

## Mtec Moulded Case Circuit Breakers

Mtec MCCBs



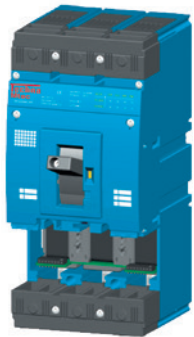
Engineered for maximum flexibility and ruggedness, Techna Mtec Moulded Case Circuit Breakers provide current-limiting protection and switching for practically all LV applications. The innovative modular design offers a complete choice of configuration options from a surprisingly small range of parts - giving you the logistical advantage of short lead times and reduced inventory costs.

Mtec electronic release modules use digital sampling to calculate true rms current for precise, accurate tripping. Current ratings can be set from 40A to 1600A and special calibrations are available for protection of motors and discrimination in distribution systems.

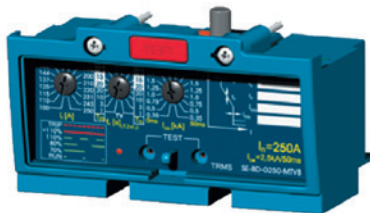
To complement the series, a comprehensive set of plug-in accessories continue the modular principle. Termination, actuation and signalling options can all be added to the base units to enhance the value of the range.

For a full Mtec configuration guide, please see page 61.

### Basic Mtec Configuration



MtecBH630SE305

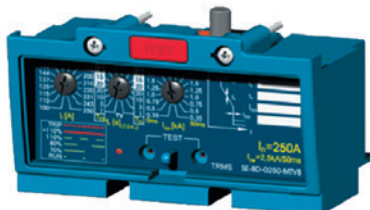


MtecSE-BH-0630-MTV8

### Mtec with Rotary Handle Configuration



MtecBH630SE305



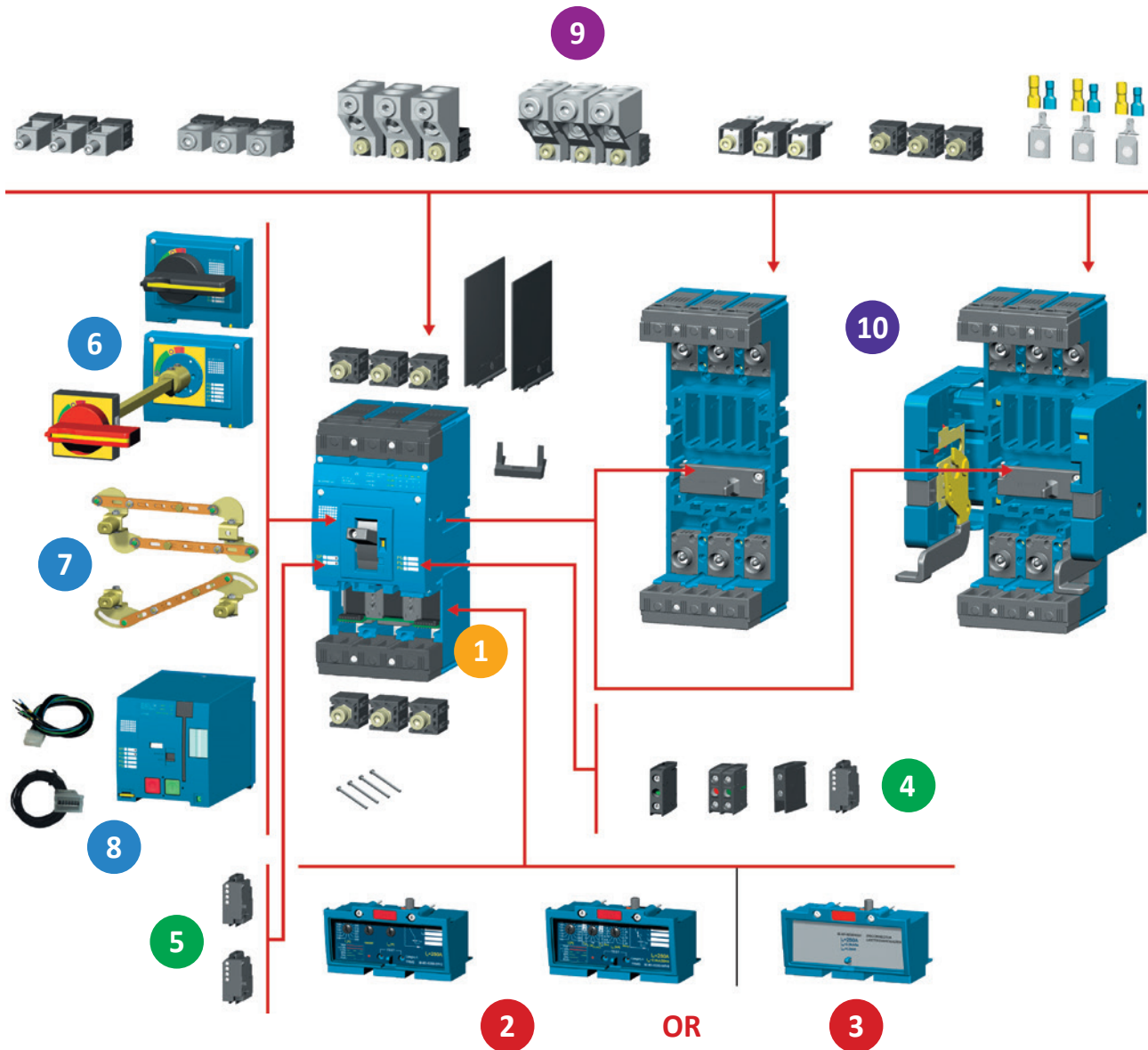
MtecSE-BH-0630-MTV8



MtecRP-BHD-CP20



MtecRP-BH-CK20



1. Base Unit	6. Optional Rotary Hand Drive
2. Overcurrent Release	7. Optional Mechanical Interlock
3. Switch Disconnect	8. Optional Motor Drive
4. Auxiliary Contact Blocks	9. Termination Options
5. Shunt Trip / Undervoltage Release	10. Optional Plug-in / Withdrawable Base

- Step 1:** Choose a Frame Size (see page 62)
- Step 6/7/8:** Choose Optional Drive Methods (see page 69)
- Step 2/3:** Pick an Electronic Trip Module (see page 64) or Switch Disconnect Module (see page 66)
- Step 9:** Optional Termination Types (see page 70)
- Step 4/5:** Add any Internal Accessories (see pages 67-68)
- Step 10:** Easy Replacement Options (please contact us for more information)

## Step 1: Mtec Switching Units

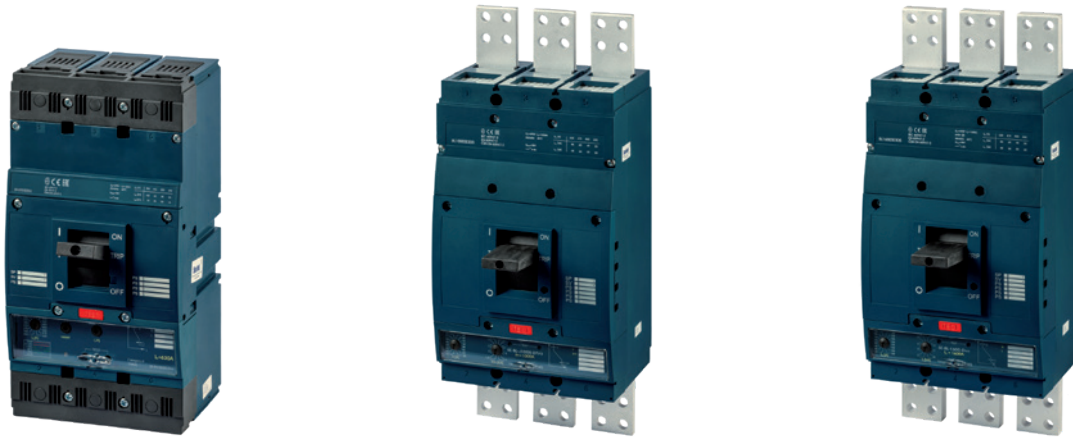


	MtecBC160			MtecBD250	
Rated Normal Current ( $I_n$ )	160A			250A	
Rated Operating Voltage ( $U_e$ )	max. 690 Vac, 250 Vdc			max. 690 Vac	
Rated Frequency ( $f_n$ )	50/60Hz			50/60Hz	
Utilisation Category (Selectivity)	A			A	
Rated Short Circuit Ultimate Breaking Capacity <sup>1)</sup> ( $I_{cu} / U_e$ )	Normal	25kA @ 415 Vac		36kA @ 415 Vac	
	Superior	-		65kA @ 415 Vac	
Rated Short Time Withstand Current at $U_e = AC 690V (I_{cw}/t)$	2kA / 1s			2.5kA / 1s	
Number of Poles	3	3+N <sup>2)</sup>	4	3	4
Dimensions (W x H x D)	75 x 135 x 70mm	100 x 135 x 70mm		105 x 225 x 105mm	140 x 225 x 105mm
Residual Current Device	●			-	
Additional Cover for Overcurrent Release	-			●	
Plug-in Design	-			●	
Withdrawable Design	-			●	
Connection - Front / Rear	● / ●			● / ●	
Connection - Busbars / Cable Lugs / Cables	● / ● / ●			● / ● / ●	
Potential Terminals	●			●	
Switches - Auxiliary / Relative / Signal / Early	● / - / ● / -			● / ● / ● / ●	
Shunt Trip	●			●	
Undervoltage Release / with Early Contact	● / -			● / ●	
Hand Drive / with Adjustable Lever	● / ●			● / ●	
Motor Drive / with Counter of Cycles	● / -			● / ●	
Lever with Locking	●			●	
Mechanical Interlocking - for Hand Drive / with Bowden Cable	● / -			● / ●	
Terminal Cover IP20	●			●	

● Available / - Unavailable

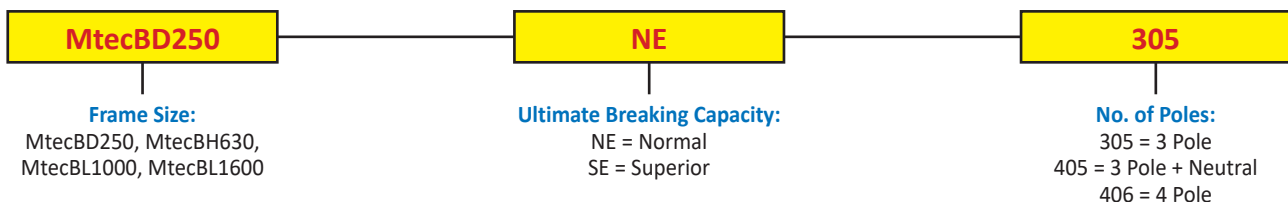
<sup>1)</sup> In case circuit breaker connection is reversed (input terminals 2, 4, 6, output terminals 1, 3, 5)  $I_{cu}$  does not change.

<sup>2)</sup> Neutral Pole is early make / late break.



MtecBH630		MtecBL1000	MtecBL1600
630A		1000A	1600A
max. 690 Vac		max. 690 Vac	max. 690 Vac
50/60Hz		50/60Hz	50/60Hz
A		A, B	A, B
36kA / 415 Vac		-	-
65kA / 415 Vac		65kA / 415 Vac	65kA / 415 Vac
8kA / 50ms, 7kA / 300ms, 6.5kA / 1s		15kA / 1s	20kA / 1s
3	4	3	3
140 x 275 x 105mm	185 x 275 x 105mm	210 x 350 x 135mm	210 x 350 x 135mm
-	-	-	-
•	-	-	-
•	-	-	-
•	-	•	•
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## Mtec Ordering Scheme



## Step 2: Overcurrent Releases (Choose DTV3, MTV8 or M001)

### MtecBC160 Electronic Release

The MtecBC160 is the smallest in our Mtec range of Moulded Case Circuit Breakers. It differs from the rest of the range in that, while it is still an electronically controlled breaker with an adjustable range, it has an inbuilt electronic release which is available in a number of different current ratings. This means that when ordering the BC160 you will need to specify the current rating within the part code.

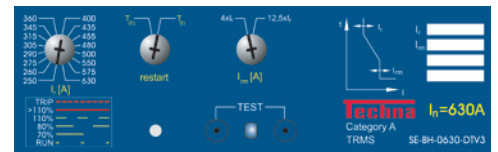
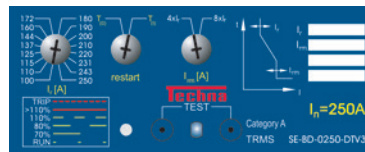
For more information see page 72.

### Mtec DTV3 Electronic Release

The Mtec DTV3 Series of Electronic Releases is designed for protection of cables and distribution systems supplied by a transformer.

Basic adjustments to tripping characteristics are made simple with rotary controls on the front panel. Rated overload current can be set from 40% to 100% of nominal current and the short-circuit trip current can also be modified.

Optional thermal memory simulation delays reset after thermal overload to allow the system to return to a safe operating temperature. Three nominal current ratings are available for each frame size.



Model Number	MtecSE-BD-[xxxx]-DTV3			MtecSE-BH-[xxxx]-DTV3		
For use with	MtecBD250			MtecBH630		
Rated Current in (A) [xxxx]	0100	0160	0250	0250	0400	0630
Overload Trip Current Ir (A)	40 - 100	63 - 160	100 - 250	100 - 250	160 - 400	250 - 630
Short Circuit Trip Current I <sub>rm</sub> (A)	4 x Ir / 8 x Ir			4 x Ir / 12.5 x Ir		
Thermal Memory Simulation	✓	✓	✓	✓	✓	✓
LED Status Indication	✓	✓	✓	✓	✓	✓



Model Number	MtecSE-BL-J[xxxx]-DTV3			MtecSE-BL-[xxxx]-DTV3		
For use with	MtecBL1000			MtecBL1600		
Rated Current in (A) [xxxx]	0315	0800	1000	0630	1000	1600
Overload Trip Current Ir (A)	125 - 315	315 - 800	400 - 1000	250 - 630	400 - 1000	630 - 1600
Short Circuit Trip Current I <sub>rm</sub> (A)	500 - 5000	1000 - 12000	1250 - 15000	800 - 1000	1250 - 15000	2000 - 20000
Thermal Memory Simulation	✓	✓	✓	✓	✓	✓
LED Status Indication	✗	✗	✗	✗	✗	✗

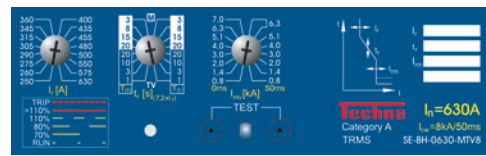
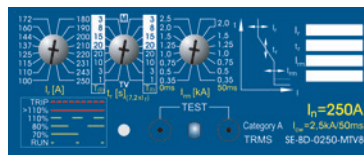
**NOTE:** Trip curves available on request.

## Mtec MTV8 Electronic Release

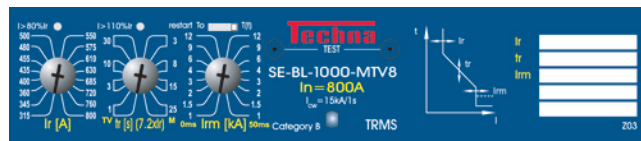
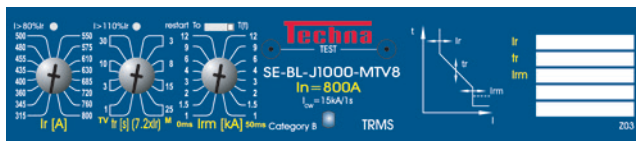
The Mtec MTV8 Series of Electronic Releases is designed for protection of cables, motors and distribution systems supplied by a transformer or generator set.

Fine-tuning of all tripping characteristics is made simple with rotary controls on the front panel. Rated overload current can be set from 40% to 100% of nominal current. Short circuit trip current is fully adjustable and can be delayed by 50ms if required. In addition, the MTV8 Series offers a choice of specially calibrated trip curves to protect motors and transformers. When motor characteristics are set, the device also protects against phase failure, tripping if one or two phases fail for longer than 4s.

Optional thermal memory simulation delays reset after thermal overload to allow the system to return to a safe operating temperature. Three nominal current ratings are available for each frame size.



Model Number	MtecSE-BD-[xxxx]-MTV8			MtecSE-BH-[xxxx]-MTV8			
For use with	MtecBD250			MtecBH630			
Rated Current in (A) [xxxx]	0100	0160	0250	0250	0400	0630	
Overload Trip Current Ir (A)	40 - 100	63 - 160	100 - 250	100 - 250	160 - 400	250 - 630	
Overload Trip Time	TV Characteristic	1 / 3 / 10 / 20			1 / 3 / 10 / 20		
	M Characteristic	3 / 8 / 15 / 20			3 / 8 / 15 / 20		
Short Circuit Trip Current I <sub>rm</sub> (A)	0.125 - 1.5	0.2 - 2.4	0.35 - 2.5	0.32 - 3.75	0.5 - 6	0.8 - 7	
Short Circuit Trip Delay (ms)	0 / 50			0 / 50			
Thermal Memory Simulation	✓	✓	✓	✓	✓	✓	
LED Status Indication	✓	✓	✓	✓	✓	✓	



Model Number	MtecSE-BL-J[xxx]-MTV8			MtecSE-BL-[xxx]-MTV8			
For use with	MtecBL1000			MtecBL1600			
Rated Current in (A) [xxxx]	0315	0800	1000	0630	1000	1600	
Overload Trip Current Ir (A)	125 - 315	315 - 800	400 - 1000	250 - 630	400 - 1000	630 - 1600	
Overload Trip Time	TV Characteristic	1 / 3 / 10 / 30			1 / 3 / 10 / 30		
	M Characteristic	3 / 8 / 15 / 25			3 / 8 / 15 / 25		
Short Circuit Trip Current I <sub>rm</sub> (A)	0.5 - 5	1 - 12	1.25 - 15	0.8 - 10	1.25 - 15	2 - 20	
Short Circuit Trip Delay (ms)	0 / 50			0 / 50			
Thermal Memory Simulation	✓	✓	✓	✓	✓	✓	
LED Status Indication	✗	✗	✗	✗	✗	✗	

**NOTE:** Trip curves available on request.



## Mtec M001 Electronic Release

The Mtec M001 Series of Electronic Releases provides completely customisable tripping characteristics for protection of virtually any distribution application. Tripping discrimination enables optimised integration with other protection devices in the system.

Fine-tuning of all tripping characteristics is made simple with rotary controls on the front panel. Rated overload current can be set from 51% to 100% of nominal current and the short circuit trip current is fully adjustable. In addition, a time-delayed secondary trip current can be set (with optional constant  $I^2t$  if required) for discrimination between the Mtec MCCB and other protection devices in the system.

Optional thermal memory simulation delays reset after thermal overload to allow the system to return to a safe operating temperature. This release is only suitable for use with MtecBL1600 Switching Units and four nominal current ratings are available.



Model Number	MtecSE-BL-[xxxx]-M001			
For use with	MtecBL1600			
Rated Current in (A) [xxxx]	0500	0630	1000	1600
Overload Trip Current Ir (A)	255 - 500	322 - 630	510 - 1000	816 - 1600
Overload Trip Time tr at (6x Ir) (S)	2 - 30			
Secondary Trip Current Irm (A)	2 - 10 x Ir / Off			
Secondary Trip Delay Time tv (ms)	50 - 300			
Constant I <sup>2</sup> t for Secondary Trip	✓	✓	✓	✓
Short Circuit Trip Current Irm (A)	0.6 - 8	0.8 - 10	1.25 - 15	2 - 20
Thermal Memory Simulation	✓	✓	✓	✓
LED Status Indication	✗	✗	✗	✗

NOTE: Trip curves available on request.

## OR Step 3: Switch Disconnect Module (Alternative to using an Overcurrent Release)

### Mtec V001 Switch Disconnect Module

Mtec V001 Switch Disconnect Adaptors can be fitted in place of an Electronic Release to allow the switching unit to be used as a switch disconnector (with no overload or short circuit protection).



Model Number	MtecSE-BD-0250-V001	MtecSE-BH-0630-V001	MtecSE-BL-J1000-V001	MtecSE-BL-1600-V001
For use with	MtecBD250	MtecBH630	MtecBL1000	MtecBL1600
Rated Current	250A	630A	1000A	1600A
Rated Operating Voltage U <sub>e</sub>	690 Vac	690 Vac	690 Vac	690 Vac
	440 Vdc	440 Vdc	440 Vdc	440 Vdc
Utilization Category (Switching Mode)	AC-23B	AC-23B	AC-23B	AC-23B
	DC-23B	DC-23B	DC-23B	DC-23B

## Step 4/5: Accessories for MtecBD250 & MtecBH630

### Contact Blocks

	Function	Contact Arrangement	Fits Cavity
MtecPS-BHD-1000	Contact Block	1NO	1 / 2 / 3 / 4 / 5
MtecPS-BHD-0100	Contact Block	1NC	1 / 2 / 3 / 4 / 5
MtecPS-BHD-2000	Contact Block	2NO	1 / 2 / 3 / 4 / 5
MtecPS-BHD-0200	Contact Block	2NC	1 / 2 / 3 / 4 / 5
MtecPS-BHD-1100	Contact Block	1NO, 1NC	1 / 2 / 3 / 4 / 5
MtecPS-BHD-0010	Contact Block	1CO	1 / 2 / 3 / 4 / 5
MtecPS-BHD-0020	Early Make/Break Contact	2CO	10



**NOTE:** Contacts are silver as standard. Gold plated contacts available on request.

### Shunt Trips

	Function	Operational Voltage	Fits Cavity
MtecSV-BHD-X024	Shunt Trip	24, 40, 48 Vac/dc	10
MtecSV-BHD-X110	Shunt Trip	110 Vac/dc	10
MtecSV-BHD-X230	Shunt Trip	230, 400, 500 Vac / 220 Vdc	10



### Undervoltage Releases

	Function	Operational Voltage	Fits Cavity
MtecSP-BHD-X024	Undervoltage Release	24, 40, 48 Vac/dc	10
MtecSP-BHD-X110	Undervoltage Release	110 Vac/dc	10
MtecSP-BHD-X230	Undervoltage Release	230, 400, 500 Vac / 220 Vdc	10
MtecSP-BHD-X024-0001	Undervoltage Release with Early Contacts	24, 40, 48 Vac/dc	10
MtecSP-BHD-X110-0001	Undervoltage Release with Early Contacts	110 Vac/dc	10
MtecSP-BHD-X230-0001	Undervoltage Release with Early Contacts	230, 400, 500 Vac / 220 Vdc	10



### Cavities Table

Switch Cavity	Switch Name	Function
1	Signal	Signals tripping of breaker by overcurrent release
2	Relative	Signals tripping of breaker by overcurrent release, TEST Button, or OFF button on motor drive
3	Auxiliary	Indicates position of the main contacts
4	Auxiliary	Indicates position of the main contacts
5	Auxiliary	Indicates position of the main contacts
10	Multi-Function	Function depends on inserted module (shunt trip, undervoltage release or early make/break contact)



## Step 4/5: Accessories for MtecBL1000 & MtecBL1600

Contact Blocks			
	Function	Contact Arrangement	Fits Cavity
MtecPS-BL-2200	Contact Block	2NO, 2NC	1 / 2 / 3 / 4



**NOTE:** Contacts are silver as standard. Gold plated contacts available on request.

Shunt Trips			
	Function	Operational Voltage	Fits Cavity
MtecSV-BL-X024	Shunt Trip	24 Vac/dc	5
MtecSV-BL-X048	Shunt Trip	48 Vac/dc	5
MtecSV-BL-X110	Shunt Trip	110 Vac/dc	5
MtecSV-BL-X230	Shunt Trip	230 Vac / 220 Vdc	5
MtecSV-BL-X400	Shunt Trip	400 Vac	5
MtecSV-BL-X500	Shunt Trip	500 Vac	5



























Undervoltage Releases			
	Function	Operational Voltage	Fits Cavity
MtecSP-BL-X024	Undervoltage Release	24 Vac/dc	5
MtecSP-BL-X048	Undervoltage Release	48 Vac/dc	5
MtecSP-BL-X110	Undervoltage Release	110 Vac/dc	5
MtecSP-BL-X230	Undervoltage Release	230 Vac / 220 Vdc	5
MtecSP-BL-X400	Undervoltage Release	400 Vac	5
MtecSP-BL-X500	Undervoltage Release	500 Vac	5



Cavities Table		
Switch Cavity	Switch Name	Function
1, 2	Auxiliary	Indicates position of the main contacts
3, 4	Relative	Signals tripping of breaker by overcurrent release, TEST Button, or OFF button on motor drive
5	Multi-Function	Function depends on inserted module (shunt trip or undervoltage release)




















**NOTE:** For Accessories for the new MtecBC160, please contact us for more information.

## Step 6/7/8: Rotary Controls, Motor Drives & Accessories

Switching Unit		MtecBD250	MtecBH630	MtecBL1000S/1600
Rotary Adaptor, Lockable (Mounts directly to front of MCCB)	Blue Panel			
		MtecRP-BD-CK20	MtecRP-BH-CK20	MtecRP-BL-CK10
	Yellow Panel			
		MtecRP-BD-CK21	MtecRP-BH-CK21	
Optional Door Interlock, IP66 (Mounts to front of switch panel)	Black Panel			
		MtecRP-BHD-CN20		MtecRP-BL-CN10
	Yellow Panel			
		MtecRP-BHD-CN21		
Optional Shaft for Door Interlock (Extends to front of switch panel)	≤365mm			
		MtecRP-BHD-CH10		MtecRP-BL-CH10
	Telescopic (245mm to 410mm)			
		MtecRP-BHD-CH20		
Rotary Handle, Lockable	Black			
		MtecRP-BHD-CP20		MtecRP-BL-CP10
	Red			
		MtecRP-BHD-CP21		MtecRP-BL-CP11
Optional Mechanical Interlock (To interlock 2 x MCCBs)	Inverse (One On / One Off)			
		MtecRP-BHD-CB10		MtecRP-BL-CB10
	Parallel (Switch On / Off Together)			
		MtecRP-BHD-CD10		
Optional Motor Drive, with Operations Counter (Instead of Rotary Handle)	110Vac/dc			
		MtecMP-BD-X110-P	MtecMP-BH-X110-P	MtecMP-BL-X110-P
	220-240Vac 220Vdc			
		MtecMP-BD-X230-P	MtecMP-BH-X230-P	MtecMP-BL-X230-P

**NOTE:** For Rotary Controls, Motor Drives & Accessories for the new MtecBC160, please contact us for more information.

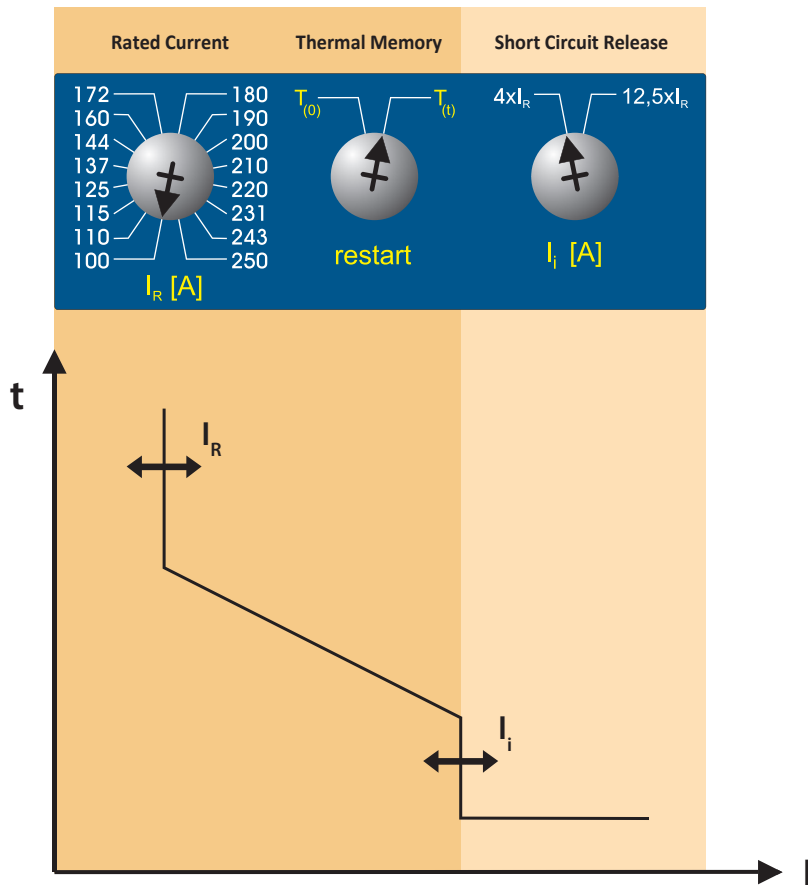
## Step 9: Termination Options

		MtecBD250	MtecBH630	MtecBL1000/1600
Busbar - Front Connection (Supplied as Standard in box with MCCB)				
		MtecCS-BD-A011	MtecCS-BH-A011	Built-in to Switching Unit
		Fits to 25mm Wide Busbar 250A	Fits to 32mm Wide Busbar 630A	
Busbar - Rear Connection				
		MtecCS-BD-A021	MtecCS-BH-A021	MtecCS-BL-A022
		Fits to 25mm Wide Busbar 250A	Fits to 32mm Wide Busbar 630A	Fits to 50mm Wide Busbar 1000A
				
				MtecCS-BL-A021 Fits to 50mm Wide Busbar 1600A
Cage Clamp				
		MtecCS-BD-T011	MtecCS-BH-T011	MtecCS-BL-2W12
		16 - 150mm <sup>2</sup> Cu Cable 250A	35 - 240mm <sup>2</sup> Cu Cable 400A	4 x (95 - 240mm <sup>2</sup> ) Cu/Al Cable 1100A
Block Clamp				
		MtecCS-BD-B011	MtecCS-BH-B012	MtecCS-BL-W011
		25 - 150mm <sup>2</sup> Cu/Al Cable 250A	25 - 150mm <sup>2</sup> Cu/Al Cable 315A	70 - 240mm <sup>2</sup> Cu/Al Cable 500A
				
		MtecCS-BH-B011 150 - 240mm <sup>2</sup> Cu/Al Cable 630A		
Double Block Clamp				
		MtecCS-BD-B021	MtecCS-BH-B022	MtecCS-BL-W010
		2 x (25 - 150mm <sup>2</sup> ) Cu/Al Cable 250A	2 x (25 - 150mm <sup>2</sup> ) Cu/Al Cable 500A	2 x (70 - 240mm <sup>2</sup> ) Cu/Al Cable 800A
				
		MtecCS-BD-B022	MtecCS-BH-021	
	2 x (150 - 240mm <sup>2</sup> ) Cu/Al Cable 250A	2 x (150 - 240mm <sup>2</sup> ) Cu/Al Cable 630A		

Alternative Options - Order as separate Kits

**NOTE:** For Connecting Sets for the new MtecBC160, please contact us for more information.

## Adjustable Parameters



### Mtec DTV3 Adjustment Guide

**Step 1:**

Set the rated current using dial marked  $I_R$  (within the range dictated by whichever Overcurrent Release has been fitted).

**Step 2:**

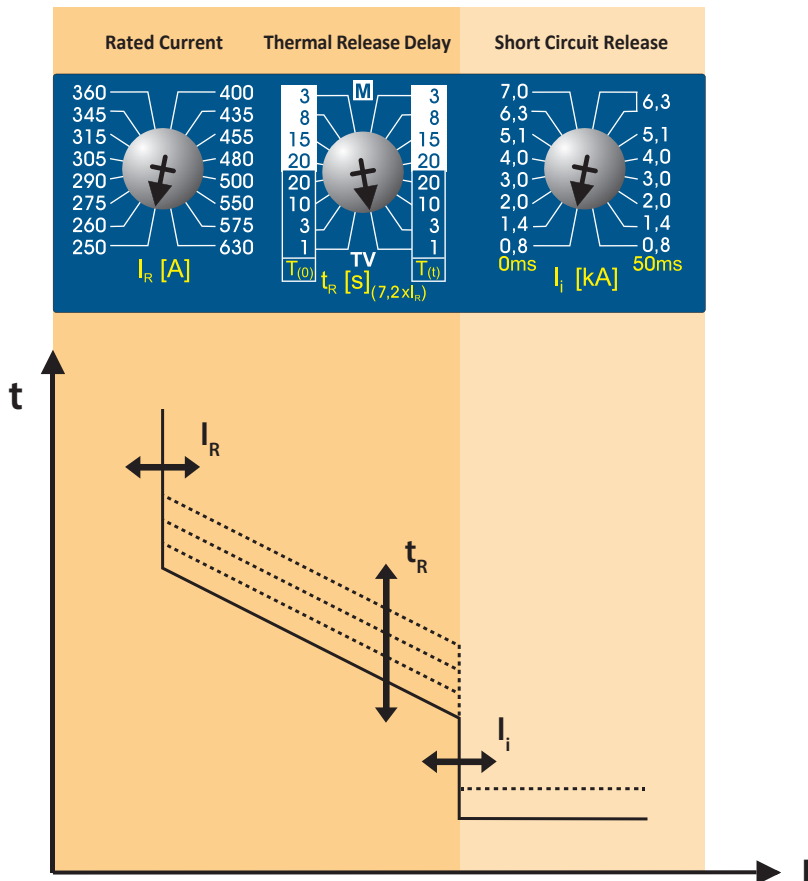
Choose whether to have Thermal Memory switched on ( $T_t$ ) or off ( $T_0$ ).

**Step 3:**

Set the Short Circuit Release Current ( $I_i$ ) as a multiple of the rated current  $I_R$ .

$I_R$  = Current Rating

$I_i$  = Short Circuit Release Current



### Mtec MTV8 Adjustment Guide

**Step 1:**

Set the rated current using dial marked  $I_R$  (within the range dictated by whichever Overcurrent Release has been fitted).

**Step 2:**

Choose the suitable mode between TV (for protection of lines, transformers and generators) and M (for motors), with Thermal Memory either active ( $T_t$ ) or inactive ( $T_0$ ), and then set the Thermal Release Delay required.

**Step 3:**

Set the Short Circuit Release Current ( $I_i$ ) either with or without a 50ms time delay.

$I_R$  = Current Rating

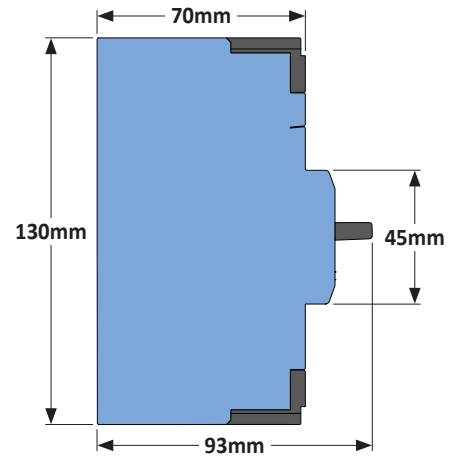
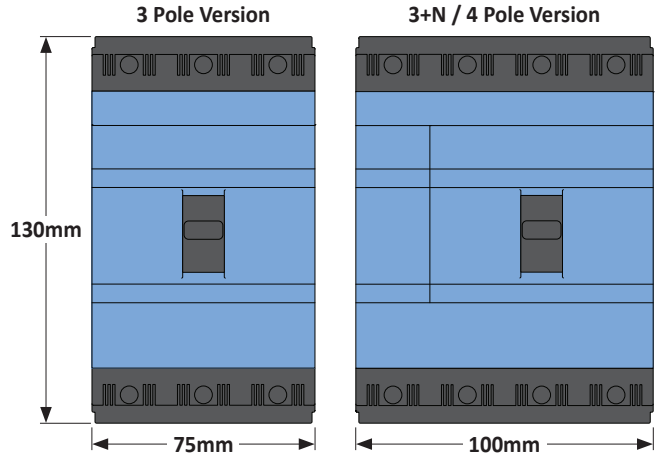
$t_R$  = Thermal Release Delay

$I_i$  = Short Circuit Release Current

## Mtec BC160 Moulded Case Circuit Breakers

### Up to 160A

Mtec MCCBs

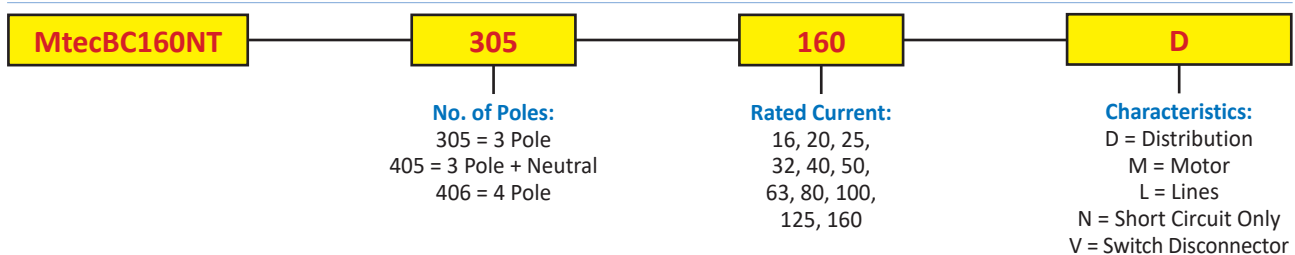


The BC160 is the smallest of our Mtec range of Moulded Case Circuit Breakers, it is an electronically controlled breaker with an adjustable range, available in a number of different current ratings. Rated to work at a maximum 690Vac and capable of handling up to 160A. Mountable either by screws or an optional DIN-Rail adaptor (MtecOD-BC-DIN1) and with a large variety of accessories available, from Shunt Trips and Undervoltage Releases to Residual Current Devices and Side Mounting Motor Drives.

### Mtec BC160 Technical Specification

	3 Pole	3+N / 4 Pole
Rated Current ( $I_n$ )	16 - 160A	
Rated Normal Current ( $I_u$ )	16 - 160A	
Rated Operating Voltage ( $U_e$ )	max. 690 Vac	
	max. 250 Vdc	max. 440 Vdc
Rated Frequency	50/60Hz	
Rated Impulse Withstand Voltage ( $U_{imp}$ )	8kV	
Rated Insulation Voltage ( $U_i$ )	690V	

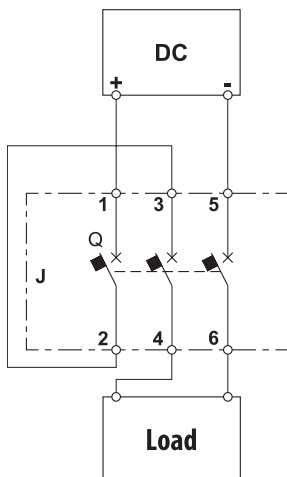
### Mtec BC160 Ordering Scheme



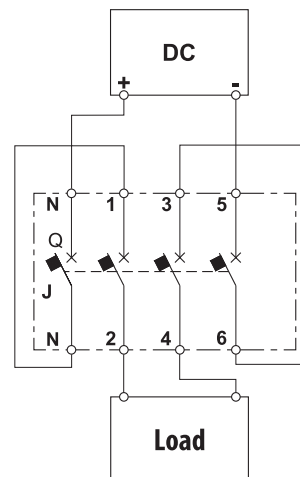
## Mtec BC160 Technical Specification

	3 Pole	3+N / 4 Pole
Utilisation Category (Switching Mode)	AC-3 (16 - 100A)	
	AC-2 (125 - 160A)	
	DC-22A	
Rated Short Circuit Ultimate Breaking Capacity (rms) ( $I_{cu} / U_e$ )	6kA / 690 Vac	
	12kA / 500 Vac	
	25kA / 415 Vac	
	40kA / 230 Vac	
	25kA / 250 Vdc	20kA / 440 Vdc
Off Time at $I_{cu}$	7ms	
Rated Short Circuit Service Breaking Capacity (rms) ( $I_{cs} / U_e$ )	3kA / 690 Vac	
	6kA / 500 Vac	
	13kA / 415 Vac	
	20kA / 230 Vac	
	13kA / 250 Vdc	13kA / 440 Vdc
Rated Short Circuit Making Capacity (Peak Value) ( $I_{cm} / U_e$ )	52kA / 415 Vac	
Losses per 1 Pole at $I_n = 160A$	15W	
Mechanical Endurance	20000 Cycles	
Electrical Endurance ( $U_e = 415Vac$ )	6000 Cycles	
Switching Frequency	120 Cycles/hr	
Degree of Protection from Front Panel	IP40	
Degree of Protection of Terminals	IP20	
Reference Ambient Temperature	40°C	
Ambient Temperature Range	-40°C to +55°C	
Pollution Degree	3	
Weight	1kg	1.3kg
Standards	EN 60947-2, IEC 60947-2	

## Mtec BC160 DC Wiring Diagrams



Connection of 3P Circuit Breaker in DC circuit up to 250Vdc.



Connection of 4P Circuit Breaker in DC circuit up to 440Vdc.