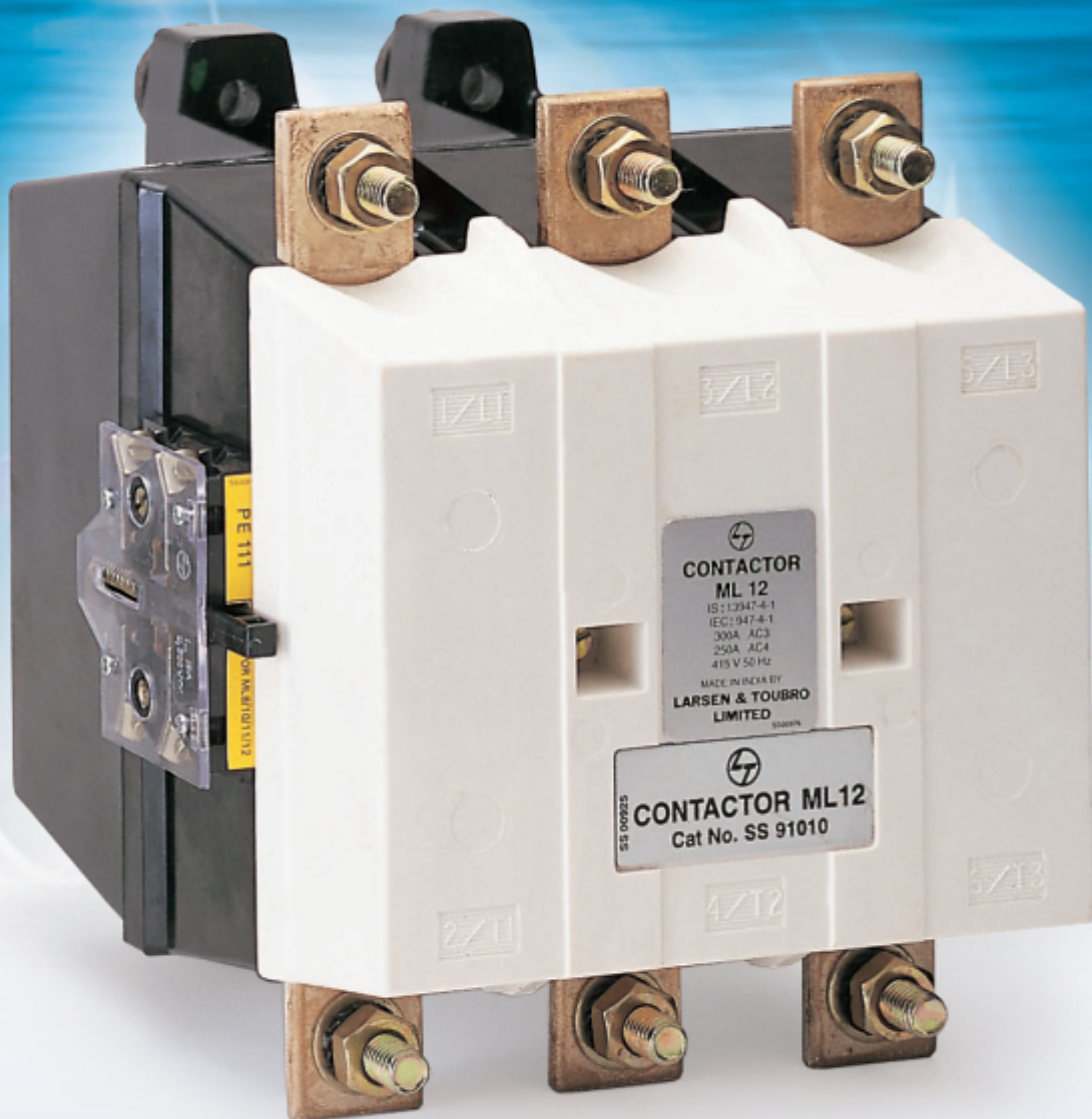




ML Series Contactor & Thermal Overload Relay

Technical Data

Contactors



Type	ML 1.5		ML 2		ML 3		ML 4		ML 6		ML 10		ML 12	
Cat. No.	SS91851		SS90701		SS90721		SS90910		SS90921		SS90935		SS91010	
Conformance Standards														
No. of poles			3		3		3		3		3		3	
Thermal rating / Utilization category AC-1 : 3 Ø, 415V, 50Hz*			25 A		40 A		45 A		100 A		125 A		250 A	
Insulation voltage , U _i (V)			500		500		500		660		660		660	
Motor duty 3Ø, 415V, 50Hz	Utilization Category AC-2		25 A		32 A		40 A		70 A		110 A		200 A	
	Utilization Category AC-3		11 kW/15hp/25 A		15 kW/20hp/32 A		22 kW/30hp/40 A		37 kW/50hp/70 A		55 kW/75hp/110 A		110 kW/150hp/200 A	
	Utilization Category AC-4		9 kW/12.5hp/21 A		15 kW/20hp/32 A		22 kW/30hp/40 A		37 kW/50hp/70 A		45 kW/60hp/85 A		110 kW/150hp/200 A	
Operational Current I _e (AC-4 Utilization Category) For contact life of 300000 Operating cycles			13.5 A		17 A		22 A		35 A		46 A		90 A	
I) Stator duty - 415V, 50Hz Duty factor (10 min. cycle duration)	20%		37 A		48 A		60 A		95 A		165 A		250 A	
	40%		37 A		48 A		60 A		95 A		165 A		250 A	
	60%		30 A		40 A		50 A		78 A		135 A		206 A	
II) Rotor duty - Delta connected Duty factor (10 min. cycle duration)	20%		56 A		72 A		90 A		157 A		270 A		370 A	
	40%		56 A		72 A		90 A		157 A		270 A		370 A	
	60%		44 A		60 A		75 A		118 A		206 A		310 A	
III) Max. Rotor Voltage (10 min. cycle duration)	Starting		830V		830V		830V		830V		830V		830V	
	Plugging		415V		415V		415V		415V		415V		415V	
	Speed control		500V		500V		500V		500V		500V		500V	
Capacitor Switching - Delta connected, 415V, 50Hz *** Single Capacitor			13 kVAr		20 kVAr		20 kVAr		50 kVAr		65 kVAr		125 kVAr	
Making Capacity at 457 V, Cos Ø - 0.35, 50Hz			252 A		400 A		480 A		840 A		1200 A		2500 A	
Breaking Capacity at 457 V, Cos Ø - 0.35, 50Hz			210 A		320 A		400 A		700 A		1000 A		2000 A	
DC rating (with 3 poles in series) and AC coil operation	DC 1 - 110V		25 A		32 A		40 A		63 A		85 A		200 A	
	DC 1 - 220V		25 A		32 A		40 A		63 A		85 A		200 A	
	DC 3 - 110V		25 A		32 A		40 A		63 A		85 A		200 A	
	DC 3 - 220V		10 A		32 A		40 A		63 A		85 A		200 A	
	DC 5 - 110V		25 A		32 A		40 A		63 A		85 A		200 A	
	DC 5 - 220V		7.5 A		32 A		40 A		63 A		85 A		200 A	
Mechanical life : No of operating cycles			15 x 10 ⁶		10 x 10 ⁶		10 x 10 ⁶		10 x 10 ⁵		10 x 10 ⁵		10 x 10 ⁶	
Max. Frequency of operation : Operating cycles/hr	Mechanical		3000		2000		2000		1200		1200		1200	
	Utilization Category AC-1		3000		750		750		1000		750		750	
	Utilization Category AC-2		750		750		750		500		500		500	
	Utilization Category AC-3		750		750		750		750		750		500	
	Utilization Category AC-4		250		250		250		250		250		250	
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	
Main terminal capacity	Wires up to (in mm) ²		2 x 10		2 x 25		2 x 25		-		-		-	
	Lugs up to (in mm) ²		16		50		50		50		95		240	
Auxiliary Contacts														
No. of built in auxiliary contacts			2 NO + 2 NC		2 NO + 2 NC		2 NO + 2 NC		2 NO + 2 NC**		2 NO + 2 NC**		2 NO + 2 NC*	
Operating Sequence			Break Before Make											
Thermal Rating at 415V, 50Hz			16 A		16 A		16 A		16 A		16 A		16 A	
Aux. Terminal Capacity : Wires up to (in 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	
AC-15 Rating at 415V, 50Hz			4 A		4 A		4 A		4 A		4 A		4 A	
Making Capacity at 415V, Cos Ø - 0.35, 50Hz			80 A		80 A		80 A		80 A		80 A		80 A	
Breaking Capacity at 415V, Cos Ø - 0.35 Ø, 50Hz			70 A		70 A		70 A		70 A		70 A		70 A	
Coil														
Voltages Available for 50Hz operation , U _c (V)			12, 24, 42, 110, 220/230, 240/250 320, 360, 380, 415/440, 525		42, 110, 220, 240 320, 360, 380, 415/440, 525			110, 220 240, 415, 525			110, 220, 240 380, 415, 525			
Pick - up	VA		60		120		120		450		4500		1450	
	Cos Ø		0.8		0.4		0.4		0.3		0.3		0.25	
Hold on	VA		15		20		20		50		50		85	
	Watts		5		8.5		8.5		17		17		27	
Limits of operation	Pick - up (% U _c)		75 - 110		75 - 110		75 - 110		75 - 110		75 - 110		75 - 110	
	Drop - off (% U _c)		65 - 15		65 - 15		65 - 15		65 - 15		65 - 15		65 - 15	
Typical closing delay in msec			5 - 35		10 - 35		10 - 35		10 - 35		10 - 35		15 - 45	
Typical opening delay in msec			5 - 20		5 - 25		5 - 25		10 - 40		10 - 40		5 - 25	
Weight (unpacked) in kg.			0.5		0.95		0.95		2.9		3		9.0	

Thermal Overload Relay



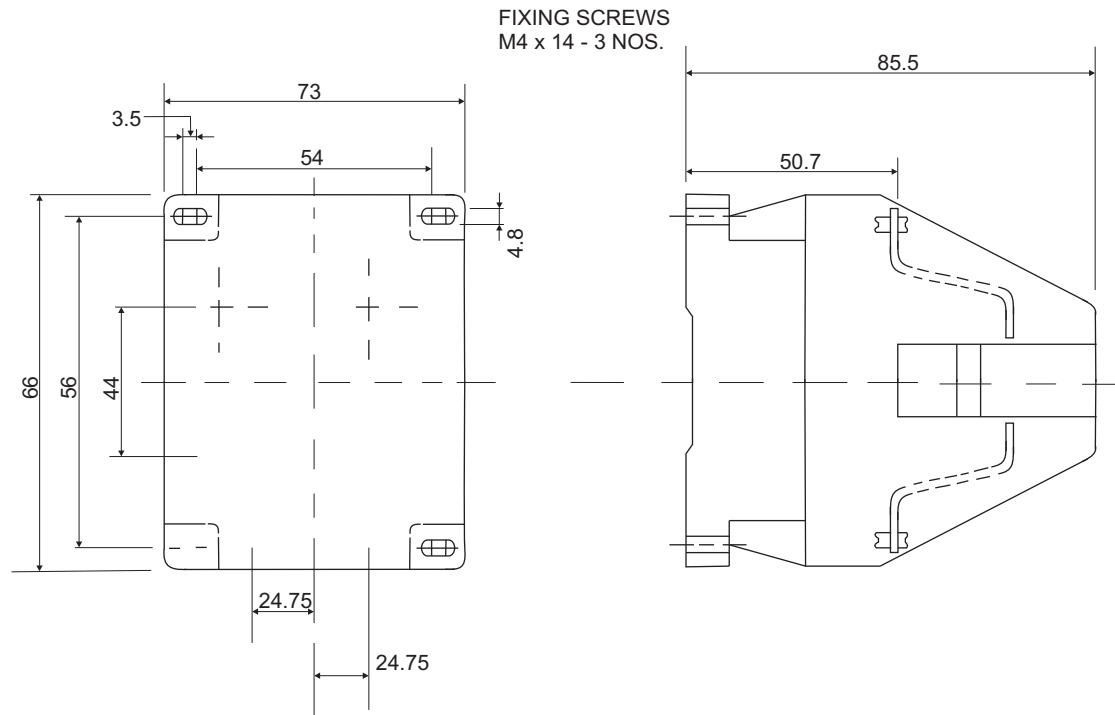
Type		ML 1.5	ML 2/3
Cat. No.		SS91858	SS91859
Rated insulation voltage (Ui)	V	500	500
Rated impulse strength (Uimp)		6	6
Service temperature	°C	-5 to + 55	-5 to + 55
Rated thermal current I _{th} at 415V, 50Hz	A	6	6
Rated operational current for AC-15 utilization category at 50Hz (A)	24 V	6	6
	110 V	5	5
	220 V	3	3
	380/415V	2	2
	500 V	2	2
Built in contacts		1 Start	1 Start
		1 Off / Reset	1 Off / Reset
		1 Alarm (NO)	1 Alarm (NO)
Tripping class (A)		10	10
Max. Frequency of operation	Op. cycles/hr	30	30
Main Terminal capacity	Lug (mm ²)	16	50
Aux. Terminal capacity	Wires (mm ²)	2 x 2.5	2 x 2.5

Accessories & Spares

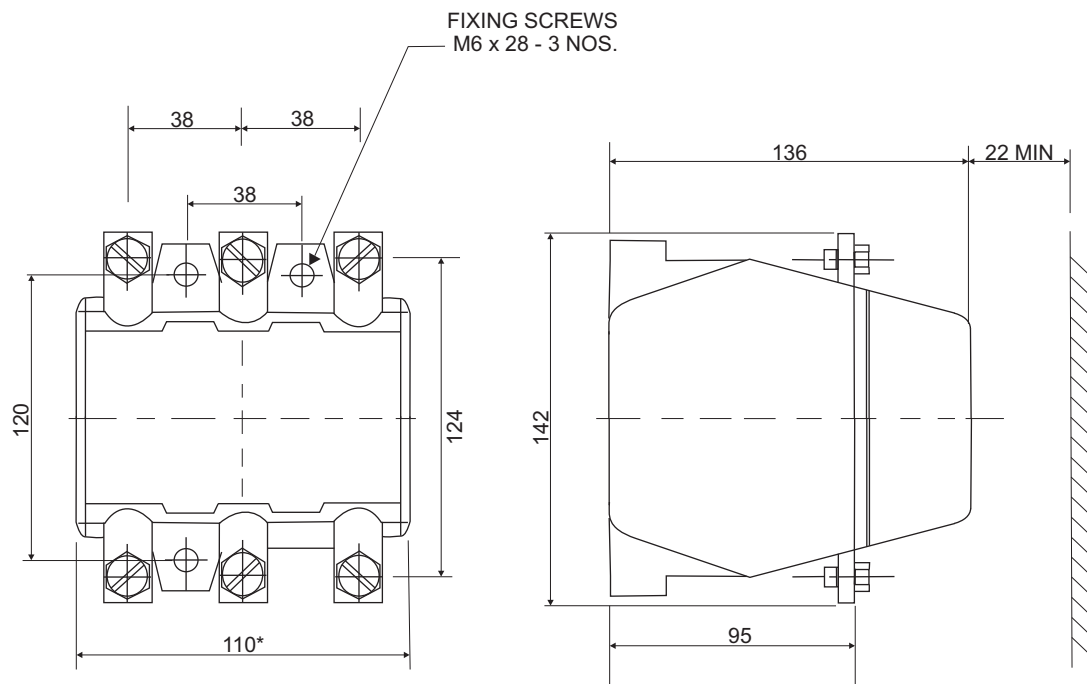
Contacteur Type	AUX.ADD ON Block	Spare Coil	Spare Kit
ML 1.5	Not Available	SS90873	SS95305
ML 2	Not Available	SS90545	SS95307
ML 3			SS95309
ML 4	SS91494	SS91258	SS95311
ML 6			SS95313
ML 10	SS91474	SS91011	SS95315
ML 12			SS95317

Overall Dimensions

ML1.5 Contactor (Without shroud)



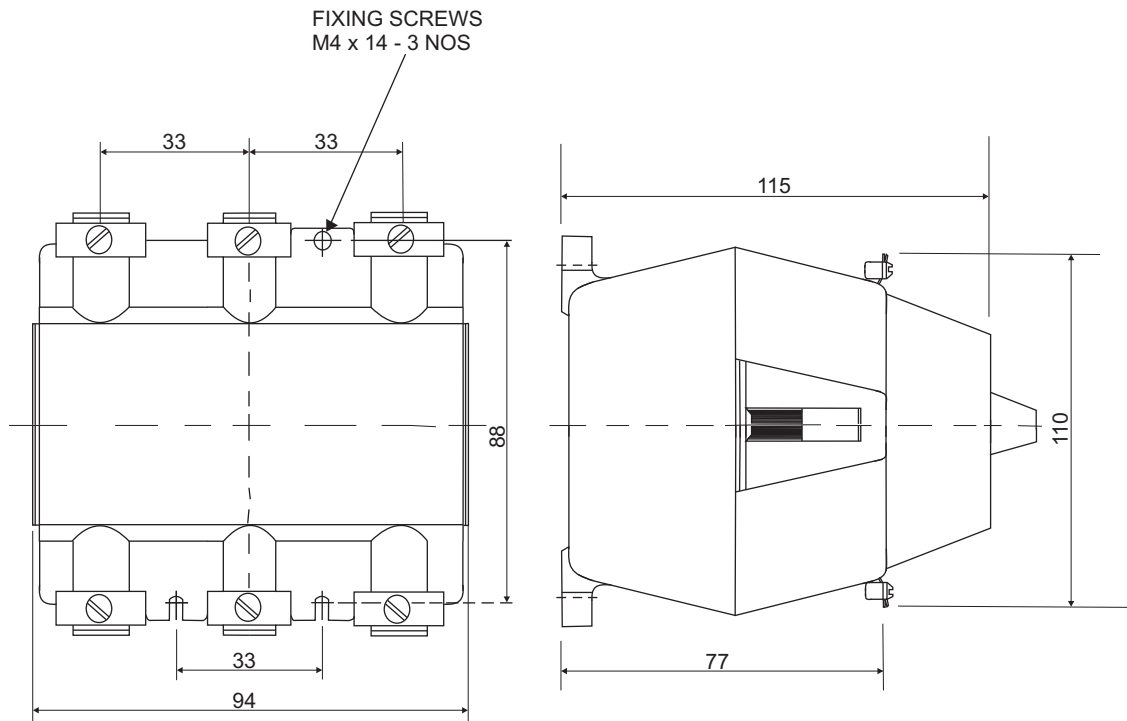
ML 4 Contactor



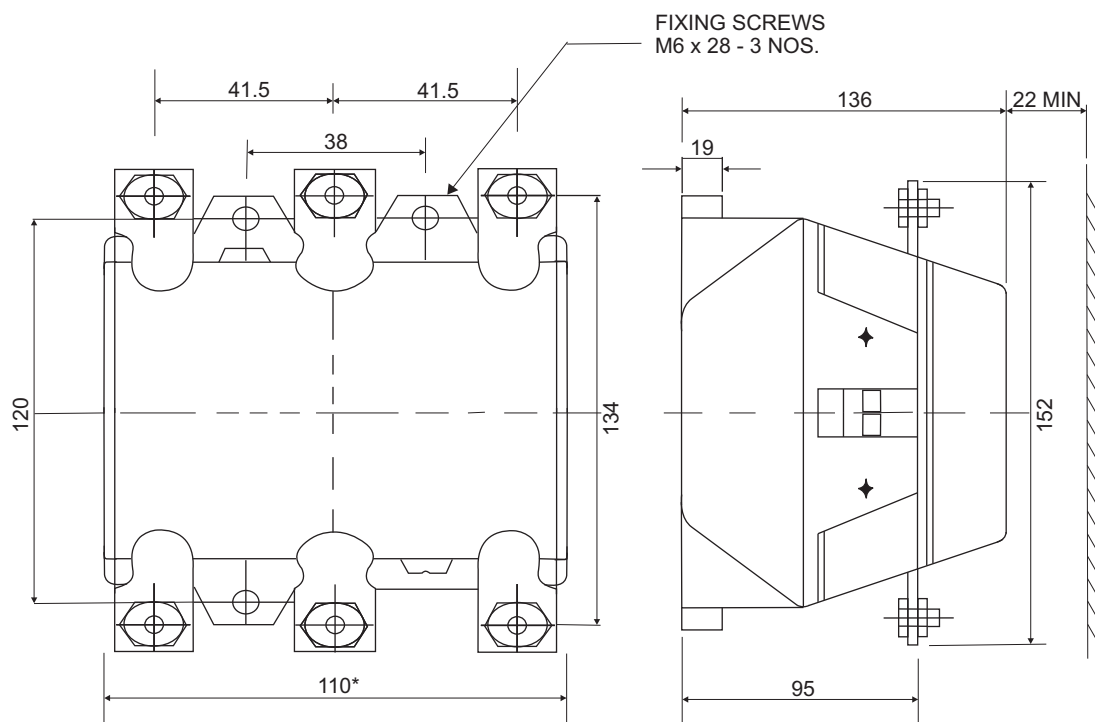
*Provide 12 mm extra for each Add-on block

Overall Dimensions

ML 2/3 Contactor



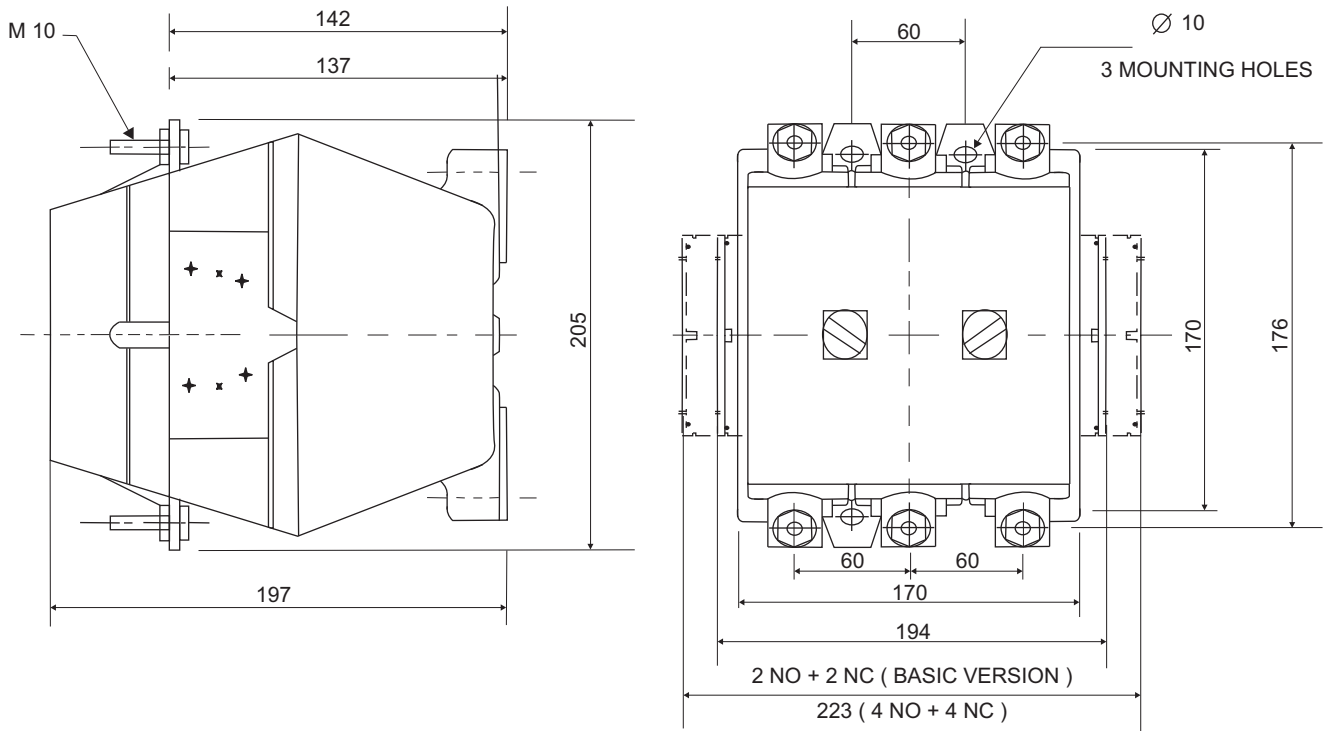
ML 6 Contactor



*Provide 12 mm extra for each Add-on block

Overall Dimensions

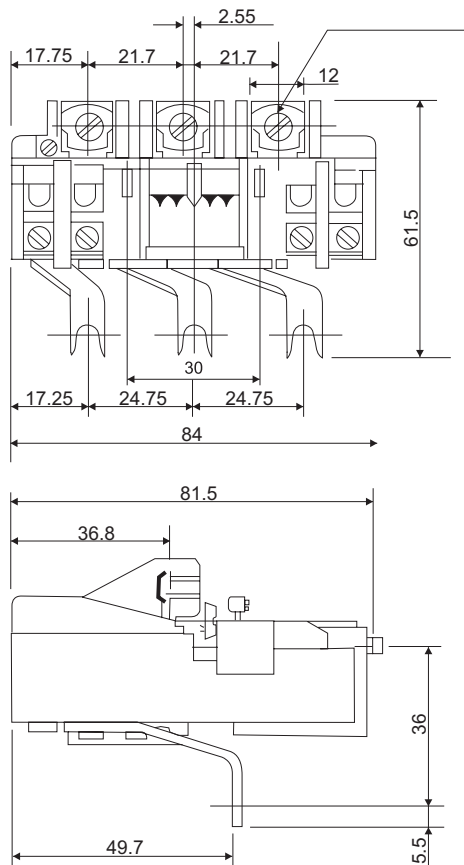
ML 10 / 12 Contactor



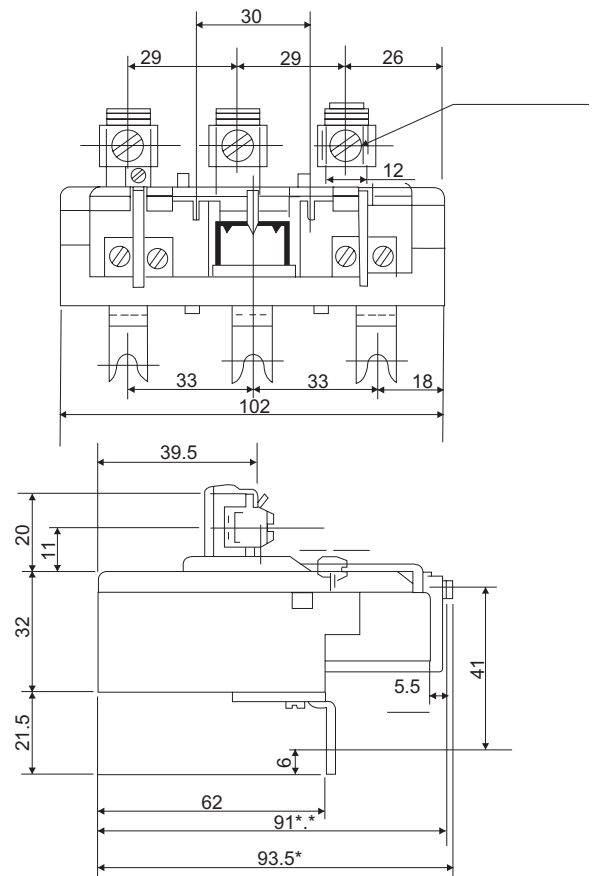
ML 0/1/1.5

Thermal Overload Relay

ML 2/3



TERMINAL SCREWS M4



TERMINAL SCREWS M4

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