



# Moulded Case Circuit Breakers

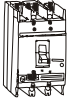
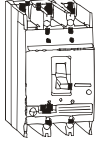
Type DH / DL / DG / DM



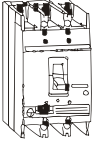
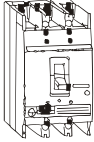


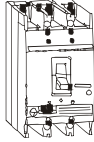
## PRODUCT HIGHLIGHTS

- Current Range 0.63 A to 800 A
- 1, 2, 3 and 4 pole version
- Normal, Standard and High breaking capacities upto 65 kA
- All MCCBs are current limiting with very low let through and cut-off
- Operating mechanism is quick make, quick break and trip free. It is independent of manual speed of operations
- The entire current carrying path is designed to ensure very low power loss per pole
- Adjustable overload releases for the entire range
- Suitable for both AC and DC applications
- Terminals suitable for both copper & aluminium terminations.
- "Push to trip" facility to verify healthiness of mechanism.
- Wide range of site fittable accessories.
- New Rotary Operating Mechanisms for DH MCCBs are of adjustable shaft length , to take panel depth variations gives clear ON / OFF / TRIP indication allows use in same quadrant of operation allows keylocking or padlocking in OFF position with door interlock
- No line load bias.
- Housing is made of heat resistant insulating material.
- Contacts are of silver alloy to have high electrical life. The mechanism is so designed that there is no arcing on the current carrying part of the contact. The strong "wipe action" of the contact system keeps the contact surface clean of oxide films.

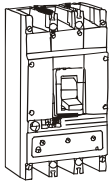
## TECHNICAL DATA

Rating		16 A	100 A			
						
<b>Type</b>		<b>DM</b>	<b>DH</b>	<b>DL</b>	<b>DM</b>	
		Motor Duty	Standard Breaking Capacity	High Breaking Capacity	Motor Duty	
<b>Poles</b>		3	3 / 4	3   4	3	
<b>Ratings (A)</b>		0.63,1,1.6,2.5,4,5,6,3,7.5,10,12,16	16,20,25,32,40,50,63,80,100	16,20,25,32,40,50,63,80,100	16,25,30,35,50,60,70,80	
<b>Rated Operational Voltage U<sub>e</sub> (V)</b>		415	415	415	415	
<b>Rated Insulation Voltage U<sub>i</sub> (V)</b>		690	750	750	750	
<b>Rated Impulse Voltage (kV)</b>		-	8	8	8	
<b>Operating Frequency (Hz)</b>		50 / 60	50 / 60	50 / 60	50 / 60	
<b>Rated S.C. Making Capacity at 415 V I<sub>cm</sub> (kA)</b>		105	52.5	143	143	
<b>Rated Ultimate S.C. Breaking Capacity I<sub>cu</sub> (kA)</b>	660 V	10	5	10   10	10	
	550 V	25	12	25   16	25	
	500 V	35	16	35   25	35	
	<b>415 V</b>	<b>50</b>	<b>25</b>	<b>65   50</b>	<b>50</b>	
	380 V	50	25	65   50	50	
	240 V	85	50	85   65	65	
<b>Rated Service S.C. Breaking Capacity at 415 V I<sub>cs</sub> (kA) as % of I<sub>cu</sub></b>		100% (50 kA)	100% (25 kA)	75% (50 kA)   100%	100% (50 kA)	
<b>DC Breaking Capacity (kA) at (L/R ≤ 15ms)</b>	110 V	-	16	50	-	
	250 V	-	10	25	-	
	with 3 Poles in series	250 V	-	16	40	-
	with midpoint grounded	500 V	-	10	25	-
<b>Capacitor Rating at 415 V, 50 Hz (kVAR)</b>		-	5,8,10,13,15,20,25,25,35	5,8,10,13,15,20,25,25,35,50	-	
<b>Mechanical Life</b>		**	30000	30000	**	
<b>Electrical Life</b>		**	10000	10000	**	
<b>Utilisation Category</b>						
<b>Operating Temperature °C</b>						
<b>Pollution Degree</b>						
<b>Release Type</b>		Magnetic	Thermal - Magnetic	Thermal - Magnetic	Magnetic	
<b>Overload Release Setting</b>		-	80 - 100%	80 - 100%	-	
<b>Short Circuit Release Setting (+/-20%)</b>		12*I <sub>n</sub>	9*I <sub>n</sub>	9*I <sub>n</sub>	12*I <sub>n</sub>	
<b>Terminal Capacity (Cables) mm<sup>2</sup></b>		-	50	50	50	
<b>(Link) mm</b>		10	16	16	16	
<b>Weight (kg)</b>		1	1.7	1.7	1.7	
<b>Dimensions</b>	H	130	157	157	157	
	W	75	90 / 120	90 / 120	90	
	Without Knob	D	105	87	87	
	With Knob	D	124	104	104	

\*\* Data on request

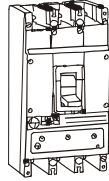
125 A		160 A			200 A	
						
DH	DH	DL	DM	DH	DL	
Standard Breaking Capacity	Standard Breaking Capacity	High Breaking Capacity	High Breaking Capacity	Standard Breaking Capacity	High Breaking Capacity	
3 / 4	3 / 4	3	3	3	3	
16,20,25,32,40,50,63,80,100, 125	160	100,125,160	100,120,160	200	200	
415	415	415	415	415	415	
750	750	750	750	750	750	
8	8	8	8	8	8	
50 / 60	50 / 60	50 / 60	50 / 60	50 / 60	50 / 60	
73.5	73.5	143	143	73.5	143	
10	7	10	10	7	10	
18	18	25	25	18	25	
35	35	35	35	25	35	
<b>35</b>	<b>35</b>	<b>65</b>	<b>50</b>	<b>35</b>	<b>65</b>	
35	35	65	50	35	65	
60	60	85	65	60	85	
100% (35 kA)	75% (27 kA)	75% (50 kA)	100% (50 kA)	50% (18 kA)	100% (50 kA)	
16	16	50	-	16	50	
10	10	25	-	10	25	
16	16	40	-	16	40	
10	10	25	-	10	25	
5,8,10,13,15,20,25,25,35,50	70	35,50,70	-	50,70,70	80	
22000	22000	20000	**	22000	20000	
7500	7000	5000	**	7000	5000	
Thermal - Magnetic	Thermal - Magnetic	Thermal - Magnetic	Magnetic	Thermal - Magnetic	Thermal - Magnetic	
80 - 100%	80 - 100%	70 - 100%	-	80 - 100%	70 - 100%	
9*I <sub>n</sub>	8*I <sub>n</sub>	8*I <sub>n</sub>	12*I <sub>n</sub>	6*I <sub>n</sub>	9*I <sub>n</sub>	
70	70	95	185	150	185	
25	25	36	36	30	36	
1.7	1.8	4.8	4.8	2.4	4.6	
157	215	338	338	215	338	
90 / 120	90 / 120	108	108	90	140	
87	87	104.5	104.5	87	104.5	
104	104	131.5	131.5	104	131.5	

## TECHNICAL DATA

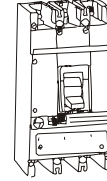
Rating		250 A		
				
Type		DH	DL	DM
		Standard Breaking Capacity	High Breaking Capacity	Motor Duty
Poles		3	3	3
Ratings (A)		200, 250, 320, 400, 500, 630	200, 250	200, 230, 250
Rated Operational Voltage Ue (V)		415	415	415
Rated Insulation Voltage Ui (V)		750	750	750
Rated Impulse Voltage (kV)		8	8	8
Operating Frequency (Hz)		50/60	50/60	50/60
Rated S.C. Making Capacity at 415 V Icm (kA)		73.5	143	105
Rated Ultimate S.C. Breaking Capacity Icu (kA)	660 V	7	10	10
	550 V	18	25	25
	500 V	25	35	35
	<b>415 V</b>	<b>35</b>	<b>65</b>	<b>50</b>
	380 V	35	65	50
	240 V	60	85	65
Rated Service S.C. Breaking Capacity at 415 V Ics (kA) as % of Icu		100% (35 kA)	75% (35 kA)	100% (50 kA)
DC Breaking Capacity (kA) at	110 V	35	35	-
(L/R <= 15ms) with 3 Poles in series with midpoint grounded	250 V	25	25	-
	250 V	40	40	-
	500 V	25	25	-
Capacitor Rating at 415 V, 50 Hz (kVAR)		80 100	80 100	-
Mechanical Life		18000	18000	**
Electrical Life		15000	15000	**
Utilisation Category				
Operating Temperature °C				
Pollution Degree				
Release Type		Thermal - Magnetic	Thermal - Magnetic	Magnetic
Overload Release Setting		80 - 100%	80 - 100%	-
Short Circuit Release Setting (+/-20%)		6*I <sub>n</sub>	6*I <sub>n</sub>	12*I <sub>n</sub>
Terminal Capacity (Cables) mm <sup>2</sup>		300	300	300
(Link) mm		40	40	40
Weight (kg)		5.2	5.2	5.2
Dimensions	H	266	266	266
	W	140	140	140
	Without Knob D	105	105	105
	With Knob D	137	137	137

\*\* Data on request

## 400 A



## 630 A



DH	DL	DM	DH	DL
Standard Breaking Capacity	Standard Breaking Capacity	Motor Duty	Standard Breaking Capacity	High Breaking Capacity
3	3	3	3	3
320, 400	320, 400	275, 325, 350, 400	500, 630	500, 630
415	415	415	415	415
750	750	750	750	750
8	8	8	8	8
50/60	50/60	50/60	50/60	50/60
73.5	143	105	73.5	105
7	10	10	7	10
18	25	25	18	25
25	35	35	25	35
<b>35</b>	<b>65</b>	<b>65</b>	<b>35</b>	<b>50</b>
35	65	65	35	50
60	85	85	60	65
100% (35 kA)	75% (50 kA)	75% (50 kA)	100% (35 kA)	100% (50 kA)
35	35	-	35	35
25	25	-	25	25
40	40	-	40	40
25	25	-	25	25
120 160	120 160	-	120 160	120 160
18000	18000	**	15000	15000
12000	12000	**	2500	2500
A				
-5 to +55				
III				
Thermal - Magnetic	Thermal - Magnetic	Magnetic	Thermal - Magnetic	Thermal - Magnetic
80 - 100%	80 - 100%	-	80 - 100%	80 - 100%
6*In	6*In	12*In	6*In	6*In
300	300	300	400	400
40	40	40	40	40
5.2	5.2	5.2	6	6
266	266	266	266	266
140	140	140	140	140
105	105	105	105	105
137	137	137	137	137

## ACCESSORIES

### INTERNAL ACCESSORIES AUXILIARY CONTACT

The auxiliary contact is used for remote signaling and control purposes. This consists of one or two potential free change over contacts.



AUXILIARY CONTACT



UNDER VOLTAGE  
RELEASE

### EXTERNAL ACCESSORIES

The Trip alarm contact gives tripping indication once the MCCB trips. The potential free change-over contacts can be used for indication or for control circuit.



SHUNT RELEASE



TRIP ALARM CONTACT





## EARTH FAULT MODULE

Earth Fault Modules Type GF1, GF2 and GF11. These modules are to be used with MCCBs for earth fault protection. The principle of operation is based on detection of the residual current in the system. They combine safety and versatility, conforming to the high performance standards, the characteristic of all L&T products.



**EARTH FAULT MODULE GF1**

GF1 is suitable up to DH / DG / DM / DL 200



**EARTH FAULT MODULE GF2**

GF2 is suitable for DH / DL / DG / DM from 250 A to 400 A MCCBs



**EARTH FAULT MODULE GF11**

GF11 is suitable All MCCBs.

### FEATURES :

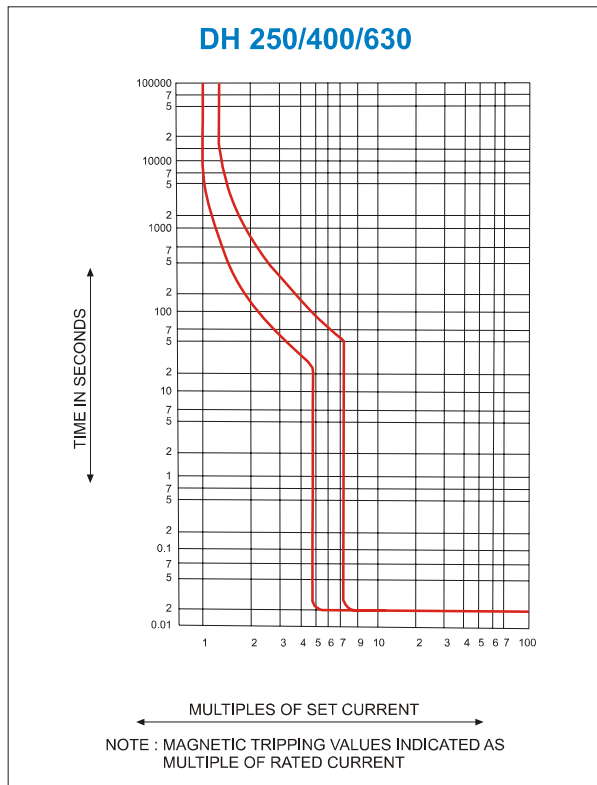
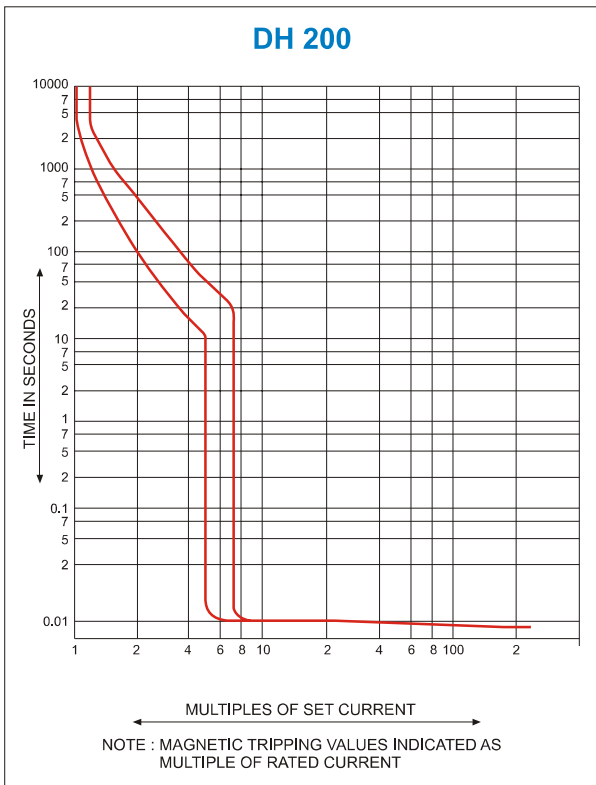
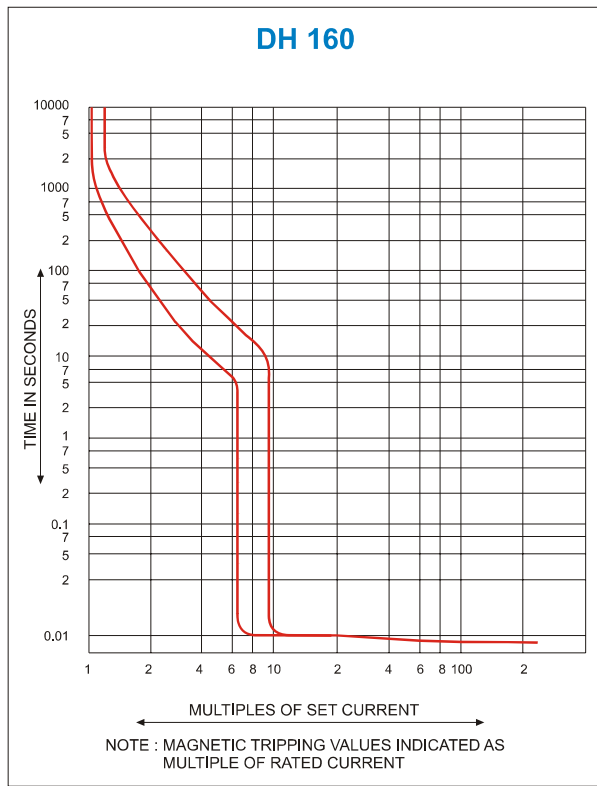
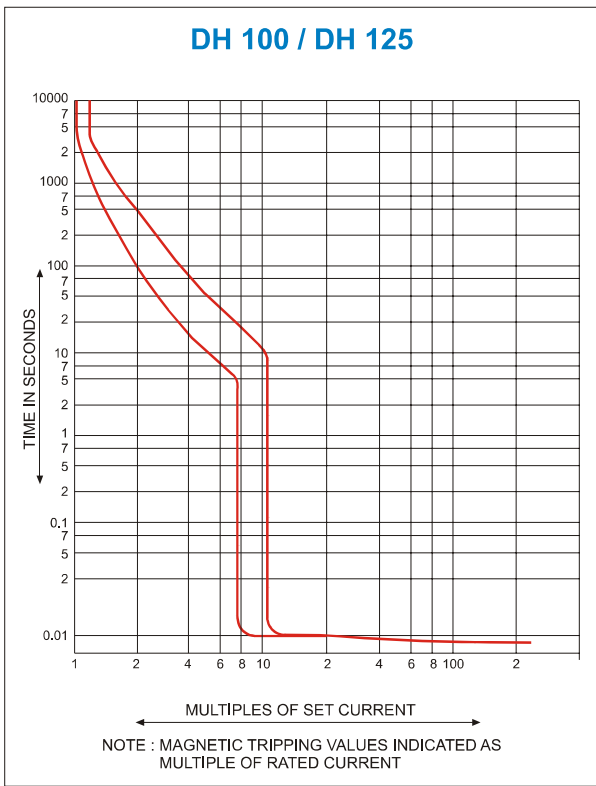
- Compact in size
- Protection against earth faults.
- Solid state design.
- Built-in moulded CBCT for GF1 & GF2. External CTs are to be used for GF11.
- Suitable for both 3 phase 3 wire & 3 Phase 4 wire systems. In case of 3 phase 4 wire system, the natural cable/twisted link should also be passed through the CBCT along with the 3 phase links / cables.
- Built-in test facility.
- Selection facility for nominal current rating (In).
- Earth fault setting is adjustable from 10% to 50% of set current
- Selectable trip times (100 ms, 200 ms).
- Manual reset for positive fault acknowledgment.
- Potential free NO contact to trip MCCB (through 240 V shunt release).
- Window dimensions suitable for Cable / Link connection in GF1 and GF2.

Note: MCCBs need to be fitted with 110 V / 240 V as shunt release for Earth Fault Module operation.

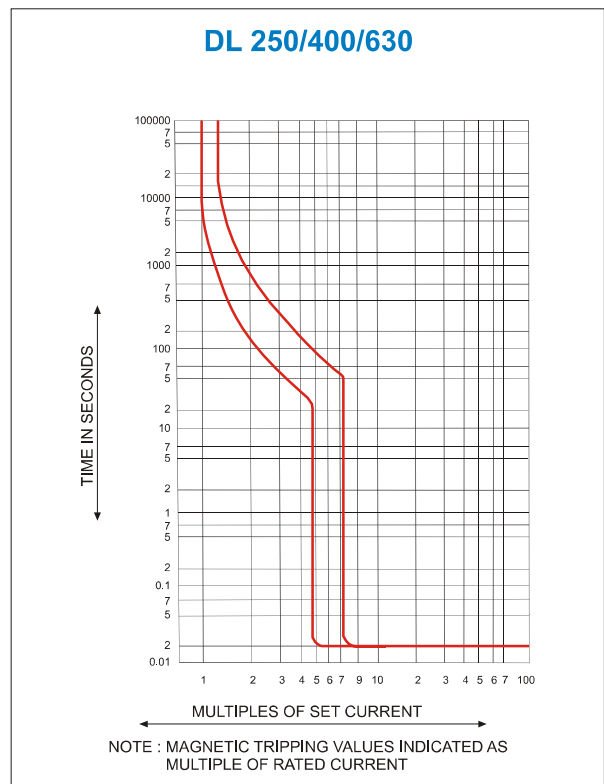
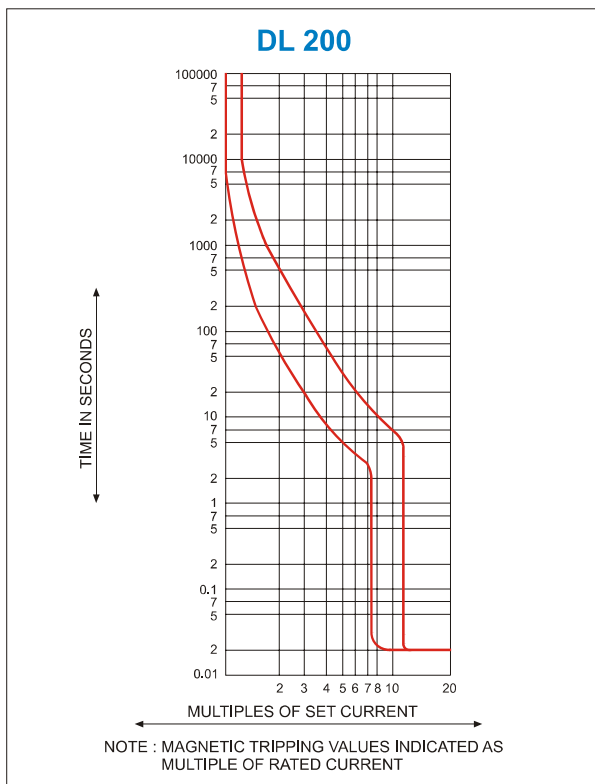
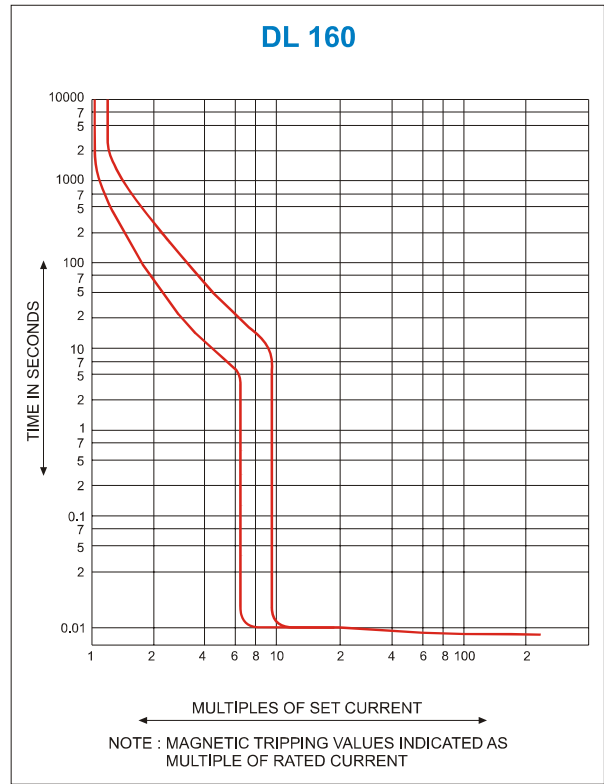
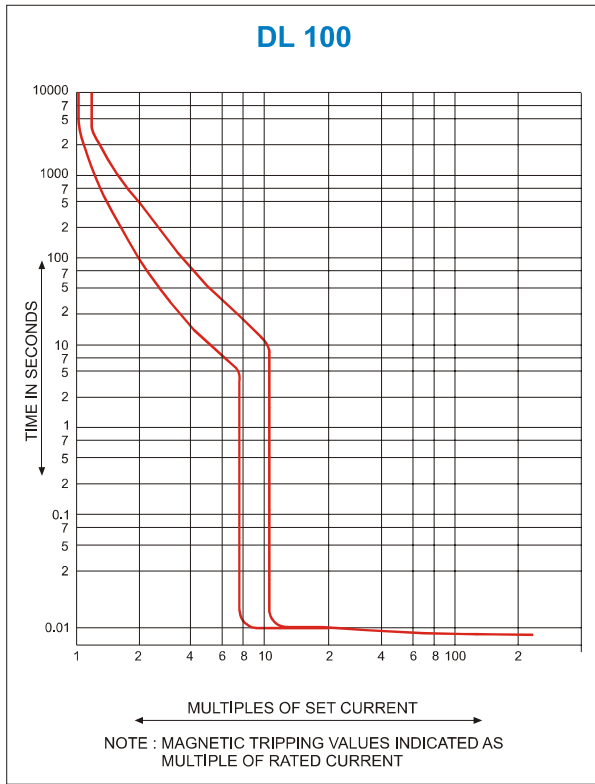
### TECHNICAL DATA

SPECIFICATION		TYPE GF1 / GF2 / GF11
1 Current Setting Range	(Is)	10% to 50% of nominal current rating (In) Continuously adjustable
2 Auxiliary Supply		240 V AC $\pm 20\%$
3 Time Delay	(ms)	100 / 200 ms Field selectable
4 Pick-up Accuracy		$\pm 10\%$ Is
5 Output Contact		1 NO contact manual reset Type contact rating 5 A 240 V AC
6 Indication		a) Power On LED b) Trip LED (manual reset)
7 Operating Temperature		+10°C to +55°C
8 Insulation		2 kV 50 Hz for one minute across independent circuit 1 kV 50 Hz for one minute across open contacts
9 Mounting		Baseplate mounting type
10 Window for Cable / Busbar entry	(mm)	<b>GF1</b> - 110 x 32 <b>GF2</b> - 165 x 61.5
11 Weight	(kg)	<b>GF1</b> - 1.2 <b>GF</b> - 2.2 <b>GF11</b> - 0.9

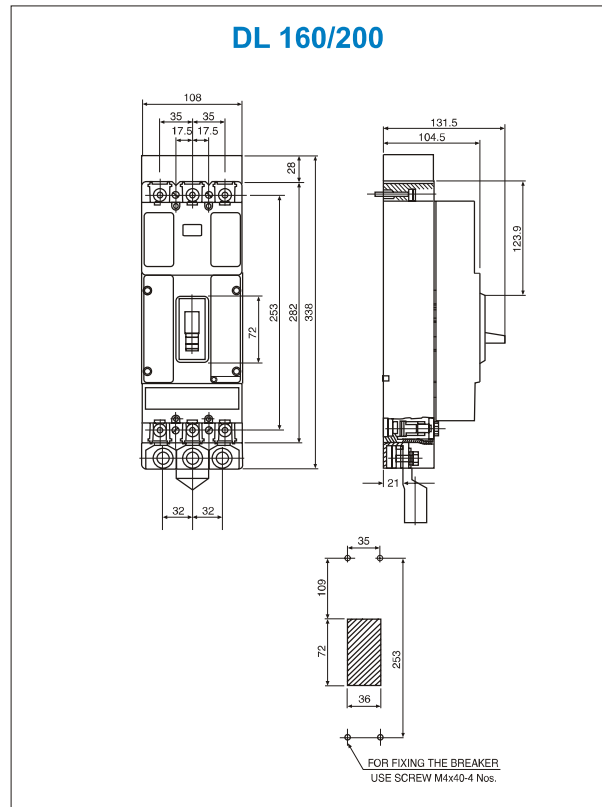
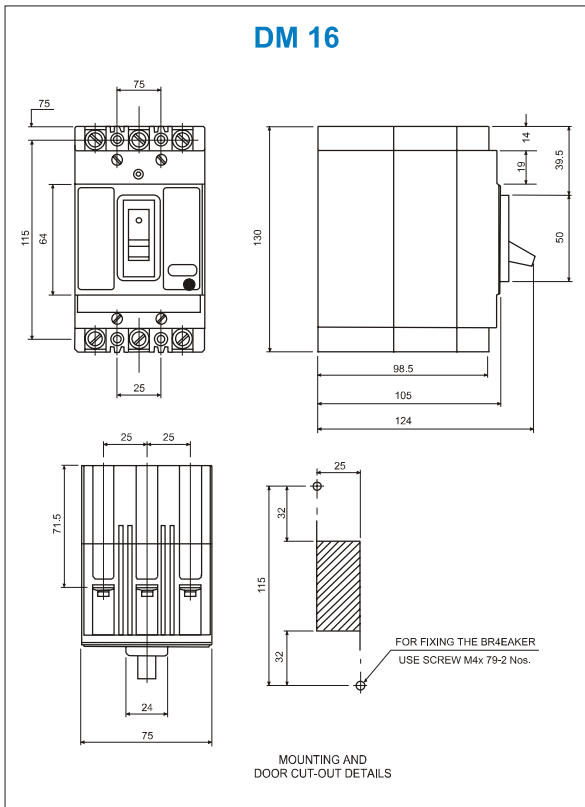
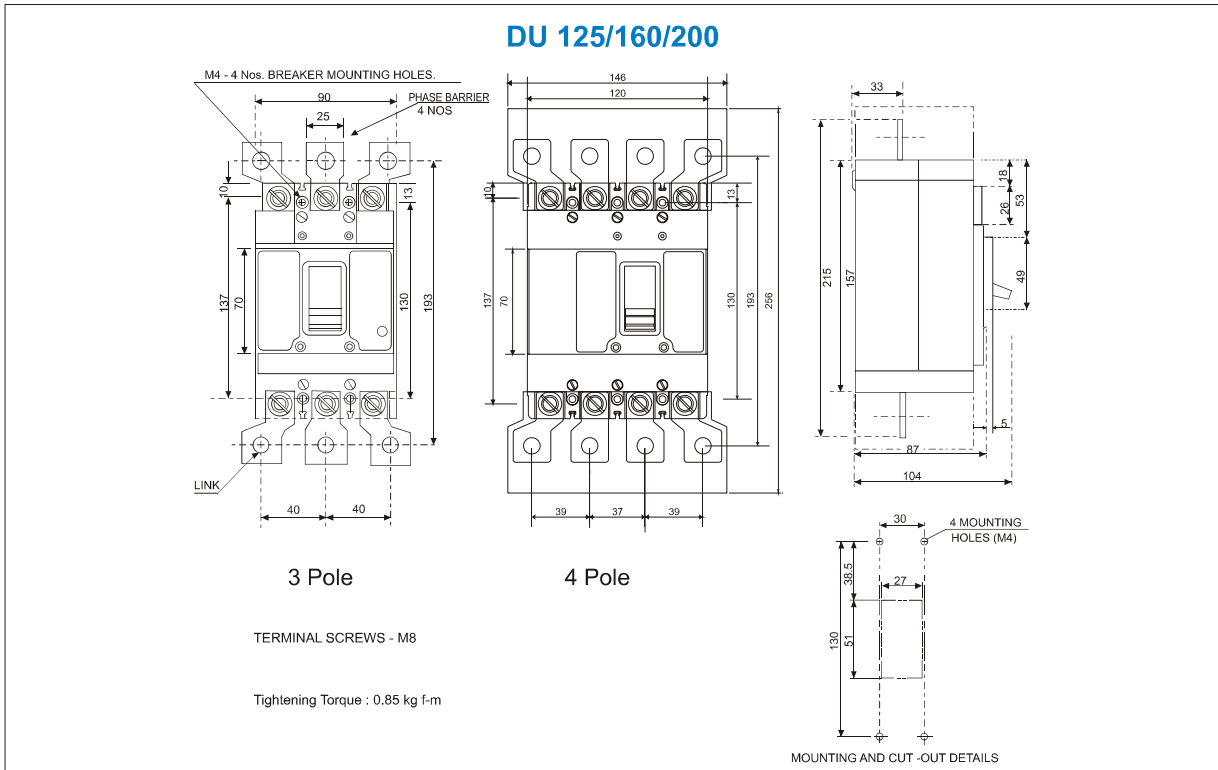
## CHARACTERISTIC CURVES TYPE DH



## CHARACTERISTIC CURVES TYPE DL



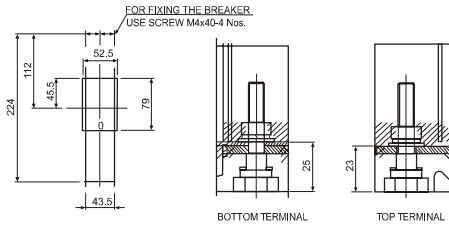
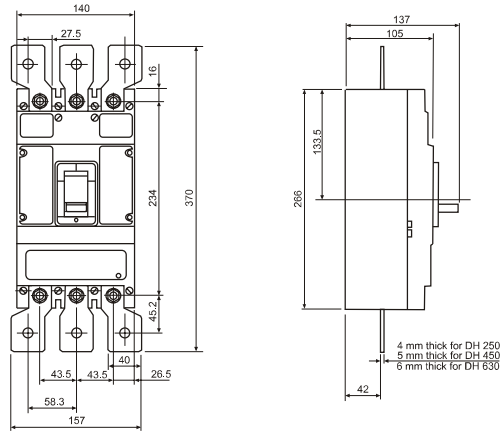
## OVERALL DIMENSIONS



ALL DIMENSIONS ARE IN mm

## OVERALL DIMENSIONS

### DH / DG / DL / DM 250/400/630

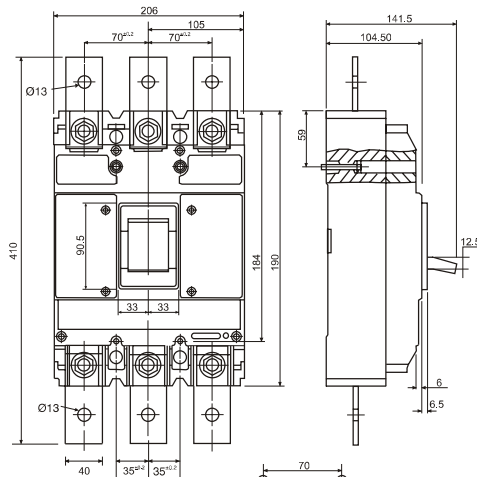


MOUNTING AND  
DOOR CUT-OUT DETAILS

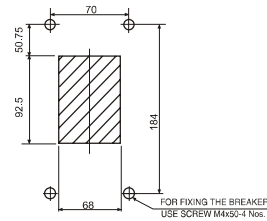
BOTTOM TERMINAL

TOP TERMINAL

### DTH 800

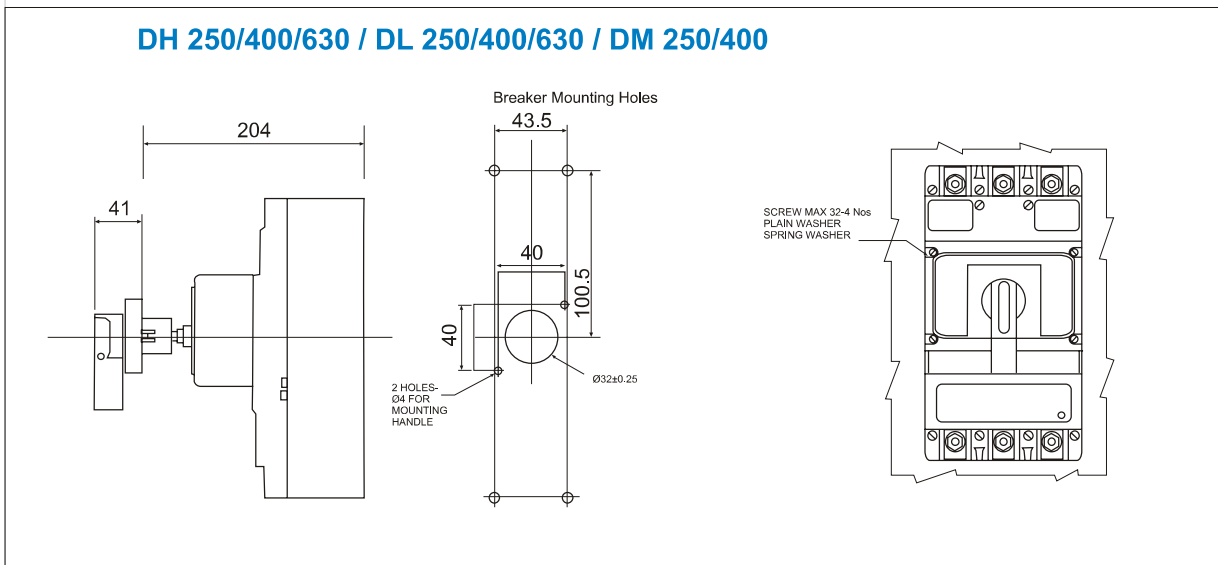
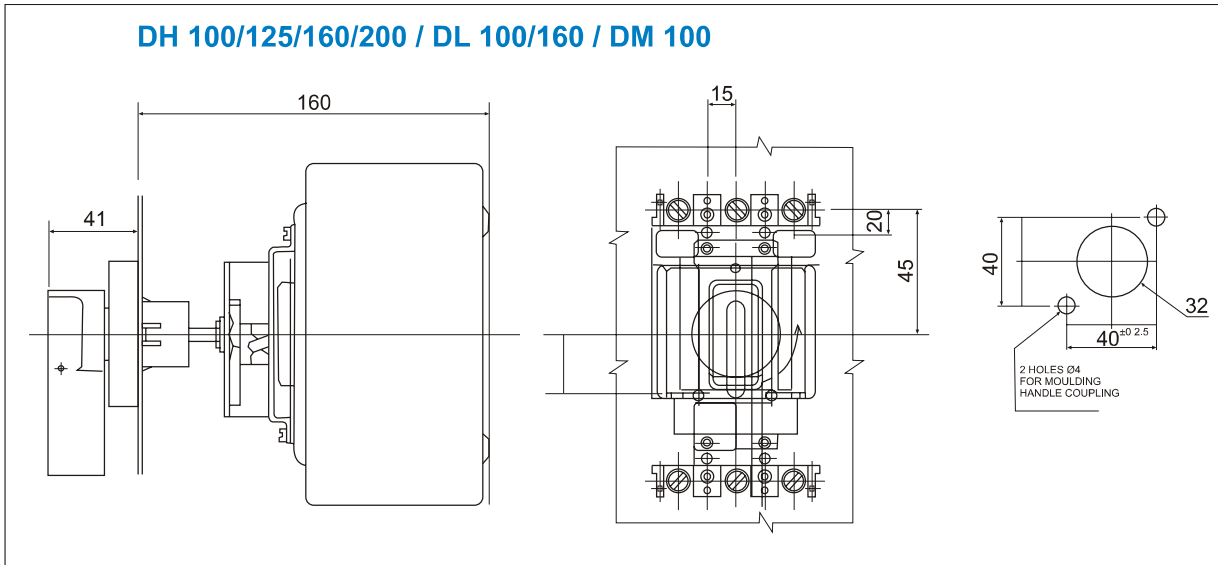


MOUNTING AND  
DOOR CUT-OUT DETAILS



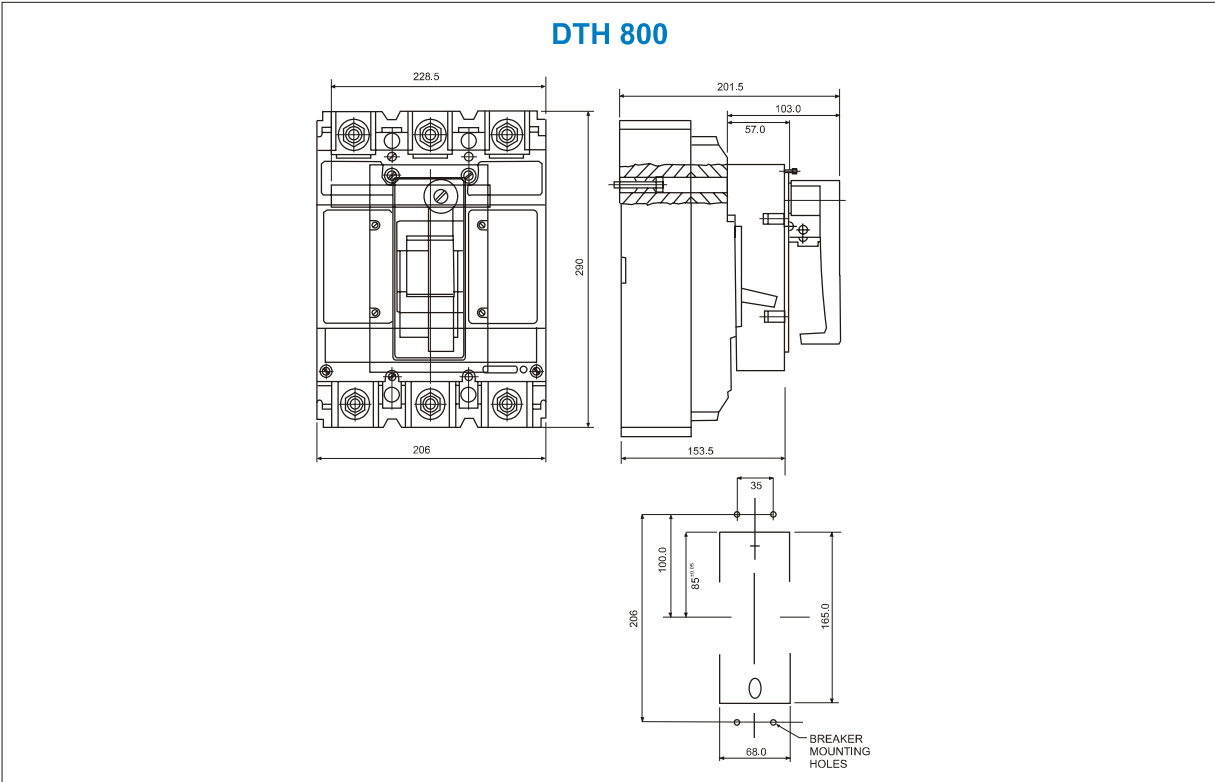
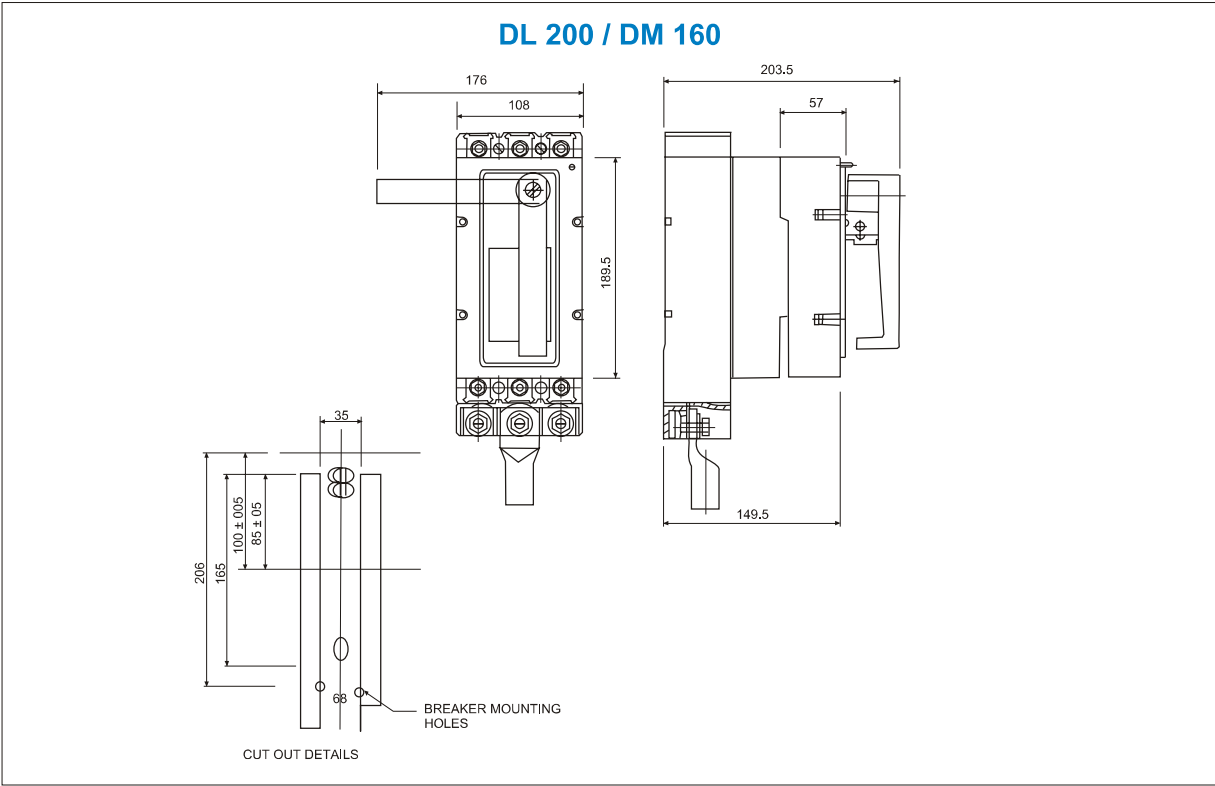
ALL DIMENSIONS ARE IN mm

## DIMENSIONAL DETAILS OF ROTARY OPERATING MECHANISM TYPE DH



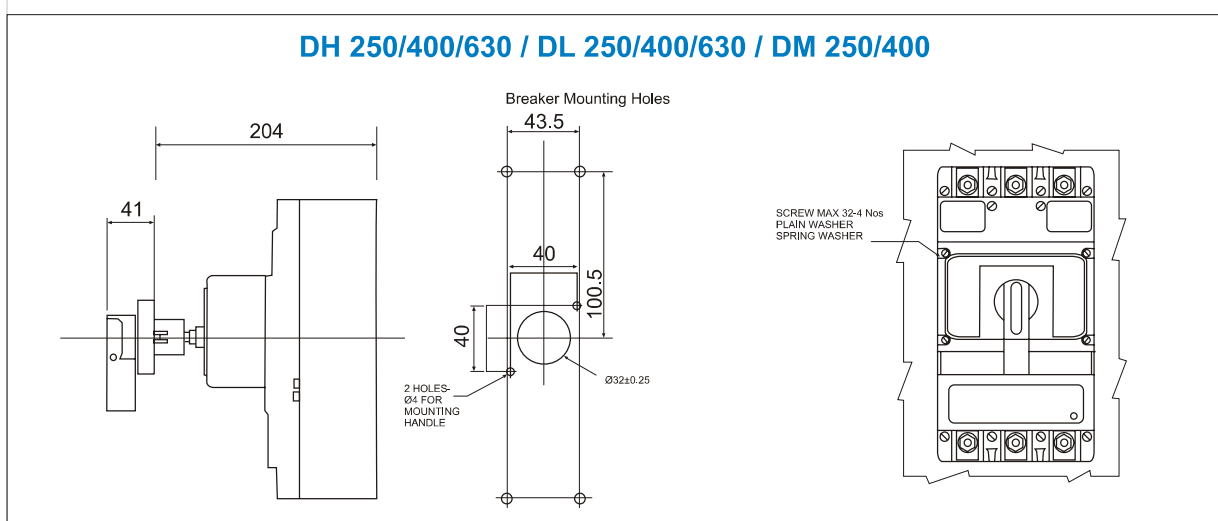
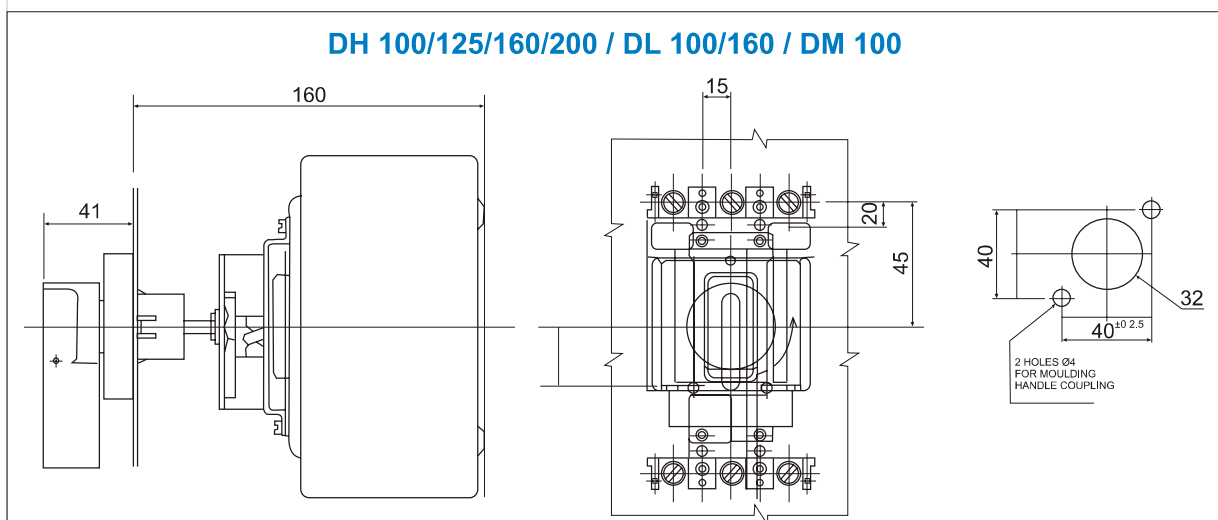
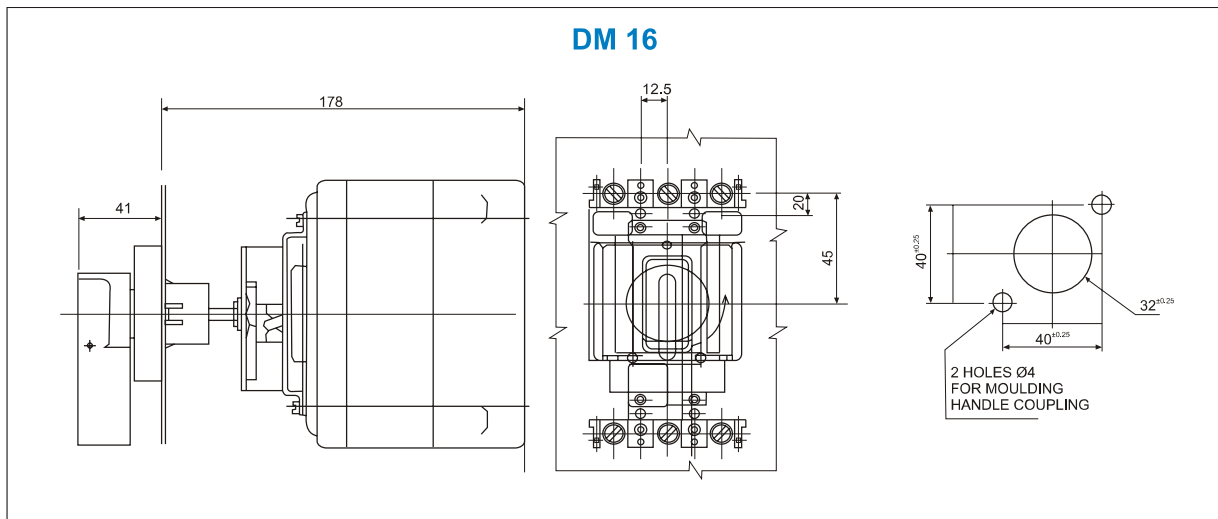
ALL DIMENSIONS ARE IN mm

# DIMENSIONAL DETAILS OF ROTARY OPERATING MECHANISM TYPE DL



ALL DIMENSIONS ARE IN mm

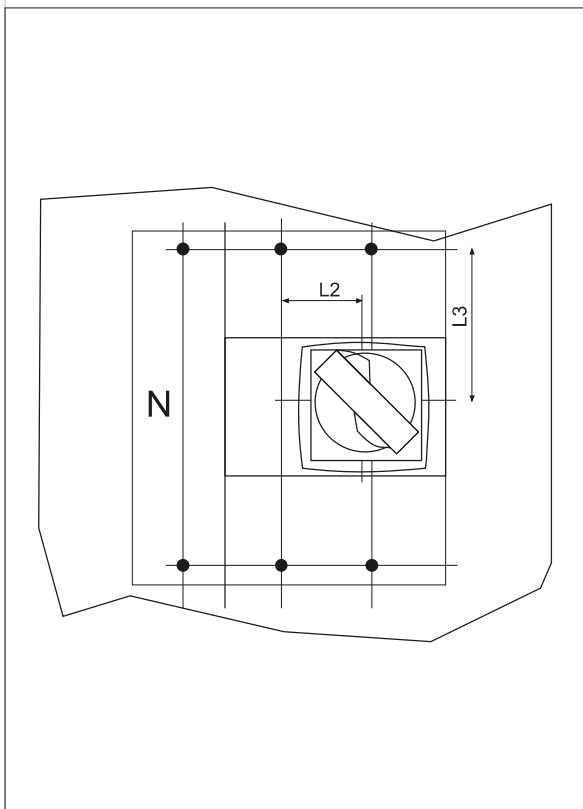
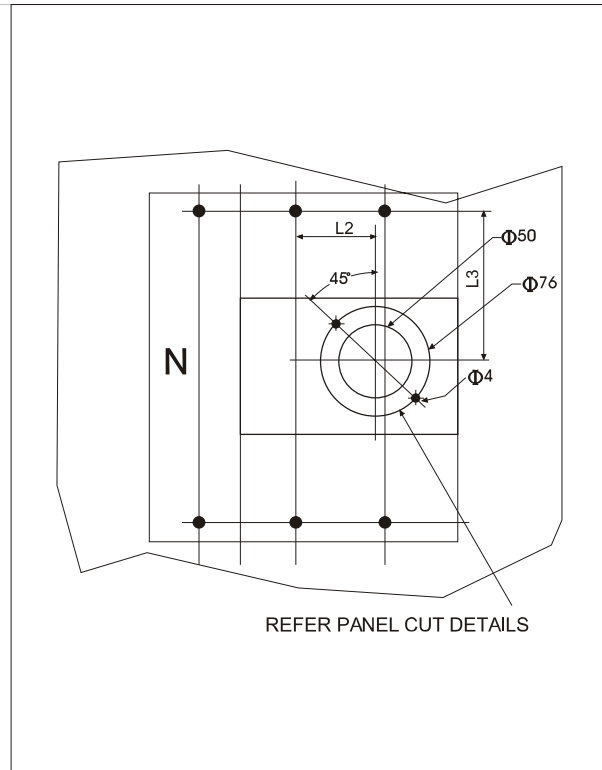
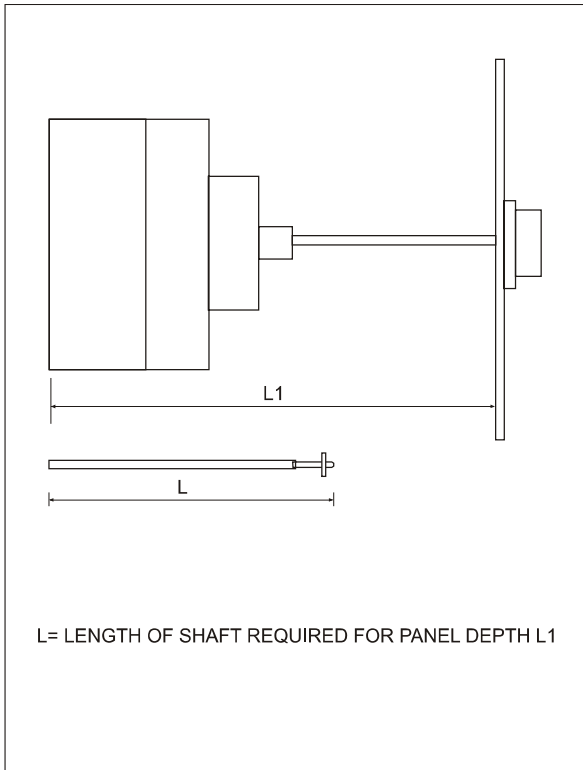
## DIMENSIONAL DETAILS OF ROTARY OPERATING MECHANISM



ALL DIMENSIONS ARE IN mm



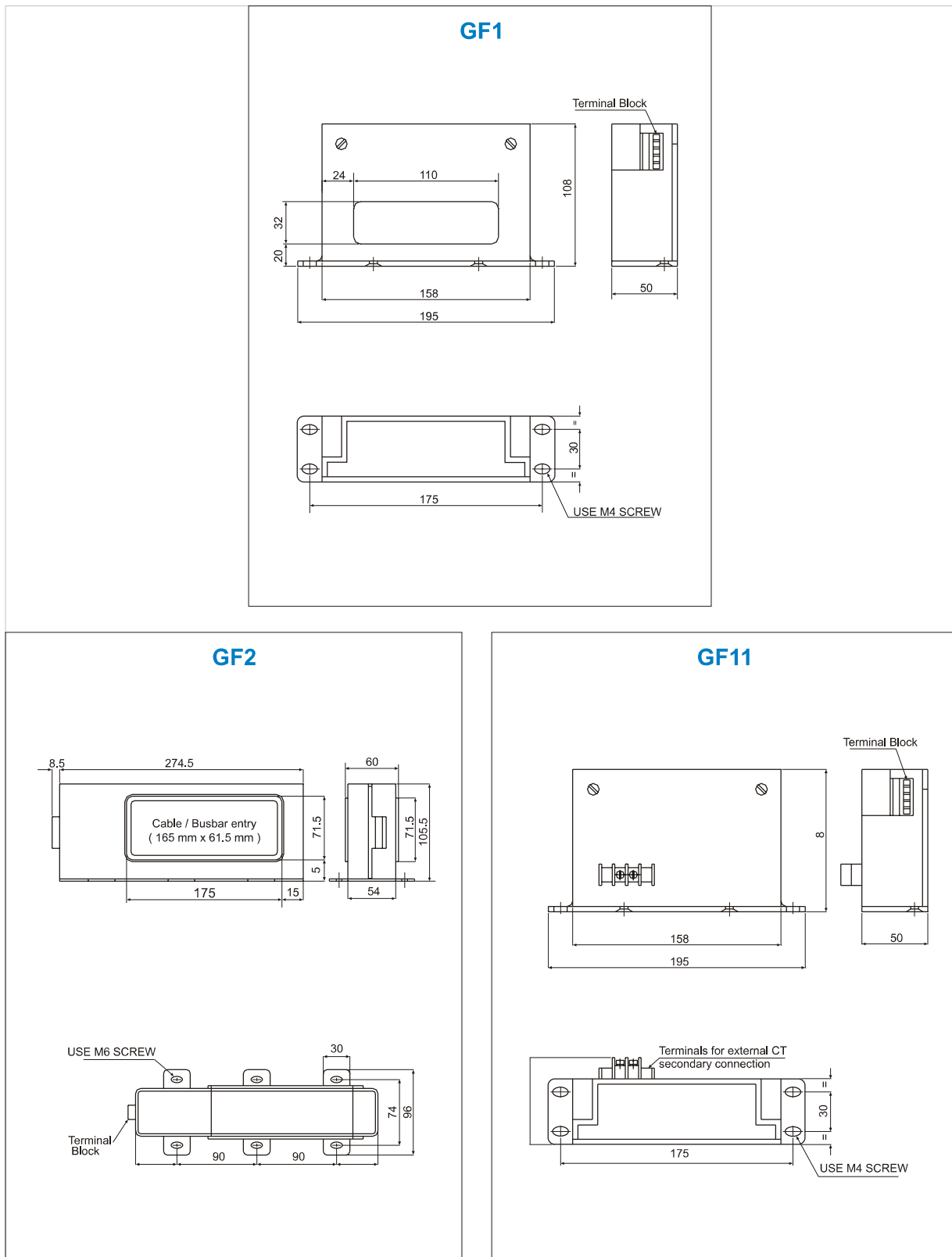
## MOUNTING DIMENSIONS OF NEW EXTENDED ROM



Cat. No.	L1 Min.	L1 Max.	L	L2	L3
CM991030000	178	377	L1-127	22	62
CM991010000 CM99101000A	203	401.5	L1-152	27.5	84
CM991020000	227	425.5	L1-176	38.75	121.7

ALL DIMENSIONS ARE IN mm

## DIMENSIONAL DETAILS FOR EARTH FAULT MODULES



## FUSELESS MOTOR PROTECTION SYSTEM

SELECTION CHART : FUSELESS PROTECTION FOR DOL STARTER FEEDERS WITH MCCBs, type 'DM' TYPE '2' Co-ordination, Iq=50 kA at 415V, 3Ø, 50 Hz. as per Standards : IEC 60947-4-1, IS 13947 (Part 4/Sec 1), EN 60947-4-1								
Sr. No.	HP	KW	FLC (A)	RELAY		CONTRACTOR	MCCB	
				TYPE	RANGE (A)		TYPE	RATING
1	0.125	0.09	0.4	MNX-R3	0.3 - 0.5	MNX 9	DM 16	0.63
2	0.16	0.12	0.45	MNX-R3	0.45 - 0.75	MNX 9	DM 16	0.63
3	0.2	0.15	0.57	MNX-R3	0.45 - 0.75	MNX 9	DM 16	1
4	0.25	0.19	0.75	MNX-R3	0.6 - 1	MNX 9	DM 16	1
5	0.33	0.25	0.9	MNX-R3	0.6 - 1	MNX 9	DM 16	1
6	0.5	0.37	1.2	MNX-R3	0.9 - 1.5	MNX 9	DM 16	1.6
7	0.75	0.55	1.6	MNX-R3	1.4 - 2.3	MNX 9	DM 16	1.6
8	1	0.75	2.1	MNX-R3	1.4 - 2.3	MNX 9	DM 16	2.5
9	1.5	1.1	2.7	MNX-R3	2.0 - 3.3	MNX 9	DM 16	2.5
10	1.75	1.3	3	MNX-R3	2.0 - 3.3	MNX 9	DM 16	4
11	2	1.5	3.8	MNX-R3	3.0 - 5.0	MNX 9	DM 16	4
12	2.5	1.8	4.8	MNX-R3	4.5 - 7.5	MNX 9	DM 16	5
13	3	2.25	5	MNX-R3	4.5 - 7.5	MNX 9	DM 16	5
14	4	3	6.4	MNX-R3	4.5 - 7.5	MNX 9	DM 16	7.5
15	5	3.7	7.9	MNX-R3	6 - 10	MNX 9	DM 16	7.5
16	6	4.5	9	MNX-R4	9 - 15	MNX 32	DM 16	10
17	7.5	5.5	11.4	MNX-R4	9 - 15	MNX 32	DM 16	12
18	10	7.5	15.4	MNX-R4	14 - 23	MNX 80	DM 16	16
19	12.5	9.3	19.5	MNX-R4	14 - 23	MNX 80	DM 100	25
20	15	11	23	MNX-R4	20 - 33	MNX 80	DM 100	25
21	17.5	13	24	MNX-R4	20 - 33	MNX 80	DM 100	30
22	20	15	29	MNX-R4	20 - 33	MNX 80	DM 100	35
23	25	18.6	38.5	MNX-R4	30 - 50	MNX 80	DM 100	50
24	30	22.5	43	MNX-R4	30 - 50	MNX 80	DM 100	50
25	35	26	47	MNX-R4	45 - 75	MNX 80	DM 100	60
26	40	30	59	MNX-R4	45 - 75	MNX 80	DM 100	70
27	45	33.5	60	MNX-R4	45 - 75	MNX 80	DM 100	70
28	50	37	69	MNX-R4	45 - 75	MNX 80	DM 100	80
29	60	45	80	MNX-R4	66 - 110	MNX 95	DM 160	100
30	75	55	100	MNX-R4	66 - 110	MNX 110	DM 160	120
31	90	67.5	120	MNX-R5	90 - 150	MNX 140	DM 160	160
32	100	75	135	MNX-R5	90 - 150	MNX 140	DM 160	160
33	110	80	139	MNX-R5	90 - 150	MNX 185	DM 250	200
34	125	90	165	MNX-R5	135 - 225	MNX 225	DM 250	200
35	150	110	200	MNX-R5	135 - 225	MNX 265	DM 400	275
36	175	130	230	MNX-R5	180 - 300	MNX 265	DM 400	325
37	197	147	260	MNX-R5	180 - 300	MNX 265	DM 400	325
38	200	150	275	MNX-R5	180 - 300	MNX 325	DM 400	325
39	215	160	280	MNX-R5	180 - 300	MNX 325	DM 400	350
40	225	168	300	MNX-R5	270 - 450	MNX 325	DM 400	350
41	245	180	320	MNX-R5	270 - 450	MNX 325	DM 400	400
42	270	200	340	MNX-R5	270 - 450	MNX 400	DM 400	400

SELECTION CHART : FUSELESS PROTECTION FOR STAR-DELTA STARTER FEEDERS WITH MCCBs, type 'DM' TYPE '2' Co-ordination, Iq=50 kA at 415 V, 3Ø, 50 Hz. as per Standards : IEC 60947-4-1, IS 13947 (Part 4/Sec 1), EN 60947-4-1											
MOTOR				MCCB			CONTACTOR			RELAY	
hp	kW	I line (A)	I phase (A)	Rating (In) (A)	Type	I mag (A)	Star	Delta	Main	Range (A)	Type
12.5	9.3	19.5	11.3	30	DM 100	360	MNX 80	MNX 80	MNX 80	9 - 15	MNX-R4
15	11	23	13.3	35	DM 100	420	MNX 80	MNX 80	MNX 80	9 - 15	MNX-R4
20	15	29	16.7	50	DM 100	600	MNX 80	MNX 80	MNX 80	14 - 23	MNX-R4
25	18.6	38.5	22.2	50	DM 100	600	MNX 80	MNX 80	MNX 80	14 - 23	MNX-R4
30	22.5	43	24.8	60	DM 100	720	MNX 80	MNX 80	MNX 80	20 - 33	MNX-R4
40	30	59	34.1	100	DM 160	1200	MNX 95	MNX 95	MNX 95	30 - 50	MNX-R4
50	37	69	39.8	100	DM 160	1200	MNX 95	MNX 95	MNX 95	30 - 50	MNX-R4
75	55	100	57.7	160	DM 160	1920	MNX 95	MNX 95	MNX 95	45 - 75	MNX-R4
100	75	135	78	200	DM 250	2400	MNX 140	MNX 140	MNX 140	60 - 100	MNX-R5
125	90	165	95.3	250	DM 250	3000	MNX 140	MNX 140	MNX 140	90 - 150	MNX-R5
150	110	200	115.5	325	DM 400	3900	MNX 225	MNX 225	MNX 225	90 - 150	MNX-R5
175	125	230	133	325	DM 400	3900	MNX 225	MNX 225	MNX 225	90 - 150	MNX-R5
200	150	275	159	400	DM 400	4800	MNX 265	MNX 265	MNX 265	135 - 225	MNX-R5

NOTES  
 1) Selection chart is for standard 3 Phases, Squirrel Cage Motor with average power factor and efficiency. 2) Motor ratings at 415 V, 50 Hz.  
 3) Open Transition is assumed for change over from star to Delta mode. 4) Contractor ratings indicated are the minimum rating suitable for the application, higher size rating can be used. 5) Normal motor starting time (<= 15 sec.) is assumed. For higher starting time refer back to L&T.

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