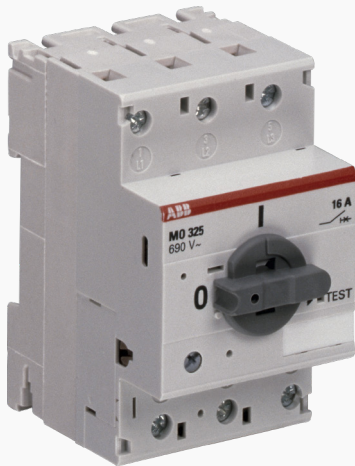


Manual motor starter magnetic only MO325



Manual motor starters magnetic only are electromechanical protection devices for the main circuit mainly used to switch motors manually ON/OFF and protect them fuseless against short-circuits. Fuseless protection with a manual motor starter saves costs, space and ensures a quick reaction under short-circuit condition, by switching off the motor within milliseconds. Fuseless starter combinations are setup together with contactors and overload relays.

Description

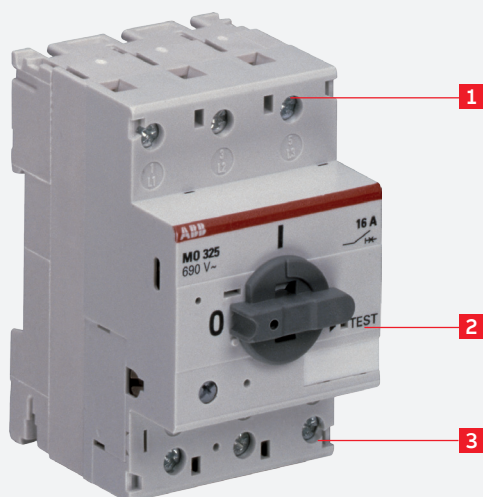
- Short-circuit protection
- Disconnect function
- Suitable for three- and single-phase application
- Trip-free mechanism
- Clear switch position indication ON/OFF



Order data

MO325 screw terminal

Setting range	Type	Order code	Weight Pkg (1 pce) kg
A			kg
0.40	MO325-0.4	1SAM160000R1003	0.310
0.63	MO325-0.63	1SAM160000R1004	0.310
1.00	MO325-1	1SAM160000R1005	0.340
1.60	MO325-1.6	1SAM160000R1006	0.370
2.50	MO325-2.5	1SAM160000R1007	0.370
4.00	MO325-4	1SAM160000R1008	0.370
6.30	MO325-6.3	1SAM160000R1009	0.370
9.00	MO325-9	1SAM160000R1010	0.370
12.50	MO325-12.5	1SAM160000R1011	0.370
16.0	MO325-16	1SAM160000R1012	0.370
20.0	MO325-20	1SAM160000R1013	0.370
25.0	MO325-25	1SAM160000R1014	0.370



Functional description

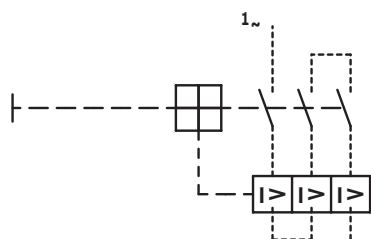
1. Terminals 1L1, 3L2, 5L3
2. Test function
3. Terminals 2T1, 4T2, 6T3

Application

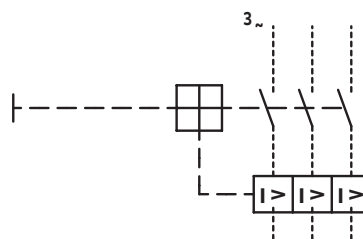
The manual motor starters magnetically protect the load and the installation against short-circuit. They are three pole protection devices with electromagnetic tripping elements for short-circuit protection. Furthermore, they provide a disconnect function for safely isolation of the installation and the supply, and can be used for the manual switching of loads.

For overload protection of the motors, an appropriate thermal or electronic overload relays must be used.

Operation mode

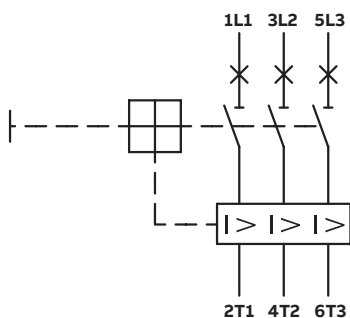


Single-phase operation



Three-phase operation

Wiring diagram

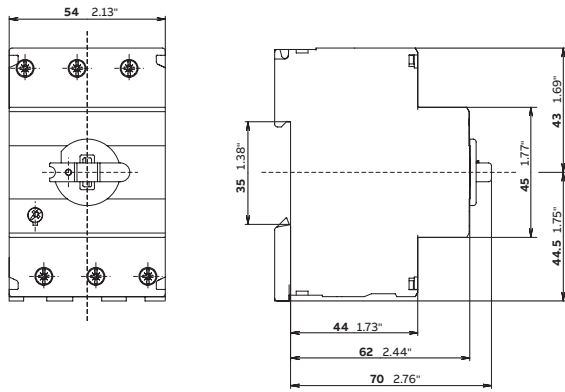


Power loss per pole

Type	Power loss per pole W
MO325-0.4	1.0
MO325-0.63	2.1
MO325-1	2.1
MO325-1.6	1.1
MO325-2.5	2.1
MO325-4	2.3
MO325-6.3	2.0
MO325-9	1.8
MO325-12.5	1.8
MO325-16	1.7
MO325-20	1.6
MO325-25	1.7

Main dimension

in mm / inches



MO325

Technical data IEC/EN

Data at $t_a = 40\text{ °C}$ and at rated values, if nothing else indicated





Main circuit

Terminal marking	1L1-3L2-5L3 2T1-4T2-6T3
Rated operational voltage U_e	690 V AC
	440 V DC
Rated operational current I_e	see table below
Rated operational current DC-5 I_e 3 conducting paths in series up to 250 V	-
Rated instantaneous short-circuit current setting I_i	see table below
Rated service short-circuit breaking capacity I_{cs}	see table "Short-circuit breaking capacity and back-up fuses" on page 6
Rated ultimate short-circuit breaking capacity I_{cu}	
Rated frequency	50/60 Hz
Number of poles	3
Power loss per pole	see table "Power loss per pole" on page 3

Isolation data

Rated impulse withstand voltage U_{imp}	6 kV
Rated insulation voltage U_i	690 V
Pollution degree	3

Electrical connection

Type		MO325
 solid		$1/2 \times 1 \dots 6 \text{ mm}^2 / 1 \times 10 \text{ mm}^2$
 flexible with ferrule		$1/2 \times 0.75 \dots 4 \text{ mm}^2 / 1 \times 6 \text{ mm}^2$
 flexible with ferrule insulated		$1/2 \times 0.75 \dots 4 \text{ mm}^2 / 1 \times 6 \text{ mm}^2$
 flexible without ferrule		$1/2 \times 1 \dots 6 \text{ mm}^2$
Stripping length		10 mm
Tightening torque		1.4 Nm
Recommended screw driver		Pozidriv 2

Type	Rated instantaneous short-circuit current setting I_i A	Rated operational current I_e A
MO325-0.4	3.90	0.40
MO325-0.63	6.14	0.63
MO325-1	11.50	1.00
MO325-1.6	16.00	1.60
MO325-2.5	27.50	2.50
MO325-4	40.00	4.00
MO325-6.3	67.73	6.30
MO325-9	135	9.00
MO325-12.5	180	12.50
MO325-16	240	16.0
MO325-20	300	20.0
MO325-25	375	25.0

General data

Mechanical durability		100 000
Electrical durability		50 000
Duty time		100 %
Dimensions (W x H x D)		see drawing "Dimensions" on page 3
Weight		see table "Order data" on page 1
Mounting		DIN-rail (EN 60715)
Mounting position		position 1-6 (optional for single mounting)
Group mounting		on request
Minimum distance to other units same type	horizontal	0 mm
	vertical	100 mm
Minimum distance to electrical conductive board	horizontal, up to 400 V	> 1.5 mm
	horizontal, up to 690 V	> 1.5 mm
	vertical	75 mm
Degree of protection	housing / main circuit terminals	IP20
Utilization category		A
Maximum operating altitude		2000 m
Maximum operating frequency		170 cycles/h

Environmental data

Ambient air temperature		
Operation	open - compensated	-
	open	-25 ... +50 °C
Storage		-50 ... +80 °C
Ambient air temperature compensation		
-		
Vibration (sinusoidal) acc. to IEC/EN 60068-2-6 (Fc)		5g / 10 ... 150 Hz
Shock (half-sine) acc. to IEC/EN 60068-2-27 (Ea)		15g / 11 ms

Standards / directives

Product standard	IEC/EN 60947-1 IEC/EN 60947-2 IEC/EN 60947-4-1 UL 60947-1 UL 60947-4-1 CSA-C22.2 No. 60947-1 CSA-C22.2 No. 60947-4-1
Low Voltage Directive	2014/35/EU
RoHS Directive	2011/65/EU

Short-circuit breaking capacity and back-up fuses

Ics Rated service short-circuit breaking capacity

Icu Rated ultimate short-circuit breaking capacity

- No back-up fuse required, because short-circuit proof up to 100 kA



Type	230 V AC			400 V AC			440 V AC			500 V AC			690 V AC		
	Ics kA	Icu kA	gG A	Ics kA	Icu kA	gG A	Ics kA	Icu kA	gG A	Ics kA	Icu kA	gG A	Ics kA	Icu kA	gG A
MO325-0.4	100	100	-	100	100	-	100	100	-	100	100	-	100	100	-
MO325-0.63	100	100	-	100	100	-	100	100	-	100	100	-	100	100	-
MO325-1	100	100	-	100	100	-	100	100	-	100	100	-	100	100	-
MO325-1.6	100	100	-	100	100	-	100	100	-	100	100	-	100	100	-
MO325-2.5	100	100	-	100	100	-	100	100	-	100	100	-	40	40	25
MO325-4	100	100	-	100	100	-	100	100	-	60	60	40	10	10	40
MO325-6.3	100	100	-	100	100	-	70	70	50	40	40	50	7	7	40
MO325-9	100	100	-	100	100	-	50	50	80	30	30	80	5	5	50
MO325-12.5	100	100	-	75	75	80	45	45	80	27	27	80	4.5	4.5	50
MO325-16	100	100	-	60	60	100	40	40	100	25	25	100	4	4	50
MO325-20	100	100	-	55	55	100	35	35	100	22	22	100	3.5	3.5	50
MO325-25	100	100	-	50	50	125	30	30	125	20	20	125	3	3	50

Technical data UL/CSA

Main circuit

Maximum operational voltage	600 V	
Manual motor controller ratings	see table below	
Motor ratings	Horse power	see table below
	Full load amps (FLA)	see table below
	Locked rotor amps (LRA)	see table below

Electrical connection

Type	MO325
 stranded	1/2 x AWG 14 ... 8
 flexible without ferrule	1/2 x AWG 14 ... 8
Stripping length	10 mm
Tightening torque	14 lb-in
Recommended screw driver	Pozidriv 2

Motor ratings, single phase

hp Horse power

FLA Full load amps

LRA Locked rotor amps

Type	110 ... 120 V AC			220 ... 240 V AC		
	hp	FLA	LRA	hp	FLA	LRA
MO325-0.4	-			-	0.4	2.4
MO325-0.63	-			-	0.63	3.78
MO325-1	-			-	1	6
MO325-1.6	-			1/10	1.5	
MO325-2.5	-			1/6	2.2	
MO325-4	1/8	3.8		1/3	3.6	
MO325-6.3	1/4	5.8		1/2	4.9	
MO325-9	1/3	7.2		1	8	
MO325-12.5	1/2	9.8		2	12	
MO325-16	1	16		2-1/2		
MO325-20	1-1/2	20		3	17.0	
MO325-25	2	24		3	17.0	

Motor rating, three phase

Type	220 ... 240 V AC			440 ... 480 V AC			550 ... 600 V AC		
	hp	FLA	LRA	hp	FLA	LRA	hp	FLA	LRA
MO325-0.4	-	0.4	2.4	-	0.4	2.4	-	0.4	2.4
MO325-0.63	-	0.63	3.78	-	0.63	3.78	-	0.63	3.78
MO325-1	-	1	6	1/2	1.1	10	1/2	0.9	8
MO325-1.6	-	1.6	9.6	3/4	1.6	12.5	3/4	1.3	10
MO325-2.5	1/2	2.2	20	1	2.1	15	1-1/2	2.4	16
MO325-4	1	4.2	30	2	3.4	25	3	3.9	25.6
MO325-6.3	1-1/2	6	40	3	4.8	32	5	6.1	36.8
MO325-9	2-1/2			5	7.6	46	7-1/2	9.0	50.8
MO325-12.5	3	9.6	64	7-1/2	11.0	63.5	10	11.0	64.8
MO325-16	5	15.2	92	10	14.0	81	10	11.0	64.8
MO325-20	5	15.2	92	10	14.0	81	15	27.0	93
MO325-25	7-1/2	22.0	127	15	21.0	116	20	35.0	116

Manual motor controller for motor disconnect / group installation

Type	Maximum short-circuit current rating	
	480 V kA	600 V kA
MO325-0.4	85	50
MO325-0.63	85	50
MO325-1	85	50
MO325-1.6	85	50
MO325-2.5	85	50
MO325-4	85	50
MO325-6.3	50	50
MO325-9	50	50
MO325-12.5	50	30
MO325-16	50	30
MO325-20	50	30
MO325-25	50	30



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