publication No. AB1 and meet appropriate classifications of Federal Specifications W C 375B/Gen.

All circuit breakers shall have a quick-make, quick-break over center toggle type mechanism and the handle mechanism shall be trip free to prevent holding contacts closed against a short circuit or sustained overload. All circuit breaker handles shall assume a position between "ON" and "OFF" when tripped automatically. Multi-pole circuit breakers shall be common-trip such that an overload or short circuit on any one pole will result in all poles opening simultaneously. Arc extinction is to be accomplished by magnetic arc chutes. All ratings are to be clearly visible. When reverse feed is indicated on the drawings, in accordance with UL, circuit breakers with sealed trip units shall be supplied.

## Thermal Magnetic Specifications

Unless otherwise noted on the drawings, all Circuit breakers 2000 Ampere and below shall have thermal-magnetic trip units, with inverse time-current characteristics. Automatic operation of these circuit breakers shall be obtained by means of thermal-magnetic tripping devices located in each pole providing inverse time delay and instantaneous circuit protection. Circuit breakers shall be ambient compensating in that, as the ambient temperature increases over 40°C, the circuit breaker automatically derates itself so as to better protect its associated conductor. Thermal-magnetic breakers from 250 to 2000A frames shall have thermal interchangeable trip units, with instantaneous magnetic trip settings that are adjustable and accessible from the front of all circuit breakers on frame sizes 250 Amperes and above. Where indicated, provide circuit breakers UL listed for application at 100% of their continuous ampere rating in their intended enclosure.

## Motor Circuit Protectors

Where indicated on the drawings and in the combination motor starter/motor control center schedule, furnish instantaneous magnetic trip only circuit breakers for motor short circuit protection. The magnetic trips shall be adjustable and accessible from the front of all circuit breaker frames. The continuous current rating shall be between 1 and 800 Amps as indicated on the drawing.

The interrupting rating of the circuit breakers shall be as indicated in the specifications and shown on the drawing or single line diagram. The interrupting rating of the circuit breakers shall be at least equal to the available short circuit current at the line terminals of the circuit breaker and correspond to the UL listed integrated short circuit current rating specified.

## Internal Accessories

Provide shunt trips, bell alarms, and auxiliary switches as shown on the contract drawings. Gold plated auxiliary switches shall be supplied for PLC connection. Internal accessories for all breakers shall be UL listed for field installation and modification.

## Connection Accessories

Unless otherwise noted, Mechanical lugs shall be provided with all Molded Case Breakers. Where indicated on the drawings, compression lugs shall be provided on 1200 Ampere frame and below circuit breakers. All compression lugs shall be supplied by the circuit breaker manufacturer.

Where indicated on the drawings, UL listed plug-in or rear connectors shall be supplied.

## Solid State Sensing Specifications

As indicated on the drawings, circuit breaker frames 400 Ampere through 3200 Ampere shall have microprocessor-based RMS sensing trip units, with the capability to measure through to the 21st harmonic. Automatic operation of all circuit breaker frames 400A and larger shall be obtained by means of solid state tripping elements providing inverse time delay and (instantaneous) and/or (short-time delay) circuit protection. Continuous current ratings shall be adjustable from 20% to 100% of the trip unit rating, without the need for a rating plug. Long-time delay and instantaneous trip shall be adjustable. The optional short-time trip function shall have adjustable pick-up settings, three fixed times and I<sup>2</sup>t ramp. Circuit breaker frames 400A and larger and where indicated on the drawings shall be 100% equipment rated.

## Integral Ground Fault Option

Main and feeder circuit breakers, as indicated on the drawings shall be provided with integral ground fault protection. Ground fault pick up shall be adjustable from 20% to 70% of the circuit breakers maximum continuous current rating. Ground fault time delay shall be adjustable with three I<sup>2</sup>t ramps.

## Metering Option

When indicated on the drawings, solid state trip breakers shall be furnished with a plug-in or panel mounted metering device. This device shall simultaneously display all three phase currents, as well as average current, ground current, and phase unbalance. In addition it shall display breaker status, a max log and a trip log. The trip log will retain and display date, time and type of trip (overload, short circuit or ground fault) for the most recent 5 trip events.

## Current Limiting Specifications

Where indicated on the drawings, Siemens current limiting circuit breakers are to be furnished. Current limiting circuit breakers shall limit the letthrough I<sup>2</sup>t to a value less than the I<sup>2</sup>t of one-half cycle wave of the symmetrical prospective current without any fusible elements when operating within its current range.

## Series Connected Combination Specifications

Where protective devices are applied in series combination, such that the prospective available fault current exceeds the interrupting rating (AIR) of the downstream protective devices, such combinations shall be UL recognized combinations. All electrical equipment using these UL recognized circuit breaker combinations shall be clearly marked in accordance with NEC Section 240-83(c).

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