

90 MCB RANGE

MODULAR DEVICES FOR CIRCUIT PROTECTION

GEWISS

TECHNICAL CHARACTERISTICS

TECHNICAL DATA

TYPE	MTC			
	MTC 45	MTC 60	MTC 100	MT 60
				
Nominal current in [A]	6-32	6-32	6-32	1-63
Usage category	A	A	A	A
Nominal operating voltage Ue [V]	230/400	230/400	230	230/400
Insulation voltage Ui [V]	500	500	500	500
Nominal frequency [Hz]	50/60	50/60	50/60	50/60
Nominal pulse holding voltage Uimp [kV]	4	4	4	4
Number of poles	1 1+N 2,3,4	1+N, 2 3,4	1+N, 2	1, 1+N 2,3,4
CA IEC 60898 - EN 60898 [A]				
Breaking capacity	lcn	4500	6000	10000 ⁽¹⁾
	lcs	1 lcn	1 lcn	0.75 lcn
	CA IEC 60947-2 - EN 60947-2 [kA]			
	Ue [V]			
	lcu	230	4.5 6 6 7.5 10	10
		400	4.5 6 6 6(2P) 6	10 (1P) 20
	lcs		100% lcu	75% lcu
	Ue [V]			
	lcs			
	lcs			
CC IEC 60947-2 - EN 60947-2 [kA]				
Breaking capacity	Ue [V]			
	lcs			
	lcs			
	lcs			
	lcs			
	lcs			
	lcs			
	lcs			
	lcs			
	lcs			
Connection	cable section [mm²]	rigid	≤ 16	≤ 16
		flexible	≤ 10	≤ 10
Electrical life (number of O-C cycles)		10000	10000	10000
Max. no. of accessories that can be used		3	3	3
Upline/downline power supply		yes	yes	yes
Sectioning displayed		yes	yes	yes
Type of RCD		MDC one-piece RCD	MDC one-piece RCD	MDC one-piece RCD
Protection class for	terminals (with terminal covers)	IP40	IP40	IP40
	other parts	IP40	IP40	IP40
Tropicalization		55°C - UR 95%	55°C - UR 95%	55°C - UR 95%
Operating temperature [°C]		-25 +60	-25 +60	-25 +60
Reference temperature [°C]		30	30	30
Curve		C	C	C
Nominal currents available in [A]				1
				2
				3
				4
				6
				10
				13
				16
				20
				25
				32
				40
				50
				63

⁽¹⁾ Breaking capacity of single pole lcn=6000A

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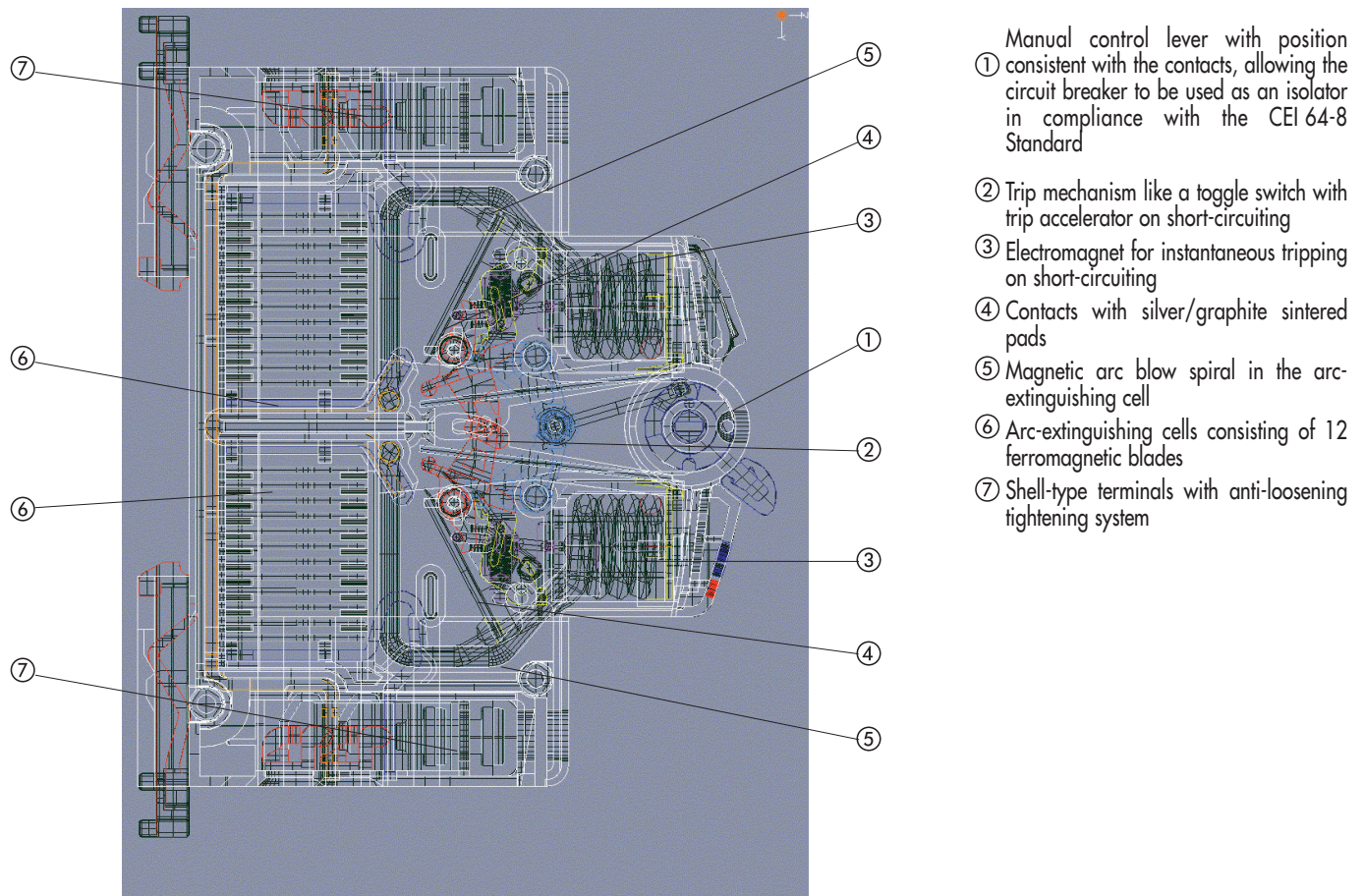
TECHNICAL CHARACTERISTICS

90 MCB
RANGE

MT																		MTHP											
MT 100						MT 250												MTHP 160			MTHP 250								
																													
1-25			32-63			6-20			25			32-40			50-63			63-125			20-63								
A			A			A			A			A			A			A			A								
230/400			230/400			230/400			230/400			230/400			230/400			230/400			230/400								
500			500			500			500			500			500			500			500								
50/60			50/60			50/60			50/60			50/60			50/60			50/60			50/60								
4			4			4			4			4			4			6			6								
1	2	3,4	1	2	3,4	1	2	3,4	1	2	3,4	1	2	3,4	1	2	3,4	1	2,3,4	1	2	3,4							
10000			10000			25000			20000			15000			12500			10000			25000								
0.75 Icn			0.75 Icn			0.75 Icn			0.75 Icn			0.75 Icn			0.75 Icn			0.75 Icn			0.75 Icn								
15	30	25	12.5	25	20	25	50	40	20	40	30	15	30	25	15	25	20	16	20	25	50	30							
15	20	15	12.5	15	12,5	25	30	25	20	25	20	15	20	15	15	15	15	16	16	25	25	25							
75% Icu			75% Icu			75% Icu			75% Icu			75% Icu			75% Icu			50% Icu			75% Icu								
10			10			20			20			20			20			10			25								
10			10			15			15			15			15			10			20								
15			15			25			25			25			25			15			30								
15			15			20			20			20			20			12			25								
15			15			25			25			25			25			15			25								
12			12			20			20			20			20			12			20								
≤ 35			≤ 35			≤ 35			≤ 35			≤ 35			≤ 35			≤ 50			≤ 50								
≤ 25			≤ 25			≤ 25			≤ 25			≤ 25			≤ 25			Terminals			Terminals								
10000			10000			10000			10000			10000			10000			10000			10000								
3			3			3			3			3			3			3			3								
yes			yes			yes			yes			yes			yes			yes			yes								
yes			yes			yes			yes			yes			yes			yes			yes								
BD breaker			BD breaker			BD breaker			BD breaker			BD breaker			BD breaker			BDHP breaker			BDHP breaker								
IP40			IP40			IP40			IP40			IP40			IP40			IP40			IP40								
IP40			IP40			IP40			IP40			IP40			IP40			IP40			IP40								
55°C - UR 95%			55°C - UR 95%			55°C - UR 95%			55°C - UR 95%			55°C - UR 95%			55°C - UR 95%			55°C - UR 95%			55°C - UR 95%								
-25 +60			-25 +60			-25 +60			-25 +60			-25 +60			-25 +60			-25 +60			-25 +60								
30			30			30			30			30			30			30			30								
C			B			D			C												C			D			C		
			1																										
			2																										
			3																										
			4																										
6			6			6			6																				
10			10			10			10																				
13			13			13																							
16			16			16			16																				
20			20			20			20															20					
25			25			25			25															25					
32			32			32			32															32					
40			40			40			40															40					
50			50						50															50					
63			63						63															63					
																								63					
																								80					
																								100					
																								125					

FEATURES OF THE NEW MECHANISM OF THE MTC COMPACT CIRCUIT BREAKERS

Placing the releases at the front with opposing magnetic blow spirals and arc-extinguishing cells, enables to significantly reduce arcing time and short-circuiting stresses on the mechanism. It has thus been possible to halve the installation and lighten the mechanism which, due to the lower power, has short pre-arcing times. The new mechanism has been sized and optimised by means of a sophisticated planning, engineering and testing programme.



BEHAVIOUR WITH CHEMICAL AND CORROSIVE AGENTS

Agent	Saline solution	Acids		Bases		Solvents				Mineral oil	UV Rays
		Concentrated	Diluted	Concentrated	Diluted	Hexane	Benzene	Acetone	Alcohol		
Resistance	Resistant	Limited resistance	Resistant	Limited resistance	Resistant	Resistant	Limited resistance	Limited resistance	Limited resistance	Resistant	Resistant

DISSIPATED POWER AND DERATINGS

MTC 45 - 60 - 100 AUTOMATIC COMPACT MINIATURE CIRCUIT BREAKERS

General characteristics

The range of MTC automatic miniature circuit breakers is distinguished by the small amount of space taken up in the distribution board and by full modularity with electrical auxiliaries and modular accessories. It is therefore possible to position all equipment necessary to protect and control the user's electrical system centrally, in small spaces. The innovations are based on a breakthrough mechanism for circuit breaker operation, a world-wide GEWISS patent which makes it possible to increase normal performance whilst decreasing the space taken up by 50%. This new device makes it possible to incorporate a double-pole one-way switch into a single 18 mm module with both poles protected by both a magnetic and a thermal release.

Temperature derating

In plant engineering situations where ambient temperature is higher than the regulatory reference temperature of 30°C, the circuit breakers may be subject to untimely tripping, i.e. opening when not required, since the increase in temperature is interpreted as a current surge. Ambient temperature, as a matter of fact, affects the initial deformation of the bimetal. At a temperature above 30°C the thermal release trips faster, behaving like a relay with a lower nominal current.

It is therefore imperative to take into account nominal current derating if the circuit breaker is installed in an ambient with a temperature above 30°C. The following tables give the max. operating currents referring to the different temperatures.

MTC 45 - 60 - 100 COMPACT MINIATURE CIRCUIT BREAKERS

In (A)	Temperature					
	10°C	20°C	30°C	40°C	50°C	60°C
2	2.1	2.05	2	1.9	1.8	1.55
6	7.2	6.6	6	5.7	5.3	5
10	11.8	10.8	10	9.6	9.1	8.6
13	15	14	13	12.4	11.7	11
16	18.2	17.2	16	15.2	14.3	13.4
20	22.8	21.4	20	19.5	18.9	18.4
25	28.5	26.8	25	24	23	22
32	36.5	34.2	32	30.8	29.5	28.8

Derating for installations in boxes with protection rating higher than IP54 necessitates multiplying the current values already derated by a coefficient of 0.7.

Dissipated power per pole

The following table details dissipated power values for MTC automatic circuit breakers in order to allow for verification of supertemperature values within the electrical board in compliance with EN 60439 and CEI 17 - 43 Standards. It also makes it possible to verify whether the power dissipated by appliances is lower or higher than that which the control unit is able to dissipate in compliance with CEI 23 - 49 and CEI 23 - 51 Standards.

MTC 45 - 60 - 100 COMPACT MINIATURE CIRCUIT BREAKERS

In (A)	2		6		10		13		16		20		25		32	
	Pole	N	Pole	N	Pole	N	Pole	N	Pole	N	Pole	N	Pole	N	Pole	N
R (mΩ)	450	1.07	29.4	2.6	20.3	2.6	14.2	2.6	8.7	2.6	5.7	2.6	5.3	2.6	3.4	2.6
P (W)	1.8	0.04	1.06	0.09	2.03	0.26	2.4	0.44	2.22	0.67	2.27	1.04	3.34	1.63	3.45	2.66

DISSIPATED POWERS AND DERATINGS

MT 60 - MT 100 - MT 250 AUTOMATIC MINIATURE CIRCUIT BREAKERS

General characteristics

Thanks to their range breadth and high performance, MT automatic miniature circuit breakers enable the construction of electrical systems for which using only MTCs would not be sufficient.

The MT range, with nominal current from 1 to 63A, B, C and D curves and breaking capacity of 6, 10 and 25 kA, is able to meet the installation needs of the commercial, advanced commercial and industrial sectors. By virtue of its total modularity with residual current devices, electric auxiliary devices and modular accessories, the MT range provides an optimum solution in any plant engineering context.

MT 60 - 100 - 250 TEMPERATURE DERATING

In (A)	Temperature (°C)					
	15	20	30	40	50	60
1	1.07	1.04	1.00	0.97	0.93	0.90
2	2.14	2.07	2.00	1.93	1.86	1.79
3	3.21	3.11	3.00	2.90	2.79	2.69
4	4.28	4.14	4.00	3.86	3.72	3.58
6	7	6.67	6.00	5.52	4.84	3.96
10	11.2	10.8	10.0	8.9	7.95	7.16
13	14.4	13.9	13.0	11.9	10.9	10
16	17.6	17.1	16.0	14.9	13.9	12.8
20	22	21.3	20.0	17.8	16.1	15.1
25	28.2	27.1	25.0	23.4	21.3	18.8
32	37	35.3	32.0	30.8	27.8	23.1
40	45	43.3	40.0	34.8	30	28
50	57.5	55	50.0	46.7	42.1	36.3
63	70	67.7	63.0	59.9	52.7	41.25

MT 60 - 100 - 250 DISSIPATED POWER PER POLE

In (A)	Tripping curves					
	B		C		D	
	P (W)	R (m1/2)	P (W)	R (m1/2)	P (W)	R (m1/2)
1	-	-	2.20	2200	-	-
2	-	-	2.70	675	-	-
3	-	-	2.30	256	-	-
4	-	-	2.20	138	-	-
6	1.42	39	1.42	39	0.80	22
10	2.13	21	2.13	21	1.20	12
13	2.1	12.4	2.1	12.4	1.3	7.7
16	2.80	11	2.80	11	1.60	6.3
20	2.56	6.4	2.56	6.4	2.10	5.3
25	3.10	5	3.10	5	2.00	3.2
32	3.00	2.9	3.00	2.9	2.40	2.4
40	3.10	1.9	3.10	1.9	2.70	1.7
50	3.87	1.5	3.87	1.5	-	-
63	4.51	1.2	4.51	1.2	-	-

MTHP 160 - MTHP 250 HIGH PERFORMANCE CIRCUIT BREAKERS

General characteristics

Thanks to their range breadth and high performance, MTHP automatic miniature circuit breakers enable the construction of electrical systems for which using only MTCs and MTs would not be sufficient. The MTHP range, with nominal current from 20 to 125A, C and D curves and breaking capacity of 10 and 25 kA, can satisfy installation needs in the commercial, advanced commercial and industrial sectors. By virtue of its total modularity with residual current devices, electric auxiliary devices and modular accessories, the MTHP range provides an optimum solution in any plant engineering context.

MTHP 160 - 250 TEMPERATURE DERATING

In (A)	Temperature				
	20°C	30°C	40°C	50°C	60°C
20	21	20	17.5	16	15
25	26	25	24	22	19
32	35	32	30	28	23
40	42	40	35	33	28
50	55	50	47	42	36
63	66	63	59	53	48
80	85	80	75	70	63
100	107	100	93	87	78
125	135	125	115	107	97

DISSIPATED POWER PER POLE (W) MTHP 160 - 250

In (A)	20	25	32	40	50	63	80	100	125
	Dissipated power W/pole								
MTHP 250	2.8	2.7	3.1	3.5	4.2	5.6	-	-	-
MTHP 160	-	-	-	-	-	5.6	5.6	7.4	11

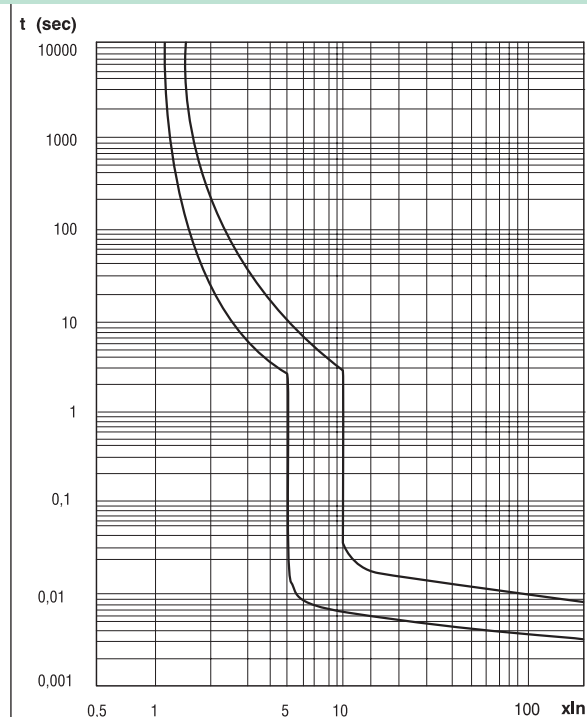
CHARACTERISTIC CURVES

TRIPPING CURVES (EN 60898)

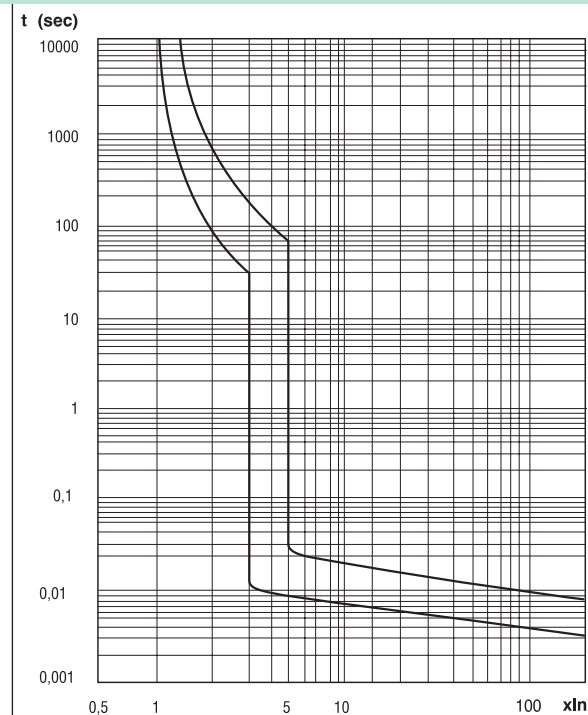
MTC 45 - 60 - 100 C curve

MT 60 - 100 - 250 C curve

MTHP 160 - 250 C curve

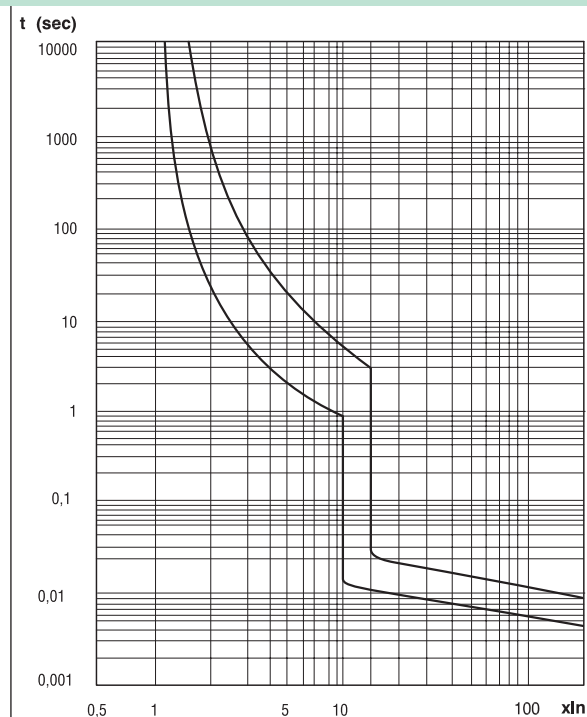


MT 60 - 100 B curve



MT 60 - 100 D curve

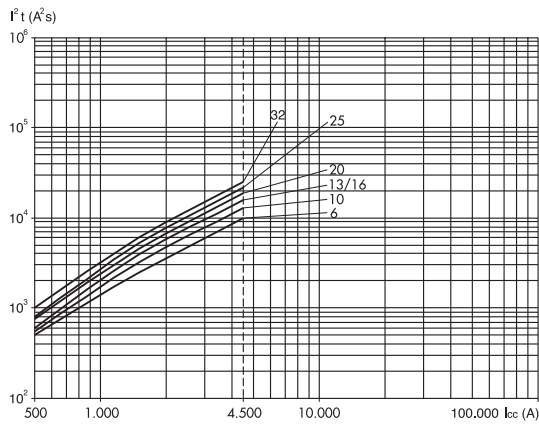
MTHP 160 D curve



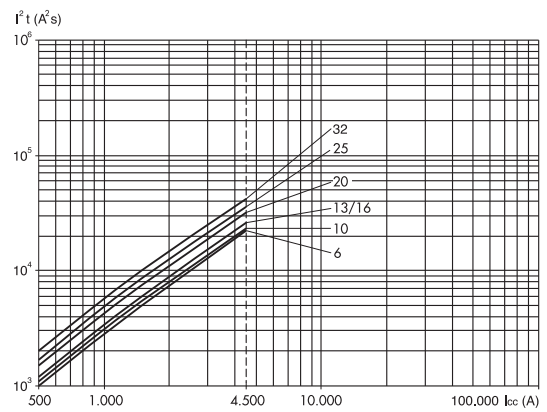
CHARACTERISTIC CURVES

MTC SPECIFIC FEEDTHROUGH ENERGY CURVES

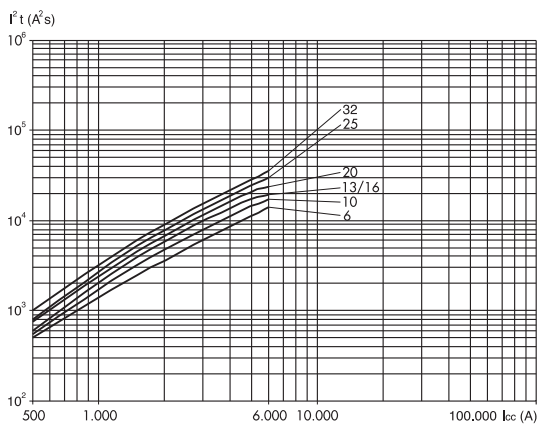
MTC 45 - 1P+N, 2P - 230V versions



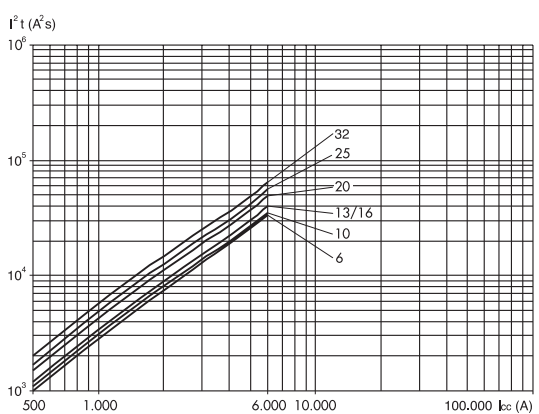
MTC 45 - 1P, 3P, 4P - 230/400V and 2P - 400V versions



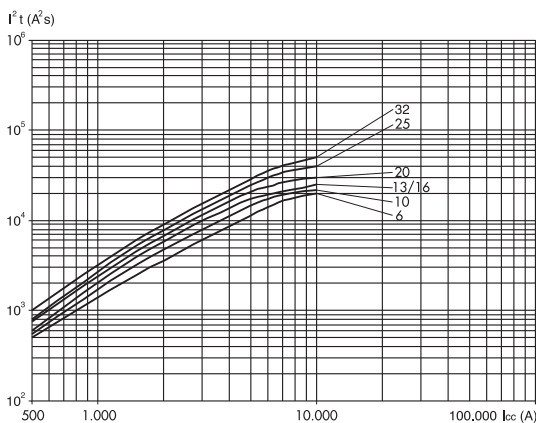
MTC 60 1P+N, 2P - 230V versions



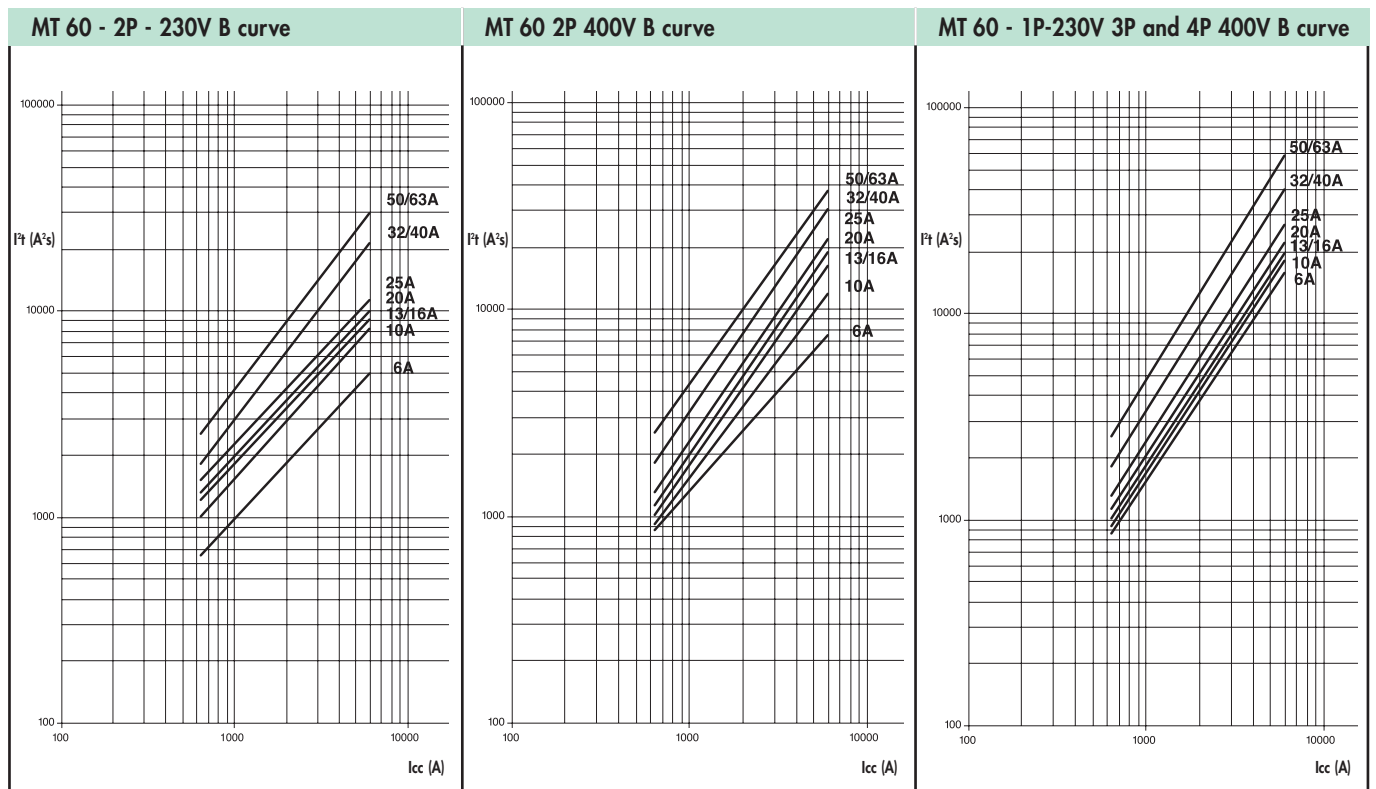
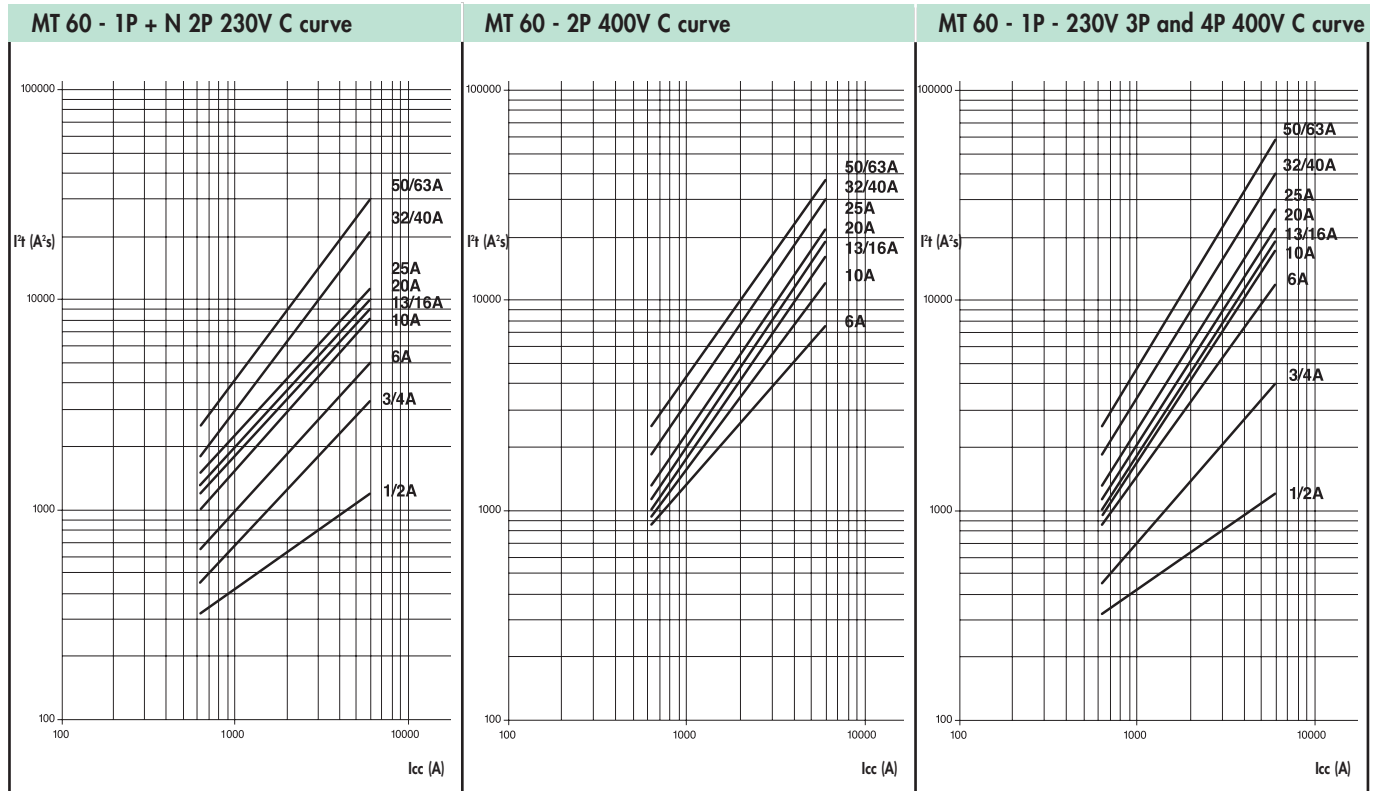
MTC 60 1P, 3P, 4P - 230/400V and 2P - 400V versions



MTC 100 1P+N, 2P - 230V versions

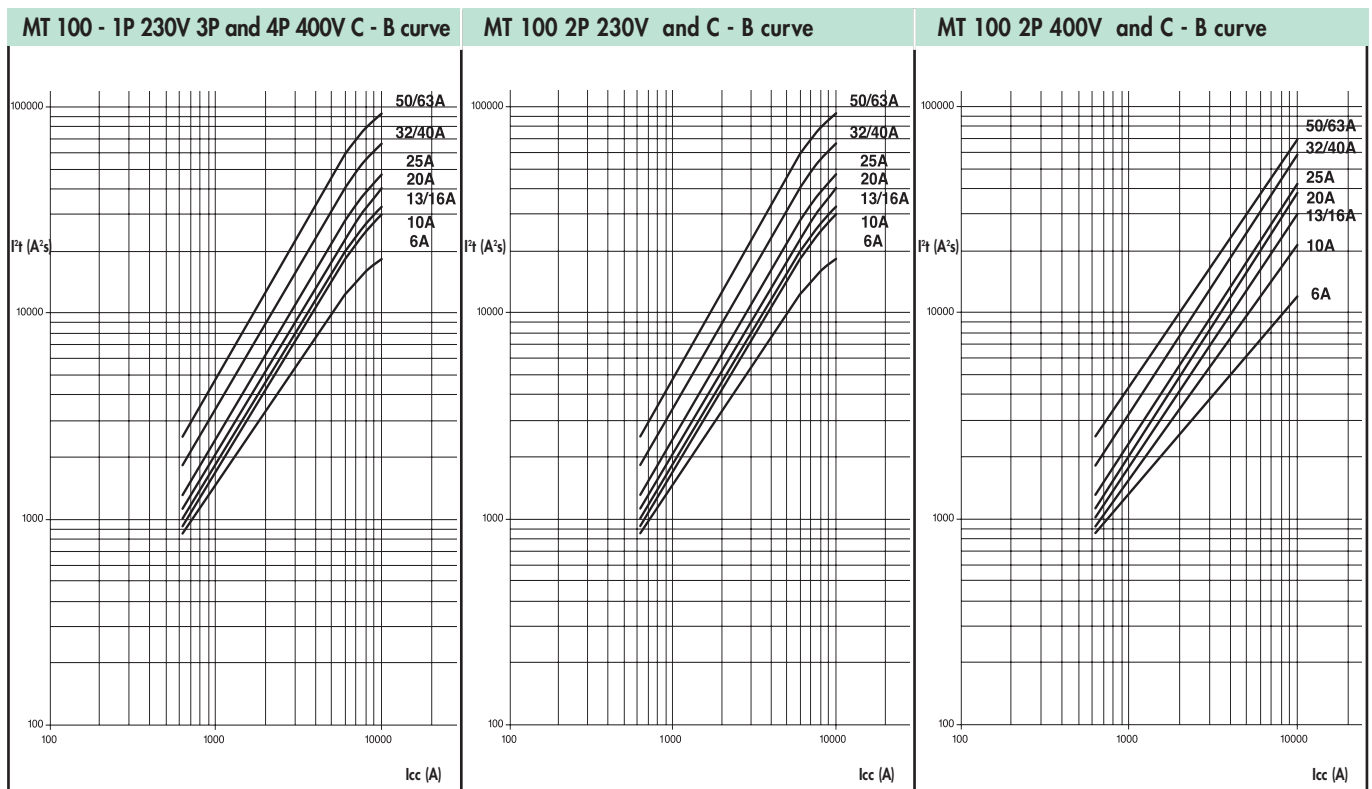
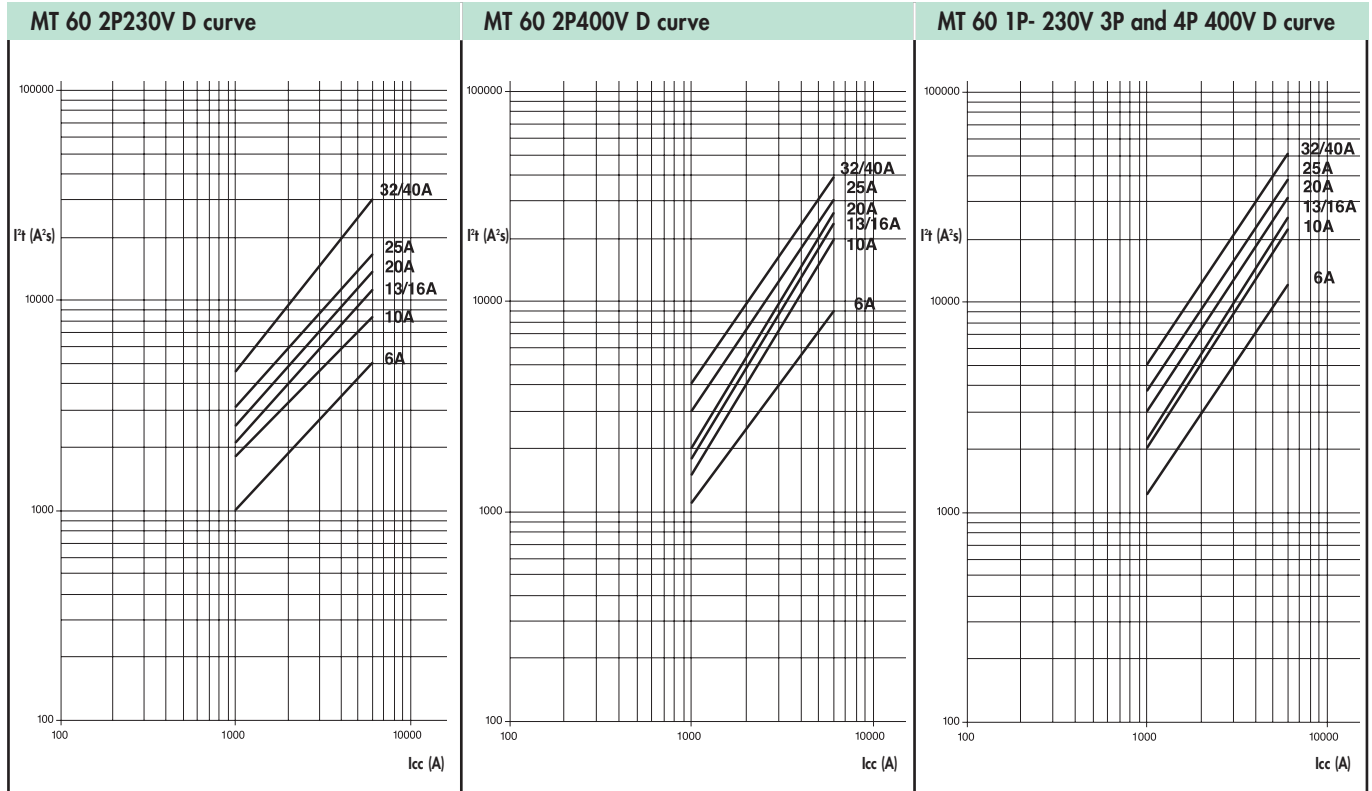


SPECIFIC FEEDTHROUGH ENERGY CURVES - MT 60 MODULAR CIRCUIT BREAKERS

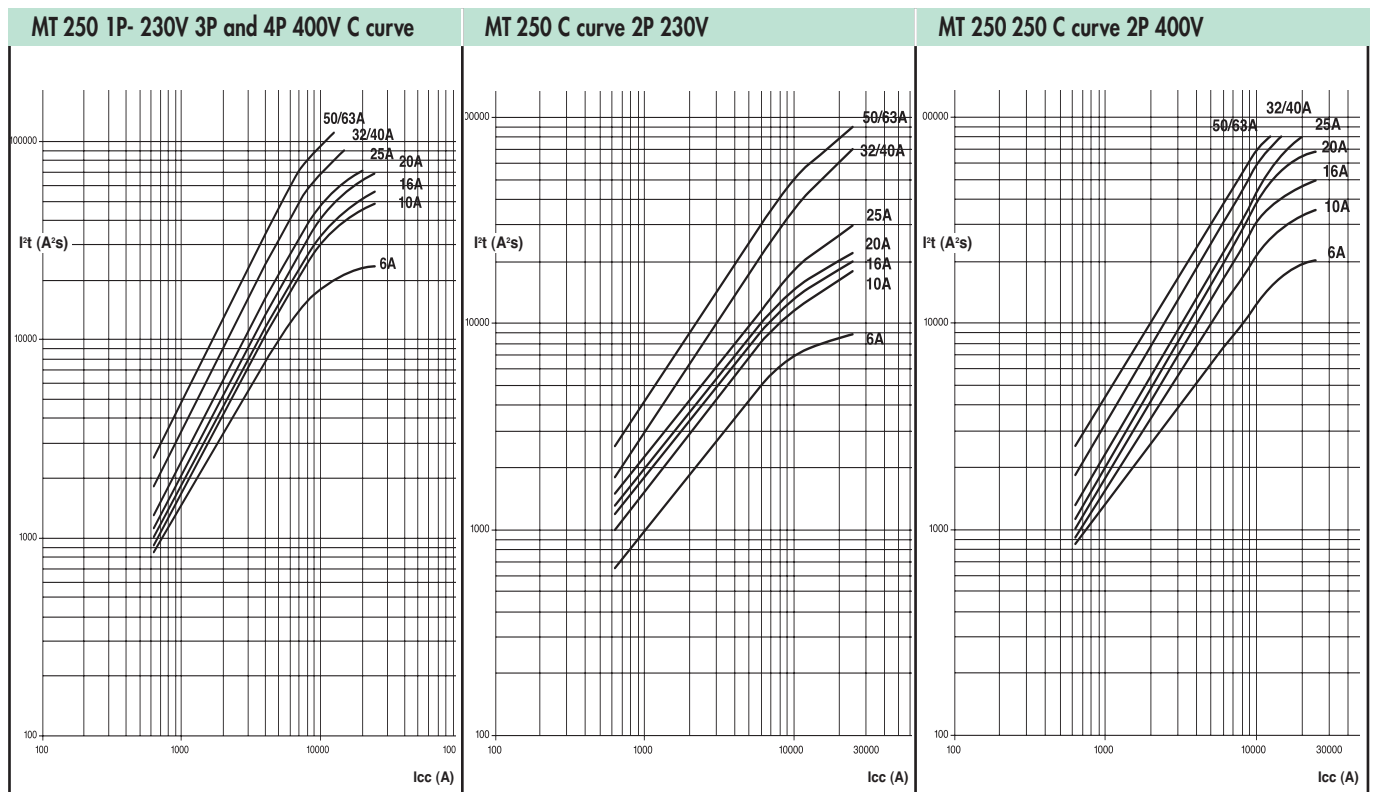
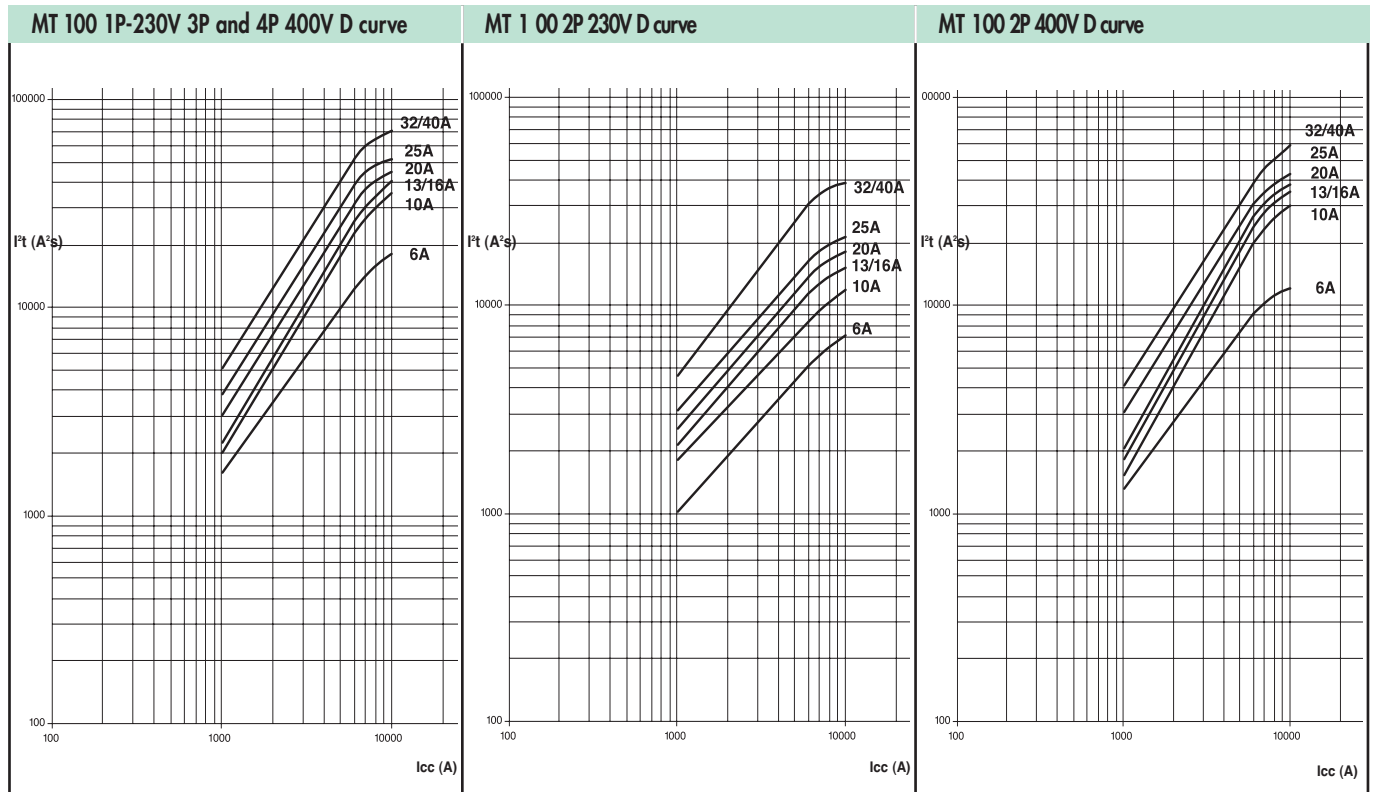


CHARACTERISTIC CURVES

SPECIFIC FEEDTHROUGH ENERGY CURVES - MT 60 - 100 MODULAR CIRCUIT BREAKERS

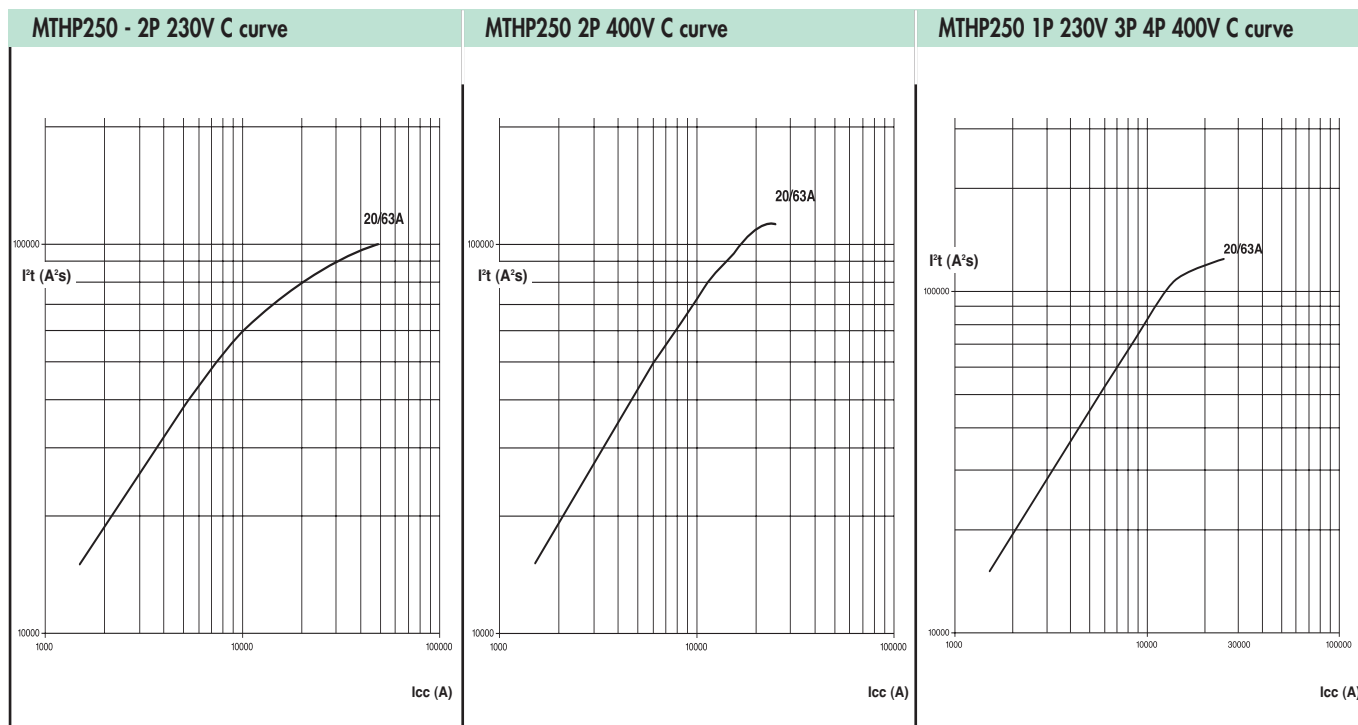


SPECIFIC FEEDTHROUGH ENERGY CURVES - MT 100 - 250 MODULAR CIRCUIT BREAKERS

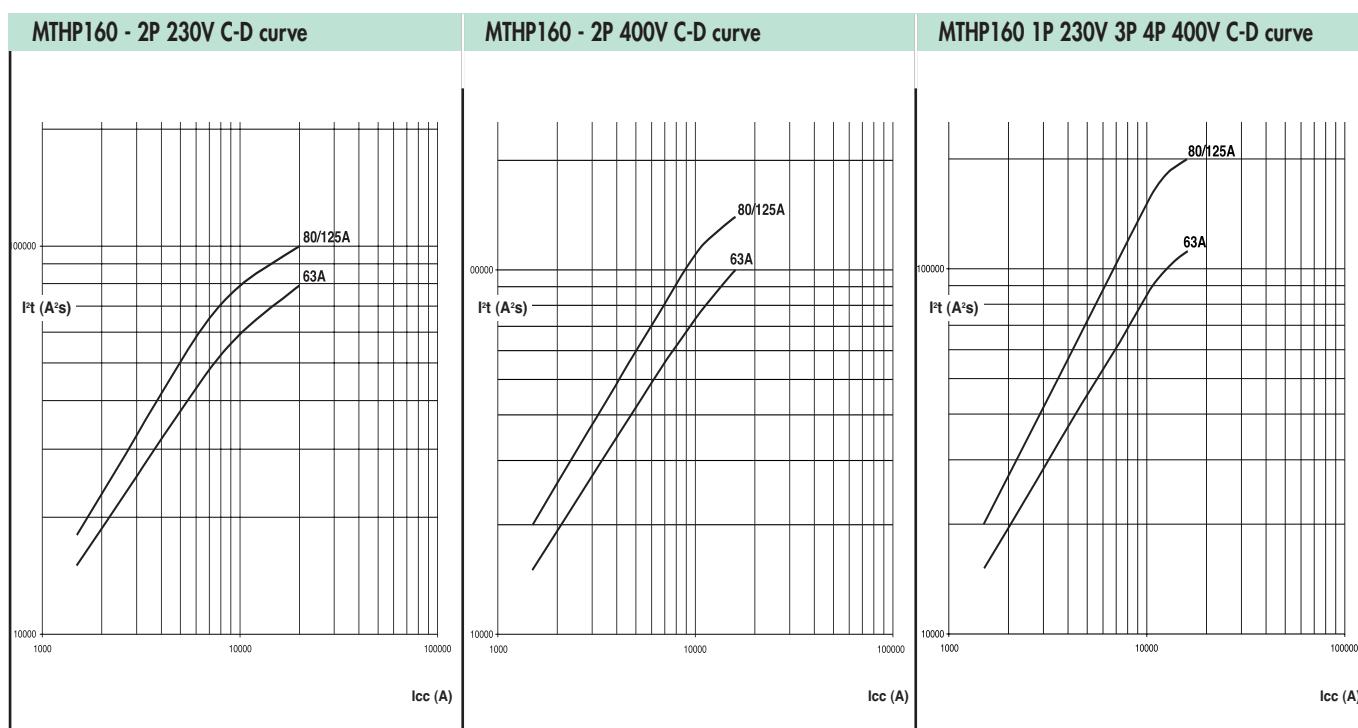


CHARACTERISTIC CURVES

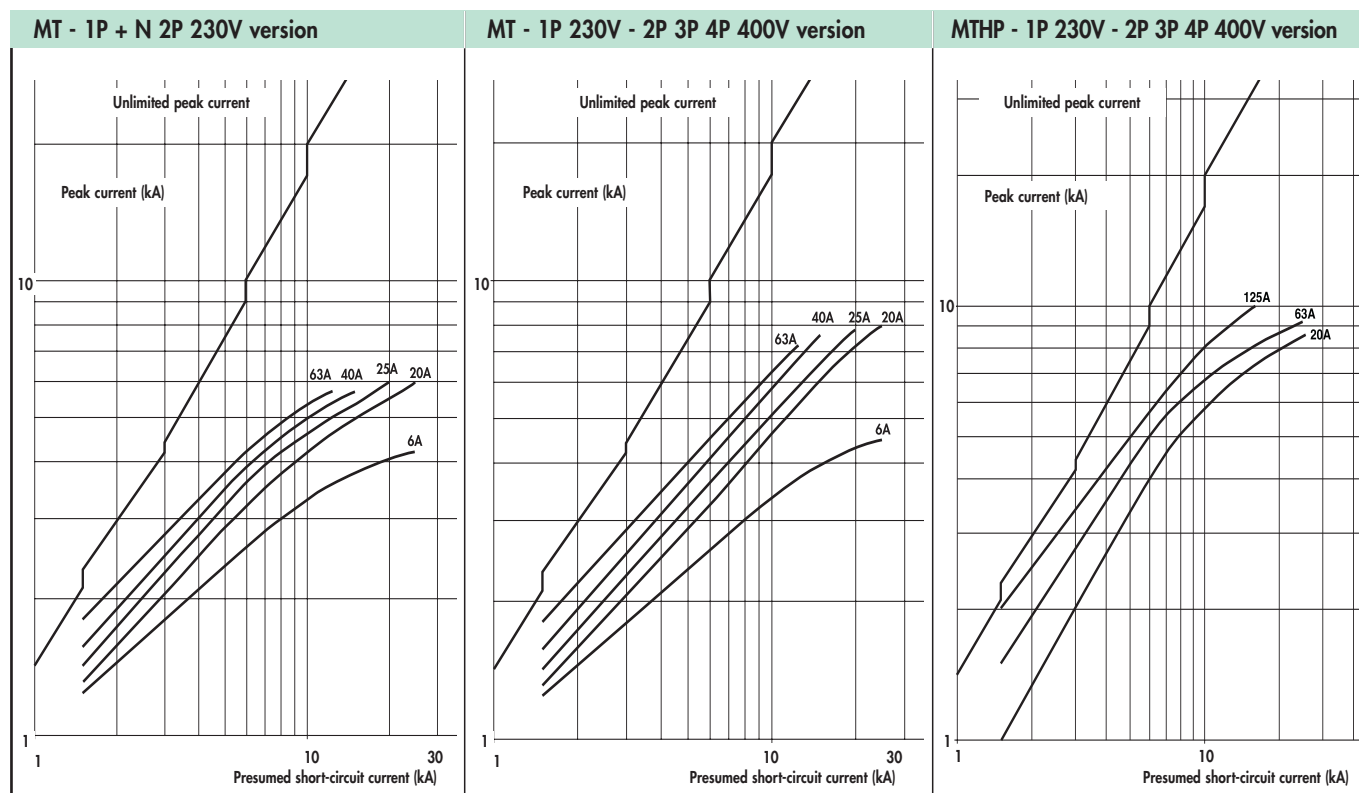
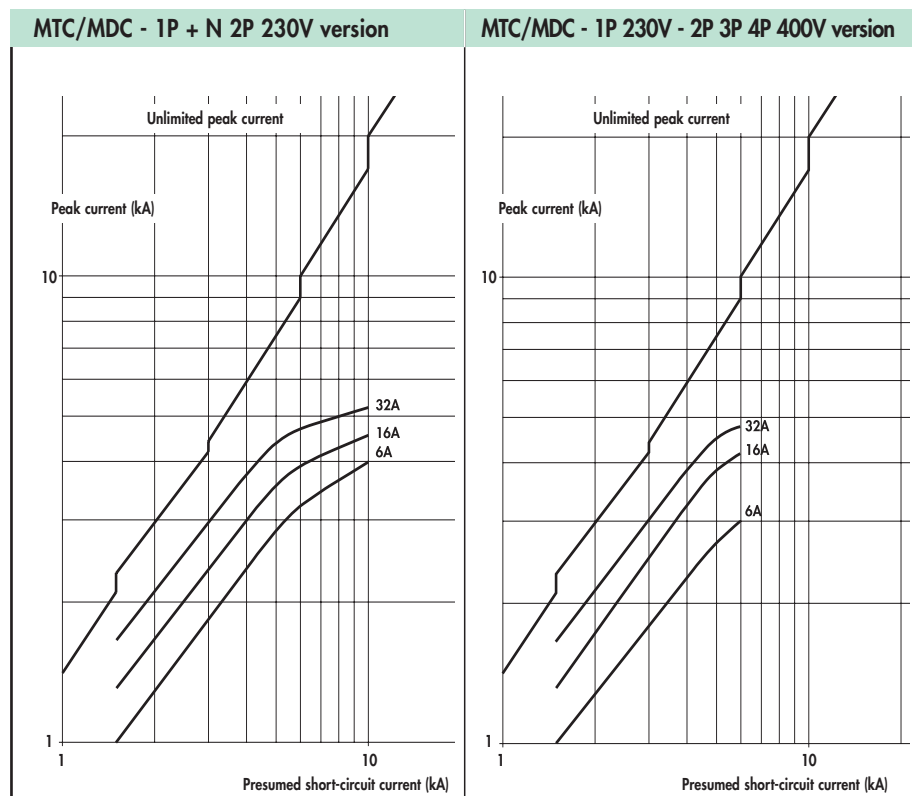
SPECIFIC FEEDTHROUGH ENERGY CURVES - MTHP 100/250 MODULAR CIRCUIT BREAKERS



SPECIFIC FEEDTHROUGH ENERGY CURVES - MTHP 160 MODULAR CIRCUIT BREAKERS



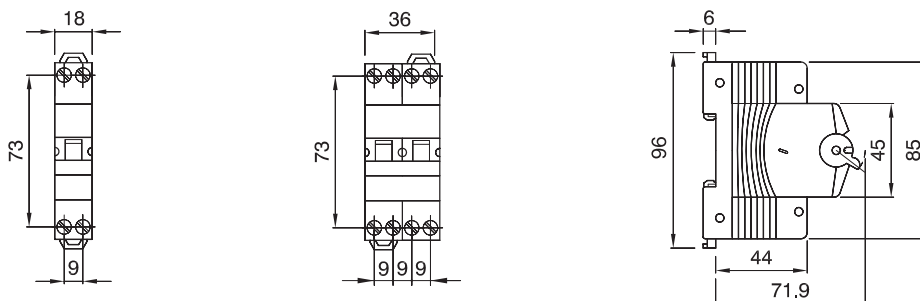
LIMITING CHARACTERISTICS OF PEAK CURRENT



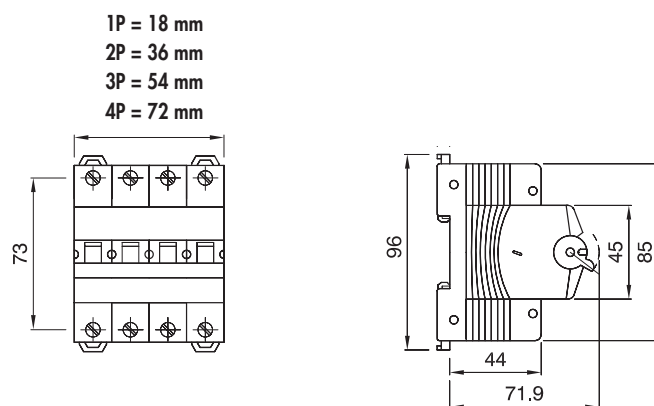
TECHNICAL CHARACTERISTICS

DIMENSION TABLES

MTC 45 - MTC 60 - MTC 100



MT 60 - MT 100 - MT 250



MTHP 160 - MTHP 250

