



M-line

Contactors and Relays

About us

Larsen & Toubro is a technology-driven company that infuses engineering with imagination. The Company offers a wide range of advanced solutions in the field of Engineering, Construction, Electrical & Automation, Machinery and Information Technology.

L&T Switchgear, a part of the Electrical & Automation business, is India's largest manufacturer of low voltage switchgear, with the scale, sophistication and range to meet global benchmarks. With over five decades of experience in this field, the Company today enjoys a leadership position in the Indian market with a growing international presence.

It offers a complete range of products including powergear, controlgear, industrial automation, building electricals & automation, reactive power management, energy meters, and protective relays. These products conform to Indian and International Standards.



Switchgear Factory, Mumbai



Switchgear Factory, Ahmednagar

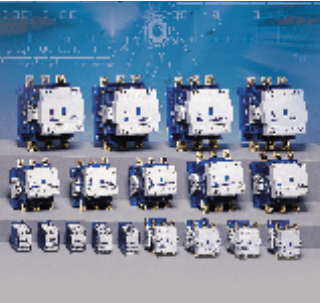
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Three Pole Power Contactors - Type MNX



- Range from 9-650A AC3
- Coil on top for 95A and above
- Built-in 2NO + 2NC auxiliary contacts for 45A & above
- Click fit type construction upto 40A
- Clear terminal marking
- Entire range is UL listed

Technical Data



		MNX 9	MNX 12	MNX 18	MNX 22	MNX 25	MNX 32	MNX 40	MNX 45	MNX 50	MNX 70	MNX 80	MNX 95	MNX 110	MNX 140	MNX 185	MNX 225	MNX 265	MNX 325	MNX 400	MNX 550	MNX 650
Catalogue No.		CS 94106 / 7*	CS 94108 / 9*	CS 94100 / 1*	CS 94980 / 81*	CS 94110	CS 94111	CS 94190	ST 19000	ST 19001	ST 19002	ST 19003	CS 94136	CS 94137	CS 94138	CS 94139	CS 94140	CS 94142	CS 94143	CS 94144	CS 94145	CS 96327
Conformance to standards		IS/IEC 60947-4-1 & IEC 60947-4-1, BSEN 60947-4-1																				
Power Contacts																						
No. of poles		3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Rated insulation voltage, U _i		690V	690V	690V	690V	690V	690V	690V	690V	690V	690V	690V	1000V	1000V	1000V	1000V	1000V	1000V	1000V	1000V	1000V	1000V
Rated impulse withstand voltage, U _{imp}		8 kV	8 kV	8 kV	8 kV	8 kV	8 kV	8 kV	8 kV	8 kV	8 kV	8 kV	8 kV	8 kV	8 kV	8 kV	8 kV	8 kV	8 kV	8 kV	8 kV	8 kV
Rated making capacity - (Amp)		450	450	450	450	480	550	550	900	900	900	900	1680	1680	1800	2220	2400	4000	4500	4500	5500	6500A
Rated breaking capacity - (Amp)		200	250	250	250	400	500	500	750	750	750	750	1400	1400	1600	1850	2000	3200	4000	4000	4500	5200A
Rated operational current, I _b At 55°C Motor duty : 3Ø, 415V, 50Hz	Utilization category AC-1	25A	30A	30A	32A	45A	55A	55A	85A	85A	100A	100A	160A	160A	160A	250A	300A	350A	400A	425A	650A	800A
	Utilization category AC-2	9A	12A	18A	22A	25A	32A	40A	45A	50A	70A	80A	95A	110A	140A	185A	225A	265A	325A	400A	550A	650A
	Utilization category AC-3	4 kW / 5.5hp / 9A	5.5 kW / 7.5hp / 12A	9.3 kW / 12.5hp / 18A	11 kW / 15hp / 22A	11 kW / 15hp / 25A	17 kW / 22.5hp / 32A	22.5 kW / 30hp / 40A	25 kW / 34hp / 45A	26 kW / 35hp / 50A	37 kW / 50hp / 70A	40 kW / 54hp / 80A	45 kW / 60hp / 95A	55 kW / 75hp / 110A	75 kW / 100hp / 140A	90 kW / 120hp / 185A	110 kW / 150hp / 225A	147 kW / 196hp / 265A	180 kW / 245hp / 325A	200 kW / 270hp / 400A	315 kW / 425hp / 550A	355 kW / 475hp / 650A
	Utilization category AC-4	4 kW / 5.5hp / 9A	5.5 kW / 7.5hp / 12A	9.3 kW / 12.5hp / 18A	11 kW / 15hp / 22A	11 kW / 15hp / 25A	17 kW / 22.5hp / 32A	22.5 kW / 30hp / 40A	25 kW / 34hp / 45A	26 kW / 35hp / 50A	30 kW / 40hp / 63A	37 kW / 50hp / 70A	45 kW / 60hp / 95A	55 kW / 75hp / 110A	75 kW / 100hp / 140A	90 kW / 120hp / 160A	100 kW / 136hp / 200A	130 kW / 175hp / 235A	140 kW / 190hp / 250A	150 kW / 200hp / 275A	168 kW / 225hp / 300A	200 kW / 267hp / 400A
Operational current I _b for AC-4 Utilization category at 415V, 3Ø, 50Hz for 2,00,000 operating cycles		5.5A	7.1A	8A	8.5A	13.5A	16A	20A	24A	24A	28.5A	43A	53A	58A	66A	90A	100A	120A	140A	150A	150A	**
Capacitor switching delta connected: 415V, 50Hz ***		6 kVAr	7.5 kVAr	9 kVAr	9 kVAr	15 kVAr	20 kVAr	20 kVAr	30 kVAr	30 kVAr	35 kVAr	40 kVAr	65 kVAr	65 kVAr	70 kVAr	100 kVAr	125 kVAr	150 kVAr	175 kVAr	175 kVAr	250 kVAr	300 kVAr
Max. Permissible peak in-rush current, I _p for capacitor switching		570A	680A	750A	750A	1400A	2000A	2000A	2450A	2450A	2650A	3000A	3500A	3500A	4000A	4500A	5400A	6100A	7000A	7000A	**	**
DC ratings (with 3 poles in series) and AC coil operation	DC 1 - 110V	9A	12A	18A	22A	25A	32A	40A	45A	50A	63A	80A	95A	110A	140A	185A	225A	265A	325A	400A	550A	650A
	DC 1 - 220V	9A	12A	18A	22A	25A	32A	40A	45A	50A	63A	80A	95A	110A	140A	185A	225A	265A	325A	400A	550A	650A
	DC 3 - 110V	9A	12A	18A	22A	25A	32A	40A	45A	50A	63A	80A	95A	110A	140A	185A	225A	265A	325A	400A	550A	650A
	DC 3 - 220V	9A	12A	18A	22A	25A	32A	40A	45A	50A	63A	80A	95A	110A	140A	185A	225A	265A	325A	400A	550A	650A
	DC 5 - 110V	9A	12A	18A	22A	25A	32A	40A	45A	50A	63A	80A	95A	110A	140A	185A	225A	265A	325A	400A	550A	650A
	DC 5 - 220V	6A	7.5A	9A	9A	12A	20A	25A	45A	50A	50A	63A	95A	110A	125A	185A	225A	265A	325A	400A	550A	650A
Mechanical life, No. of operating cycles		15 x 10 ⁵	15 x 10 ⁵	15 x 10 ⁵	15 x 10 ⁵	10 x 10 ⁵	10 x 10 ⁵	10 x 10 ⁵	10 x 10 ⁵	10 x 10 ⁵	10 x 10 ⁵	10 x 10 ⁵	10 x 10 ⁵	10 x 10 ⁵	10 x 10 ⁵	10 x 10 ⁵	10 x 10 ⁵	10 x 10 ⁵	10 x 10 ⁵	10 x 10 ⁵	10 x 10 ⁵	10 x 10 ⁵
Max. frequency of operations: Operating cycles/hr	Mechanical	7200	7200	7200	7200	7200	7200	3600	3600	3600	3600	3600	3600	3600	3600	3600	3600	3600	3600	3600	1200	1200
	Utilization Category AC-1	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	750	750
	Utilization Category AC-2	750	750	750	750	750	750	750	750	750	750	750	750	750	750	750	750	750	750	750	750	750
	Utilization Category AC-3	750	750	750	750	750	750	750	750	750	750	750	750	750	750	750	750	750	750	750	750	750
	Utilization Category AC-4	300	300	300	300	300	300	300	300	300	300	300	300	300	300	250	150	150	150	150	150	150
Service temperature		-20°C to +55°C	-20°C to +55°C	-20°C to +55°C	-20°C to +55°C	-20°C to +55°C	-20°C to +55°C	-20°C to +55°C	-20°C to +55°C	-20°C to +55°C	-20°C to +55°C	-20°C to +55°C	-20°C to +55°C	-20°C to +55°C	-20°C to +55°C	-20°C to +55°C	-20°C to +55°C	-20°C to +55°C	-20°C to +55°C	-20°C to +55°C	-20°C to +55°C	-20°C to +55°C
Main terminal capacity	Lug (mm ²)	1 x 6	1 x 6	1 x 6	1 x 6	1 x 10	1 x 10	1 x 10	1 x 35	1 x 35	1 x 35	1 x 35	1 x 120	1 x 120	1 x 120	1 x 185	1 x 185	2 x 240 / 1 x 300	2 x 240 / 1 x 300	2 x 240 / 1 x 300	2 x 50mm x 5mm	-
	Link (mm ²)	-	-	-	-	-	-	-	1 x 12.5mm x 3mm	1 x 12.5mm x 3mm	1 x 12.5mm x 3mm	1 x 12.5mm x 3mm	2 x 25mm x 3mm	2 x 25mm x 3mm	2 x 25mm x 3mm	2 x 30mm x 5mm	2 x 30mm x 5mm	2 x 30mm x 5mm	2 x 50mm x 5mm	2 x 50mm x 5mm	2 x 50mm x 5mm	2 x 60mm x 5mm
	Solid Conductors (mm ²)	2 x 4	2 x 4	2 x 4	2 x 4	2 x 6	2 x 6	2 x 6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Multi strand conductors (mm ²)	2 x 2.5	2 x 2.5	2 x 2.5	2 x 2.5	2 x 4	2 x 4	2 x 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Auxiliary Contacts																						
No. of built-in auxiliary contacts		1NO or 1NC	1NO or 1NC	1NO or 1NC	1NO or 1NC	#	#	#	2NO + 2NC	2NO + 2NC	2NO + 2NC	2NO + 2NC	2NO + 2NC	2NO + 2NC	2NO + 2NC	2NO + 2NC	2NO + 2NC	2NO + 2NC	2NO + 2NC	2NO + 2NC	2NO + 2NC	2NO + 2NC
Conventional thermal current, I _{th} at 55°C		10A	10A	10A	10A	10A	10A	10A	10A	10A	10A	10A	10A	10A	10A	10A	10A	10A	10A	10A	10A	10A
AC-15 rating at 415V, 50Hz		4A	4A	4A	4A	4A	4A	4A	4A	4A	4A	4A	4A	4A	4A	4A	4A	4A	4A	4A	4A	4A
Terminal capacity (Solid or multi strand conductors (mm ²))		2 x 2.5	2 x 2.5	2 x 2.5	2 x 2.5	2 x 2.5	2 x 2.5	2 x 2.5	2 x 2.5	2 x 2.5	2 x 2.5	2 x 2.5	2 x 2.5	2 x 2.5	2 x 2.5	2 x 2.5	2 x 2.5	2 x 2.5	2 x 2.5	2 x 2.5	2 x 2.5	2 x 2.5
Coil																						
Voltage available for 50Hz U _c (V)		24, 42, 110, 220, 240, 415, 525	24, 42, 110, 220, 240, 415, 525	24, 42, 110, 220, 240, 415, 525	24, 42, 110, 220/240, 415, 525	24, 42, 110, 220/240, 415, 525	24, 42, 110, 220/240, 415, 525	24, 42, 110, 220/240, 415, 525	24, 42, 110, 220/240, 415, 525	24, 42, 110, 220/240, 415, 525	24, 42, 110, 220/240, 415, 525	24, 42, 110, 220/240, 415, 525	24, 42, 110, 220/240, 415, 525	24, 42, 110, 220/240, 415, 525	24, 42, 110, 220, 240, 415, 525	110, 240, 415, 525	110, 240, 415, 525	110, 240, 415, 525	110, 240, 415, 525	110, 240, 415, 525	110, 240, 415	110, 240, 415
Pick-up	VA	68	68	68	68	68	68	68	190	190	190	190	550	550	550	960	960	2100	2100	2100	1000	1000
	CosØ	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.77	0.77	0.77	0.77	0.64	0.64	0.64	0.3	0.3	0.21	0.21	0.21	-	-
Hold-on	VA	11	11	11	11	11	11	11	21	21	21	21	36	36	36	56	56	95	95	95	25	25
	Watts	4	4	4	4	4	4	4	5.5	5.5	5.5	5.5	10	10	10	16	16	35	35	35	10	10
Limits of operation	Pick-up (%U _c)	65 - 120	65 - 120	65 - 120	65 - 120	65 - 120	65 - 120	80 - 110	80 - 110	80 - 110	80 - 110	80 - 110	80 - 110	80 - 110	80 - 110	80 - 110	80 - 110	80 - 110	80 - 110	80 - 110	80 - 110	80 - 110
	Drop-off (%U _c)	35 - 50	35 - 50	35 - 50	35 - 50	35 - 50	35 - 50	35 - 65	35 - 65	35 - 65	35 - 65	35 - 65	35 - 65	35 - 65	35 - 65	35 - 65	35 - 65	35 - 65	35 - 65	35 - 65	35 - 65	35 - 65

* With 1NC auxiliary contacts
** Data available on request
*** For capacitor switching, please connect inductor in series

Add - on block can be ordered separately
• 60Hz & 50/60Hz Coils available on request

Four Pole Power Contactors - Type MCX



- Range from 16-800AAC1
- Wide operating band upto 100AAC1
- Compact mechanical interlock arrangement upto 80A

Technical Data



Type		MCX 01	MCX 02	MCX 03	MCX 04	MCX 11	MCX 12	MCX 21	MCX 22	MCX 31	MCX 32	MCX 33	MCX 34	MCX 41	MCX 42	MCX 43	MCX 44	MCX 45	MCX 46	MCX 47
Catalogue No.		CS97009	CS97010	CS97011	CS97012	CS97013	CS97014	CS97016	CS97017	CS97019	CS97020	CS97021	CS97022	CS97023	CS97024	CS97025	CS97026	CS97027	CS97028	CS94291
Conformance to standards							IS/IEC 60947 - 4 - 1 & IEC 60947 - 4 - 1													
Preferred DG ratings, kVA		7.5	15	20	25	30	40	50	62.5	82.5	100	125	160	200	225	250	320	380	437.5	500
Power contacts		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
No. of poles		4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Number of built-in auxiliary contacts		-	-	-	-	-	-	2NO + 2NC	2NO + 2NC	1NO + 1NC	1NO + 1NC	1NO + 1NC	1NO + 1NC	2NO + 2NC	2NO + 2NC	2NO + 2NC	2NO + 2NC	2NO + 2NC	2NO + 2NC	2NO + 2NC
Rated insulation voltage, Ui		690V	690V	690V	690V	690V	690V	690V	690V	1000V	1000V	1000V	1000V	1000V	1000V	1000V	1000V	1000V	1000V	1000V
Rated operational voltage, Ue		415V	415V	415V	415V	415V	415V	415V	415V	415V	415V	415V	415V	415V	415V	415V	415V	415V	415V	415V
Rated impulse withstand voltage, Uimp		8 kV	8 kV	8 kV	8 kV	8 kV	8 kV	8 kV	8 kV	8 kV	8 kV	8 kV	8 kV	8 kV	8 kV	8 kV	8 kV	8 kV	8 kV	8kV
Conventional thermal current, Ith / Utilization category AC1 at 40°C		16A	25A	32A	40A	50A	63A	80A	100A	130A	160A	200A	255A	325A	360A	400A	500A	600A	700A	800A
Motor Duty : 3 ph, 415V, 50Hz Utilization category AC-3		9A	12A	18A	22A	25A	35A	45A	65A	80A	100A	120A	130A	225A	265A	300A	350A	425A	500A	550A
Service temperature		-20°C to 55°C	-20°C to 55°C	-20°C to 55°C	-20°C to 55°C	-20°C to 55°C	-20°C to 55°C	-20°C to 55°C	-20°C to 55°C	-20°C to 55°C	-20°C to 55°C	-20°C to 55°C	-20°C to 55°C	-20°C to +55°C	-20°C to +55°C	-20°C to +55°C	-20°C to +55°C	-20°C to +55°C	-20°C to +55°C	-20°C to +55°C
Main terminal capacity	With lug (sq.mm)	1 x 6	1 x 6	1 x 6	1 x 6	1 x 16	1 x 16	1 x 35	1 x 35	1 x 120	1 x 120	1 x 120	1 x 120	2 x 240	2 x 240	2 x 240	2 x 240	2 x 240	2 x 240	2 x 240
	Link	-	-	-	-	-	-	1 x (12.5mm x 3mm)	1 x (12.5mm x 3mm)	2 x (25mm x 3mm)	2 x (25mm x 3mm)	2 x (25mm x 3mm)	2 x (25mm x 3mm)	2 x (50mm x 5mm)	2 x (50mm x 5mm)	2 x (50mm x 5mm)	2 x (50mm x 5mm)	2 x (50mm x 5mm)	2 x (50mm x 5mm)	2 x (50mm x 5mm)
	Solid conductor (sq.mm)	2 x 4	2 x 4	2 x 4	2 x 4	2 x 10	2 x 10	-	-	-	-	-	-	-	-	-	-	-	-	-
	Multistrand conductors (sq.mm)	2 x 2.5	2 x 2.5	2 x 2.5	2 x 2.5	2 x 6	2 x 6	-	-	-	-	-	-	-	-	-	-	-	-	-
Auxiliary terminal capacity	Solid or multistrand conductors (sq.mm)	-	-	-	-	-	-	-	-	-	-	-	-	2 x 2.5	2 x 2.5	2 x 2.5	2 x 2.5	2 x 2.5	2 x 2.5	2 x 2.5
Coil																				
Voltage available for 50Hz opn, Uc (V)		110, 220, 240, 415	110, 220, 240, 415	110, 220, 240, 415	110, 220, 240, 415	110, 240, 415	110, 240, 415	240, 415	240, 415	110, 240, 415	110, 240, 415	110, 240, 415	110, 240, 415	110, 240, 415	110, 240, 415	110, 240, 415	110, 240, 415	110, 240, 415	110, 240, 415	110, 240, 415
Pick-up	VA	68	68	68	68	180	180	190	190	550	550	550	550	2100	2100	2100	2100	1000	1000	1000
Hold-on	VA	11	11	11	11	22	22	22	22	36	36	36	36	95	95	95	95	25	25	25
	Watts	4	4	4	4	5	5	5.5	5.5	10	10	10	10	35	35	35	35	10	10	10
Limits of operation	Pick-up (%Uc)	65 - 120	65 - 120	65 - 120	65 - 120	50 - 120	50 - 120	65 - 120	65 - 120	80 - 110	80 - 110	80 - 110	80 - 110	80 - 110	80 - 110	80 - 110	80 - 110	80 - 110	80 - 110	80 - 110
	Drop-off (%Uc)	35 - 55	35 - 55	35 - 55	35 - 55	25 - 45	25 - 45	40 - 60	40 - 60	35 - 65	35 - 65	35 - 65	35 - 65	35 - 65	35 - 65	35 - 65	35 - 65	35 - 65	35 - 65	35 - 65
Overall dimensions H x W x D in mm		83 x 45 x 88	83 x 45 x 88	83 x 45 x 88	83 x 45 x 88	80 x 83.5 x 91.8	80 x 83.5 x 91.8	109 x 106 x 120.5	109 x 106 x 120.5	175 x 183.5 x 152	175 x 183.5 x 152	175 x 183.5 x 152	175 x 183.5 x 152	278 x 248 x 221	278 x 248 x 221	275 x 248 x 221	275 x 248 x 221	275 x 248 x 221	275 x 248 x 221	275 x 248 x 221
Mounting dimensions H x W in mm		(60-65-70) x 35	(60-65-70) x 35	(60-65-70) x 35	(60-65-70) x 35	(55 - 58) x 70	(55 - 58) x 70	80 x 85	80 x 85	115 x 165	115 x 165	115 x 165	115 x 165	170 x 225	170 x 225	170 x 225	170 x 225	170 x 225	170 x 225	170 x 225

Thermal Overload Relays - Type MN



- Available in 3 frame sizes from 0.2-570A
- Direct mounting on MNX Contactors
- Trip class 10A (30 available in MN 12L)
- Ambient temperature compensated
- Built-in single phasing protection



Technical Data

		MN 2	MN 5	MN 12	MN 12L
Catalogue No.		SS94141	SS94136	SS94138	SS94127
		SS94142	SS94137	SS94139	
		SS94144	-		
		SS94145	-		
Conformance to standards		IS/IEC 60947 - 4 - 1 & IEC 60947 - 4 - 1			
Range		0.2 - 0.33	9 - 15	42 - 69	42 - 69
		0.3 - 0.5	14 - 23	60 - 100	60 - 100
		0.45 - 0.75	20 - 33	90 - 150	90 - 150
		0.6 - 1	30 - 50	135 - 225	135 - 225
		0.9 - 1.5	45 - 75	180 - 300	180 - 300
		1.4 - 2.3	66 - 110	270 - 450	340 - 570
		2 - 3.3	-	-	-
		3.0 - 5	-	-	-
		4.5 - 7.5	-	-	-
		6.0 - 10	-	-	-
		9.0 - 15	-	-	-
		14 - 23	-	-	-
		20 - 33	-	-	-
		24 - 40	-	-	-
				-	-
Mounting		Direct	Direct	-	-
		Separate	Separate	Separate	Separate
Suitable for Contactors		MNX 9, 12, 18 22, 25, 32, 40	MNX 45, 50, 70 80, 95, 110, 140	MNX 185, 225, 265 325, 400, 550	
Rated Insulation Voltage	U _i	690V	690V	690V	690V
Rated Impulse Voltage	U _{imp}	6kV	6kV	6kV	6kV
Service Temperature		-5°C to 55°C			
Start / OFF / Reset		1 Start & OFF / Reset			
Built-in Contacts		2NO + 1NC	2NO + 1NC	2NO + 1NC	2NO + 1NC
Rated Operational Current for AC-15 utilization category at 50Hz	24V	6A	6A	6A	6A
	110V	5A	5A	5A	5A
	220V	3A	3A	3A	3A
	380 / 415V	2A	2A	2A	2A
	500V	2A	2A	2A	2A
Trip Class		10A	10A	10A	30
Max. Frequency of Operations	Cycles / hr.	30	30	30	30
Main Terminal Capacity	Lug (mm ²)	10	50	240	240
Aux. Terminal Capacity	Wires (mm ²)	2 x 2.5	2 x 2.5	2 x 2.5	2 x 2.5

Note - All relays are Ambient Temperature Compensated

Mini Contactors - Type MX



- Range from 6A-12A AC3
- Control contactors available in all NO/NC combinations (4 Pole)
- All accessories are with top mounting
- Available with AC or DC control
- Built-in surge suppressor with DC control
- Direct mounting thermal overload relay type MX-R0
- RoHS Compliant



Technical Data

Type Designation for AC / DC Control			MX 6 AC / DC	MX 9 AC / DC	MX 12 AC / DC	
Catalogue No. for AC control			CS94012 / 3		CS94014 / 5	CS94016 / 7
Catalogue No. for DC control			CS94021 / 2		CS94023 / 4	CS94025 / 6
Conforming to standards			IS/IEC 60947-4-1, IEC 60947-4-1, EN 60947-4-1			
Rated insulation voltage, Ui			690V			
Service temperature			-5°C to +55°C			
Degree of protection			Protection against direct finger contact from front			
Tightening torque			0.8 Nm			
Power Contacts						
No. of main poles			3			
Conventional thermal current, Ith			20A			
Rated current at 415V, 50Hz	Utilization category AC-1		20A			
	Utilization category AC-3		6A / 3kW	9A / 4kW	12A / 5.5kW	
Making capacity at 415V, 50Hz			10 Ie (AC-3) A			
Breaking capacity at 415V, 50Hz			8 Ie (AC-3) A			
Short-circuit protection	gG fuse at 415V, 50Hz		20A			
Electrical durability (AC-3)			1	0.8 Million	0.6	
Frequency of operation at Uc	Utilization category AC-1		3000 Opn / hr			
	Utilization category AC-3		750 Opn / hr			
Main terminal capacity	Solid conductors		2 x 2.5 mm²			
	Multi-stranded conductors		2 x 2.5 mm²			
Auxiliary Contacts						
No. of built-in auxiliary contact			1NO or 1NC			
Conventional thermal current, Ith			10A			
Rated current at 415V, 50Hz	Utilization category AC-15		4A			
Short-circuit protection	gG fuse at 415V, 50Hz		10A			
Electrical durability (AC-15) at 415V, 50Hz			1.5 Million			
Minimum non-overlapping distance			0.5 mm			
Maximum frequency of operation at Uc (AC-15)			1000 Opn / hr			
Auxiliary terminal capacity	Solid conductors		2 x 2.5 mm²			
	Multi-stranded conductors		2 x 2.5 mm²			
Maximum Permissible control cable length for drop-off*		415V	69.30 m			
		240V	207.21 m			
		110V	986.37 m			

CS94012 / 14 / 16 / 21 / 23 / 25 are 3 Main + 1NO auxiliary contact

CS94013 / 15 / 17 / 22 / 24 / 26 are 3 Main + 1NC auxiliary contact

*Cable Capacitance assumed to be 0.2 microfarad/km

Contactor Relays - Type MX



Technical Data

Type Designation for AC / DC Control			MX 0 AC / DC				
Catalogue No. for AC control			CS94018	CS94019	CS94020	CS94041	CS94042
Catalogue No. for DC control			CS94027	CS94028	CS94029	CS94043	CS94044
Contact combination			40E	31E	22E	13E	04E
Conforming to standards			IS/IEC 60947-5-1, IEC 60947-5-1, EN 60947-5-1				
Rated insulation voltage, Ui			690V				
Service temperature			-5°C to +55°C				
Degree of protection			Protection against direct finger contact from front				
Tightening torque			0.8 Nm				
Contacts							
No. of poles			4				
Contact details			4NO	3NO+1NC	2NO+2NC	1NO+3NC	4NC
Conventional thermal current, Ith			10A				
Rated current at 415V, 50Hz		Utilization category AC-15	4A				
Short-circuit protection		gG fuse at 415V, 50Hz	10A				
Electrical durability (AC-15) at 415V, 50Hz			1.5 Million				
Minimum non-overlapping distance			0.5 mm				
Maximum frequency of operation at Uc for AC-15			1000 Opn / hr				
Terminal capacity		Solid conductors	2 x 2.5 mm ²				
		Multi-stranded conductors	2 x 2.5 mm ²				
Control Circuit for Power Contactor & Contactor Relay							
Coil voltage			AC			DC	
Standard Coil voltage Uc, at 50Hz			24V, 110V, 240V, 415V			24V, 110V, 220V	
Average consumption at Uc, 50Hz	Pick-up		26VA			2.8VA	
	Hold-on		4.5VA			2.8VA	
			1.2 W			2.8 W	
Limits of operation	Pick-up		80 (% Uc) - 110 (% Uc)			80 (% Uc) - 110 (% Uc)	
	Drop-off		20 (% Uc) - 65 (% Uc)			10 (% Uc) - 65 (% Uc)	
Operating time at Uc, 50Hz	Between coil energisation and: - Opening of NC contacts - Closing of NO contacts		5 ms ...20 ms			5 ms...25 ms	
			10 ms...25 ms			10 ms...30 ms	
	Between coil de-energisation and: - Opening of NO contacts - Closing of NC contacts		10 ms...25 ms			10 ms...30 ms	
			15 ms...30 ms			15 ms...35 ms	
Mechanical durability			10 Million			10 Million	
Maximum frequency of operation at Uc			9000 Opn / hr			9000 Opn / hr	
Maximum Permissible control cable length for drop-off*		415V	69.30 m				
		240V	207.21 m				
		110V	986.37 m				

Note

- 1) 5 NC and above combinations not recommended for DC control
- 2) *Cable Capacitance assumed to be 0.2 microfarad/km

Auxiliary Contact Blocks

Technical Data



Type Designation		MX-A1							
Catalogue No.		CS94030	CS94031	CS94032	CS94033	CS94034	CS94035	CS94036	CS94037
Contact combination		20E	11E	02E	40E	31E	22E	13E	04E
Conforming to standards		IS/IEC 60947-5-1, IEC 60947-5-1, EN 60947-5-1							
Rated insulation voltage, Ui		690V							
Service temperature		-5°C to +55°C							
Degree of protection		Protection against direct finger contact from front							
Tightening torque		0.8 Nm							
Contacts									
No. of poles		2			4				
Contact details		2NO	1NO+1NC	2NC	4NO	3NO+1NC	2NO+2NC	1NO+3NC	4NC
Conventional thermal current, Ith		10A							
Rated current at 415V, 50Hz		3A							
Utilization category AC-15									
Short-circuit protection gG fuse at 415V, 50Hz		10A							
Electrical durability (AC-15) at 415V, 50Hz		1 Million							
Minimum overlapping distance		0.5 mm							
Maximum frequency of operation at Uc for (AC-15)		1000 Opn / hr							
Terminal capacity	Solid conductors	2 mm ² x 2.5 mm ²							
	Multi-stranded conductors	2 mm ² x 2.5 mm ²							

Mechanical Interlock



Type designation	MX-M1
Catalogue No.	CS94038

Surge Suppressor



Type designation	MX-S1
Catalogue No.	CS94039
Suitable coil voltage at 50Hz	24-48V; 110-240V; 360-415V

Thermal Overload Relay - Type MX - R0



Technical Data

Type Designation		MX-R0	
Catalogue No.		ST94074	
Conformance to standards		IS/IEC 60947 - 4 - 1 & IEC 60947 - 4 - 1	
Current Range		Range (A)	Ordering Suffix
		0.1 - 0.16	OOBO
		0.16 - 0.24	OODO
		0.22 - 0.33	OOEO
		0.3 - 0.45	OOGO
		0.45 - 0.67	OOHO
		0.67 - 1.0	OOKO
		1.0 - 1.5	OOMO
		1.4 - 2.1	OONO
		1.8 - 2.7	OOPO
		2.4 - 3.6	OOQO
		3.5 - 5	OOSO
		4 - 6	OOTO
		5.5 - 8.5	OOUO
		8.5 - 12.5	OOVO
Rated insulation voltage, Ui		690V	
Rated impulse voltage, Uimp		6 kV	
Service temperature		-5°C to +55°C	
Contacts			
Rated operational current for AC-15 utilization category at 50Hz for	24V	6A	
	110V	5A	
	220V	3A	
	380 / 415V	2A	
	500V	2A	
Tripping class		10	
Maximum frequency of operation		30 Opn / hr	
Main terminal capacity (Lug)		10 mm²	
Auxiliary terminal capacity (Wires)		2 mm² x 2.5 mm²	
Mounting		Direct	
OFF / Reset		1 OFF and Reset	
Built-in contacts		1NO and 1NC	

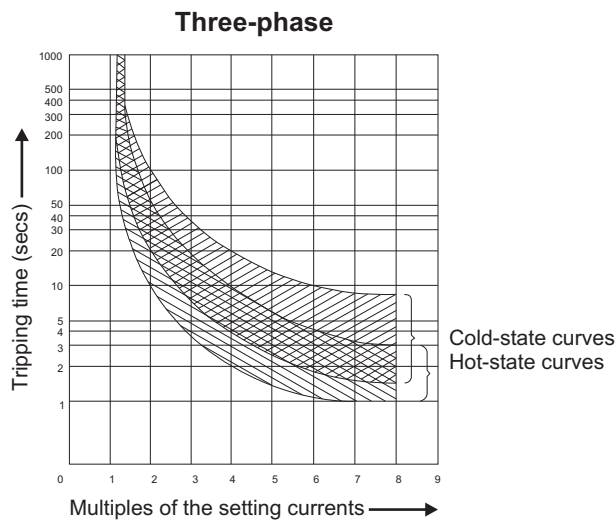
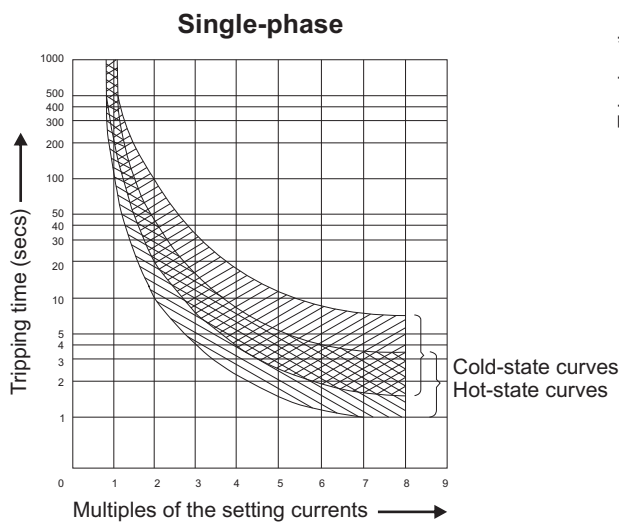
Thermal Overload Relay - Type MX - R0

Technical Data

Relay Selection Chart

Range (A)	Back-up fuse (HF)	Contactor
0.1 - 0.16	2	MX 6
0.16 - 0.24	2	MX 6
0.22 - 0.33	2	MX 6
0.3 - 0.45	2	MX 6
0.45 - 0.67	2	MX 6
0.67 - 1.0	2	MX 6
1.0 - 1.5	2	MX 6
1.4 - 2.1	4	MX 6
1.8 - 2.7	4	MX 6
2.4 - 3.6	4	MX 6
3.5 - 5	6	MX 6
4 - 6	8	MX 6
5.5 - 8.5	10	MX 9
8.5 - 12.5	16	MX 12

Protection Characteristics



Ordering information of Accessories & Spares for MNX

Contactor Type	Auxiliary Add on Block			Mechanical Interlock Kit	Surge Suppressor	Spare Coil	Spare kit	
	Mounting	Configuration	Cat. No.					
MNX 9 MNX 12 MNX 18 MNX 22	Top	4NO	CS94112	CS94126	CS94166	CS94105	MNX 9	CS94123
		3NO + 1NC	CS94113				MNX 12	CS94124
		2NO + 2NC	CS94114				MNX 18	CS94125
		1NO + 3NC	CS94115				MNX 22	CS94269
		4NC	CS94116					
		2NO	CS94117					
MNX 25 MNX 32 MNX 40		1NO + 1NC	CS94118				MNX 25	CS94127
		2NC	CS94119				MNX 32	CS94128
		1NO	CS94120				MNX 40	CS94147
		1NC	CS94121					
		First Left	1NO + 1NC					
		First Right	1NO + 1NC					
MNX 45 MNX 50 MNX 70 MNX 80	First Left	1NO + 1NC	CS94201	CS94197	CS94163	CS94192	MNX 45	CS94149
	First Right	1NO + 1NC	CS94202				MNX 50	CS94150
	Second Left	1NO + 1NC	CS94203				MNX 70	CS94151
	Second Right	1NO + 1NC	CS94204				MNX 80	CS94152
MNX 95 MNX 110 MNX 140				CS94198	CS94164	CS94196	MNX 95	CS94153
							MNX 110	CS94154
				MNX 140		CS94155		
MNX 185 MNX 225	First Left	1NO + 1NC	CS94205	CS94199		CS94194	MNX 185	CS94156
	First Right	1NO + 1NC	CS94206				MNX 225	CS94157
MNX 265 MNX 325 MNX 400	Second Left	1NO + 1NC	CS94207	CS94200	CS94165	CS94195	MNX 265	CS94159
	Second Right	1NO + 1NC	CS94208				MNX 325	CS94160
						MNX 400	CS94161	
MNX 550 MNX 650							CS94193	MNX 550
						MNX 650	CS96336	

Ordering information of Accessories & Spares for MCX

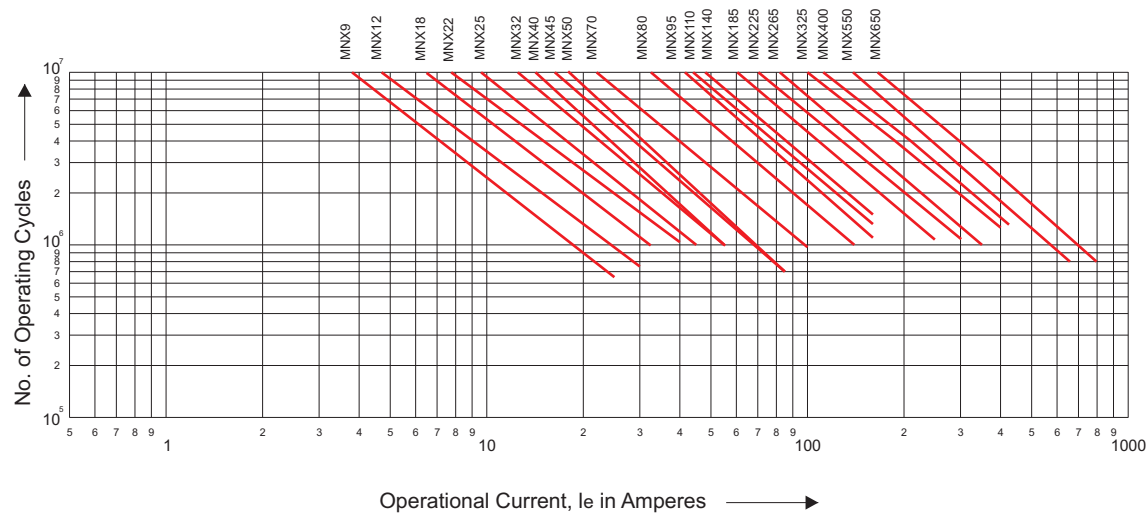
Contactor Type	Auxiliary Add on Block						Mechanical Interlock Kit	Surge Suppressor	Spare Coil	Spare kit	
	Mounting	Configuration	Cat. No.	Mounting	Configuration	Cat. No.					
MCX 01	First Left	1NO + 1NC	CS94220	Top	4NO	CS94112	CS94126	CS94166	CS94105	-	
MCX 02	First Right	1NO + 1NC	CS94221		3NO + 1NC	CS94113					
MCX 03					2NO + 2NC	CS94114					
MCX 04					1NO + 3NC	CS94115					
					4NC	CS94116					
					2NO	CS94117					
					1NO + 1NC	CS94118					
					2NC	CS94119					
					1NO	CS94120					
					1NC	CS94121					
MCX 11	First Left	1NO + 1NC	CS94201				-	CS94163	CS94009	MCX 11	CS94077
MCX 12	First Right	1NO + 1NC	CS94202							MCX 12	CS94078
MCX 21	Second Left	1NO + 1NC	CS94203				CS93095		CS94192	MCX 21	CS94330
MCX 22	Second Right	1NO + 1NC	CS94204							MCX 22	CS94331
MCX 31							CS94992	CS94164	CS94196	MCX 31	CS94081
MCX 32										MCX 32	CS94082
MCX 33										MCX 33	CS94083
MCX 34	First Left	1NO + 1NC	CS94205							MCX 34	CS94084
MCX 41	First Right	1NO + 1NC	CS94206				CS94301	CS94165	CS94195	MCX 41	CS94295
MCX 42	Second Left	1NO + 1NC	CS94207							MCX 42	CS94296
MCX 43	Second Right	1NO + 1NC	CS94208							MCX 43	CS94297
MCX 44									CS94193	MCX 44	CS94298
MCX 45										MCX 45	CS94299
MCX 46										MCX 46	CS94300
MCX 47										MCX 47	-

Mechanically interlocked Contactors

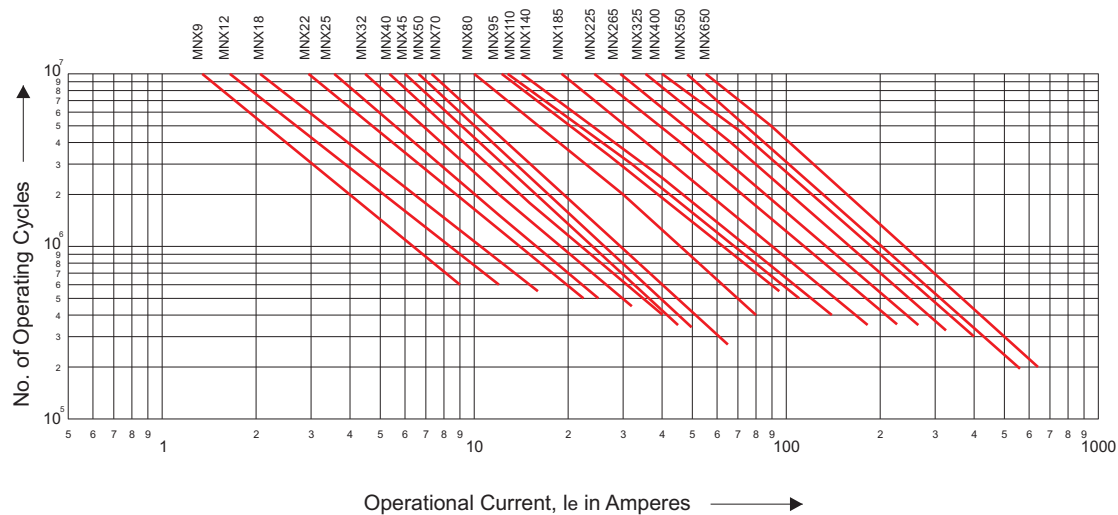
Type	Built-in Auxiliary Contacts	Cat. No.
Two MCX 11	-	CS94362
Two MCX 12	-	CS94365
MCX 11 - MCX 12	-	CS94363

Electrical Life Curves - Type MNX

Utilization Category AC-1

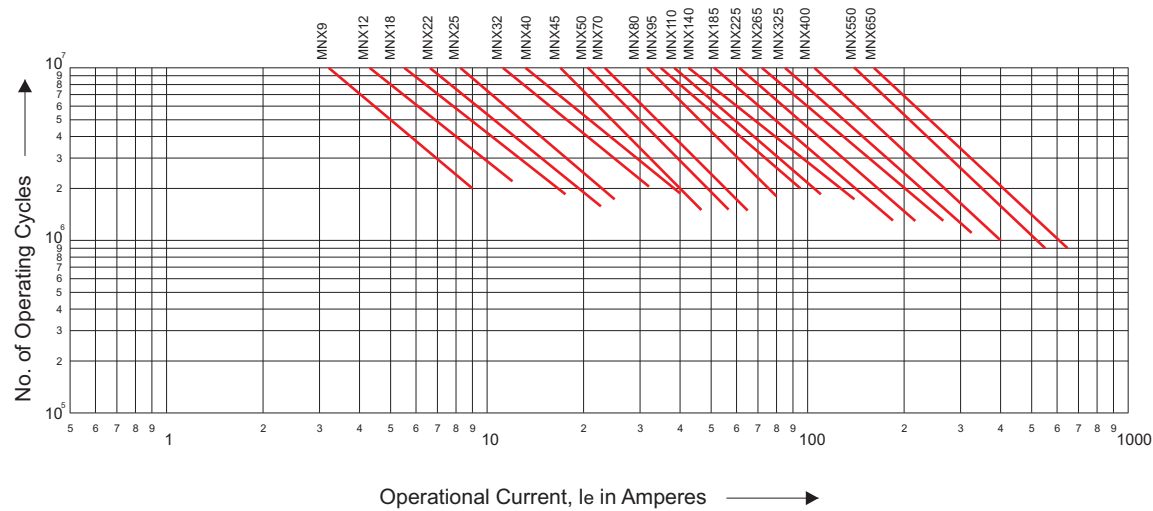


Utilization Category AC-2

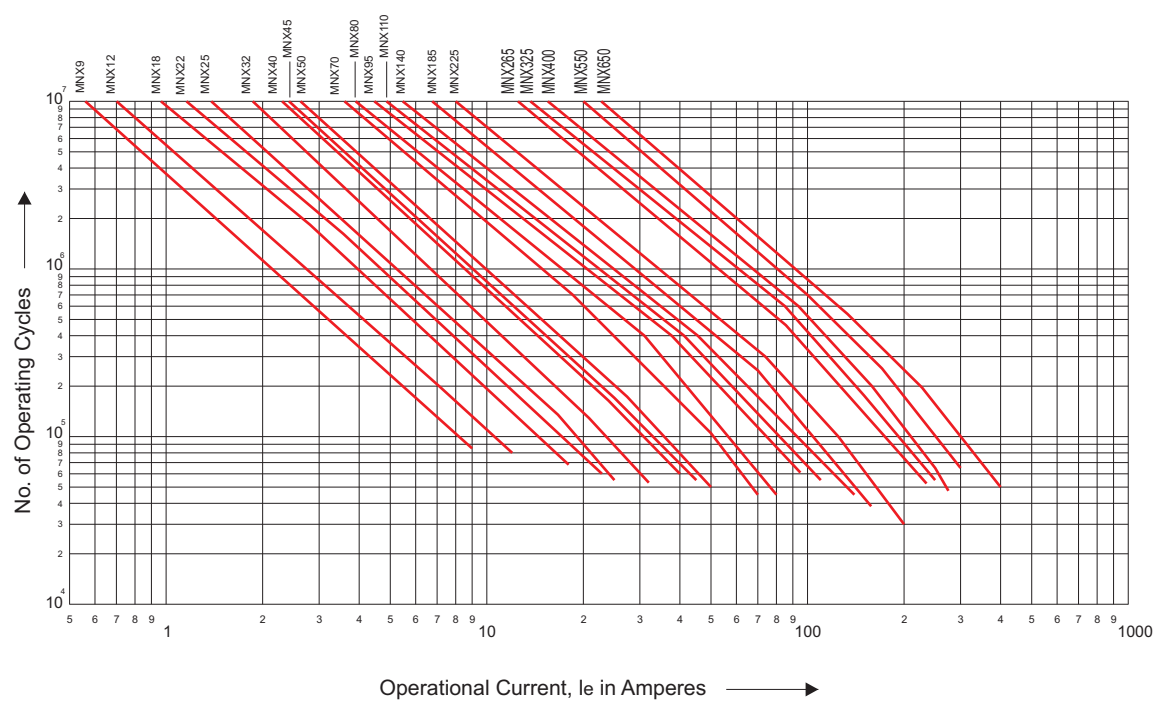


Electrical Life Curves - Type MNX

Utilisation Category AC-3



Utilization Category AC- 4



3 Pole Power Contactors - Type MNX

MNX 9
MNX 12
MNX 18

MNX 25
MNX 32
MNX 40

MNX 45 / 50
MNX 70 / 80

MNX 95
MNX 110
MNX 140

MNX 185
MNX 225

MNX 265, MNX 325
MNX 400, MNX 550
MNX 650

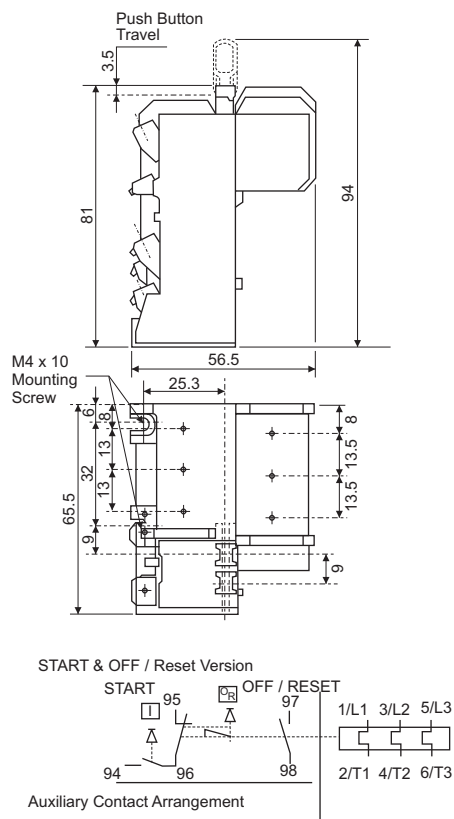
Contactor	MXN265/325/ 400/550	MXN650
A	241	259
B	275	296
C	62.5	74
D	35	40
E	55	56
F	5	6

16

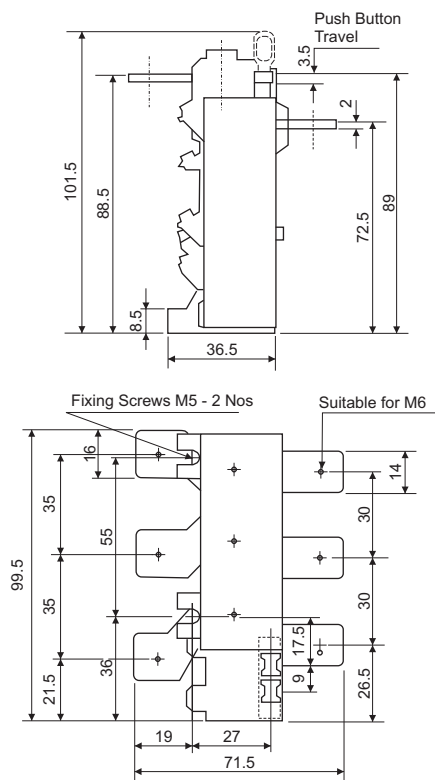
Overall Dimensions

Thermal Overload Relay - Type MN

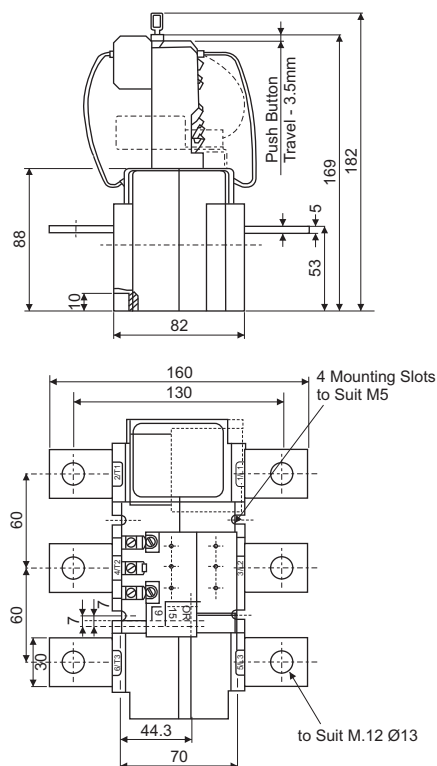
MN 2 (Separate Mounting)



MN 5 (Separate Mounting)



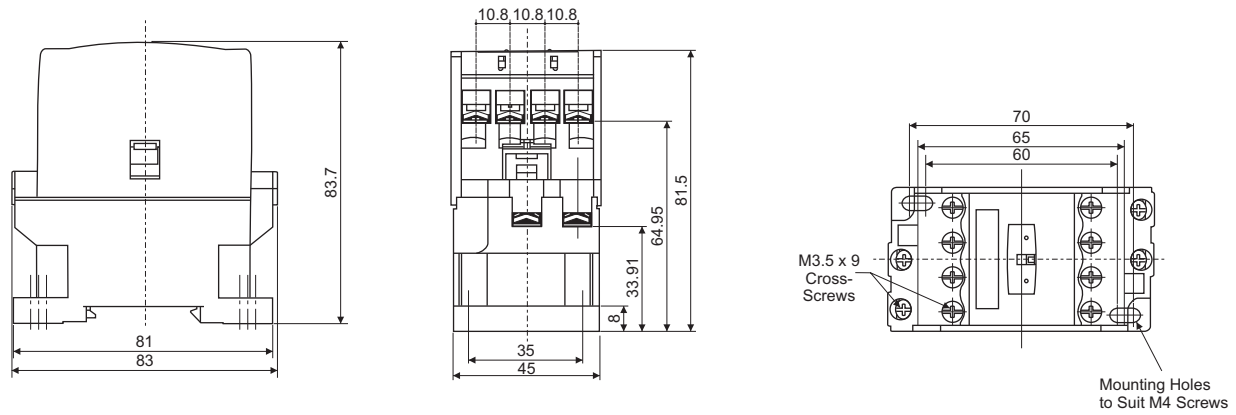
MN 12 / 12L (Relay)



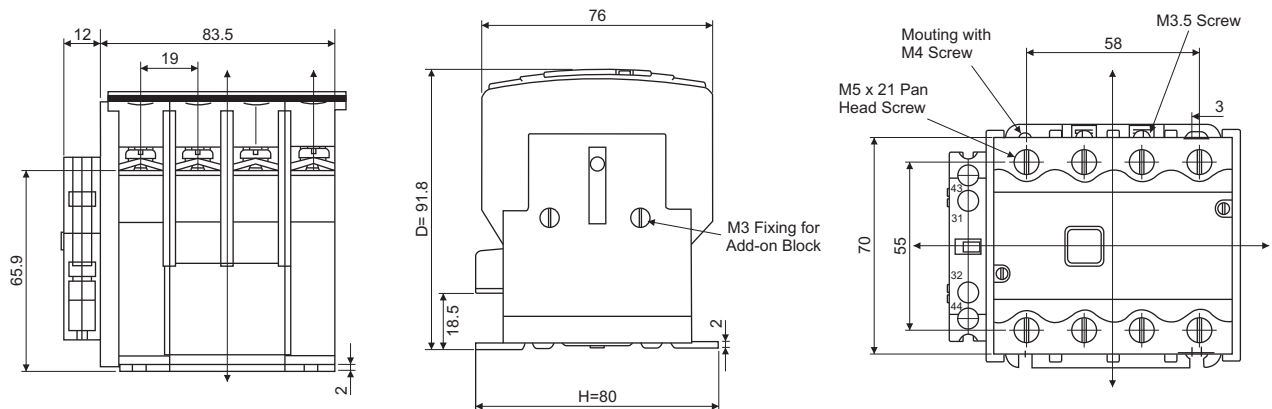
Overall Dimensions

Four Pole Contactors - Type MCX

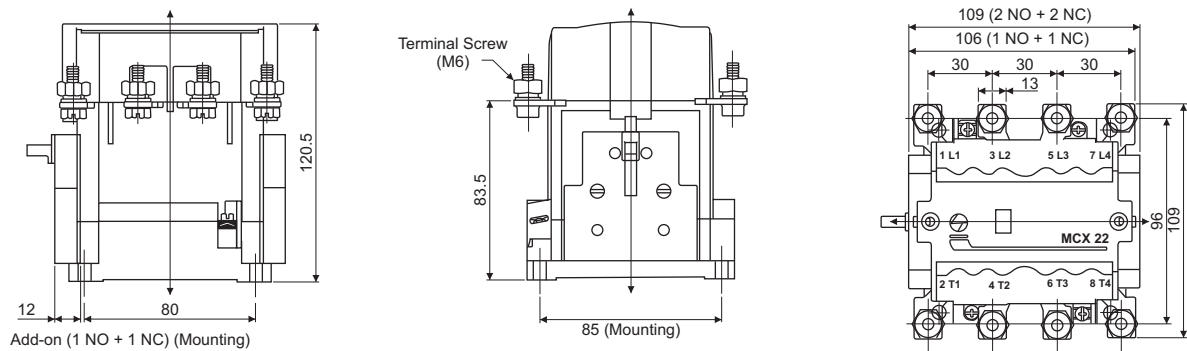
MCX 01 / MCX 02 / MCX 03 / MCX 04



MCX 11 / MCX 12



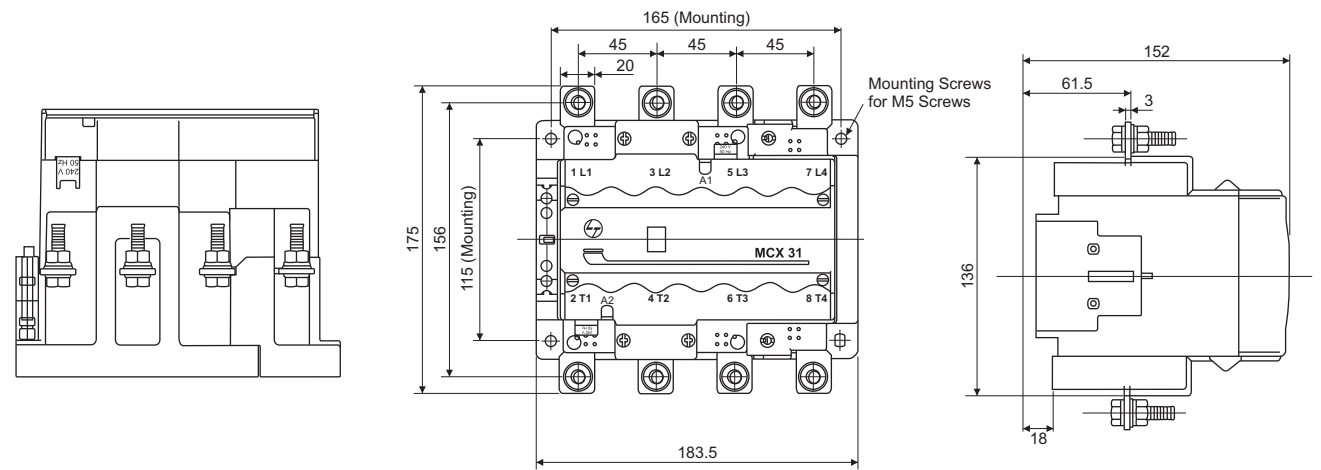
MCX 21 / MCX 22



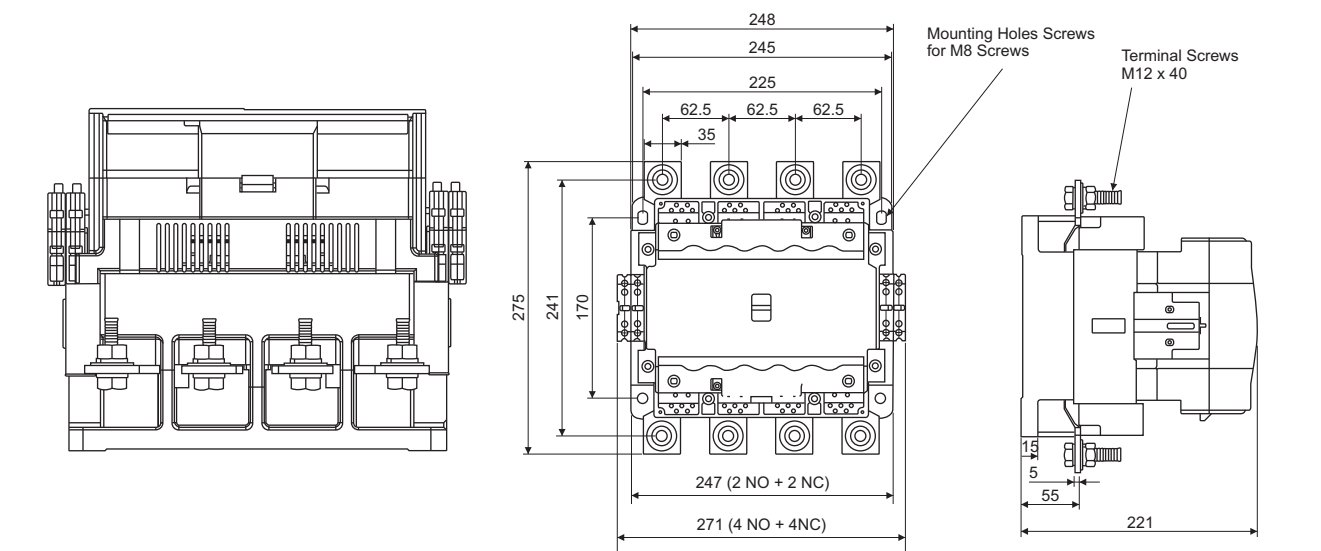
Overall Dimensions

Four Pole Contactors - Type MCX

MCX 31 / MCX 32 / MCX 33 / MCX 34



MCX 41 / MCX 42 / MCX 43 / MCX 44 / MCX 45 / MCX 46 / MCX 47

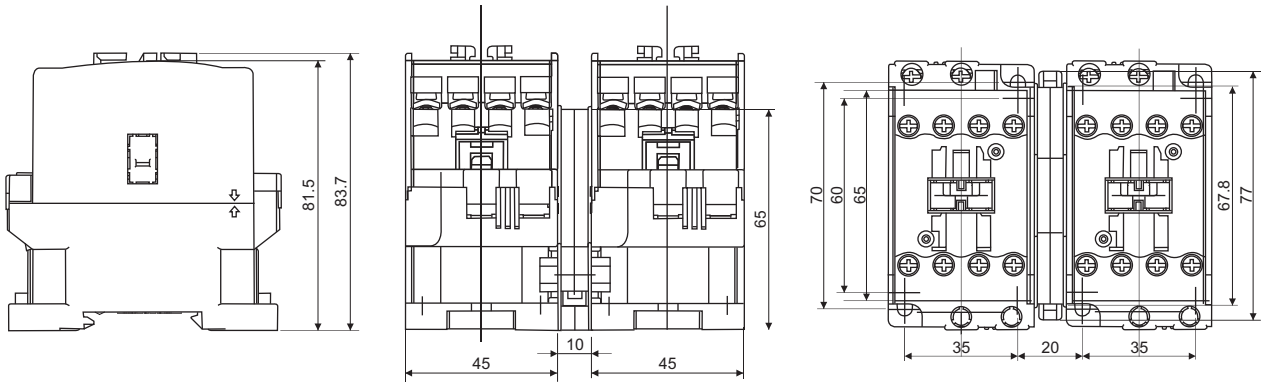


All Dimensions are in mm

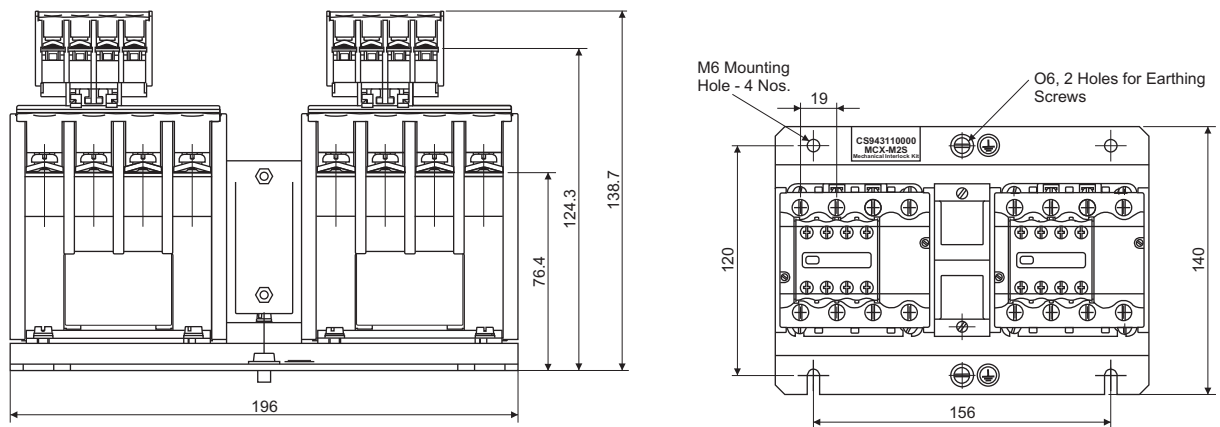
Overall Dimensions (With Mechanical Interlock Kit)

Four Pole Contactors - Type MCX

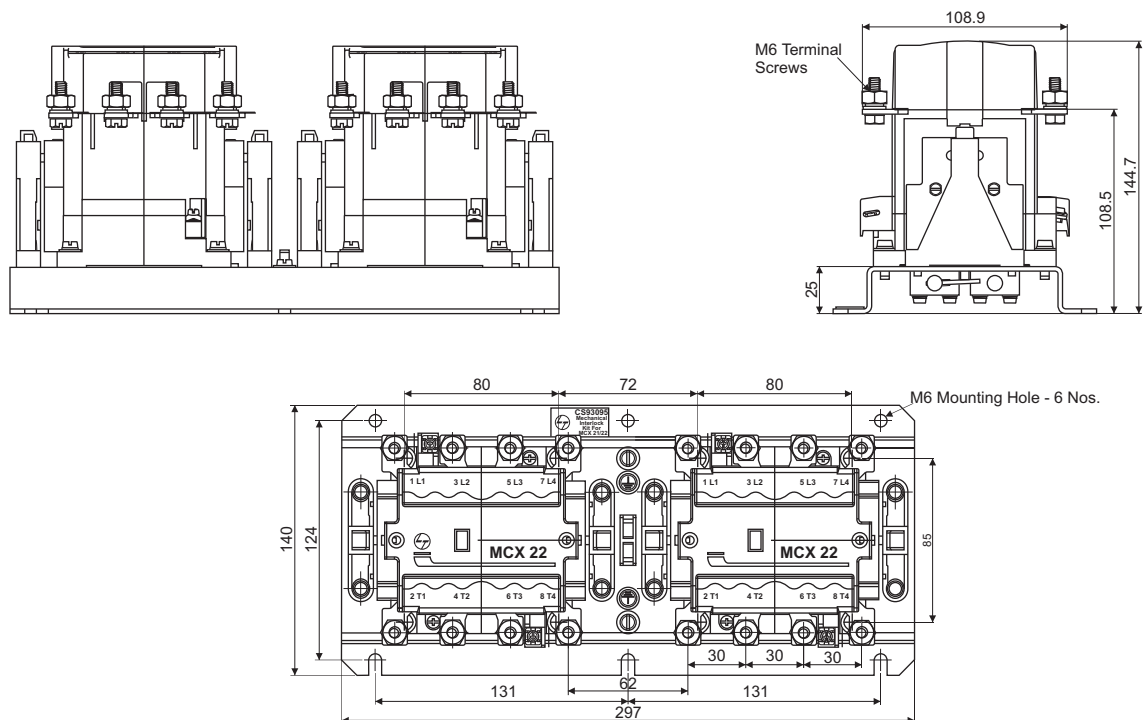
MCX 01-04



MCX 11 / MCX 12



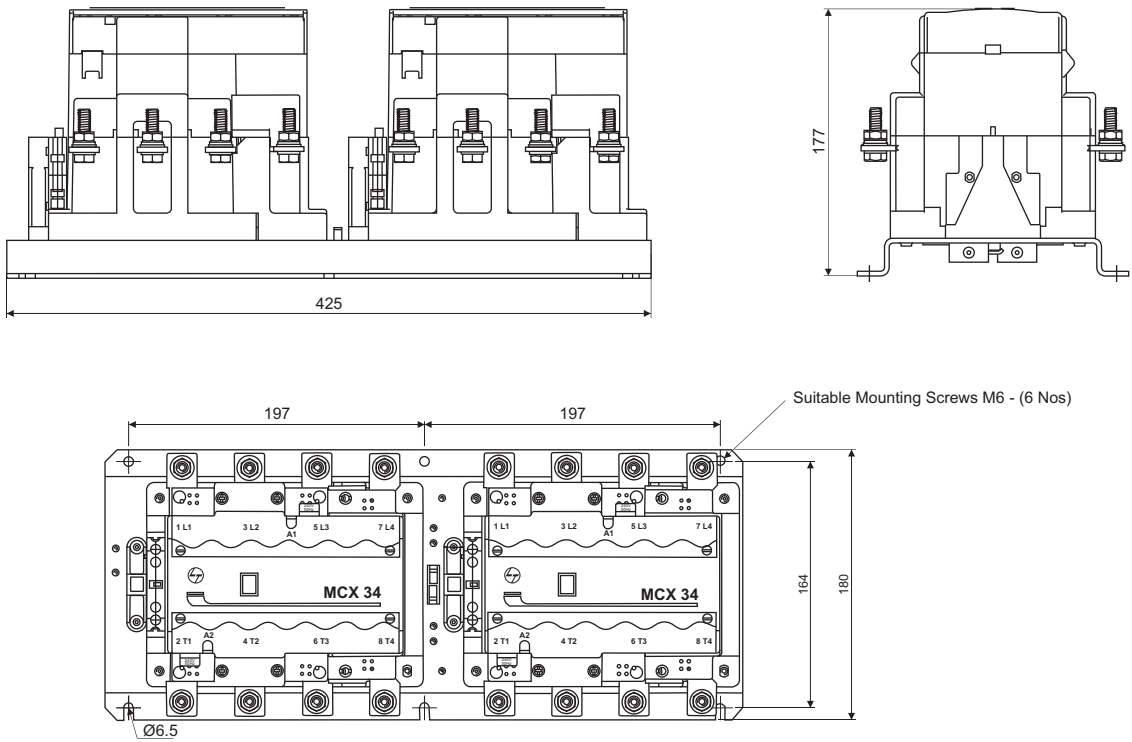
MCX 21-22



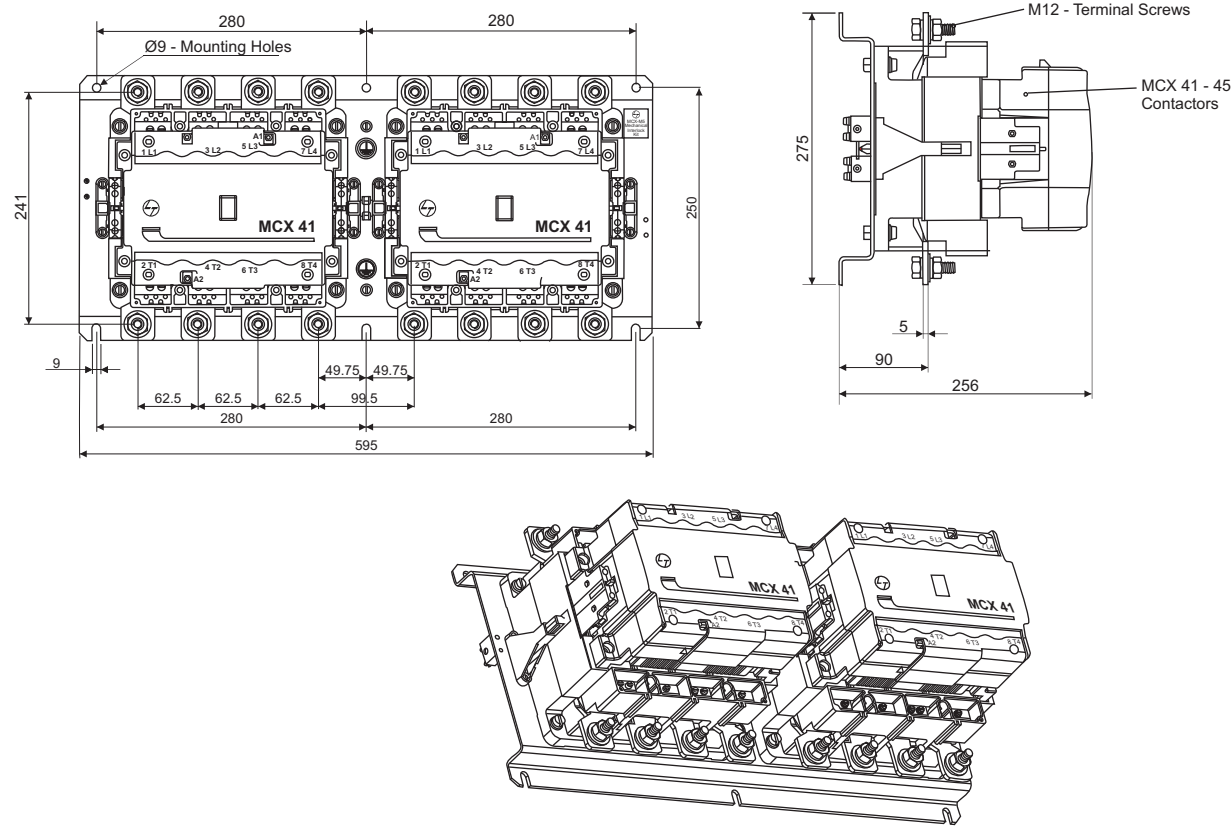
Overall Dimensions

Four Pole Contactors - Type MCX

MCX 31-34

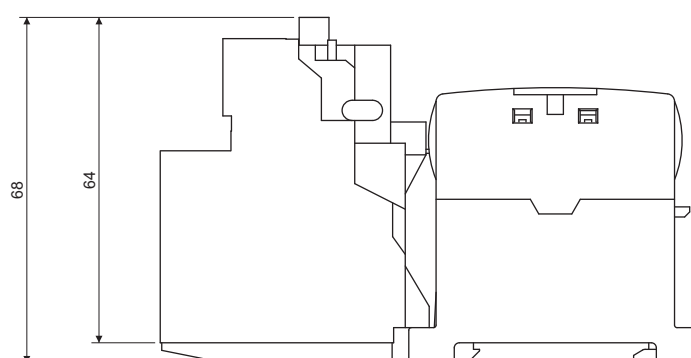


MCX 41 / MCX 42 / MCX 43 / MCX 44 / MCX 45 / MCX 46 / MCX 47

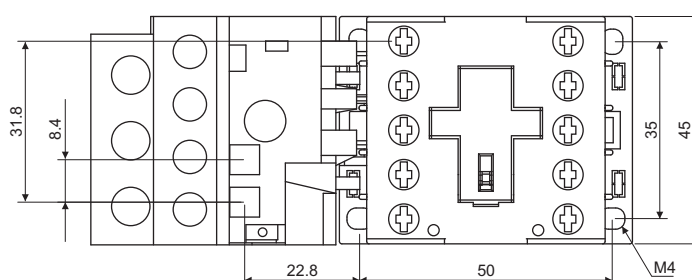


All Dimensions are in mm

Mini Contactors



Weight (gm)		
Type	AC control	DC control
Power Contactor	180	230
Contactor Relay		



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