



0.10 to 32 A – with thermal and electromagnetic protection

Ics up to 50 kA

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MS116 manual motor starters

0.10 to 32 A – with thermal and electromagnetic protection

2



MS116-16



MS116-25



MS116-0.16-HKF1-11



MS116-32-HKF1-11

Description

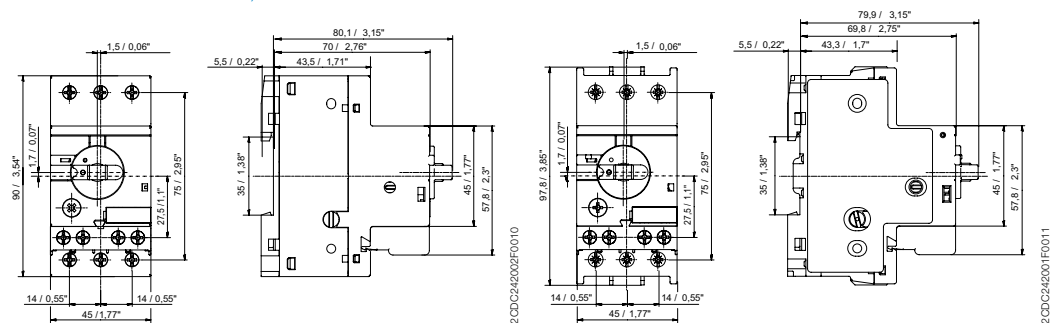
Manual motor starters (MMS) are protection devices for the main circuit. They combine motor control and protection in a single device. MMS are used mainly to switch motors manually ON/OFF and protect them and the installation fuse less against short-circuit, overload and phase failures. Fuse less protection with a manual motor starter saves costs, space and ensures a quick reaction under short-circuit condition, by switching off the motor within milliseconds.

MS116 is a compact and economic range for motor protection up to 7.5 kW (400 V) / 32 A in width of 45 mm. Further features are the build-in disconnect function, temperature compensation, trip-free mechanism and a rotary handle with a clear switch position indication. The manual motor starter is suitable for three- and single-phase applications. Auxiliary contacts, signalling contacts, undervoltage releases, shunt trips, three-phase bus bars, power in-feed blocks and locking devices for protection against unauthorized changes are available as accessory.

Ordering details

Rated operational power 400 V AC-3	Rated operational current	Short-circuit breaking capacity I_{cs} at 400 V AC	Rated instantaneous short-circuit current setting I_i	Type	Order code	Weight (1 pce)
kW	A	kA	A			kg
0.03	0.10 ... 0.16	50	1.56	MS116-0.16	1SAM250000R1001	0.225
0.06	0.16 ... 0.25	50	2.44	MS116-0.25	1SAM250000R1002	0.225
0.09	0.25 ... 0.40	50	3.90	MS116-0.4	1SAM250000R1003	0.225
0.12	0.40 ... 0.63	50	6.14	MS116-0.63	1SAM250000R1004	0.225
0.25	0.63 ... 1.00	50	11.50	MS116-1.0	1SAM250000R1005	0.225
0.55	1.00 ... 1.60	50	18.40	MS116-1.6	1SAM250000R1006	0.265
0.75	1.60 ... 2.50	50	28.75	MS116-2.5	1SAM250000R1007	0.265
1.5	2.50 ... 4.00	50	50.00	MS116-4.0	1SAM250000R1008	0.265
2.2	4.00 ... 6.30	50	78.75	MS116-6.3	1SAM250000R1009	0.265
4.0	6.30 ... 10.0	50	150	MS116-10	1SAM250000R1010	0.265
5.5	8.00 ... 12.0	25	180	MS116-12	1SAM250000R1012	0.265
7.5	10.0 ... 16.0	16	240	MS116-16	1SAM250000R1011	0.265
9.0	16.0 ... 20.0	10	300	MS116-20	1SAM250000R1013	0.310
12.5	20.0 ... 25.0	10	375	MS116-25	1SAM250000R1014	0.310
15.5	25.0 ... 32.0	10	480	MS116-32	1SAM250000R1015	0.310
0.03	0.10 ... 0.16	50	1.56	MS116-0.16-HKF1-11	1SAM250005R1001	0.240
0.06	0.16 ... 0.25	50	2.44	MS116-0.25-HKF1-11	1SAM250005R1002	0.240
0.09	0.25 ... 0.40	50	3.90	MS116-0.4-HKF1-11	1SAM250005R1003	0.240
0.12	0.40 ... 0.63	50	6.14	MS116-0.63-HKF1-11	1SAM250005R1004	0.240
0.25	0.63 ... 1.00	50	11.50	MS116-1.0-HKF1-11	1SAM250005R1005	0.240
0.55	1.00 ... 1.60	50	18.40	MS116-1.6-HKF1-11	1SAM250005R1006	0.280
0.75	1.60 ... 2.50	50	28.75	MS116-2.5-HKF1-11	1SAM250005R1007	0.280
1.5	2.50 ... 4.00	50	50.00	MS116-4.0-HKF1-11	1SAM250005R1008	0.280
2.2	4.00 ... 6.30	50	78.75	MS116-6.3-HKF1-11	1SAM250005R1009	0.280
4.0	6.30 ... 10.0	50	150	MS116-10.0-HKF1-11	1SAM250005R1010	0.280
5.5	8.00 ... 12.0	25	180	MS116-12.0-HKF1-11	1SAM250005R1012	0.280
7.5	10.0 ... 16.0	16	240	MS116-16.0-HKF1-11	1SAM250005R1011	0.280
9.0	16.0 ... 20.0	10	300	MS116-20-HKF1-11	1SAM250005R1013	0.326
12.5	20.0 ... 25.0	10	375	MS116-25-HKF1-11	1SAM250005R1014	0.326
15.5	25.0 ... 32.0	10	480	MS116-32-HKF1-11	1SAM250005R1015	0.326

Main dimensions mm, inches



MS116 manual motor starters

Technical data

Main circuit – Utilization characteristics according to IEC/EN

Type	MS116
Standards	IEC/EN 60947-2, IEC/EN 60947-4-1, IEC/EN 60947-1
Rated operational voltage U_e	690 V AC
Rated frequency	50/60 Hz
Trip class	10A
Number of poles	3
Duty time	100 %
Rated impulse withstand voltage U_{imp}	6 kV
Rated insulation voltage U_i	690 V AC
Rated operational current I_e	See ordering details
Rated instantaneous short-circuit current setting I_i	See ordering details
Rated service short-circuit breaking capacity I_{cs}	See table "Short-circuit breaking capacity and back-up fuses"
Rated ultimate short-circuit breaking capacity I_{cu}	See table "Short-circuit breaking capacity and back-up fuses"

Short-circuit breaking capacity and back-up fuses

I_{cs} Rated service short-circuit breaking capacity

I_{cu} Rated ultimate short-circuit breaking capacity

I_{cc} Prospective short-circuit current at installation location

Note: Maximum rated current of the back-up fuses if $I_{cc} > I_{cs}$

Type	230 V AC			400 V AC			440 V AC			500 V AC			690 V AC		
	I_{cs} kA	I_{cu} kA	gG, aM A	I_{cs} kA	I_{cu} kA	gG, aM A	I_{cs} kA	I_{cu} kA	gG, aM A	I_{cs} kA	I_{cu} kA	gG, aM A	I_{cs} kA	I_{cu} kA	gG, aM A
MS116-0.16															
MS116-0.25															
MS116-0.4															
MS116-0.63															
MS116-1.0	No back-up fuse required up to $I_{cc} = 50$ kA														
MS116-1.6	No back-up fuse required up to $I_{cc} = 50$ kA														
MS116-2.5							10	10	25	10	10	25	5	5	25
MS116-4.0							6	6	25	6	6	25	2	2	25
MS116-6.3							6	6	63	6	6	63	2	2	40
MS116-10							6	6	63	6	6	63	2	2	50
MS116-12	25	25	80	25	25	80	6	6	63	6	6	63	2	2	50
MS116-16	16	16	80	16	16	80	6	6	63	4	4	63	2	2	63
MS116-20	10	15	-	10	15	-	3	6	-	3	4	-	2	2	-
MS116-25	10	15	-	10	15	-	3	6	-	3	4	-	2	2	-
MS116-32	10	10	-	10	10	-	3	6	-	3	4	-	2	2	-

MS116-10: No need for back-up fuse in networks with a prospective current of up to 50 kA at 400 V.

MS116-16: No need for back-up fuse in networks with a prospective current of up to 16 kA at 400 V.

With an appropriate 80 A type gG fuse the device can be used in a network with a prospective current of up to 100 kA.

MS116-32: No need for back-up fuse in networks with a prospective current of up to 15 kA at 400 V.

MS116 manual motor starters

Technical data

Main circuit – Utilization characteristics according to UL/CSA

Type	MS116	
Standards	UL 508, CSA 22.2 No. 14	
Maximum operational voltage	600 V AC	
Manual motor controller ratings	See table "UL 508 – Manual motor controller"	
Trip rating	125 % FLA	
Motor ratings	Horse power	See table "Motor rating, three phase"
	Full load amps (FLA)	See table "Motor rating, three phase"
	Locked rotor amps (LRA)	See table "Motor rating, three phase"

Motor rating, three phase

hp Horse power

FLA Full load amps

LRA Locked rotor amps

Type	110-120 V AC			220-240 V AC			440-480 V AC			500-600 V AC		
	hp	FLA	LRA	hp	FLA	LRA	hp	FLA	LRA	hp	FLA	LRA
MS116-0.16	-	0.16	0.96	-	0.16	0.96	-	0.16	0.96	-	0.16	0.96
MS116-0.25	-	0.25	1.5	-	0.25	1.5	-	0.25	1.5	-	0.25	1.5
MS116-0.4	-	0.4	2.4	-	0.4	2.4	-	0.4	2.4	-	0.4	2.4
MS116-0.63	-	0.63	3.78	-	0.63	3.78	-	0.63	3.78	-	0.63	3.78
MS116-1.0	-	1.0	6.0	-	1.0	6.0	-	1.0	6.0	1/2	0.9	8
MS116-1.6	-	1.6	9.6	-	1.6	9.6	3/4	1.6	12.5	3/4	1.3	10
MS116-2.5	-	2.5	15.0	1/2	2.2	20	1	2.1	15	1-1/2	2.4	16
MS116-4.0	-	4.0	16.0	1	4.2	30	2	3.4	25	3	3.9	25.6
MS116-6.3	1/2	4.4	40	1-1/2	6.4	40	3	4.8	32	5	6.1	36.8
MS116-10	1	8.4	60	3	9.6	64	5	7.6	46	7-1/2	9	50.8
MS116-12	1-1/2	12	80	3	9.6	64	7-1/2	11	63.5	10	11	64.8
MS116-16	2	13.6	100	5	15.2	92	10	14	81	10	11	64.8
MS116-20	3	19.2	128	5	15.2	92	10	14	81	15	17	93
MS116-25	3	19.2	128	7-1/2	22	127	15	21	116	20	22	116
MS116-32	5	30.4	184	10	28	162	20	27	145	25	27	146

UL 508 – Manual motor controller

Type	Maximum fuse type K5 o. RK5 per UL/NEC 480 V / 600 V A	Maximum short-circuit current for motor disconnect ¹⁾			
		480 V		600 V	
		kA	kA	kA	kA
MS116-0.16	100	30	5	18	5
MS116-0.25	100	30	5	18	5
MS116-0.4	100	30	5	18	5
MS116-0.63	100	30	5	18	5
MS116-1.0	100	30	5	18	5
MS116-1.6	100	30	5	18	5
MS116-2.5	100	30	5	18	5
MS116-4.0	100	18	5	18	5
MS116-6.3	100	18	5	18	5
MS116-10	100	18	5	18	5
MS116-12	100	18	5	18	5
MS116-16	100	18	5	18	5
MS116-20	100	18	5	18	5
MS116-25	100	18	5	18	5
MS116-32	100	18	5	18	5

¹⁾ Suitable as motor disconnect only when provided with padlock SA1 or SA3...



MS116 manual motor starters

Technical data

General technical data

Type	MS116	
Pollution degree	3	
Phase loss sensitive	Yes	
Ambient air temperature		
Operation	Open - compensated without derating	-25 ... +55 °C
	Open	-25 ... +70 °C
	Enclosed (IB132)	0 ... +40 °C
Storage	-50 ... +80 °C	
Ambient air temperature compensation	Continuous	
Maximum operating altitude permissible	2000 m	
Resistance to shock acc. to IEC 60068-2-27	25 g / 11 ms	
Resistance to vibrations acc. to IEC 60068-2-6	5 g / 3 ... 150 Hz	
Mounting position	Position 1-6 (optional for single mounting)	
Mounting	DIN-rail (EN 60715)	
Group mounting	On request	
Minimum distance to other units same type	Horizontal	0 mm
	Vertical	150 mm
Minimum distance to electrical conductive board	Horizontal, up to 400 V	0 mm
	Horizontal, up to 690 V	> 1.5 mm
	Vertical	75 mm
Degree of protection	Enclosure / terminals	IP20

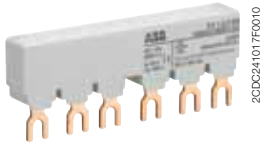
Connecting characteristics

Main circuit		MS116 ≤ 16 A	MS116 ≥ 20 A
Type			
Connecting capacity			
 Solid	1 or 2 x	1 ... 4 mm ²	2.5 ... 6 mm ²
 Flexible	1 or 2 x	0.75 ... 2.5 mm ²	1 ... 6 mm ²
	Stranded acc. to UL/CSA	1 or 2 x AWG 16-12	AWG 12-8
	Flexible acc. to UL/CSA	1 or 2 x AWG 16-12	AWG 12-8
Stripping length	9 mm		10 mm
Tightening torques	0.8 ... 1.2 Nm / 10 ... 12 lb.in		2.0 Nm / 18 lb.in
Connection screw	M3.5 (Pozidriv 2 / 5.5 mm)		M4 (Pozidriv 2 / 6.5 mm)

MS116 manual motor starters

Main accessories

2



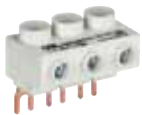
PS1-2-0-65

2CDC241017F0010



PS1-3-1-100

2CDC241014F0010



S1-M1-25

1SBC101226F0014



S1-M2-25

1SBC101266F0014



SA1

SKO108B91

Description

Three-phase busbars ensure a quick and safe connection and are therefore a cost effective solution. A variety of different three-phase busbars up to 100 A are in the assortment. Between 2 and 5 manual motor starters with none, one or two lateral auxiliary contacts can be connected. Different three-phase feeder terminals are available according to the application.

Ordering details

Rated operational current A	Number of MMS	Number of lateral aux.	Type	Order code	Pkg qty	Weight (1 pce) kg
Three-phase busbars						
65	2	0	PS1-2-0-65	1SAM201906R1102	10	0.034
65	3	0	PS1-3-0-65	1SAM201906R1103	10	0.055
65	4	0	PS1-4-0-65	1SAM201906R1104	10	0.077
65	5	0	PS1-5-0-65	1SAM201906R1105	10	0.098
65	2	1	PS1-2-1-65	1SAM201906R1112	10	0.036
65	3	1	PS1-3-1-65	1SAM201906R1113	10	0.060
65	4	1	PS1-4-1-65	1SAM201906R1114	10	0.087
65	5	1	PS1-5-1-65	1SAM201906R1115	10	0.108
65	2	2	PS1-2-2-65	1SAM201906R1122	10	0.040
65	3	2	PS1-3-2-65	1SAM201906R1123	10	0.067
65	4	2	PS1-4-2-65	1SAM201906R1124	10	0.095
65	5	2	PS1-5-2-65	1SAM201906R1125	10	0.122
100	3	0	PS1-3-0-100	1SAM201916R1103	10	0.084
100	4	0	PS1-4-0-100	1SAM201916R1104	10	0.117
100	5	0	PS1-5-0-100	1SAM201916R1105	10	0.154
100	3	1	PS1-3-1-100	1SAM201916R1113	10	0.094
100	4	1	PS1-4-1-100	1SAM201916R1114	10	0.134
100	5	1	PS1-5-1-100	1SAM201916R1115	10	0.172
100	3	2	PS1-3-2-100	1SAM201916R1123	10	0.105

Rated operational current A	Rated cross section mm ²	Mounting form	Type	Order code	Pkg qty	Weight (1 pce) kg
Three-phase feeder terminals						
65	25	Flat	S1-M1-25	1SAM201907R1101	10	0.038
65	25	High	S1-M2-25	1SAM201907R1102	10	0.051
65	25	UL type E and IEC	S1-M3-25	1SAM201907R1103	10	0.042
100	35	UL type E and IEC	S1-M3-35	1SAM201913R1103	10	0.060

Description	Type	Order code	Pkg qty	Weight (1 pce) kg
Protection cover for busbars	BS1-3	1SAM201908R1001	50	0.003
Lock handle	SA1	GJF1101903R0001	10	0.003
Padlock	SA2	GJF1101903R0002	10	0.020
Lock handle box SA1/SA2	SA3	GJF1101903R0003	10	0.050
Screw fixing kit	FS116	1SAM201909R1001	1	0.020

MS116 manual motor starters

Main accessories



HKF1-11

1SBC101208F0014



HK1-11

1SBC101208F0014



SK1-11

1SBC101210F0014



AA1-24

1SBC101211F0014



UA1-24

1SBC101212F0014

Description

MS116 manual motor starters can be equipped with auxiliary contacts for lateral/front mounting, signalling contact for lateral mounting, undervoltage release and shunt trips. The accessories can be fitted wiring free and without tools. A variety of combinations is possible as required for the application. The auxiliary contacts change position with the main contacts. The signalling contact signals tripping regardless if it was caused by short-circuit or overload. Undervoltage release are used for remote tripping of the manual motor starter especially for emergency stop circuits. Shunt trips release the MMS used for remote tripping.

Ordering details

Auxiliary contacts: N.O.	Auxiliary contacts: N.C.	Description	Type	Order code	Pkg qty	Weight (1 pce)
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Auxiliary contacts – mountable on the front

1	1		HKF1-11	1SAM201901R1001	10	0.015
1	1		HKF1-20	1SAM201901R1002	10	0.015

Auxiliary contacts – mountable on the right

1	1	max. 2 pieces	HK1-11	1SAM201902R1001	2	0.035
2	0	max. 2 pieces	HK1-20	1SAM201902R1002	2	0.035
0	2	max. 2 pieces	HK1-02	1SAM201902R1003	2	0.035
2	0	with lead contacts	HK1-20L	1SAM201902R1004	2	0.035

Signalling contacts – mountable on the right

1	1	for tripped alarm, max. 2 pieces	SK1-11	1SAM201903R1001	2	0.035
2	0	for tripped alarm, max. 2 pieces	SK1-20	1SAM201903R1002	2	0.035
0	2	for tripped alarm, max. 2 pieces	SK1-02	1SAM201903R1003	2	0.035

Rated control supply voltage	Frequency	Type	Order code	Pkg qty	Weight (1 pce)
V	Hz				kg

Shunt trip units – mountable on the left

24	50/60	AA1-24	1SAM201910R1001	1	0.100
110	50/60	AA1-110	1SAM201910R1002	1	0.100
200 ... 240	50/60	AA1-230	1SAM201910R1003	1	0.100
350 ... 415	50/60	AA1-400	1SAM201910R1004	1	0.100

Undervoltage releases – mountable on the left

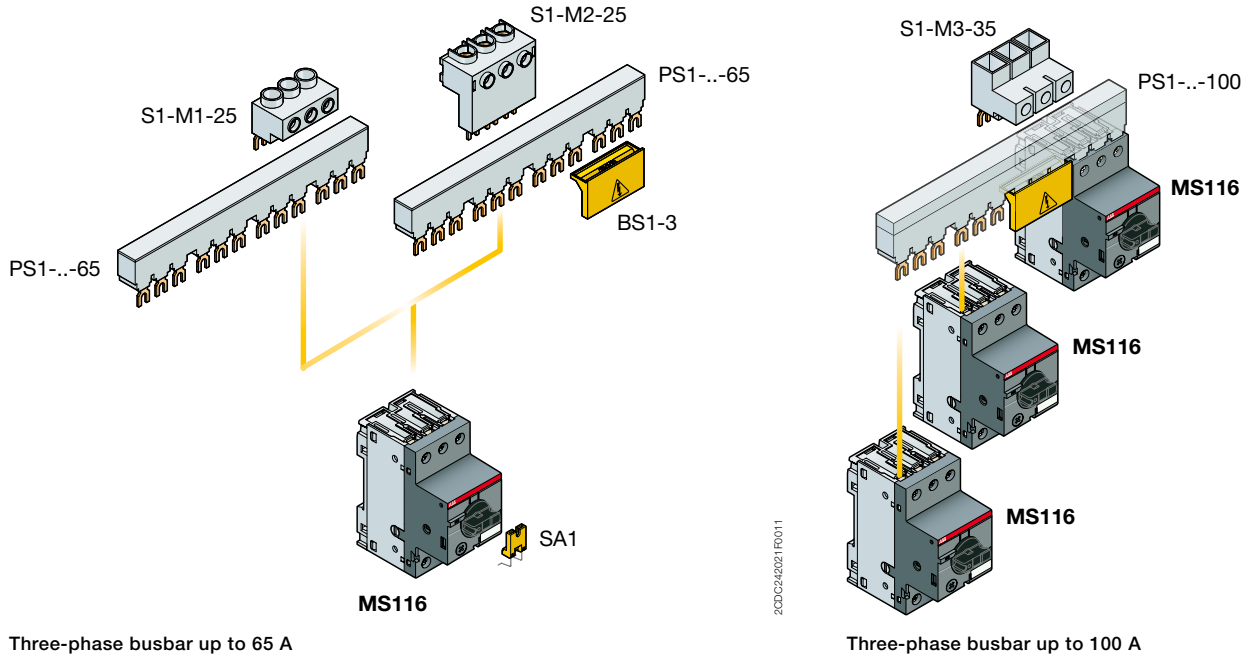
24	50	UA1-24	1SAM201904R1001	1	0.100
48	50	UA1-48	1SAM201904R1002	1	0.100
60	50	UA1-60	1SAM201904R1003	1	0.100
110 ... 120	50/60	UA1-120	1SAM201904R1004	1	0.100
208	60	UA1-208	1SAM201904R1008	1	0.100
230 ... 240	50/60	UA1-230	1SAM201904R1005	1	0.100
400	50	UA1-400	1SAM201904R1006	1	0.100
415 ... 480	50/60	UA1-415	1SAM201904R1007	1	0.100

MS116 manual motor starters

Main accessories

Manual motor starter with three-phase busbar systems

2



Three-phase busbar up to 65 A

Three-phase busbar up to 100 A

General technical data

Type	PS1-xxx-65	PS1-xxx-100	S1-Mx-25	S1-Mx-35
Standards	IEC/EN 60947-2, IEC/EN 60947-4-1, IEC/EN 60947-1			
Rated operational voltage U_n	690 V			
Rated operational current I_n	65 A	100 A	65 A	100 A
Rated frequency	50/60 Hz			
Rated impulse withstand voltage U_{imp}	6 kV			
Rated insulation voltage U_i	690 V AC			
Pollution degree	3			
Cross-section	10 mm ²	16 mm ²	25 mm ²	35 mm ²
Ambient air temperature	Operation -25 ... +70 °C Storage -50 ... +80 °C			
Resistance to shock acc. to IEC 60068-2-27	25 g / 11 ms			
Resistance to vibrations acc. to IEC 60068-2-6	3 g / 3 ... 150 Hz			

Electrical connection

Main circuit

Type	S1-Mx-25	S1-Mx-35
Connecting capacity		
Solid	1 x 6 ... 25 mm ²	10 ... 35 mm ²
Flexible	1 x 6 ... 16 mm ²	10 ... 35 mm ²
Stranded acc. to UL/CSA	1 x AWG 10-4	AWG 8-2
Flexible acc. to UL/CSA	1 x AWG 10-6	AWG 8-2
Stripping length	10 mm	12 mm
Tightening torques	2.5 Nm / 22 lb.in	4.5 Nm / 40 lb.in
Connection screw	PZ2 (6 mm)	Hexagon SW4

MS116 manual motor starters



Main accessories

General technical data

Type	HK1	SK1	HKF1
Standards	IEC/EN 60947-2, IEC/EN 60947-4-1, IEC/EN 60947-1		
Rated operational voltage U_e	690 V AC / 600 V DC		250 V AC / 250 V DC
Conventional free-air thermal current I_{th}	65 A	100 A	100 A
Rated frequency	50/60 Hz		
Rated impulse withstand voltage U_{imp}	6 kV		
Rated insulation voltage U_i	690 V AC		
Pollution degree	3		
Ambient air temperature	Operation	-25 ... +70 °C	
	Storage	-50 ... +80 °C	
Resistance to shock acc. to IEC 60068-2-27	25 g / 11 ms		
Resistance to vibrations acc. to IEC 60068-2-6	3 g / 3 ... 150 Hz		
Number of poles	1 N.C. + 1 N.O. / 2 N.O. / 2 N.C.	1 N.C. + 1 N.O.	1 N.C. + 1 N.O.
I_e / Rated operational current AC-15 acc. to IEC/EN 60947-5-1 for utilization category			
	24 V, 120 V, 50/60 Hz	6 A	3 A
	240 V, 50/60 Hz	4 A	1.5 A
	400 V, 50/60 Hz	3 A	-
	440 V, 600 V, 690 V, 50/60 Hz	1 A	-
I_e / Rated operational current DC-13 acc. to IEC/EN 60947-5-1 for utilization category			
	24 V	2 A	1 A
	125 V	0.55 A	0.27 A
	250 V	0.27 A	0.11 A
	440 V, 600 V	0.15 A	-
Minimum switching capacity	17 V / 3 mA		
Short-circuit protective device	N.C., 95-96	10 A Type gG	
	N.O., 97-98	10 A Type gG	
Duty time	100 %		
Mounting	Right side of MMS		Front of MMS
Mounting positions	1-6		
Mechanical durability	50000 cycles		-
Electrical durability	50000 cycles		-

Electrical connection

Main circuit

Type	HK1	SK1	HKF1
Connecting capacity			
 Solid	1 or 2 x	1 ... 1.5 mm ²	
 Flexible	1 or 2 x	0.75 ... 1.5 mm ²	
Stranded acc. to UL/CSA	1 or 2 x	AWG 16-14	
Flexible acc. to UL/CSA	1 or 2 x	AWG 16-14	
Stripping length	8 mm		
Tightening torques	0.8 ... 1.2 Nm / 7 lb.in		
Connection screw	M3 (Pozidriv 2)		

MS116 manual motor starters

Main accessories

2



IB132-Y



IB132-G



DMS132-Y



DMS132-G

Description

IB132 are IP65 enclosures for single MMS installation. Additional mounting of auxiliary and signalling contacts, shunt trips and undervoltage release is possible. The handle is lockable in OFF position. For detailed specification see installation instruction.

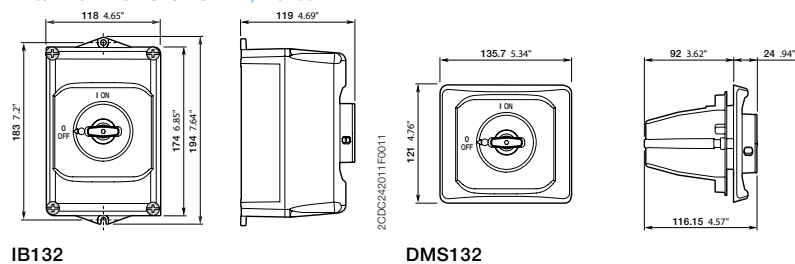
DMS132 are IP65 door mounting kits for MMS installation in any enclosure. Additional mounting of auxiliary, signalling, shunt trips and undervoltage release is possible. The handle is lockable in OFF position. For detailed specification see installation instruction.

Ordering details

Description	Color	Type	Order code	Pkg qty	Weight (1 pce) kg
Enclosures IP65					
Padlockable max. 3 padlocks with bail diameter 4 ... 6.5 mm	Yellow/red	IB132-Y	1SAM201911R1011	1	0.370
	Grey/black	IB132-G	1SAM201911R1010	1	0.370
Door mounting kit IP65					
Padlockable max. 3 padlocks with bail diameter 4 ... 6.5 mm	Yellow/red	DMS132-Y	1SAM201912R1011	1	0.170
	Grey/black	DMS132-G	1SAM201912R1010	1	0.170

Indication I-O-T and ON-OFF-T

Main dimensions mm, inches



MS116 manual motor starters

Main accessories



2CDC241003F0011

MSHD-LB



2CDC241002S0011

MSHD-LY



2CDC241004S0011

MSMN



2CDC241005S0011

MSOX-30



2CDC241001S0012

MSH-AR

Description

The complete set includes handle, shaft and driver. All accessories fit 6 mm shafts of maximum 180 mm length. The degree of protection for handles MSHD is IP64.

Ordering details

Description	Shaft length mm	Type	Order code	Pkg qty	Weight (1 pce) kg
Shafts					
For selector type handles. Shaft diameter 6 mm. Shaft extension for door coupling driver.	85	OXS6X85	1SCA101647R1001	1	0.020
	105	OXS6X105	1SCA108043R1001	1	0.020
	130	OXS6X130	1SCA101655R1001	1	0.030
	180	OXS6X180	1SCA101659R1001	1	0.040

Description	Color	Type	Order code	Pkg qty	Weight (1 pce) kg
Selector type handles IP64					
Padlockable max. 3 padlocks with bail diameter 5 ... 8 mm, door interlock in ON position defeatable, for use with 6 mm OXS6...types up to 180 mm or driver shafts MSOX.	Black	MSHD-LB ¹⁾	1SAM201920R1001	1	0.065
	Yellow	MSHD-LY	1SAM201920R1002	1	0.065

¹⁾ Indication I-O and ON-OFF

Description	Type	Order code	Pkg qty	Weight (1 pce) kg
Driver				
Coupling driver for use with 6 mm OXS6... types up to 180 mm.	MSMN ¹⁾	1SAM101923R0002	1	0.002
	MSMNO ²⁾	1SAM101923R0012	1	0.002

¹⁾ Coded - Positioning of ON indication dependent from mounting orientation of the MS

²⁾ Uncoded - Positioning of ON indication independent from mounting orientation of the MS

Description	Shaft length mm	Type	Order code	Pkg qty	Weight (1 pce) kg
Driver shafts					
Driver shaft - combination driver & shaft. Shaft diameter 6 mm.	32	MSOX-32 ¹⁾	1SAM101924R0003	1	0.010
	30	MSOX-30 ²⁾	1SAM101924R0013	1	0.010

¹⁾ MSOX-32 is for normal vertical use

²⁾ MSOX-30 is for horizontal use

Description	Type	Order code	Pkg qty	Weight (1 pce) kg
Shaft alignment ring				
The MSH-AR support the long axis for alignment to the handle inlet. It makes closing panel doors more easy.	MSH-AR	1SAM201920R1000	1	0.010

MS132 manual motor starters

0.10 to 32 A – with thermal and electromagnetic protection

2



MS132-10

1SBC101232F0010



MS132-32

2CDC241001F0011



MS132-0.16-HKF1-11

2CDC241014F0011



MS132-32-HKF1-11

2CDC241015F0011

Description

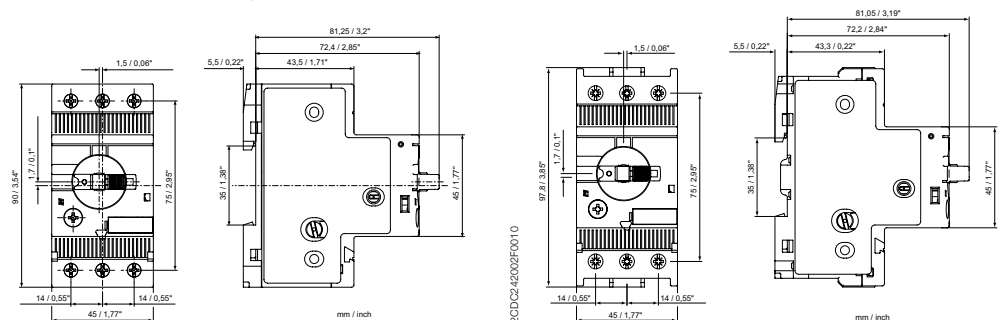
Manual motor starters (MMS) are protection devices for the main circuit. They combine motor control and protection in a single device. MMS are used mainly to switch motors manually ON/OFF and protect them and the installation fuse less against short-circuit, overload and phase failures. Fuse less protection with a manual motor starter saves costs, space and ensures a quick reaction under short-circuit condition, by switching off the motor within milliseconds.

MS132 is a compact and powerful range for motor protection up to 15 kW (400 V) / 32 A in width of 45 mm. Further features are the built-in disconnect function, temperature compensation, trip-free mechanism and a rotary handle with a clear switch position indication. The manual motor starter is suitable for three- and single-phase applications. The handle is lockable to protect against unauthorized changes. Auxiliary contacts, signalling contacts, undervoltage releases, shunt trips, three-phase bus bars, power in-feed blocks.

Ordering details

Rated operational power 400 V AC-3	Setting range	Short-circuit breaking capacity I _{CS} at 400 V AC	Rated instantaneous short-circuit current setting I _i	Type	Order code	Weight (1 pce)
kW	A	kA	A			kg
0.03	0.10 ... 0.16	100	1.56	MS132-0.16	1SAM350000R1001	0.215
0.06	0.16 ... 0.25	100	2.44	MS132-0.25	1SAM350000R1002	0.215
0.09	0.25 ... 0.40	100	3.90	MS132-0.4	1SAM350000R1003	0.215
0.12	0.40 ... 0.63	100	6.14	MS132-0.63	1SAM350000R1004	0.215
0.25	0.63 ... 1.00	100	11.50	MS132-1.0	1SAM350000R1005	0.215
0.55	1.00 ... 1.60	100	18.40	MS132-1.6	1SAM350000R1006	0.265
0.75	1.60 ... 2.50	100	28.75	MS132-2.5	1SAM350000R1007	0.265
1.5	2.50 ... 4.00	100	50.00	MS132-4.0	1SAM350000R1008	0.265
2.2	4.00 ... 6.30	100	78.75	MS132-6.3	1SAM350000R1009	0.265
4.0	6.30 ... 10.0	100	150	MS132-10	1SAM350000R1010	0.265
5.5	8.00 ... 12.0	100	180	MS132-12	1SAM350000R1012	0.310
7.5	10.0 ... 16.0	100	240	MS132-16	1SAM350000R1011	0.310
9.0	16.0 ... 20.0	100	300	MS132-20	1SAM350000R1013	0.310
12.5	20.0 ... 25.0	50	375	MS132-25	1SAM350000R1014	0.310
15.5	25.0 ... 32.0	25	480	MS132-32	1SAM350000R1015	0.310
0.03	0.10 ... 0.16	100	1.56	MS132-0.16-HKF1-11	1SAM350005R1001	0.231
0.06	0.16 ... 0.25	100	2.44	MS132-0.25-HKF1-11	1SAM350005R1002	0.231
0.09	0.25 ... 0.40	100	3.90	MS132-0.4-HKF1-11	1SAM350005R1003	0.231
0.12	0.40 ... 0.63	100	6.14	MS132-0.63-HKF1-11	1SAM350005R1004	0.231
0.25	0.63 ... 1.00	100	11.50	MS132-1.0-HKF1-11	1SAM350005R1005	0.231
0.55	1.00 ... 1.60	100	18.40	MS132-1.6-HKF1-11	1SAM350005R1006	0.281
0.75	1.60 ... 2.50	100	28.75	MS132-2.5-HKF1-11	1SAM350005R1007	0.281
1.5	2.50 ... 4.00	100	50.00	MS132-4.0-HKF1-11	1SAM350005R1008	0.281
2.2	4.00 ... 6.30	100	78.75	MS132-6.3-HKF1-11	1SAM350005R1009	0.281
4.0	6.30 ... 10.0	100	150	MS132-10.0-HKF1-11	1SAM350005R1010	0.281
5.5	8.00 ... 12.0	100	180	MS132-12.0-HKF1-11	1SAM350005R1012	0.326
7.5	10.0 ... 16.0	100	240	MS132-16.0-HKF1-11	1SAM350005R1011	0.326
9.0	16.0 ... 20.0	100	300	MS132-20-HKF1-11	1SAM350005R1013	0.326
12.5	20.0 ... 25.0	50	375	MS132-25-HKF1-11	1SAM350005R1014	0.326
15.5	25.0 ... 32.0	25	480	MS132-32-HKF1-11	1SAM350005R1015	0.326

Main dimensions mm, inches



MS132 ≤ 10 A

MS132 ≥ 12 A

MS132 manual motor starters

Technical data

Main circuit – Utilization characteristics according to IEC/EN

Type	MS132
Standards	IEC/EN 60947-2, IEC/EN 60947-4-1, IEC/EN 60947-1
Rated operational voltage U_e	690 V AC / 250 V DC
Rated frequency	DC, 50/60 Hz
Trip class	10 (10A for 1SAM350000R1001)
Number of poles	3
Duty time	100 %
Rated impulse withstand voltage U_{imp}	6 kV
Rated insulation voltage U_i	690 V AC
Rated operational current I_e	See ordering details
Rated instantaneous short-circuit current setting I_i	See ordering details
Rated service short-circuit breaking capacity I_{cs}	See table "Short-circuit breaking capacity and back-up fuses"
Rated ultimate short-circuit breaking capacity I_{cu}	See table "Short-circuit breaking capacity and back-up fuses"

Short-circuit breaking capacity and back-up fuses

I_{cs} Rated service short-circuit breaking capacity

I_{cu} Rated ultimate short-circuit breaking capacity

I_{cc} Prospective short-circuit current at installation location

Note: Maximum rated current of the back-up fuses if $I_{cc} > I_{cs}$

Type	230 V AC			400 V AC			440 V AC			500 V AC			690 V AC		
	I_{cs} kA	I_{cu} kA	gG, aM A	I_{cs} kA	I_{cu} kA	gG, aM A	I_{cs} kA	I_{cu} kA	gG, aM A	I_{cs} kA	I_{cu} kA	gG, aM A	I_{cs} kA	I_{cu} kA	gG, aM A
MS132-0.16															
MS132-0.25															
MS132-0.4															
MS132-0.63															
MS132-1.0															
MS132-1.6															
MS132-2.5	No back-up fuse required up to $I_{cc} = 100$ kA														
MS132-4.0							20	20	35	20	20	35	3	3	on request
MS132-6.3							20	20	63	20	20	63	3	3	on request
MS132-10							20	20	100	20	20	100	3	3	on request
MS132-12							20	20	100	20	20	100	3	3	on request
MS132-16							20	20	125	20	20	125	3	3	on request
MS132-20							20	20	125	20	20	125	3	3	on request
MS132-25	50	50	125	50	50	125	20	20	125	10	10	125	3	3	on request
MS132-32	25	50	125	25	50	125	20	20	125	10	10	125	3	3	on request

MS132-16: No need for back-up fuse in networks with a prospective current of up to 100 kA at 400 V.

MS132-32: No need for back-up fuse in networks with a prospective current of up to 50 kA at 400 V.

With an appropriate 125 A type gG fuse the device can be used in a network with a prospective current of up to 100 kA

MS132 manual motor starters

Technical data

Main circuit – Utilization characteristics according to UL/CSA

Type	MS132	
Standards	UL 508, CSA 22.2 No. 14	
Maximum operational voltage	600 V AC	
Manual motor controller ratings	See table "UL 508 – Manual motor controller"	
Trip rating	125 % FLA	
Motor ratings	Horse power	See table "Motor rating, three phase"
	Full load amps (FLA)	See table "Motor rating, three phase"
	Locked rotor amps (LRA)	See table "Motor rating, three phase"

Motor rating, three phase

hp Horse power

FLA Full load amps

LRA Locked rotor amps

Type	110-120 V AC			220-240 V AC			440-480 V AC			500-600 V AC		
	hp	FLA	LRA	hp	FLA	LRA	hp	FLA	LRA	hp	FLA	LRA
MS132-0.16	-	0.16	0.96	-	0.16	0.96	-	0.16	0.96	-	0.16	0.96
MS132-0.25	-	0.25	1.5	-	0.25	1.5	-	0.25	1.5	-	0.25	1.5
MS132-0.4	-	0.4	2.4	-	0.4	2.4	-	0.4	2.4	-	0.4	2.4
MS132-0.63	-	0.63	3.78	-	0.63	3.78	-	0.63	3.78	-	0.63	3.78
MS132-1.0	-	1.0	6.0	-	1.0	6.0	-	1.0	6.0	1/2	1.0	6.0
MS132-1.6	-	1.6	9.6	-	1.6	9.6	3/4	1.6	9.6	3/4	1.6	9.6
MS132-2.5	-	2.5	15.0	1/2	2.5	15.0	1	2.5	15.0	1-1/2	2.5	15.0
MS132-4.0	-	4.0	24.0	1	4.0	24.0	2	4.0	24.0	3	3.9	26.0
MS132-6.3	1/2	6.3	37.8	1-1/2	6.3	37.8	3	4.8	32.0	5	6.1	37.0
MS132-10	3/4	10.0	60.0	3	9.6	64.0	5	7.6	46.0	7-1/2	9.0	51.0
MS132-12	1-1/2	12.0	72.0	3	9.6	64.0	7-1/2	11.0	64.0	10	11.0	65.0
MS132-16	2	16.0	84.0	5	15.2	92.0	10	14.0	81.0	10	11.0	65.0
MS132-20	3	19.2	128.0	5	15.2	92.0	10	14.0	81.0	15	17.0	93.0
MS132-25	3	19.2	128.0	7-1/2	22.0	127.0	15	21.0	116.0	20	22.0	116.0
MS132-32	5	30.4	184.0	10	28.0	162.0	20	27.0	145.0	25	27.0	146.0

UL 508 – Manual motor controller

Type	Maximum short-circuit current for motor disconnect ¹⁾		for group installation		for self-protected combination motor controller (type E) in combination with feeder block S1-M3-xx		for tap conductor protection	
	480 V kA	600 V kA	480 V kA	600 V kA	480Y / 277 V kA	600Y / 347 V kA	480 V kA	600 V kA
MS132-0.16	65	47	65	47	65	47	65	47
MS132-0.25	65	47	65	47	65	47	65	47
MS132-0.4	65	47	65	47	65	47	65	47
MS132-0.63	65	47	65	47	65	47	65	47
MS132-1.0	65	47	65	47	65	47	65	47
MS132-1.6	65	47	65	47	65	47	65	47
MS132-2.5	65	47	65	47	65	47	65	47
MS132-4.0	65	18	65	30	65	18	65	18
MS132-6.3	65	18	65	30	65	-	65	18
MS132-10	65	18	65	30	65	-	65	18
MS132-12	30	18	30	30	30	-	30	18
MS132-16	30	18	30	30	30	-	30	18
MS132-20	30	18	30	30	30	-	30	18
MS132-25	30	18	30	30	30	-	30	18
MS132-32	30	18	30	30	30	-	30	18



MS132 manual motor starters

Technical data

General technical data

Type	MS132	
Pollution degree	3	
Phase loss sensitive	Yes	
Ambient air temperature		
Operation	Open - compensated without derating	-25 ... +60 °C
	Open	-25 ... +70 °C
	Enclosed (IB132)	0 ... +40 °C
Storage	-50 ... +80 °C	
Ambient air temperature compensation	Continuous	
Maximum operating altitude permissible	2000 m	
Resistance to shock acc. to IEC 60068-2-27	25 g / 11 ms	
Resistance to vibrations acc. to IEC 60068-2-6	5 g / 3 ... 150 Hz	
Mounting position	Position 1-6 (optional for single mounting)	
Mounting	DIN-rail (EN 60715)	
Group mounting	On request	
Minimum distance to other units same type	Horizontal	0 mm
	Vertical	150 mm
Minimum distance to electrical conductive board	Horizontal, up to 400 V	0 mm
	Horizontal, up to 690 V	> 1.5 mm
	Vertical	75 mm
Degree of protection	Enclosure / terminals	IP20

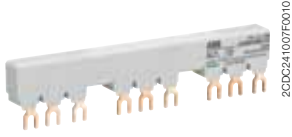
Connecting characteristics

Main circuit		MS132-0.16 ... MS132-10	MS132-12 ... MS132-16	MS132-20 ... MS132-32
Type				
Connecting capacity				
 Solid	1 or 2 x	1 ... 4 mm ²	1 ... 4 mm ²	2.5 ... 6 mm ²
 Flexible	1 or 2 x	0.75 ... 2.5 mm ²	0.75 ... 2.5 mm ²	1 ... 6 mm ²
	Stranded acc. to UL/CSA	1 or 2 x AWG 16-12	AWG 16-12	AWG 12-8
	Flexible acc. to UL/CSA	1 or 2 x AWG 16-12	AWG 16-12	AWG 12-8
Stripping length		9 mm	10 mm	10 mm
Tightening torques		0.8 ... 1.2 Nm / 10 ... 12 lb.in	1.5 Nm / 14 lb.in	2.0 Nm / 18 lb.in
Connection screw		M3.5 (Pozidriv 2)	M4 (Pozidriv 2)	M4 (Pozidriv 2)

MS132 manual motor starters

Main accessories

2



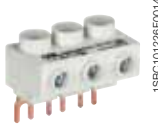
PS1-3-1-65

2CDC241007F0010



PS1-3-1-100

2CDC241014F0010



S1-M1-25

1SBC101228F0014



S1-M2-25

1SBC101266F0014



S1-M3-25

1SBC101214F0014



SA2

SK0108B01

Description

Three-phase busbars ensure a quick and safe connection and are therefore a cost effective solution. A variety of different three-phase busbars up to 100 A are in the assortment. Between 2 and 5 manual motor starters with none, one or two lateral auxiliary contacts can be connected. Different three-phase feeder terminals are available according to the application.

Ordering details

Rated operational current A	Number of MMS	Number of lateral aux.	Type	Order code	Pkg qty	Weight (1 pce) kg
Three-phase busbars						
65	2	0	PS1-2-0-65	1SAM201906R1102	10	0.034
65	3	0	PS1-3-0-65	1SAM201906R1103	10	0.055
65	4	0	PS1-4-0-65	1SAM201906R1104	10	0.077
65	5	0	PS1-5-0-65	1SAM201906R1105	10	0.098
65	2	1	PS1-2-1-65	1SAM201906R1112	10	0.036
65	3	1	PS1-3-1-65	1SAM201906R1113	10	0.060
65	4	1	PS1-4-1-65	1SAM201906R1114	10	0.087
65	5	1	PS1-5-1-65	1SAM201906R1115	10	0.108
65	2	2	PS1-2-2-65	1SAM201906R1122	10	0.040
65	3	2	PS1-3-2-65	1SAM201906R1123	10	0.067
65	4	2	PS1-4-2-65	1SAM201906R1124	10	0.095
65	5	2	PS1-5-2-65	1SAM201906R1125	10	0.122
100	3	0	PS1-3-0-100	1SAM201916R1103	10	0.084
100	4	0	PS1-4-0-100	1SAM201916R1104	10	0.117
100	5	0	PS1-5-0-100	1SAM201916R1105	10	0.154
100	3	1	PS1-3-1-100	1SAM201916R1113	10	0.094
100	4	1	PS1-4-1-100	1SAM201916R1114	10	0.134
100	5	1	PS1-5-1-100	1SAM201916R1115	10	0.172
100	3	2	PS1-3-2-100	1SAM201916R1123	10	0.105

Rated operational current A	Rated cross section mm ²	Mounting form	Type	Order code	Pkg qty	Weight (1 pce) kg
Three-phase feeder terminals						
65	25	Flat	S1-M1-25	1SAM201907R1101	10	0.038
65	25	High	S1-M2-25	1SAM201907R1102	10	0.051
65	25	UL type E and IEC	S1-M3-25	1SAM201907R1103	10	0.042
100	35	UL type E and IEC	S1-M3-35	1SAM201913R1103	10	0.060

Description	Type	Order code	Pkg qty	Weight (1 pce) kg
Protection cover for busbars	BS1-3	1SAM201908R1001	50	0.003
Padlock	SA2	GJF1101903R0002	10	0.020
Screw fixing kit	FS116	1SAM201909R1001	1	0.020

MS132 manual motor starters

Main accessories



HKF1-11

1SBC101208F0014



HK1-11

1SBC101209F0014



SK1-11

1SBC101210F0014



CK1-11

1SBC101286F0014



AA1-24

1SBC101211F0014



UA1-24

1SBC101212F0014

Description

MS132 manual motor starters can be equipped with auxiliary contacts for lateral/front mounting, signalling contact for lateral mounting, undervoltage release and shunt trips. Two different signalling contacts are available. The accessories can be fitted wiring free and without tools. A variety of combinations is possible as required for the application. The auxiliary contacts change position with the main contacts. The signalling contact SK signals tripping regardless if it was caused by short-circuit or overload. The signalling contact CK signals tripping in case it was caused by short-circuit. Undervoltage release are used for remote tripping of the manual motor starter especially for emergency stop circuits. Shunt trips release the MMS used for remote tripping.

Ordering details

Auxiliary contacts N.O.	Auxiliary contacts N.C.	Description	Type	Order code	Pkg qty	Weight (1 pce)
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Auxiliary contacts – mountable on the front

1	1		HKF1-11	1SAM201901R1001	10	0.015
1	1		HKF1-20	1SAM201901R1002	10	0.015

Auxiliary contacts – mountable on the right

1	1	max. 2 pieces	HK1-11	1SAM201902R1001	2	0.035
2	0	max. 2 pieces	HK1-20	1SAM201902R1002	2	0.035
0	2	max. 2 pieces	HK1-02	1SAM201902R1003	2	0.035
2	0	with lead contacts	HK1-20L	1SAM201902R1004	2	0.035

Signalling contacts – mountable on the right

1	1	for tripped alarm, max. 2 pieces	SK1-11	1SAM201903R1001	2	0.035
2	0	for tripped alarm, max. 2 pieces	SK1-20	1SAM201903R1002	2	0.035
0	2	for tripped alarm, max. 2 pieces	SK1-02	1SAM201903R1003	2	0.035
1	1	for short-circuit alarm, max. 2 pieces	CK1-11	1SAM301901R1001	2	0.035
2	0	for short-circuit alarm, max. 2 pieces	CK1-20	1SAM301901R1002	2	0.035
0	2	for short-circuit alarm, max. 2 pieces	CK1-02	1SAM301901R1003	2	0.035

Rated control supply voltage	Frequency	Type	Order code	Pkg qty	Weight (1 pce)
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V	Hz				kg
Shunt trip units – mountable on the left					
24	50/60	AA1-24	1SAM201910R1001	1	0.100
110	50/60	AA1-110	1SAM201910R1002	1	0.100
200 ... 240	50/60	AA1-230	1SAM201910R1003	1	0.100
350 ... 415	50/60	AA1-400	1SAM201910R1004	1	0.100

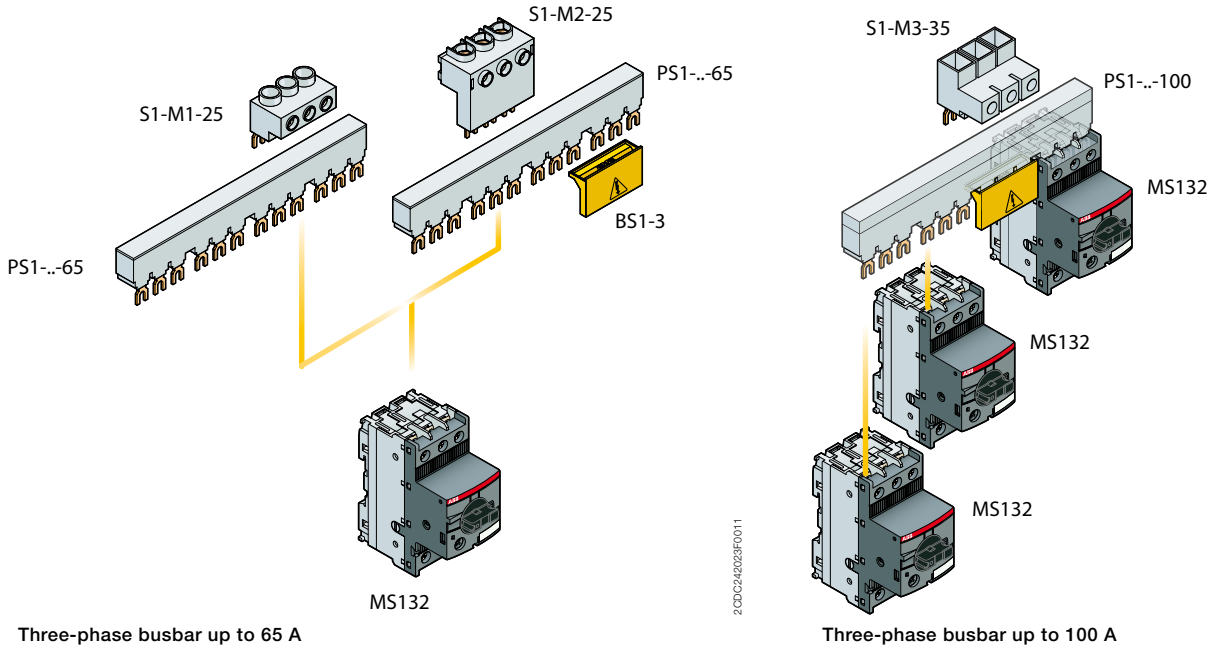
Undervoltage releases – mountable on the left

24	50	UA1-24	1SAM201904R1001	1	0.100
48	50	UA1-48	1SAM201904R1002	1	0.100
60	50	UA1-60	1SAM201904R1003	1	0.100
110 ... 120	50/60	UA1-120	1SAM201904R1004	1	0.100
208	60	UA1-208	1SAM201904R1008	1	0.100
230 ... 240	50/60	UA1-230	1SAM201904R1005	1	0.100
400	50	UA1-400	1SAM201904R1006	1	0.100
415 ... 480	50/60	UA1-415	1SAM201904R1007	1	0.100

MS132 manual motor starters

Main accessories

Manual motor starter with three-phase busbar systems



General technical data

Type	PS1-xxx-65	PS1-xxx-100	S1-Mx-25	S1-Mx-35
Standards	IEC/EN 60947-2, IEC/EN 60947-4-1, IEC/EN 60947-1			
Rated operational voltage U_n	690 V			
Rated operational current I_n	65 A	100 A	65 A	100 A
Rated frequency	50/60 Hz			
Rated impulse withstand voltage U_{imp}	6 kV			
Rated insulation voltage U_i	690 V AC			
Pollution degree	3			
Cross-section	10 mm ²	16 mm ²	25 mm ²	35 mm ²
Ambient air temperature	Operation: -25 ... +70 °C Storage: -50 ... +80 °C			
Resistance to shock acc. to IEC 60068-2-27	25 g / 11 ms			
Resistance to vibrations acc. to IEC 60068-2-6	3 g / 3 ... 150 Hz			

Electrical connection

Main circuit

Type	S1-Mx-25	S1-Mx-35
Connecting capacity		
Solid	1 x : 6 ... 25 mm ²	10 ... 35 mm ²
Flexible	1 x : 6 ... 16 mm ²	10 ... 35 mm ²
Stranded acc. to UL/CSA	1 x : AWG 10-4	AWG 8-2
Flexible acc. to UL/CSA	1 x : AWG 10-6	AWG 8-2
Stripping length	10 mm	12 mm
Tightening torques	2.5 Nm / 22 lb.in	4.5 Nm / 40 lb.in
Connection screw	PZ2 (6 mm)	Hexagon SW4

MS132 manual motor starters



Main accessories

General technical data

Type	HK1	SK1	CK1	HKF1
Standards	IEC/EN 60947-2, IEC/EN 60947-4-1, IEC/EN 60947-1			
Rated operational voltage U_e	690 V AC / 600 V DC			250 V AC / 250 V DC
Conventional free-air thermal current I_n	65 A	100 A	65 A	100 A
Rated frequency	50/60 Hz			
Rated impulse withstand voltage U_{imp}	6 kV			
Rated insulation voltage U_i	690 V AC			
Pollution degree	3			
Ambient air temperature	Operation	-25 ... +70 °C		
	Storage	-50 ... +80 °C		
Resistance to shock acc. to IEC 60068-2-27	25 g / 11 ms			
Resistance to vibrations acc. to IEC 60068-2-6	3 g / 3 ... 150 Hz			
Number of poles	1 N.C. + 1 N.O. / 2 N.O. / 2 N.C.	1 N.C. + 1 N.O.	1 N.C. + 1 N.O. / 2 N.O. / 2 N.C.	1 N.C. + 1 N.O.
I_e / Rated operational current AC-15 acc. to IEC/EN 60947-5-1 for utilization category				
	24 V, 120 V, 50/60 Hz	6 A		3 A
	240 V, 50/60 Hz	4 A		1.5 A
	400 V, 50/60 Hz	3 A		-
	440 V, 600 V, 690 V, 50/60 Hz	1 A		-
I_e / Rated operational current DC-13 acc. to IEC/EN 60947-5-1 for utilization category				
	24 V	2 A		1 A
	125 V	0.55 A		0.27 A
	250 V	0.27 A		0.11 A
	440 V, 600 V	0.15 A		-
Minimum switching capacity	17 V / 3 mA			
Short-circuit protective device	N.C., 95-96	10 A Type gG		
	N.O., 97-98	10 A Type gG		
Duty time	100 %			
Mounting	Right side of MMS			Front of MMS
Mounting positions	1-6			
Mechanical durability	50000 cycles		100000 cycles	-
Electrical durability	50000 cycles		100000 cycles	-

Electrical connection

Main circuit

Type	HK1	SK1	CK1	HKF1
Connecting capacity				
 Solid	1 or 2 x	1 ... 1.5 mm ²		1 ... 2.5 mm ²
 Flexible	1 or 2 x	0.75 ... 1.5 mm ²		
Stranded acc. to UL/CSA	1 or 2 x	AWG 16-14		
Flexible acc. to UL/CSA	1 or 2 x	AWG 16-14		
Stripping length	8 mm			
Tightening torques	0.8 ... 1.2 Nm / 7 lb.in			
Connection screw	M3 (Pozidriv 2)			

MS132 manual motor starters

Main accessories

2



IB132-Y

2CDC241004F0010



IB132-G

2CDC241003F0010



DMS132-Y

2CDC241002F0010



DMS132-G

2CDC241001F0010

Description

IB132 are IP65 enclosures for single MMS installation. Additional mounting of auxiliary and signalling contacts, shunt trips and undervoltage release is possible. The handle is lockable in OFF position. For detailed specification see installation instruction.

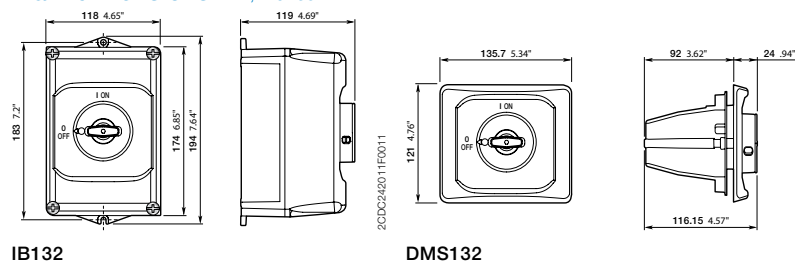
DMS132 are IP65 door mounting kits for MMS installation in any enclosure. Additional mounting of auxiliary, signalling, shunt trips and undervoltage release is possible. The handle is lockable in OFF position. For detailed specification see installation instruction.

Ordering details

Description	Colour	Type	Order code	Pkg qty	Weight (1 pce) kg
Enclosures IP65					
Padlockable max. 3 padlocks with bail diameter 4 ... 6.5 mm	Yellow/red	IB132-Y	1SAM201911R1011	1	0.370
	Grey/black	IB132-G	1SAM201911R1010	1	0.370
Door mounting kit IP65					
Padlockable max. 3 padlocks with bail diameter 4 ... 6.5 mm	Yellow/red	DMS132-Y	1SAM201912R1011	1	0.170
	Grey/black	DMS132-G	1SAM201912R1010	1	0.170

Indication I-O-T and ON-OFF-T

Main dimensions mm, inches



MS132 manual motor starters

Main accessories



MSHD-LTB

2CDC241007F0011



MSHD-LTY

2CDC241008F0011



MSMN

2CDC241009S0011



MSOX-30

2CDC241005S0011



MSH-AR

2CDC241001S0012

Description

The complete set includes handle, shaft and driver. All accessories fit 6 mm shafts of maximum 180 mm length. The degree of protection for handles MSHD is IP64.

Ordering details

Description	Shaft length mm	Type	Order code	Pkg qty	Weight (1 pce) kg
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Shafts

For selector type handles. Shaft diameter 6 mm. Shaft extension for door coupling driver.

85	OXS6X85	1SCA101647R1001	1	0.020
105	OXS6X105	1SCA108043R1001	1	0.020
130	OXS6X130	1SCA101655R1001	1	0.030
180	OXS6X180	1SCA101659R1001	1	0.040

Description	Colour	Type	Order code	Pkg qty	Weight (1 pce) kg
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Selector type handles IP64

Padlockable max. 3 padlocks with bail diameter 5 ... 8 mm, door interlock in ON position defeatable, for use with 6 mm OXS6...types up to 180 mm or driver shafts MSOX.

Black	MSHD-LTB ¹⁾	1SAM201920R1011	1	0.065
Yellow	MSHD-LTY ¹⁾	1SAM201920R1012	1	0.065

¹⁾ Indication I-O-T and ON-OFF-T

Description	Type	Order code	Pkg qty	Weight (1 pce) kg
-------------	------	------------	------------	-------------------------

Driver

Coupling driver for use with 6 mm OXS6... types up to 180 mm.

MSMN ¹⁾	1SAM101923R0002	1	0.002
MSMNO ²⁾	1SAM101923R0012	1	0.002

¹⁾ Coded - Positioning of ON indication dependent from mounting orientation of the MS

²⁾ Uncoded - Positioning of ON indication independent from mounting orientation of the MS

Description	Shaft length mm	Type	Order code	Pkg qty	Weight (1 pce) kg
-------------	--------------------	------	------------	------------	-------------------------

Driver shafts

Driver shaft - combination driver & shaft. Shaft diameter 6 mm.

32	MSOX-32 ¹⁾	1SAM101924R0003	1	0.010
30	MSOX-30 ²⁾	1SAM101924R0013	1	0.010

¹⁾ MSOX-32 is for normal vertical use

²⁾ MSOX-30 is for horizontal use

Description	Type	Order code	Pkg qty	Weight (1 pce) kg
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Shaft alignment ring

The MSH-AR support the long axis for alignment to the handle inlet. It makes closing panel doors more easy.

MSH-AR	1SAM201920R1000	1	0.010
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MO132 manual motor starters magnetic only 0.10 to 32 A – with electromagnetic protection

2



MO132-6.3



MO132-32

Description

Manual motor starters magnetic only are electromechanical protection devices for the main circuit. They are used mainly to switch motors manually ON/OFF and protect them fuse less against short-circuit.

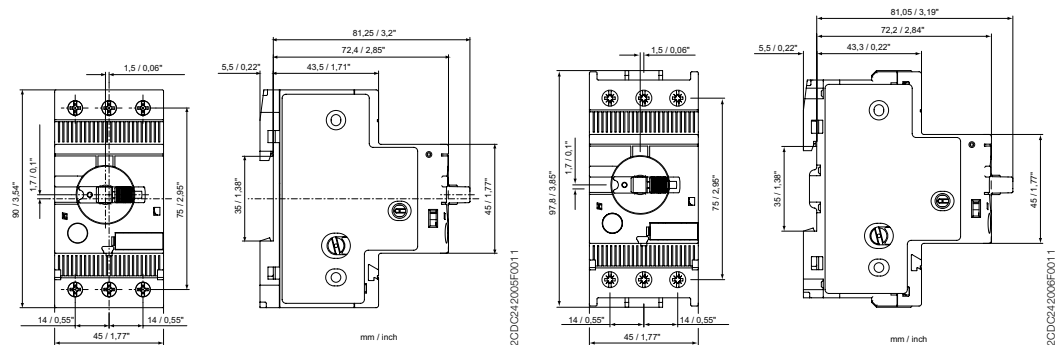
Fuse less protection with a manual motor starter saves costs, space and ensures a quick reaction under short-circuit condition, by switching off the motor within milliseconds. Fuse less starter combinations are setup together with contactors and overload relays.

Ordering details

Rated operational power 400 V AC-3 ¹⁾ kW	Rated operational current A	Short-circuit breaking capacity I _{CS} at 400 V AC kA	Rated instantaneous short-circuit current setting I _i A	Type	Order code	Weight (1 pce) kg
0.03	0.16	100	1.56	MO132-0.16	1SAM360000R1001	0.215
0.06	0.25	100	2.44	MO132-0.25	1SAM360000R1002	0.215
0.09	0.40	100	3.90	MO132-0.4	1SAM360000R1003	0.215
0.12	0.63	100	6.14	MO132-0.63	1SAM360000R1004	0.215
0.25	1.0	100	11.50	MO132-1.0	1SAM360000R1005	0.215
0.55	1.6	100	18.40	MO132-1.6	1SAM360000R1006	0.265
0.75	2.5	100	28.75	MO132-2.5	1SAM360000R1007	0.265
1.5	4.0	50	50.00	MO132-4.0	1SAM360000R1008	0.265
2.2	6.3	50	78.75	MO132-6.3	1SAM360000R1009	0.265
4.0	10	50	125.00	MO132-10	1SAM360000R1010	0.265
5.5	12	50	150.00	MO132-12	1SAM360000R1012	0.310
7.5	16	50	200.00	MO132-16	1SAM360000R1011	0.310
9.0	20	50	250.00	MO132-20	1SAM360000R1013	0.310
12.5	25	50	313.00	MO132-25	1SAM360000R1014	0.310
15.5	32	25	400.00	MO132-32	1SAM360000R1015	0.310

¹⁾ For overload protection of motors, an appropriate thermal or electronic overload relay must be used

Main dimensions mm, inches



MO132 manual motor starters magnetic only

Technical data

Main circuit – Utilization characteristics according to IEC/EN

Type	MO132
Standards	IEC/EN 60947-2, IEC/EN 60947-4-1, IEC/EN 60947-1
Rated operational voltage U_e	690 V AC
Rated frequency	50/60 Hz
Number of poles	3
Duty time	100 %
Rated impulse withstand voltage U_{imp}	6 kV
Rated insulation voltage U_i	690 V AC
Rated operational current I_e	See ordering details
Rated instantaneous short-circuit current setting I_i	See ordering details
Rated service short-circuit breaking capacity I_{cs}	See table "Short-circuit breaking capacity and back-up fuses"
Rated ultimate short-circuit breaking capacity I_{cu}	See table "Short-circuit breaking capacity and back-up fuses"

Short-circuit breaking capacity and back-up fuses

I_{cs} Rated service short-circuit breaking capacity
 I_{cu} Rated ultimate short-circuit breaking capacity
 I_{cc} Prospective short-circuit current at installation location
 Note: Maximum rated current of the back-up fuses if $I_{cc} > I_{cs}$

Type	230 V AC			400 V AC			440 V AC			500 V AC			690 V AC		
	I_{cs} kA	I_{cu} kA	gG, aM A	I_{cs} kA	I_{cu} kA	gG, aM A	I_{cs} kA	I_{cu} kA	gG, aM A	I_{cs} kA	I_{cu} kA	gG, aM A	I_{cs} kA	I_{cu} kA	gG, aM A
MO132-0.16	No back-up fuse required up to $I_{cc} = 100$ kA														
MO132-0.25															
MO132-0.4															
MO132-0.63															
MO132-1.0															
MO132-1.6															
MO132-2.5															
MO132-4.0	20	20	35	20	20	35	20	20	35	3	3	*			
MO132-6.3	20	20	63	20	20	63	20	20	63	3	3	*			
MO132-10	20	20	100	20	20	100	20	20	100	3	3	*			
MO132-12	20	20	100	20	20	100	20	20	100	3	3	*			
MO132-16	20	20	125	20	20	125	20	20	125	3	3	*			
MO132-20	20	20	125	20	20	125	20	20	125	3	3	*			
MO132-25	50	50	125	50	50	125	10	10	125	10	10	125	3	3	*
MO132-32	25	50	125	25	50	125	10	10	125	10	10	125	3	3	*

*not available yet

General technical data

Type	MO132
Pollution degree	3
Phase loss sensitive	Yes
Ambient air temperature	Operation: -25 ... +60 °C Storage: -50 ... +80 °C
Ambient air temperature compensation	Continuous
Maximum operating altitude permissible	2000 m
Resistance to shock acc. to IEC 60068-2-27	25 g / 11 ms
Resistance to vibrations acc. to IEC 60068-2-6	5 g / 3 ... 150 Hz
Mounting position	Position 1-6 (optional for single mounting)
Mounting	DIN-rail (EN 60715)
Group mounting	On request
Minimum distance to other units same type	Horizontal: 0 mm Vertical: 150 mm
Minimum distance to electrical conductive board	Horizontal, up to 400 V: 0 mm Horizontal, up to 690 V: > 1.5 mm Vertical: 75 mm
Degree of protection	Enclosure / terminals: IP20

Connecting characteristics

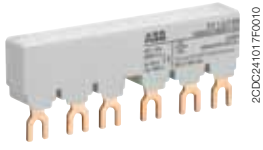
Main circuit

Type	MO132-0.16 ... MO132-10	MO132-12 ... MO132-16	MO132-20 ... MO132-32
Connecting capacity	1 or 2 x 1 ... 4 mm ²	1 ... 4 mm ²	2.5 ... 6 mm ²
	1 or 2 x 0.75 ... 2.5 mm ²	0.75 ... 2.5 mm ²	1 ... 6 mm ²
	1 or 2 x AWG 16-12	AWG 16-12	AWG 12-8
	1 or 2 x AWG 16-12	AWG 16-12	AWG 12-8
Stripping length	9 mm	10 mm	10 mm
Tightening torques	0.8 ... 1.2 Nm / 10 ... 12 lb.in	1.5 Nm / 14 lb.in	2.0 Nm / 18 lb.in
Connection screw	M3.5 (Pozi driv 2)	M4 (Pozi driv 2)	M4 (Pozi driv 2)

MO132 manual motor starters magnetic only

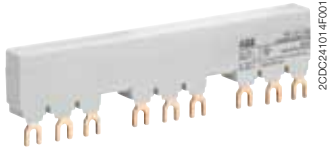
Main accessories

2



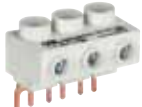
PS1-2-0-65

2CDC241017F0010



PS1-3-1-100

2CDC241014F0010



S1-M1-25

1SBC101226F0014



S1-M2-25

1SBC101266F0014



SA1

SKO106B91

Description

Three-phase busbars ensure a quick and safe connection and are therefore a cost effective solution. A variety of different three-phase busbars up to 100 A are in the assortment. Between 2 and 5 manual motor starters with none, one or two lateral auxiliary contacts can be connected. Different three-phase feeder terminals are available according to the application.

Ordering details

Rated operational current A	Number of MMS	Number of lateral aux.	Type	Order code	Pkg qty	Weight (1 pce) kg
Three-phase busbars						
65	2	0	PS1-2-0-65	1SAM201906R1102	10	0.034
65	3	0	PS1-3-0-65	1SAM201906R1103	10	0.055
65	4	0	PS1-4-0-65	1SAM201906R1104	10	0.077
65	5	0	PS1-5-0-65	1SAM201906R1105	10	0.098
65	2	1	PS1-2-1-65	1SAM201906R1112	10	0.036
65	3	1	PS1-3-1-65	1SAM201906R1113	10	0.060
65	4	1	PS1-4-1-65	1SAM201906R1114	10	0.087
65	5	1	PS1-5-1-65	1SAM201906R1115	10	0.108
65	2	2	PS1-2-2-65	1SAM201906R1122	10	0.040
65	3	2	PS1-3-2-65	1SAM201906R1123	10	0.067
65	4	2	PS1-4-2-65	1SAM201906R1124	10	0.095
65	5	2	PS1-5-2-65	1SAM201906R1125	10	0.122
100	3	0	PS1-3-0-100	1SAM201916R1103	10	0.084
100	4	0	PS1-4-0-100	1SAM201916R1104	10	0.117
100	5	0	PS1-5-0-100	1SAM201916R1105	10	0.154
100	3	1	PS1-3-1-100	1SAM201916R1113	10	0.094
100	4	1	PS1-4-1-100	1SAM201916R1114	10	0.134
100	5	1	PS1-5-1-100	1SAM201916R1115	10	0.172
100	3	2	PS1-3-2-100	1SAM201916R1123	10	0.105

Rated operational current A	Rated cross section mm ²	Mounting form	Type	Order code	Pkg qty	Weight (1 pce) kg
Three-phase feeder terminals						
65	25	Flat	S1-M1-25	1SAM201907R1101	10	0.038
65	25	High	S1-M2-25	1SAM201907R1102	10	0.051
65	25	UL type E and IEC	S1-M3-25	1SAM201907R1103	10	0.042
100	35	UL type E and IEC	S1-M3-35	1SAM201913R1103	10	0.060

Description	Type	Order code	Pkg qty	Weight (1 pce) kg
Protection cover for busbars	BS1-3	1SAM201908R1001	50	0.003
Padlock + two keys	SA2	GJF1101903R0002	10	0.020
Screw fixing kit	FS116	1SAM201909R1001	1	0.020

MO132 manual motor starters magnetic only

Main accessories



HKF1-11

1SBC101208FC014



HK1-11

1SBC101208FC014



SK1-11

1SBC101210FC014



AA1-24

1SBC101211FR014



UA1-24

1SBC101212FR014

Description

MO132 manual motor starters can be equipped with auxiliary contacts for lateral/front mounting, signalling contact for lateral mounting, undervoltage release and shunt trips. The accessories can be fitted wiring free and without tools. A variety of combinations is possible as required for the application. The auxiliary contacts change position with the main contacts. Undervoltage release are used for remote tripping of the manual motor starter especially for emergency stop circuits. Shunt trips release the MMS used for remote tripping.

Ordering details

Auxiliary contacts: N.O.	Auxiliary contacts: N.C.	Description	Type	Order code	Pkg qty	Weight (1 pce)
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Auxiliary contacts – mountable on the front

1	1		HKF1-11	1SAM201901R1001	10	0.015
1	1		HKF1-20	1SAM201901R1002	10	0.015

Auxiliary contacts – mountable on the right

1	1	Max. 2 pieces	HK1-11	1SAM201902R1001	2	0.035
2	0	Max. 2 pieces	HK1-20	1SAM201902R1002	2	0.035
0	2	Max. 2 pieces	HK1-02	1SAM201902R1003	2	0.035
2	0	With lead contacts	HK1-20L	1SAM201902R1004	2	0.035

Signalling contacts – mountable on the right

1	1	For tripped alarm, max. 2 pieces	SK1-11	1SAM201903R1001	2	0.035
2	0	For tripped alarm, max. 2 pieces	SK1-20	1SAM201903R1002	2	0.035
0	2	For tripped alarm, max. 2 pieces	SK1-02	1SAM201903R1003	2	0.035

Rated control supply voltage	Frequency	Type	Order code	Pkg qty	Weight (1 pce)
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V	Hz				kg
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Shunt trip units – mountable on the left

24	50/60	AA1-24	1SAM201910R1001	1	0.100
110	50/60	AA1-110	1SAM201910R1002	1	0.100
200 ... 240	50/60	AA1-230	1SAM201910R1003	1	0.100
350 ... 415	50/60	AA1-400	1SAM201910R1004	1	0.100

Undervoltage releases – mountable on the left

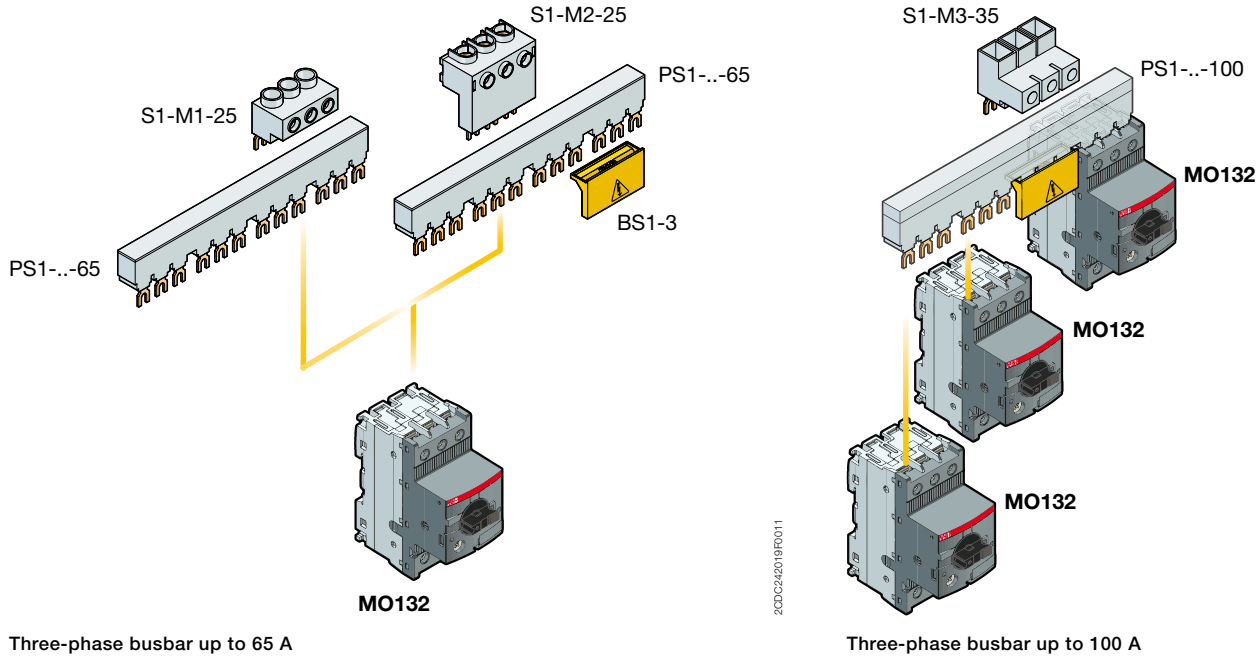
24	50	UA1-24	1SAM201904R1001	1	0.100
48	50	UA1-48	1SAM201904R1002	1	0.100
60	50	UA1-60	1SAM201904R1003	1	0.100
110 ... 120	50/60	UA1-120	1SAM201904R1004	1	0.100
208	60	UA1-208	1SAM201904R1008	1	0.100
230 ... 240	50/60	UA1-230	1SAM201904R1005	1	0.100
400	50	UA1-400	1SAM201904R1006	1	0.100
415 ... 480	50/60	UA1-415	1SAM201904R1007	1	0.100

MO132 manual motor starters magnetic only

Main accessories

Manual motor starter with three-phase busbar systems

2



Three-phase busbar up to 65 A

Three-phase busbar up to 100 A

General technical data

Type	PS1-xxx-65	PS1-xxx-100	S1-Mx-25	S1-Mx-35
Standards	IEC/EN 60947-2, IEC/EN 60947-4-1, IEC/EN 60947-1			
Rated operational voltage U_n	690 V			
Rated operational current I_n	65 A	100 A	65 A	100 A
Rated frequency	50/60 Hz			
Rated impulse withstand voltage U_{imp}	6 kV			
Rated insulation voltage U_i	690 V AC			
Pollution degree	3			
Cross-section	10 mm ²	16 mm ²	25 mm ²	35 mm ²
Ambient air temperature	Operation -25 ... +70 °C Storage -50 ... +80 °C			
Resistance to shock acc. to IEC 60068-2-27	25 g / 11 ms			
Resistance to vibrations acc. to IEC 60068-2-6	3 g / 3 ... 150 Hz			

Electrical connection

Main circuit

Type	S1-Mx-25	S1-Mx-35
Connecting capacity		
Solid	1 x 6 ... 25 mm ²	10 ... 35 mm ²
Flexible	1 x 6 ... 16 mm ²	10 ... 35 mm ²
Stranded acc. to UL/CSA	1 x AWG 10-4	AWG 8-2
Flexible acc. to UL/CSA	1 x AWG 10-6	AWG 8-2
Stripping length	10 mm	12 mm
Tightening torques	2,5 Nm / 22 lb.in	4,5 Nm / 40 lb.in
Connection screw	PZ2 (6 mm)	Hexagon SW4

MO132 manual motor starters magnetic only



Main accessories

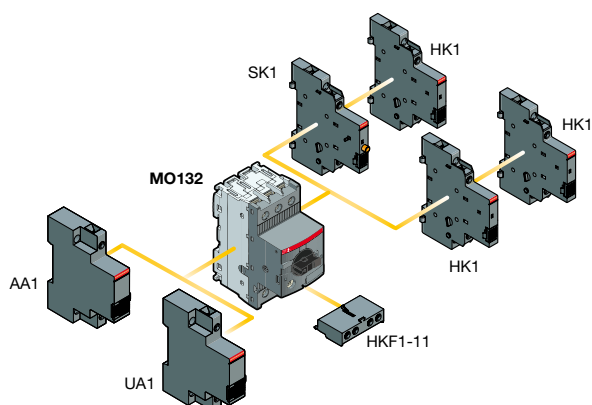
General technical data

Type	HK1	SK1	HKF1
Standards	IEC/EN 60947-2, IEC/EN 60947-4-1, IEC/EN 60947-1		
Rated operational voltage U_e	690 V AC / 600 DC		250 V AC / 250 V DC
Conventional free-air thermal current I_{th}	65 A	100 A	100 A
Rated frequency	50/60 Hz		
Rated impulse withstand voltage U_{imp}	6 kV		
Rated insulation voltage U_i	690 V AC		
Pollution degree	3		
Ambient air temperature	Operation	-25 ... +70 °C	
	Storage	-50 ... +80 °C	
Resistance to shock acc. to IEC 60068-2-27	25 g / 11 ms		
Resistance to vibrations acc. to IEC 60068-2-6	3 g / 3 ... 150 Hz		
Number of poles	1 N.C. + 1 N.O. / 2 N.O. / 2 N.C.	1 N.C. + 1 N.O.	1 N.C. + 1 N.O.
I_e / Rated operational current AC-15 acc. to IEC/EN 60947-5-1 for utilization category			
	24 V, 120 V, 50/60 Hz	6 A	3 A
	240 V, 50/60 Hz	4 A	1.5 A
	400 V, 50/60 Hz	3 A	-
	440 V, 600 V, 690 V, 50/60 Hz	1 A	-
I_e / Rated operational current DC-13 acc. to IEC/EN 60947-5-1 for utilization category			
	24 V	2 A	1 A
	125 V	0.55 A	0.27 A
	250 V	0.27 A	0.11 A
	440 V, 600 V	0.15 A	-
Minimum switching capacity	17 V / 3 mA		
Short-circuit protective device	N.C., 95-96	10 A Type gG	
	N.O., 97-98	10 A Type gG	
Duty time	100 %		
Mounting	Right side of MMS		Front of MMS
Mounting positions	1-6		
Mechanical durability	50000 cycles		-
Electrical durability	50000 cycles		-

Electrical connection

Main circuit

Type	HK1	SK1	HKF1
Connecting capacity			
 Solid	1 or 2 x	1 ... 1.5 mm ²	
 Flexible	1 or 2 x	0.75 ... 1.5 mm ²	
Stranded acc. to UL/CSA	1 or 2 x	AWG 16-14	
Flexible acc. to UL/CSA	1 or 2 x	AWG 16-14	
Stripping length	8 mm		
Tightening torques	0.8 ... 1.2 Nm / 7 lb.in		
Connection screw	M3 (Pozidriv 2)		



2CDD242018F0011

2CDD131036C0201_7s9

MO132 manual motor starters magnetic only

Main accessories

2



IB132-Y



IB132-G



DMS132-Y



DMS132-G

Description

IB132 are IP65 enclosures for single MMS installation. Additional mounting of auxiliary and signalling contacts, shunt trips and undervoltage release is possible. The handle is lockable in OFF position. For detailed specification see installation instruction.

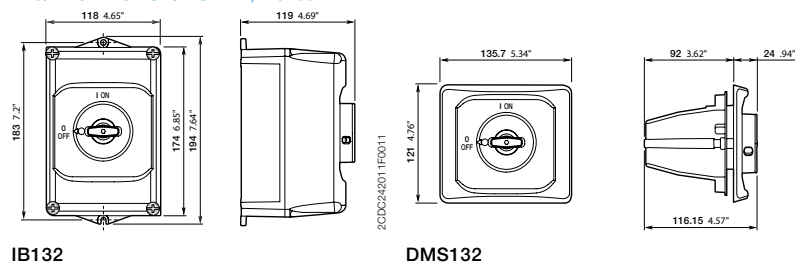
DMS132 are IP65 door mounting kits for MMS installation in any enclosure. Additional mounting of auxiliary, signalling, shunt trips and undervoltage release is possible. The handle is lockable in OFF position. For detailed specification see installation instruction.

Ordering details

Description	Color	Type	Order code	Pkg qty	Weight (1 pce) kg
Enclosures IP65					
Padlockable max. 3 padlocks with bail diameter 4 ... 6.5 mm	Yellow/red	IB132-Y	1SAM201911R1011	1	0.370
	Grey/black	IB132-G	1SAM201911R1010	1	0.370
Door mounting kit IP65					
Padlockable max. 3 padlocks with bail diameter 4 ... 6.5 mm	Yellow/red	DMS132-Y	1SAM201912R1011	1	0.170
	Grey/black	DMS132-G	1SAM201912R1010	1	0.170

Indication I-O-T and ON-OFF-T

Main dimensions mm, inches



MO132 manual motor starters magnetic only

Main accessories



2CDC241007F0011

MSHD-LTB



2CDC241008F0011

MSHD-LTY



2CDC241004S0011

MSMN



2CDC241005S0011

MSOX-30



2CDC241001S0012

MSH-AR

Description

The complete set includes handle, shaft and driver. All accessories fit 6 mm shafts of maximum 180 mm length. The degree of protection for handles MSHD is IP64.

Ordering details

Description	Shaft length mm	Type	Order code	Pkg qty	Weight (1 pce) kg
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Shafts

For selector type handles. Shaft diameter 6 mm. Shaft extension for door coupling driver.

85	OXS6X85	1SCA101647R1001	1	0.020
105	OXS6X105	1SCA108043R1001	1	0.020
130	OXS6X130	1SCA101655R1001	1	0.030
180	OXS6X180	1SCA101659R1001	1	0.040

Description	Color	Type	Order code	Pkg qty	Weight (1 pce) kg
-------------	-------	------	------------	------------	-------------------------

Selector type handles IP64

Padlockable max. 3 padlocks with bail diameter 5 ... 8 mm, door interlock in ON position defeatable, for use with 6 mm OXS6...types up to 180 mm or driver shafts MSOX.

Black	MSHD-LTB ¹⁾	1SAM201920R1011	1	0.065
Yellow	MSHD-LTY ¹⁾	1SAM201920R1012	1	0.065

¹⁾ Indication I-O-T and ON-OFF-T

Description	Type	Order code	Pkg qty	Weight (1 pce) kg
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Driver

Coupling driver for use with 6 mm OXS6... types up to 180 mm.

MSMN ¹⁾	1SAM101923R0002	1	0.002
MSMNO ²⁾	1SAM101923R0012	1	0.002

¹⁾ Coded - Positioning of ON indication dependent from mounting orientation of the MS

²⁾ Uncoded - Positioning of ON indication independent from mounting orientation of the MS

Description	Shaft length mm	Type	Order code	Pkg qty	Weight (1 pce) kg
-------------	--------------------	------	------------	------------	-------------------------

Driver shafts

Driver shaft - combination driver & shaft. Shaft diameter 6 mm.

32	MSOX-32 ¹⁾	1SAM101924R0003	1	0.010
30	MSOX-30 ²⁾	1SAM101924R0013	1	0.010

¹⁾ MSOX-32 is for normal vertical use

²⁾ MSOX-30 is for horizontal use

Description	Type	Order code	Pkg qty	Weight (1 pce) kg
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Shaft alignment ring

The MSH-AR support the long axis for alignment to the handle inlet. It makes closing panel doors more easy.

MSH-AR	1SAM201920R1000	1	0.010
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MS450, MS495, MS497 manual motor starters

22 to 100 A – with thermal and electromagnetic protection

2



MS450-40

2CDC241024F0009



MS495-40

1S5E101164F0014



MS497-100

2CDC241022F0011

Description

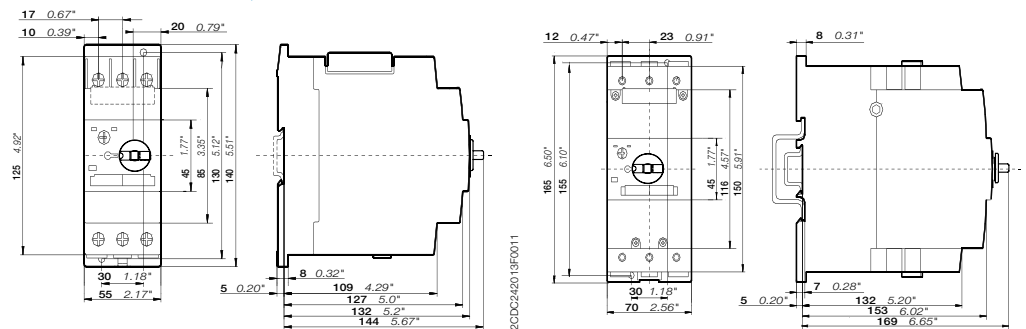
Manual motor starters (MMS) are protection devices for the main circuit. They combine motor control and protection in a single device. MMS are used mainly to switch motors manually ON/OFF and protect them and the installation fuse less against short-circuit, overload and phase failures. Fuse less protection with a manual motor starter saves costs, space and ensures a quick reaction under short-circuit condition, by switching off the motor within milliseconds.

Further features are the build-in disconnect function, temperature compensation, trip-free mechanism and a rotary handle with a clear switch position indication. The manual motor starter is suitable for three- and single-phase applications. The handle is lockable to protect against unauthorized changes. Auxiliary contacts, signalling contacts, undervoltage releases, shunt trips, three-phase busbars, power in-feed blocks are available as accessory.

Ordering details

Rated operational power 400 V AC-3	Setting range	Short-circuit breaking capacity I_{cs} at 400 V AC	Rated instantaneous short-circuit current setting I_i	Type	Order code	Weight (1 pce)
kW	A	kA	A			kg
MS450 manual motor starter						
15.8	28.0 ... 40.0	25	520.00	MS450-40	1SAM450000R1005	1.047
22	36.0 ... 45.0	25	585.00	MS450-45	1SAM450000R1006	1.039
22	40.0 ... 50.0	25	650.00	MS450-50	1SAM450000R1007	1.027
MS495 manual motor starter						
30	45.0 ... 63.0	25	819.00	MS495-63	1SAM550000R1007	2.247
37	57.0 ... 75.0	25	975.00	MS495-75	1SAM550000R1008	2.253
45	70.0 ... 90.0	25	1170.00	MS495-90	1SAM550000R1009	2.280
55	80.0 ... 100.0	25	1235.00	MS495-100	1SAM550000R1010	2.295
MS497 manual motor starter						
15	22.0 ... 32.0	50	416.00	MS497-32	1SAM580000R1004	2.222
18.5	28.0 ... 40.0	50	520.00	MS497-40	1SAM580000R1005	2.203
22	36.0 ... 50.0	50	650.00	MS497-50	1SAM580000R1006	2.230
30	45.0 ... 63.0	50	819.00	MS497-63	1SAM580000R1007	2.255
37	57.0 ... 75.0	50	975.00	MS497-75	1SAM580000R1008	2.266
45	70.0 ... 90.0	50	1170.00	MS497-90	1SAM580000R1009	2.268
55	80.0 ... 100.0	50	1235.00	MS497-100	1SAM580000R1010	2.275

Main dimensions mm, inches



MS450

MS495, MS497

2CDC242013F0011

2CDC131042C0201

MS450, MS495, MS497 manual motor starters

Technical data

Main circuit – Utilization characteristics according to IEC/EN

Type	MS450, MS495, MS497
Standards	IEC/EN 60947-2, IEC/EN 60947-4-1, IEC/EN 60947-1
Rated operational voltage U_e	690 V AC / 450 V DC
Rated frequency	50/60 Hz
Trip class	10
Number of poles	3
Duty time	100 %
Rated impulse withstand voltage U_{imp}	6 kV
Rated insulation voltage U_i	690 V AC
Rated operational current I_e	See ordering details
Rated instantaneous short-circuit current setting I_i	See ordering details
Rated service short-circuit breaking capacity I_{cs}	See table "Short-circuit breaking capacity and back-up fuses"
Rated ultimate short-circuit breaking capacity I_{cu}	See table "Short-circuit breaking capacity and back-up fuses"

Short-circuit breaking capacity and back-up fuses

I_{cs} Rated service short-circuit breaking capacity

I_{cu} Rated ultimate short-circuit breaking capacity

I_{cc} Prospective short-circuit current at installation location

Note: Maximum rated current of the back-up fuses if $I_{cc} > I_{cs}$

Type	240 V AC			400 V AC			440 V AC			500 V AC			690 V AC		
	I_{cs} kA	I_{cu} kA	gG, aM A	I_{cs} kA	I_{cu} kA	gG, aM A	I_{cs} kA	I_{cu} kA	gG, aM A	I_{cs} kA	I_{cu} kA	gG, aM A	I_{cs} kA	I_{cu} kA	gG, aM A
Short-circuit protection MS450															
MS450-40	No back-up fuse required up to $I_{cc} = 100$ kA	25	50	160	15	50	125	5	10	100	2	4	63		
MS450-45		25	50	160	15	50	125	5	10	100	2	4	63		
MS450-50		25	50	160	15	50	125	5	10	100	2	4	80		

MS450: No need for back-up fuse in networks with a prospective current of up to 50 kA at 400 V.
With an appropriate 160 A type gG fuse the device can be used in a network with a prospective current of up to 100 kA.

Short-circuit protection MS495

MS495-40	No back-up fuse required up to $I_{cc} = 100$ kA	25	50	125	20	50	125	6	12	125	3	6	63
MS495-50		25	50	125	20	50	125	6	12	125	3	6	80
MS495-63		25	50	160	20	50	160	6	12	160	3	6	80
MS495-75		25	50	160	20	50	160	6	8	160	3	5	100
MS495-90		25	50	160	20	50	160	6	8	160	3	5	125
MS495-100		25	50	160	20	50	160	6	8	160	3	5	125

MS495-40: No need for back-up fuse in networks with a prospective current of up to 50 kA at 400 V.
With an appropriate 125 A type gG fuse the device can be used in a network with a prospective current of up to 100 kA.
MS495-100: No need for back-up fuse in networks with a prospective current of up to 50 kA at 400 V.
With an appropriate 160 A type gG fuse the device can be used in a network with a prospective current of up to 100 kA.

Short-circuit protection MS497

MS497-32	No back-up fuse required up to $I_{cc} = 100$ kA	50	100	No back-up fuse required up to $I_{cc} = 100$ kA	50	100	No back-up fuse required up to $I_{cc} = 100$ kA	11	22	100	7	12	63	
MS497-40		50	100		50	100		9	18	160	6	12	80	
MS497-50		50	100		50	100		7.5	15	160	5	10	100	
MS497-63		50	100		50	70		200	7.5	15	160	4	7.5	100
MS497-75		50	100		50	70		200	5	10	160	3	6	125
MS497-90		50	100		50	70		200	5	10	160	3	6	160
MS497-100		50	100		50	70		200	5	10	160	3	6	160

MS497-32: No need for back-up fuse in networks with a prospective current of up to 100 kA at 440 V.
MS497-90: No need for back-up fuse in networks with a prospective current of up to 70 kA at 440 V.
With an appropriate 200 A type gG fuse the device can be used in a network with a prospective current of up to 100 kA.



MS450, MS495, MS497 manual motor starters

Technical data

General technical data

Type		MS450	MS495	MS497
Pollution degree		3		
Phase loss sensitive		Yes		
Ambient air temperature				
Operation	Open - compensated without derating	-20 ... +60 °C		
	Open	-20 ... +70 °C		
	Enclosed	-20 ... +35 °C		
Storage		-50 ... +80 °C		
Ambient air temperature compensation		Continuous		
Maximum operating altitude permissible		2000 m		
Resistance to shock acc. to IEC 60068-2-27		25 g / 11 ms	-	
Resistance to vibrations acc. to IEC 60068-2-6		2 g / 5-150 Hz		
Mounting position		Position 1-6 (optional for single mounting)		
Mounting		DIN-rail 35 mm (EN 60715)	DIN-rail 15 mm / 75 mm (EN 60715)	
Minimum distance to other units same type	Horizontal	0 mm	0 mm	
	Vertical - up to 240 V	-	50 mm	
	Vertical - up to 440 V	-	70 mm	
	Vertical - up to 500 V	-	110 mm	
	Vertical - up to 690 V	-	150 mm	
	Vertical	50 mm	-	
Minimum distance to electrical conductive board	Horizontal	10 mm	-	
	Horizontal - up to 500 V	-	10 mm	
	Horizontal - up to 690 V	-	30 mm	
	Vertical - up to 240 V	-	50 mm	
	Vertical - up to 440 V	-	70 mm	
	Vertical - up to 500 V	-	110 mm	
	Vertical - up to 690 V	-	150 mm	
	Vertical	50 mm	-	
Degree of protection		Enclosure / terminals	IP20	

Connecting characteristics

Main circuit		Type		MS450	MS495	MS497
Connecting capacity						
	Solid	1 or 2 x		0.75 ... 16 mm ²	2.5 ... 16 mm ²	2.5 ... 16 mm ²
	Flexible	1 x		0.75 ... 35 mm ²	10 ... 70 mm ²	10 ... 70 mm ²
			2 x		0.75 ... 25 mm ²	10 ... 50 mm ²
Stranded acc. to UL/CSA		1 x		AWG 18-2	AWG 10-2/0	AWG 10-2/0
		2 x	AWG 18-2	AWG 10-1/0	AWG 10-1/0	
Flexible acc. to UL/CSA		1 x	AWG 18-2	AWG 10-2/0	AWG 10-2/0	
		2 x	AWG 18-2	AWG 10-1/0	AWG 10-1/0	
Stripping length			13 mm	17 mm	17 mm	
Tightening torques			3 - 4.5 Nm / 27 ... 40 lb.in	4 - 6 Nm / 35 - 53 lb.in	4 - 6 Nm / 35 - 53 lb.in	
Connection screw			Pozidriv 2	Hexagon 4	Hexagon 4	

MS450, MS495, MS497 manual motor starters

Main accessories



SA2

SKO109B81

Description

Three-phase busbars ensure a quick and safe connection and are therefore a cost-effective solution. A variety of different three-phase busbars up to 108A are in the assortment. Between 2 and 4 manual motor starters with none or two lateral auxiliary contacts can be connected.

Ordering details

Rated operational current A	Number of MMS	Number of lateral aux.	Type	Order code	Pkg qty	Weight (1 pce) kg
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Three-phase busbars for MS450 only

108	2	0	PS4-2-0	1SAM401911R1001	5	0.134
108	3	0	PS4-3-0	1SAM401911R1002	5	0.206
108	4	0	PS4-4-0	1SAM401911R1003	5	0.280
108	2	1	PS4-2-2	1SAM401911R1004	5	0.148
108	3	1	PS4-3-2	1SAM401911R1005	5	0.250
108	4	1	PS4-4-2	1SAM401911R1006	5	0.362

Rated operational current A	Rated cross section mm ²	Mounting form	Type	Order code	Pkg qty	Weight (1 pce) kg
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Three-phase feeder terminals for MS450 only

108	25	Flat	S4-M1	1SAM401911R1007	2	0.106
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Description	For MMS	Type	Order code	Pkg qty	Weight (1 pce) kg
Protection cover for busbar	PS4	BS4-3	1SAM401911R1008	10	0.001
Disconnecter module	MS450	TB450	1SAM401910R1001	1	0.315
Terminal shroud	MS450	KA450	1SAM401908R1001	1	0.154
Terminal shroud	MS495	KA495	1SAM501901R1001	10	0.018
Terminal shroud	MS495	KA495C ¹⁾	1SAM501902R1001	10	0.038
Terminal insulation barrier for UL508E	MS495	DX495	1SAM401912R1001	1	0.154
Padlock + 2 keys	MS450, MS495, MS497	SA2	GJF1101903R0002	10	0.020

¹⁾ Is plugged onto the housing after removing the box terminals, if using cable lugs.

MS450, MS495, MS497 manual motor starters

Main accessories

2



HK4-11

2CDC241026S0011



HKS4-20

2CDC241026S0011



SK4-11

2CDC241026S0011



AA4-24

2CDC241026S0011

Description

MS450, MS495, MS497 manual motor starters can be equipped with auxiliary contacts for lateral/front mounting, signalling contact for lateral mounting, undervoltage release and shunt trips. The accessories can be fitted wiring free and without tools. A variety of combinations is possible as required for the application. The auxiliary contacts change position with the main contacts. Undervoltage release are used for remote tripping of the manual motor starter especially for emergency stop circuits. Shunt trips release the MMS used for remote tripping.

Ordering details

Auxiliary contacts N.O.	Auxiliary contacts N.C.	Description	Type	Order code	Pkg qty	Weight (1 pce) kg
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Auxiliary contacts – mountable on the front

1	1		HK4-11	1SAM401901R1001	10	0.017
		Changeover	HK4-W	1SAM401901R1002	10	0.015

Auxiliary contacts – mountable on the left

1	1	Max. 1 pieces	HKS4-11	1SAM401902R1001	2	0.045
2	0	Max. 1 pieces	HKS4-20	1SAM401902R1002	2	0.045
0	2	Max. 1 pieces	HKS4-02	1SAM401902R1003	2	0.045

Signalling contacts – mountable on the right

2	2	Separate signalling acc. UL508E 1 N.O. + 1 N.C. for short circuit and 1NO+NC for general tripping , max. 2 pieces	SK4-11	1SAM401904R1001	1	0.093
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Rated control supply voltage V	Frequency Hz	Type	Order code	Pkg qty	Weight (1 pce) kg
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Shunt trip units – mountable on the left

20 ... 24	50/60	AA4-24	1SAM401907R1001	1	0.135
90 ... 110	50/60	AA4-110	1SAM401907R1002	1	0.135
200 ... 240	50/60	AA4-230	1SAM401907R1003	1	0.128
350 ... 415	50/60	AA4-400	1SAM401907R1004	1	0.125

Undervoltage releases – mountable on the left

24	50/60	UA4-24	1SAM401905R1004	1	0.134
110/120	50/60	UA4-110	1SAM401905R1001	1	0.134
230/240	50/60	UA4-230	1SAM401905R1002	1	0.131
400/440	50/60	UA4-400	1SAM401905R1003	1	0.129
230/240	50/60	UA4-HK-230	1SAM401906R1001	1	0.140
400/440	50/60	UA4-HK-400	1SAM401906R1002	1	0.137

MS450, MS495, MS497 manual motor starters



Main accessories

General technical data

Type		PS4-xxx	S4-M1
Standards		IEC/EN 60947-1	
Rated operational voltage U_n		690 V AC	
Rated operational current I_n		108 A	
Rated frequency		50/60 Hz	
Rated impulse withstand voltage U_{imp}		6 kV	
Rated insulation voltage U_i		690 V AC	
Pollution degree		3	
Cross-section		10 mm ²	25 mm ²
Ambient air temperature	Operation	-25 ... +70 °C	
	Storage	-50 ... +80 °C	

Electrical connection

Main circuit

Type		S4-M1
Connecting capacity		
 Solid	1 x	2.5 ... 50 mm ²
 Flexible	1 x	4 ... 16 mm ²
Stranded acc. to UL/CSA	1 x	AWG 14-4
Flexible acc. to UL/CSA	1 x	AWG 14-4
Tightening torques		4 Nm
Connection screw		Pozidriv 2

MS450, MS495, MS497 manual motor starters



Main accessories

General technical data

Type	HK4-11	HK4-W	HKS4	SK4	
Standards	IEC/EN 60947-1, IEC/EN 60947-5-1, UL 508, CSA22.2 No. 14				
Rated operational voltage U_n	230 V AC / 220 V DC	690 V AC / 220 V DC	690 V AC	690 V AC	
Conventional free-air thermal current I_{th}	2.5 A	5 A	10 A	10 A	
Rated frequency	DC, 50/60 Hz				
Rated impulse withstand voltage U_{imp}	6 kV				
Rated insulation voltage U_i	300 V	300 V	690 V	690 V	
Pollution degree	3				
Ambient air temperature	Operation -20 ... +70 °C Storage -50 ... +80 °C				
Resistance to shock acc. to IEC 60068-2-27	25 g / 11 ms				
Resistance to vibrations acc. to IEC 60068-2-6	2 g / 5 ... 150Hz				
Number of poles	1 N.C. + 1 N.O.	Changeover	1 N.C. + 1 N.O. / 2 N.O. / 2 N.C.	2 N.C. + 2 N.O.	
I_n / Rated operational current AC-15 acc. to IEC/EN 60947-5-1 for utilization category					
	24 V, 50/60 Hz	2 A	4 A	6 A	6 A
	230 V, 50/60 Hz	0.5 A	3 A	4 A	4 A
	400 V, 50/60 Hz	-	1.5 A	3 A	3 A
	690 V, 50/60 Hz	-	0.5 A	1 A	1 A
I_n / Rated operational current DC-13 acc. to IEC/EN 60947-5-1 for utilization category					
	24 V	1 A	1 A	2 A	2 A
	48 V	0.3 A	-	-	-
	60 V	0.15 A	-	-	-
	110 V	-	0.22 A	0.5 A	0.5 A
	230 V	-	0.1 A	0.25 A	0.25 A
Minimum switching capacity	17 V / 1 mA				
Short-circuit protective device	10 A Type gG				
Duty time	100 %				
Mounting	Front of MMS	Front of MMS	Left side of MMS	Left side of MMS	
Mounting positions	1-6				
Mechanical durability	100000 cycles				
Electrical durability	100000 cycles				

Electrical connection

Main circuit

Type	HK4-11	HK4-W	HKS4	SK4
Connecting capacity				
 Solid	1 x	0.5 ... 2.5 mm ²		
	2 x	0.5 ... 1.5 mm ² or 0.75 ... 2.5 mm		
 Flexible	1 x	0.5 ... 2.5 mm ²		
	2 x	0.5 ... 1.5 mm ² or 0.75 ... 2.5 mm		
Stranded acc. to UL/CSA	1 or 2 x	AWG 18-14		
Flexible acc. to UL/CSA	1 or 2 x	AWG 18-14		
Stripping length	10 mm			
Tightening torques	0.8 ... 1.2 Nm / 7 ... 10.3 lb.in			
Connection screw	Pozidriv 2			

MS450, MS495, MS497 manual motor starters

Main accessories



MSHD-LTB

2CDC241007F0011



MSHD-LTY

2CDC241006F0011



MSMN

2CDC241004F0011

Description

The complete set includes handle, shaft and driver. All accessories fit 6 mm shafts of maximum 180 mm length. The degree of protection for handles MSHD is IP64.

Ordering details

Description	Shaft length mm	Type	Order code	Pkg qty	Weight (1 pce) kg
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Shafts

For selector type handles. Shaft diameter 6 mm. Shaft extension for door coupling driver.

85	OXS6X85	1SCA101647R1001	1	0.020
105	OXS6X105	1SCA108043R1001	1	0.020
130	OXS6X130	1SCA101655R1001	1	0.030
180	OXS6X180	1SCA101659R1001	1	0.040

Description	Color	Type	Order code	Pkg qty	Weight (1 pce) kg
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Selector type handles IP64

Padlockable max. 3 padlocks with bail diameter 5 ... 8 mm, door interlock in ON position defeatable, for use with 6 mm OXS6...types up to 180 mm or driver shafts MSOX.

Black	MSHD-LTB ¹⁾	1SAM201920R1011	1	0.065
Yellow	MSHD-LTY ¹⁾	1SAM201920R1012	1	0.065

¹⁾ Indication I-O-T and ON-OFF-T

Description	Type	Order code	Pkg qty	Weight (1 pce) kg
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Driver

Coupling driver for use with 6 mm OXS6... types up to 180 mm.

MSMN ¹⁾	1SAM101923R0002	1	0.002
MSMNO ²⁾	1SAM101923R0012	1	0.002

¹⁾ Coded - Positioning of ON indication dependent from mounting orientation of the MS

²⁾ Uncoded - Positioning of ON indication independent from mounting orientation of the MS

MO450, MO495, MO496 manual motor starters magnetic only 16 to 100 A – with electromagnetic protection

2



MO450-40

STO2901



MO495-75

STO2901



MO496-100

2CDC241021S0011

Description

The manual motor starter magnetic only is used to manually switch on and off motors and to protect them reliably and without the need for a fuse from short-circuits.

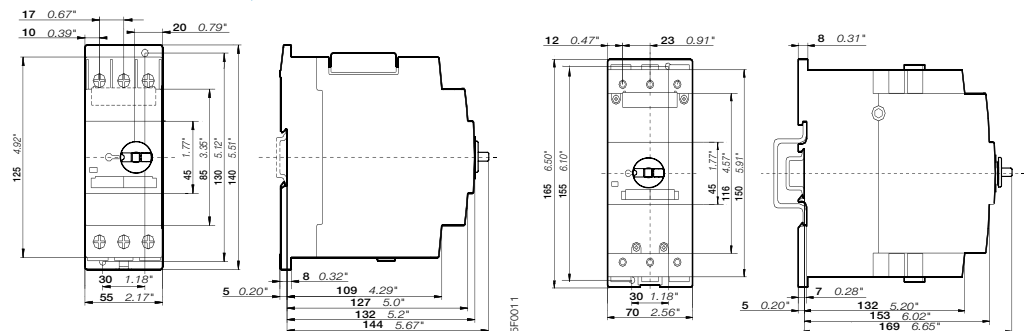
Further features are the build-in disconnect function, trip-free mechanism and a rotary handle with a clear switch position indication. The manual motor starter magnetic only is suitable for three- and single-phase applications. The handle is lockable to protect against unauthorized changes. Auxiliary contacts, signalling contacts, undervoltage releases, shunt trips, three-phase busbars, power in-feed blocks are available as accessory.

Ordering details

Rated operational power 400 V AC-3 ¹⁾ kW	Rated operational current A	Short-circuit breaking capacity I _{cs} at 400 V AC kA	Rated instantaneous short-circuit current setting I _i A	Type	Order code	Weight (1 pce) kg
MO450 manual motor starter						
15.8	40	25	520.00	MO450-40	1SAM460000R1005	1.033
22	45	25	585.00	MO450-45	1SAM460000R1006	1.040
22	50	25	650.00	MO450-50	1SAM460000R1007	1.019
MO495 manual motor starter						
30	63	25	819.00	MO495-63	1SAM560000R1007	2.244
37	75	25	975.00	MO495-75	1SAM560000R1008	2.247
45	90	25	1170.00	MO495-90	1SAM560000R1009	2.269
55	100	25	1235.00	MO495-100	1SAM560000R1010	2.292
MO496 manual motor starter						
7.5	16	50	208.00	MO496-16	1SAM590000R1001	2.175
9.0	20	50	260.00	MO496-20	1SAM590000R1002	2.188
12.5	25	50	325.00	MO496-25	1SAM590000R1003	2.219
15	32	50	416.00	MO496-32	1SAM590000R1004	2.208
18.5	40	50	520.00	MO496-40	1SAM590000R1005	2.218
22	50	50	650.00	MO496-50	1SAM590000R1006	2.218
30	63	50	819.00	MO496-63	1SAM590000R1007	2.248
37	75	50	975.00	MO496-75	1SAM590000R1008	2.278
45	90	50	1170.00	MO496-90	1SAM590000R1009	2.266
55	100	50	1235.00	MO496-100	1SAM590000R1010	2.293

¹⁾ For overload protection of motors, an appropriate thermal or electronic overload relay must be used

Main dimensions mm, inches



MO450

MO495, MO496

MO450, MO495, MO496 manual motor starters magnetic only

Technical data

Main circuit – Utilization characteristics according to IEC/EN

Type	MO450, MO495, MO496
Standards	IEC/EN 60947-2, IEC/EN 60947-4-1, IEC/EN 60947-1
Rated operational voltage U_e	690 V AC / 450 V DC
Rated frequency	50/60 Hz
Number of poles	3
Duty time	100 %
Rated impulse withstand voltage U_{imp}	6 kV
Rated insulation voltage U_i	690 V AC
Rated operational current I_e	See ordering details
Rated instantaneous short-circuit current setting I_i	See ordering details
Rated service short-circuit breaking capacity I_{cs}	See table "Short-circuit breaking capacity and back-up fuses"
Rated ultimate short-circuit breaking capacity I_{cu}	See table "Short-circuit breaking capacity and back-up fuses"

Short-circuit breaking capacity and back-up fuses

I_{cs} Rated service short-circuit breaking capacity

I_{cu} Rated ultimate short-circuit breaking capacity

I_{cc} Prospective short-circuit current at installation location

Note: Maximum rated current of the back-up fuses if $I_{cc} > I_{cs}$

Type	240 V AC			400 V AC			440 V AC			500 V AC			690 V AC		
	I_{cs} kA	I_{cu} kA	gG, aM A	I_{cs} kA	I_{cu} kA	gG, aM A	I_{cs} kA	I_{cu} kA	gG, aM A	I_{cs} kA	I_{cu} kA	gG, aM A	I_{cs} kA	I_{cu} kA	gG, aM A
Short-circuit protection MO450															
MO450-40	No back-up fuse required up to $I_{cc} = 100$ kA			25	50	160	15	50	125	5	10	100	2	4	63
MO450-45				25	50	160	15	50	125	5	10	100	2	4	63
MO450-50				25	50	160	15	50	125	5	10	100	2	4	80

MO450: No need for back-up fuse in networks with a prospective current of up to 50 kA at 400 V.
With an appropriate 160 A type gG fuse the device can be used in a network with a prospective current of up to 100 kA.

Short-circuit protection MO495

MO495-63				25	50	160	20	50	160	6	12	160	3	6	80
MO495-75				25	50	160	20	50	160	6	8	160	3	5	100
MO495-90				25	50	160	20	50	160	6	8	160	3	5	125
MO495-100				25	50	160	20	50	160	6	8	160	3	5	125

MO495-100: No need for back-up fuse in networks with a prospective current of up to 50 kA at 400 V.
With an appropriate 160 A type gG fuse the device can be used in a network with a prospective current of up to 100 kA.

Short-circuit protection MO496

MO496-16	No back-up fuse required up to $I_{cc} = 100$ kA			50	100		50	100	No back-up fuse required up to $I_{cc} = 100$ kA	11	22	100	7	12	63
MO496-20				50	100		50	100		11	22	100	7	12	63
MO496-25				50	100		50	100		11	22	100	7	12	63
MO496-32				50	100	No back-up fuse required up to $I_{cc} = 100$ kA	50	100		11	22	100	7	12	63
MO496-40				50	100		50	100		9	18	160	6	12	80
MO496-50				50	100		50	100		7.5	15	160	5	10	100
MO496-63				50	100		50	70	200	7.5	15	160	4	7.5	100
MO496-75				50	100		50	70	200	5	10	160	3	6	125
MO496-90				50	100		50	70	200	5	10	160	3	6	160
MO496-100				50	100		50	70	200	5	10	160	3	6	160

MO496-32: No need for back-up fuse in networks with a prospective current of up to 100 kA at 440 V.
MO496-90: No need for back-up fuse in networks with a prospective current of up to 70 kA at 440 V.
With an appropriate 200 A type gG fuse the device can be used in a network with a prospective current of up to 100 kA.



MO450, MO495, MO496 manual motor starters magnetic only

Technical data

General technical data

Type		MO450	MO495	MO496
Pollution degree		3		
Phase loss sensitive		Yes		
Ambient air temperature				
Operation	Open - compensated without derating	-20 ... +60 °C		
	Open	-20 ... +70 °C		
	Enclosed	-20 ... +35 °C		
Storage		-50 ... +80 °C		
Ambient air temperature compensation		Continuous		
Maximum operating altitude permissible		2000 m		
Resistance to shock acc. to IEC 60068-2-27		25 g / 11 ms		
Resistance to vibrations acc. to IEC 60068-2-6		2 g / 5-150 Hz	-	
Mounting position		Position 1-6 (optional for single mounting)		
Mounting		DIN-rail 35 mm (EN 60715)	DIN-rail 15 mm / 75 mm (EN 60715)	
Minimum distance to other units same type	Horizontal	0 mm	0 mm	
	Vertical - up to 240 V	-	50 mm	
	Vertical - up to 440 V	-	70 mm	
	Vertical - up to 500 V	-	110 mm	
	Vertical - up to 690 V	-	150 mm	
	Vertical	50 mm	-	
Minimum distance to electrical conductive board	Horizontal	10 mm	-	
	Horizontal - up to 500 V	-	10 mm	
	Horizontal - up to 690 V	-	30 mm	
	Vertical - up to 240 V	-	50 mm	
	Vertical - up to 440 V	-	70 mm	
	Vertical - up to 500 V	-	110 mm	
	Vertical - up to 690 V	-	150 mm	
	Vertical	50 mm	-	
Degree of protection	Enclosure / terminals	IP20		

Connecting characteristics

Main circuit				
Type		MO450	MO495	MO496
Connecting capacity				
 Solid	1 or 2 x	0.75 ... 16 mm ²	2.5 ... 16 mm ²	2.5 ... 16 mm ²
	 Flexible	1 x	0.75 ... 35 mm ²	10 ... 70 mm ²
2 x		0.75 ... 25 mm ²	10 ... 50 mm ²	10 ... 50 mm ²
Stranded acc. to UL/CSA	1 x	AWG 18-2	AWG 10-2/0	AWG 10-2/0
	2 x	AWG 18-2	AWG 10-1/0	AWG 10-1/0
Flexible acc. to UL/CSA	1 x	AWG 18-2	AWG 10-2/0	AWG 10-2/0
	2 x	AWG 18-2	AWG 10-1/0	AWG 10-1/0
Stripping length		13 mm	17 mm	17 mm
Tightening torques		3 - 4.5 Nm / 27 ... 40 lb.in	4 - 6 Nm / 35 - 53 lb.in	4 - 6 Nm / 35 - 53 lb.in
Connection screw		Pozidriv 2	Hexagon 4	Hexagon 4

MO450, MO495, MO496 manual motor starters magnetic only

Main accessories



SA2

SKO109B81

Description

Three-phase busbars ensure a quick and safe connection and are therefore a cost-effective solution. A variety of different three-phase busbars up to 108 A are in the assortment. Between 2 and 4 manual motor starters with none or two lateral auxiliary contacts can be connected.

Ordering details

Rated operational current A	Number of MMS	Number of lateral aux.	Type	Order code	Pkg qty	Weight (1 pce) kg
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Three-phase busbars for MO450 only

108	2	0	PS4-2-0	1SAM401911R1001	5	0.134
108	3	0	PS4-3-0	1SAM401911R1002	5	0.206
108	4	0	PS4-4-0	1SAM401911R1003	5	0.280
108	2	1	PS4-2-2	1SAM401911R1004	5	0.148
108	3	1	PS4-3-2	1SAM401911R1005	5	0.250
108	4	1	PS4-4-2	1SAM401911R1006	5	0.362

Rated operational current A	Rated cross section mm ²	Mounting form	Type	Order code	Pkg qty	Weight (1 pce) kg
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Three-phase feeder terminals for MO450 only

108	25	Flat	S4-M1	1SAM401911R1007	2	0.106
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Description	for MMS	Type	Order code	Pkg qty	Weight (1 pce) kg
Protection cover for busbar	PS4	BS4-3	1SAM401911R1008	10	0.001
Disconnecter module	MO450	TB450	1SAM401910R1001	1	0.315
Terminal shroud	MO450	KA450	1SAM401908R1001	1	0.154
Terminal shroud	MO495	KA495	1SAM501901R1001	10	0.018
Terminal shroud	MO495	KA495C ⁽¹⁾	1SAM501902R1001	10	0.038
Terminal insulation barrier for UL508E	MO495	DX495	1SAM401912R1001	1	0.154
Padlock + 2 keys	MO450, MO495, MO496	SA2	GJF1101903R0002		

⁽¹⁾ is plugged onto the housing after removing the box terminals, if using cable lugs or buses

MO450, MO495, MO496 manual motor starters magnetic only

Main accessories

2



HK4-11

2CDC24102850011



HKS4-20

2CDC24102850011



SK4-11

2CDC24102850011



AA4-24

2CDC24102850011

Description

MO450, MO495, MO497 manual motor starters can be equipped with auxiliary contacts for lateral/front mounting, signalling contact for lateral mounting, undervoltage release and shunt trips. The accessories can be fitted wiring free and without tools. A variety of combinations is possible as required for the application. The auxiliary contacts change position with the main contacts. Undervoltage release are used for remote tripping of the manual motor starter especially for emergency stop circuits. Shunt trips release the MMS used for remote tripping.

Ordering details

Auxiliary contacts N.O.	Auxiliary contacts N.C.	Description	Type	Order code	Pkg qty	Weight (1 pce) kg
Auxiliary contacts – mountable on the front						
1	1		HK4-11	1SAM401901R1001	10	0.017
-	-	Changeover	HK4-W	1SAM401901R1002	10	0.015
Auxiliary contacts – mountable on the left						
1	1	Max. 1 pieces	HKS4-11	1SAM401902R1001	2	0.045
2	0	Max. 1 pieces	HKS4-20	1SAM401902R1002	2	0.045
0	2	Max. 1 pieces	HKS4-02	1SAM401902R1003	2	0.045
Signalling contacts – mountable on the right						
2	2	Separate signalling acc. UL508E 1 N.O. + 1 N.C. for short circuit and 1 N.O. + 1 N.C. for general tripping, max. 2 pieces	SK4-11	1SAM401904R1001	1	0.093

Rated control supply voltage V	Frequency Hz	Type	Order code	Pkg qty	Weight (1 pce) kg
Shunt trip units – mountable on the left					
20 ... 24	50/60	AA4-24	1SAM401907R1001	1	0.135
90 ... 110	50/60	AA4-110	1SAM401907R1002	1	0.135
200 ... 240	50/60	AA4-230	1SAM401907R1003	1	0.128
350 ... 415	50/60	AA4-400	1SAM401907R1004	1	0.125
Undervoltage releases – mountable on the left					
24	50/60	UA4-24	1SAM401905R1004	1	0.134
110/120	50/60	UA4-110	1SAM401905R1001	1	0.134
230/240	50/60	UA4-230	1SAM401905R1002	1	0.131
400/440	50/60	UA4-400	1SAM401905R1003	1	0.129
230/240	50/60	UA4-HK-230	1SAM401906R1001	1	0.140
400/440	50/60	UA4-HK-400	1SAM401906R1002	1	0.137

MO450, MO495, MO496 manual motor starters magnetic only



Main accessories

General technical data

Type		PS4-xxx	S4-M1
Standards		IEC/EN 60947-1	
Rated operational voltage U_n		690 V AC	
Rated operational current I_n		108 A	
Rated frequency		50/60 Hz	
Rated impulse withstand voltage U_{imp}		6 kV	
Rated insulation voltage U_i		690 V AC	
Pollution degree		3	
Cross-section		10 mm ²	25 mm ²
Ambient air temperature	Operation	-25 ... +70 °C	
	Storage	-50 ... +80 °C	

Electrical connection

Main circuit

Type		S4-M1
Connecting capacity		
 Solid	1 x	2.5 ... 50 mm ²
 Flexible	1 x	4 ... 16 mm ²
Stranded acc. to UL/CSA	1 x	AWG 14-4
Flexible acc. to UL/CSA	1 x	AWG 14-4
Tightening torques		4 Nm
Connection screw		Pozidriv 2

MO450, MO495, MO496 manual motor starters magnetic only



Main accessories

General technical data

Type	HK4-11	HK4-W	HKS4	SK4	
Standards	IEC/EN 60947-1, IEC/EN 60947-5-1, UL 508, CSA22.2 No. 14				
Rated operational voltage U_n	230 V AC / 220 V DC	690 V AC / 220 V DC	690 V AC	690 V AC	
Conventional free-air thermal current I_{th}	2.5 A	5 A	10 A	10 A	
Rated frequency	DC, 50/60 Hz				
Rated impulse withstand voltage U_{imp}	6 kV				
Rated insulation voltage U_i	300 V	300 V	690 V	690 V	
Pollution degree	3				
Ambient air temperature	Operation -20 ... +70 °C Storage -50 ... +80 °C				
Resistance to shock acc. to IEC 60068-2-27	25 g / 11 ms				
Resistance to vibrations acc. to IEC 60068-2-6	2 g / 5 ... 150Hz				
Number of poles	1 N.C. + 1 N.O.	Changeover	1 N.C. + 1 N.O. / 2 N.O. / 2 N.C.	2 N.C. + 2 N.O.	
I_n / Rated operational current AC-15 acc. to IEC/EN 60947-5-1 for utilization category					
	24 V, 50/60 Hz	2 A	4 A	6 A	6 A
	230 V, 50/60 Hz	0.5 A	3 A	4 A	4 A
	400 V, 50/60 Hz	-	1.5 A	3 A	3 A
	690 V, 50/60 Hz	-	0.5 A	1 A	1 A
I_n / Rated operational current DC-13 acc. to IEC/EN 60947-5-1 for utilization category					
	24 V	1 A	1 A	2 A	2 A
	48 V	0.3 A	-	-	-
	60 V	0.15 A	-	-	-
	110 V	-	0.22 A	0.5 A	0.5 A
	230 V	-	0.1 A	0.25 A	0.25 A
Minimum switching capacity	17 V / 1 mA				
Short-circuit protective device	10 A Type gG				
Duty time	100 %				
Mounting	Front of MMS	Front of MMS	Left side of MMS	Left side of MMS	
Mounting positions	1-6				
Mechanical durability	100000 cycles				
Electrical durability	100000 cycles				

Electrical connection

Main circuit

Type	HK4-11	HK4-W	HKS4	SK4
Connecting capacity				
 Solid	1 x	0.5 ... 2.5 mm ²		
	2 x	0.5 ... 1.5 mm ² or 0.75 ... 2.5 mm		
 Flexible	1 x	0.5 ... 2.5 mm ²		
	2 x	0.5 ... 1.5 mm ² or 0.75 ... 2.5 mm		
Stranded acc. to UL/CSA	1 or 2 x	AWG 18-14		
Flexible acc. to UL/CSA	1 or 2 x	AWG 18-14		
Stripping length	10 mm			
Tightening torques	0.8 ... 1.2 Nm / 7 ... 10.3 lb.in			
Connection screw	Pozidriv 2			

MO450, MO495, MO496 manual motor starters magnetic only

Main accessories



2CDC241007F0011

MSHD-LTB



2CDC241006F0011

MSHD-LTY



2CDC241004F0011

MSMN

Description

The complete set includes handle, shaft and driver. All accessories fit 6 mm shafts of maximum 180 mm length. The degree of protection for handles MSHD is IP64.

Ordering details

Description	Shaft length mm	Type	Order code	Pkg qty	Weight (1 pce) kg
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Shafts

Description	Shaft length mm	Type	Order code	Pkg qty	Weight (1 pce) kg
For selector type handles. Shaft diameter 6 mm. Shaft extension for door coupling driver.	85	OXS6X85	1SCA101647R1001	1	0.020
	105	OXS6X105	1SCA108043R1001	1	0.020
	130	OXS6X130	1SCA101655R1001	1	0.030
	180	OXS6X180	1SCA101659R1001	1	0.040

Description	Color	Type	Order code	Pkg qty	Weight (1 pce) kg
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Selector type handles IP64

Description	Color	Type	Order code	Pkg qty	Weight (1 pce) kg
Padlockable max. 3 padlocks with bail diameter 5 ... 8 mm, door interlock in ON position defeatable, for use with 6 mm OXS6...types up to 180 mm or driver shafts MSOX.	Black	MSHD-LTB ¹⁾	1SAM201920R1011	1	0.065
	Yellow	MSHD-LTY ¹⁾	1SAM201920R1012	1	0.065

¹⁾ Indication I-O-T and ON-OFF-T

Description	Type	Order code	Pkg qty	Weight (1 pce) kg
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Driver

Description	Type	Order code	Pkg qty	Weight (1 pce) kg
Coupling driver for use with 6 mm OXS6... types up to 180 mm.	MSMN ¹⁾	1SAM101923R0002	1	0.002
	MSMNO ²⁾	1SAM101923R0012	1	0.002

¹⁾ Coded - Positioning of ON indication dependent from mounting orientation of the MS

²⁾ Uncoded - Positioning of ON indication independent from mounting orientation of the MS

MS325 manual motor starters

0.10 to 25 A – with thermal and electromagnetic protection

2



MS325-16

Description

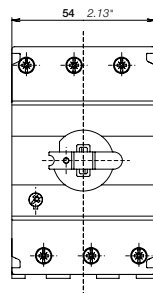
Manual motor starters (MMS) are protection devices for the main circuit. They combine motor control and protection in a single device. MMS are used mainly to switch motors manually ON/OFF and protect them and the installation fuse less against short-circuit, overload and phase failures. Fuse less protection with a manual motor starter saves costs, space and ensures a quick reaction under short-circuit condition, by switching off the motor within milliseconds.

MS325 is a compact and powerful range for motor protection up to 12.5 kW (400 V) / 25 A in width of 54 mm. Further features are the build-in disconnect function, temperature compensation, trip-free mechanism and a rotary handle with a clear switch position indication. The manual motor starters are suitable for three- and single-phase applications. Auxiliary contacts, signalling contacts, undervoltage releases, shunt trips, three-phase busbars, power in-feed blocks are available as accessories.

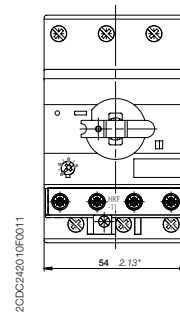
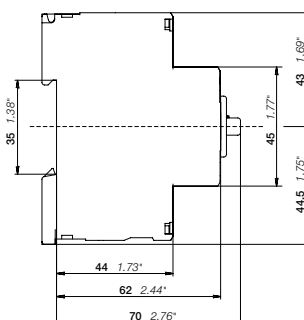
Ordering details

Rated operational power 400 V AC-3	Setting range	Short-circuit breaking capacity I_{cs} at 400 V AC	Rated instantaneous short-circuit current setting I_i	Type	Order code	Weight (1 pce)
kW	A	kA	A			kg
0.03	0.10 ... 0.16	100	1.56	MS325-0.16	1SAM150000R1001	0.280
0.06	0.16 ... 0.25	100	2.44	MS325-0.25	1SAM150000R1002	0.280
0.09	0.25 ... 0.40	100	3.9	MS325-0.4	1SAM150000R1003	0.280
0.12	0.40 ... 0.63	100	6.14	MS325-0.63	1SAM150000R1004	0.280
0.25	0.63 ... 1.00	100	11.5	MS325-1	1SAM150000R1005	0.310
0.55	1.00 ... 1.60	100	18.4	MS325-1.6	1SAM150000R1006	0.340
0.75	1.60 ... 2.50	100	28.75	MS325-2.5	1SAM150000R1007	0.340
1.5	2.50 ... 4.00	100	50	MS325-4	1SAM150000R1008	0.340
2.2	4.00 ... 6.30	100	78.75	MS325-6.3	1SAM150000R1009	0.340
4.0	6.30 ... 9.00	100	135	MS325-9	1SAM150000R1010	0.340
5.5	9.00 ... 12.5	75	180	MS325-12.5	1SAM150000R1011	0.340
7.5	12.5 ... 16.0	60	240	MS325-16	1SAM150000R1012	0.340
9.0	16.0 ... 20.0	55	300	MS325-20	1SAM150000R1013	0.340
12.5	20.0 ... 25.0	50	375	MS325-25	1SAM150000R1014	0.340
0.03	0.10 ... 0.16	100	1.56	MS325-0.16-HKF11	1SAM150005R0001	0.300
0.06	0.16 ... 0.25	100	2.44	MS325-0.25-HKF11	1SAM150005R0002	0.300
0.09	0.25 ... 0.40	100	3.9	MS325-0.4-HKF11	1SAM150005R0003	0.300
0.12	0.40 ... 0.63	100	6.14	MS325-0.63-HKF11	1SAM150005R0004	0.300
0.25	0.63 ... 1.00	100	11.5	MS325-1-HKF11	1SAM150005R0005	0.330
0.55	1.00 ... 1.60	100	18.4	MS325-1.6-HKF11	1SAM150005R0006	0.360
0.75	1.60 ... 2.50	100	28.75	MS325-2.5-HKF11	1SAM150005R0007	0.360
1.5	2.50 ... 4.00	100	50	MS325-4-HKF11	1SAM150005R0008	0.360
2.2	4.00 ... 6.30	100	78.75	MS325-6.3-HKF11	1SAM150005R0009	0.360
4.0	6.30 ... 9.00	100	135	MS325-9-HKF11	1SAM150005R0010	0.360
5.5	9.00 ... 12.5	75	180	MS325-12.5-HKF11	1SAM150005R0011	0.360
7.5	12.5 ... 16.0	60	240	MS325-16-HKF11	1SAM150005R0012	0.360
9.0	16.0 ... 20.0	55	300	MS325-20-HKF11	1SAM150005R0013	0.360
12.5	20.0 ... 25.0	50	375	MS325-25-HKF11	1SAM150005R0014	0.360

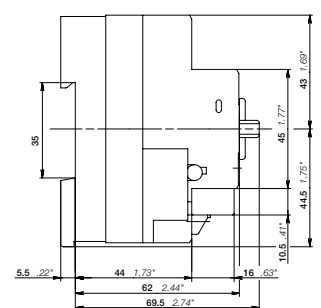
Main dimensions mm, inches



MS325



MS325 + HKF11



MS325 manual motor starters

Technical data

Main circuit – Utilization characteristics according to IEC/EN

Type	MS325
Standards	IEC/EN 60947-2, IEC/EN 60947-4-1, IEC/EN 60947-1
Rated operational voltage U_e	690 V AC / 440 V DC
Rated frequency	50/60 Hz
Trip class	10A
Number of poles	3
Duty time	100 %
Rated impulse withstand voltage U_{imp}	6 kV
Rated insulation voltage U_i	690 V AC
Rated operational current I_e	See ordering details
Rated instantaneous short-circuit current setting I_i	See ordering details
Rated service short-circuit breaking capacity I_{cs}	See table "Short-circuit breaking capacity and back-up fuses"
Rated ultimate short-circuit breaking capacity I_{cu}	See table "Short-circuit breaking capacity and back-up fuses"

Short-circuit breaking capacity and back-up fuses

I_{cs} Rated service short-circuit breaking capacity

I_{cu} Rated ultimate short-circuit breaking capacity

I_{cc} Prospective short-circuit current at installation location

Note: Maximum rated current of the back-up fuses if $I_{cc} > I_{cs}$

Type	230 V AC			400 V AC			440 V AC			500 V AC			690 V AC		
	I_{cs} kA	I_{cu} kA	gG, aM A	I_{cs} kA	I_{cu} kA	gG, aM A	I_{cs} kA	I_{cu} kA	gG, aM A	I_{cs} kA	I_{cu} kA	gG, aM A	I_{cs} kA	I_{cu} kA	gG, aM A
MS325-0.16															
MS325-0.25															
MS325-0.4															
MS325-0.63															
MS325-1															
MS325-1.6															
MS325-2.5													40	40	25
MS325-4											60	60	40	10	40
MS325-6.3							70	70	50		40	40	50	7	40
MS325-9							50	50	80		30	30	80	5	50
MS325-12.5				75	75	80	45	45	80		27	27	80	4.5	50
MS325-16				60	60	100	40	40	100		25	25	100	4	50
MS325-20				55	55	100	35	35	100		22	22	100	3.5	50
MS325-25				50	50	125	30	30	125		20	20	125	3	50

MS325-9: No need for back-up fuse in networks with a prospective current of up to 100 kA at 400 V.

MS325-16: No need for back-up fuse in networks with a prospective current of up to 60 kA at 400 V.

With an appropriate 100 A type gG fuse the device can be used in a network with a prospective current of up to 100 kA

MS325 manual motor starters

Technical data

Main circuit – Utilization characteristics according to UL/CSA

Type	MS325	
Standards	UL 508, CSA 22.2 No. 14	
Maximum operational voltage	600 V AC	
Manual motor controller ratings	See table "UL 508 – Manual motor controller"	
Trip rating	125 % FLA	
Motor ratings	Horse power	See table "Motor rating, three phase"
	Full load amps (FLA)	See table "Motor rating, three phase"
	Locked rotor amps (LRA)	See table "Motor rating, three phase"

Motor rating, three phase

hp Horse power

FLA Full load amps

LRA Locked rotor amps

Type	220-240 V AC			440-480 V AC			500-600 V AC		
	hp	FLA	LRA	hp	FLA	LRA	hp	FLA	LRA
MS325-0.16	-	0.16	0.96	-	0.16	0.96	-	0.16	0.96
MS325-0.25	-	0.25	1.5	-	0.25	1.5	-	0.25	1.5
MS325-0.4	-	0.4	2.4	-	0.4	2.4	-	0.4	2.4
MS325-0.63	-	0.63	3.78	-	0.63	3.78	-	0.63	3.78
MS325-1	-	1.0	6.0	1/2	1.1	10.0	1/2	0.9	8.0
MS325-1.6	-	1.6	9.6	3/4	1.6	12.5	3/4	1.3	10.0
MS325-2.5	1/2	2.2	20.0	1	2.1	15.0	1-1/2	2.4	16.0
MS325-4	1	4.2	30.0	2	3.4	25.0	3	3.9	25.6
MS325-6.3	1-1/2	6.0	40.0	3	4.8	32.0	5	6.1	36.8
MS325-9	2-1/2	-	-	5	7.6	46.0	7-1/2	9.0	50.8
MS325-12.5	3	9.6	64.0	7-1/2	11.0	63.5	10	11.0	64.8
MS325-16	5	15.2	92.0	10	14.0	81.0	10	11.0	64.8
MS325-20	5	15.2	92.0	10	14.0	81.0	15	27.0	93.0
MS325-25	7-1/2	22.0	127.0	15	21.0	116.0	20	35.0	116.0

UL 508 – Manual motor controller

Type	Max. Circuit Breaker UL/NEC		Max. fuse type UL/NEC	Maximum fuse type K5 o. RK5 per UL/NEC	Maximum short-circuit current for motor disconnect ¹⁾		for group installation		for Tap Conductor Protection 480Y/277V	UL 508 Type E 480Y/277V
	480 V	600 V			480 V	600 V	480 V	600 V		
	A	A	kA	kA	kA	kA	kA	kA		
MS325-0.16	-	S7H1200	1600 (class L)	1200	85	50	85	50	18	18
MS325-0.25	-	S7H1200	1600 (class L)	1200	85	50	85	50	18	18
MS325-0.4	-	S7H1200	1600 (class L)	1200	85	50	85	50	18	18
MS325-0.63	-	S7H1200	1600 (class L)	1200	85	50	85	50	18	18
MS325-1	-	S7H1200	1600 (class L)	1200	85	50	85	50	18	18
MS325-1.6	-	S7H1200	1600 (class L)	1200	85	50	85	50	18	18
MS325-2.5	-	S7H1200	1600 (class L)	1200	85	50	85	50	18	18
MS325-4	-	S7H1200	1600 (class L)	1200	85	50	85	50	18	18
MS325-6.3	S7H1200	S7H1200	600 (class K5)	1200	50	50	50	50	18	18
MS325-9	S7H1200	S4H2500	600 (class K5)	250	50	50	50	50	18	18
MS325-12.5	S4H250	S7H1200	400 (class K5)	1200	50	30	50	30	18	18
MS325-16	S4H250	S7H1200	400 (class K5)	1200	50	30	50	30	18	18
MS325-20	S4H250	S4H250	400 (class K5)	250	50	30	50	30	18	18
MS325-25	S4H250	S4H250	400 (class K5)	250	50	30	50	30	18	18

¹⁾ Suitable as motor disconnect only when provided with padlock SA1 or SA3...



MS325 manual motor starters

Technical data

General technical data

Type	MS325	
Pollution degree	3	
Phase loss sensitive	Yes	
Ambient air temperature		
Operation	Open - compensated without derating	-25 ... +70 °C
	Open	-25 ... +70 °C
	Enclosed (IB325)	0 ... +40 °C
Storage	-50 ... +80 °C	
Ambient air temperature compensation	Continuous	
Maximum operating altitude permissible	2000 m	
Resistance to shock acc. to IEC 60068-2-27	15 g / 1/2 sinusoidal shock for 11 ms	
Resistance to vibrations acc. to IEC 60068-2-6	5 g / 3 ... 150 Hz	
Mounting position	Position 1-6 (optional for single mounting)	
Mounting	DIN-rail (EN 60715)	
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	Enclosure / terminals	IP20

Connecting characteristics

Main circuit		Type	MS325
Connecting capacity			
	Solid	1 x	1 x 1 ... 10 mm ²
		2 x	2 x 1 ... 6 mm ²
	Flexible	1 x	1 x 1 ... 6 mm ²
		2 x	2 x 0.75 ... 4 mm ²
	Stranded acc. to UL/CSA	1 or 2 x	AWG 14-8
	Flexible acc. to UL/CSA	1 or 2 x	AWG 14-8
Stripping length		10 mm	
Tightening torques		1.4 Nm / 14 lb.in	
Connection screw		M3.5 (Pozidriv 2)	

MS325 manual motor starters

Main accessories

2



SKO10891

SA1



SKO10891

SA2



SKO10891

SA3

Description

Three-phase busbars ensure a quick and safe connection and are therefore a cost effective solution. A variety of different three-phase busbars up to 63 A are in the assortment. Between 2 and 5 manual motor starters with none, one or two lateral auxiliary contacts can be connected. Different three-phase feeder terminals are available according to the application.

Ordering details

Rated operational current	Number of MMS	Number of lateral aux.	Type	Order code	Pkg qty	Weight (1 pce)
A						kg

Three-phase busbars

63	2	0	PS3-2-0	1SAM101937R0012	10	0.038
63	3	0	PS3-3-0	1SAM101937R0013	10	0.062
63	4	0	PS3-4-0	1SAM101937R0014	10	0.087
63	5	0	PS3-5-0	1SAM101937R0015	10	0.115
63	6	0	PS3-6-0	1SAM101937R0016	10	0.137
63	2	1	PS3-2-1	1SAM101937R0022	10	0.040
63	3	1	PS3-3-1	1SAM101937R0023	10	0.068
63	4	1	PS3-4-1	1SAM101937R0024	10	0.097
63	5	1	PS3-5-1	1SAM101937R0025	10	0.126
63	3	2	PS3-2-2	1SAM101937R0032	10	0.043
63	4	2	PS3-4-2	1SAM101937R0034	10	0.106

Rated operational current	Rated cross section	Mounting form	Type	Order code	Pkg qty	Weight (1 pce)
A	mm ²					kg

Three-phase feeder terminals

63	25	Flat	S3-M1	1SAM101938R0001	10	0.041
63	25	High	S3-M2	1SAM101938R0002	10	0.053
63	35	UL type E and IEC	S3-M3	1SAM101938R0004	10	0.050

Description	Type	Order code	Pkg qty	Weight (1 pce)
Protection cover for busbars	BS3-3	1SAM101938R0003	50	0.001
Lock handle	SA1	GJF1101903R0001	10	0.003
Padlock	SA2	GJF1101903R0002	10	0.020
Lock handle box SA1/SA2	SA3	GJF1101903R0003	10	0.050

MS325 manual motor starters

Main accessories



HKF



HK



SK

Description

MS325 manual motor starters can be equipped with auxiliary contacts for lateral/front mounting, signalling contact for lateral mounting, undervoltage release and shunt trips. A variety of combinations is possible as required for the application. The auxiliary contacts change position with the main contacts. The signalling contact signals tripping regardless if it was caused by short-circuit or overload. Undervoltage release are used for remote tripping of the manual motor starter especially for emergency stop circuits. Shunt trips release the MMS used for remote tripping

Ordering details

Auxiliary contacts: N.O.	Auxiliary contacts: N.C.	Description	Type	Order code	Pkg qty	Weight (1 pce)
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Auxiliary contacts – mountable on the front

1	1		HKF-11	1SAM101928R0001	10	0.015
2	0		HKF-20	1SAM101928R0002	10	0.020

Auxiliary contacts – mountable on the left

1	1	Max. 2 pieces	HK-11	1SAM101901R0001	2	0.030
2	0	Max. 2 pieces	HK-20	1SAM101901R0002	2	0.030
0	2	Max. 2 pieces	HK-02	1SAM101901R0003	2	0.030

Signalling contacts – mountable on the left

1	1	For tripped alarm, max. 1 pieces	SK-11	1SAM101904R0003	10	0.030
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Signalling contacts – mountable on the right

1	1	For short-circuit alarm	CK-11	1SAM101943R0001	10	0.035
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Rated control supply voltage	Frequency	Type	Order code	Pkg qty	Weight (1 pce)
V	Hz				kg

Shunt trip units – mountable as slide in

24 ... 60	50/60	AA-24	1SAM101909R0001	10	0.025
110 ... 240	50/60	AA-230	1SAM101909R0002	10	0.025
220 ... 415	50/60	AA-400	1SAM101909R0003	10	0.025

Undervoltage releases – mountable as slide in

24	50	UAF-24	1SAM101903R0024	10	0.02
48	50	UAF-48	1SAM101903R0048	10	0.02
60	50	UAF-60	1SAM101903R0060	10	0.02
110	50	UAF-110	1SAM101903R0110	10	0.02
230	50	UAF-230	1SAM101903R0230	10	0.02
400	50	UAF-400	1SAM101903R0400	10	0.02
415	50	UAF-415	1SAM101903R0415	10	0.02
500	50	UAF-500	1SAM101903R0500	10	0.02

MS325 manual motor starters



Main accessories

General technical data

Type	PS3	S3-M1/S3-M2	S3-M3
Standards	IEC/EN 60947-2, IEC/EN 60947-4-1, IEC/EN 60947-1		
Rated operational voltage U_o	690 V AC		
Rated operational current I_o	63 A		
Rated frequency	50/60 Hz		
Rated impulse withstand voltage U_{imp}	6 kV		
Rated insulation voltage U_i	690 V AC		
Pollution degree	3		
Cross-section	10 mm ²	25 mm ²	
Ambient air temperature	Operation	-25 ... +70 °C	
	Storage	-50 ... +80 °C	
Resistance to shock acc. to IEC 60068-2-27	15 g / 11 ms		
Resistance to vibrations acc. to IEC 60068-2-6	3 g / 3 ... 150 Hz		

Electrical connection

Main circuit

Type	PS3, S3-Mx		
Connecting capacity			
 Solid	1 x	6 ... 25 mm ²	
 Flexible	1 x	6 ... 16 mm ²	
Stranded acc. to UL/CSA	1 x	AWG 10-4	
Flexible acc. to UL/CSA	1 x	AWG 10-6	
Stripping length	10 mm		
Tightening torques	2.5 Nm / 22 lb.in		
Connection screw	PZ2 (6 mm)		

MS325 manual motor starters

Main accessories



2CDC241004F0010

IB325-Y



2CDC241003F0010

IB325-G



2CDC241002F0010

DMS325-Y



2CDC241001F0010

DMS325-G

Description

IB325 are IP65 enclosures for single MMS installation. Additional mounting of auxiliary and signalling contacts, shunt trips and undervoltage release is possible. The handle is lockable in OFF position. For detailed specification see installation instruction.

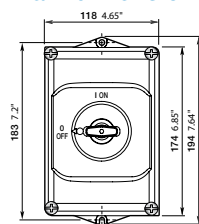
DMS325 are IP65 door mounting kits for MMS installation in any enclosure. Additional mounting of auxiliary, signalling, shunt trips and undervoltage release is possible. The handle is lockable in OFF position. For detailed specification see installation instruction.

Ordering details

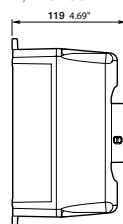
Description	Color	Type	Order code	Pkg qty	Weight (1 pce) kg
Enclosures IP65					
Padlockable max. 3 padlocks with bail diameter 4 ... 6.5 mm	Yellow/red	IB325-G	1SAM101940R1000	1	0.370
	Grey/black	IB325-Y	1SAM101940R1001	1	0.370
Door mounting kit IP65					
Padlockable max. 3 padlocks with bail diameter 4 ... 6.5 mm	Yellow/red	DMS325-G	1SAM101941R1000	1	0.170
	Grey/black	DMS325-Y	1SAM101941R1001	1	0.170

Indication I-O and ON-OFF

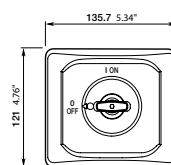
Main dimensions mm, inches



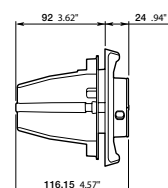
IB325



2CDC242011F0011



DMS325



2CDC242012F0011

MS325 manual motor starters

Main accessories

2



2CDC241003R0011

MSHD-LB



2CDC241002R0011

MSHD-LY



2CDC241004S0011

MSMN



2CDC241005S0011

MSOX-30



2CDC241001S0012

MSH-AR

Description

The complete set includes handle, shaft and driver. All accessories fit 6 mm shafts of maximum 180 mm length. The degree of protection for handles MSHD is IP64.

Ordering details

Description	Shaft length mm	Type	Order code	Pkg qty	Weight (1 pce) kg
Shafts					
For selector type handles. Shaft diameter 6 mm. Shaft extension for door coupling driver.	85	OXS6X85	1SCA101647R1001	1	0.020
	105	OXS6X105	1SCA108043R1001	1	0.020
	130	OXS6X130	1SCA101655R1001	1	0.030
	180	OXS6X180	1SCA101659R1001	1	0.040

Description	Color	Type	Order code	Pkg qty	Weight (1 pce) kg
Selector type handles IP64					
Padlockable max. 3 padlocks with bail diameter 5 ... 8 mm, door interlock in ON position defeatable, for use with 6 mm OXS6...types up to 180 mm or driver shafts MSOX.	Black	MSHD-LB ¹⁾	1SAM201920R1001	1	0.065
	Yellow	MSHD-LY	1SAM201920R1002	1	0.065

¹⁾ Indication I-O and ON-OFF

Description	Type	Order code	Pkg qty	Weight (1 pce) kg
Driver				
Coupling driver for use with 6 mm OXS6... types up to 180 mm.	MSMN ¹⁾	1SAM101923R0002	1	0.002
	MSMNO ²⁾	1SAM101923R0012	1	0.002

¹⁾ Coded - Positioning of ON indication dependent from mounting orientation of the MS

²⁾ Uncoded - Positioning of ON indication independent from mounting orientation of the MS

Description	Shaft length mm	Type	Order code	Pkg qty	Weight (1 pce) kg
Driver shafts					
Driver shaft - combination driver & shaft. Shaft diameter 6 mm.	32	MSOX-32 ¹⁾	1SAM101924R0003	1	0.010
	30	MSOX-30 ²⁾	1SAM101924R0013	1	0.010

¹⁾ MSOX-32 is for normal vertical use

²⁾ MSOX-30 is for horizontal use

Description	Type	Order code	Pkg qty	Weight (1 pce) kg
Shaft alignment ring				
The MSH-AR support the long axis for alignment to the handle inlet. It makes closing panel doors more easy.	MSH-AR	1SAM201920R1000	1	0.010

MO325 manual motor starters magnetic only 0.4 to 25 A – with electromagnetic protection



MO325-16

2CDC241003R0009

Description

The MO325 manual motor starters magnetic only are 54 mm width devices. These devices are used to manually switch on and off motors and to protect them reliably and without the need for a fuse from short-circuits.

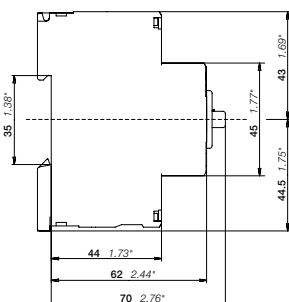
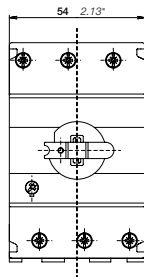
Further features are the build-in disconnect function, trip-free mechanism and a rotary handle with a clear switch position indication. The manual motor starter magnetic only is suitable for three- and single-phase applications. Auxiliary contacts, signalling contacts, undervoltage releases, shunt trips, three-phase busbars, power in-feed blocks are available as accessory.

Ordering details

Rated operational power 400 V AC-3 ¹⁾	Rated operational current	Short-circuit breaking capacity I_{cs} at 400 V AC	Rated instantaneous short-circuit current setting I_i	Type	Order code	Weight (1 pce)
kW	A	kA	A			kg
0.09	0.40	100	3.9	MO325-0.4	1SAM160000R1003	0.280
0.12	0.63	100	6.14	MO325-0.63	1SAM160000R1004	0.280
0.25	1.0	100	11.5	MO325-1	1SAM160000R1005	0.310
0.55	1.6	100	18.4	MO325-1.6	1SAM160000R1006	0.340
0.75	2.5	100	28.75	MO325-2.5	1SAM160000R1007	0.340
1.5	4.0	100	50	MO325-4	1SAM160000R1008	0.340
2.2	6.3	100	78.75	MO325-6.3	1SAM160000R1009	0.340
4.0	9.0	100	135	MO325-9	1SAM160000R1010	0.340
5.5	12.5	75	180	MO325-12.5	1SAM160000R1011	0.340
7.5	16	60	240	MO325-16	1SAM160000R1012	0.340
9.0	20	55	300	MO325-20	1SAM160000R1013	0.340
12.5	25	50	375	MO325-25	1SAM160000R1014	0.340

¹⁾ For overload protection of motors, an appropriate thermal or electronic overload relay must be used

Main dimensions mm, inches



MO325

2CDC24010R0011

2CDC131037C0201

MO325 manual motor starters magnetic only

Technical data

2

Main circuit – Utilization characteristics according to IEC/EN

Type	MO325
Standards	IEC/EN 60947-2, IEC/EN 60947-4-1, IEC/EN 60947-1
Rated operational voltage U_e	690 V AC / 440 V DC
Rated frequency	50/60 Hz
Number of poles	3
Duty time	100 %
Rated impulse withstand voltage U_{imp}	6 kV
Rated insulation voltage U_i	690 V AC
Rated operational current I_e	See ordering details
Rated instantaneous short-circuit current setting I_i	See ordering details
Rated service short-circuit breaking capacity I_{cs}	See table "Short-circuit breaking capacity and back-up fuses"
Rated ultimate short-circuit breaking capacity I_{cu}	See table "Short-circuit breaking capacity and back-up fuses"

Short-circuit breaking capacity and back-up fuses

I_{cs} Rated service short-circuit breaking capacity

I_{cu} Rated ultimate short-circuit breaking capacity

I_{cc} Prospective short-circuit current at installation location

Note: Maximum rated current of the back-up fuses if $I_{cc} > I_{cs}$

Type	230 V AC			400 V AC			440 V AC			500 V AC			690 V AC			
	I_{cs} kA	I_{cu} kA	gG, aM A	I_{cs} kA	I_{cu} kA	gG, aM A	I_{cs} kA	I_{cu} kA	gG, aM A	I_{cs} kA	I_{cu} kA	gG, aM A	I_{cs} kA	I_{cu} kA	gG, aM A	
MO325-0.4																
MO325-0.63																
MO325-1							No back-up fuse required up to $I_{cc} = 100$ kA									
MO325-1.6																
MO325-2.5																
MO325-4																
MO325-6.3													40	40	25	
MO325-9											60	60	40	10	10	40
MO325-12.5							70	70	50	40	40	50	7	7	40	
MO325-16							50	50	80	30	30	80	5	5	50	
MO325-20				75	75	80	45	45	80	27	27	80	4.5	4.5	50	
MO325-25				60	60	100	40	40	100	25	25	100	4	4	50	

MO325-9: No need for back-up fuse in networks with a prospective current of up to 100 kA at 400 V.

MO325-16: No need for back-up fuse in networks with a prospective current of up to 60 kA at 400 V.

With an appropriate 100 A type gG fuse the device can be used in a network with a prospective current of up to 100 kA



MO325 manual motor starters magnetic only

Technical data

General technical data

Type	MO325	
Pollution degree	3	
Phase loss sensitive	Yes	
Ambient air temperature		
Operation	Open - compensated without derating	-25 ... +70 °C
	Open	-25 ... +70 °C
	Enclosed (IB132)	0 ... +40 °C
Storage	-50 ... +80 °C	
Ambient air temperature compensation	Continuous	
Maximum operating altitude permissible	2000 m	
Resistance to shock acc. to IEC 60068-2-27	15 g / 1/2 sinusoidal shock for 11 ms	
Resistance to vibrations acc. to IEC 60068-2-6	5 g / 3 ... 150 Hz	
Mounting position	Position 1-6 (optional for single mounting)	
Group mounting		
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	Enclosure / terminals	IP20

Connecting characteristics

Main circuit		
Type	MO325	
Connecting capacity		
 Solid	1 x	1 x 1 ... 10 mm ²
	2 x	2 x 1 ... 6 mm ²
 Flexible	1 x	1 x 1 ... 6 mm ²
	2 x	2 x 0.75 ... 4 mm ²
	1 or 2 x	AWG 14-8
Stranded acc. to UL/CSA	1 or 2 x	AWG 14-8
Flexible acc. to UL/CSA	1 or 2 x	AWG 14-8
Stripping length	10 mm	
Tightening torques	1.4 Nm / 14 lb.in	
Connection screw	M3.5 (Pozidriv 2)	

MO325 manual motor starters magnetic only

Main accessories

2



SKO109B91

SA1



SKO109B91

SA2



SKO109B91

SA3

Description

Three-phase busbars ensure a quick and safe connection and are therefore a cost effective solution. A variety of different three-phase busbars up to 63 A are in the assortment. Between 2 and 5 manual motor starters with none, one or two lateral auxiliary contacts can be connected. Different three-phase feeder terminals are available according to the application.

Ordering details

Rated operational current A	Number of MMS	Number of lateral aux.	Type	Order code	Pkg qty	Weight (1 pce) kg
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Three-phase busbars

63	2	0	PS3-2-0	1SAM101937R0012	10	0.038
63	3	0	PS3-3-0	1SAM101937R0013	10	0.062
63	4	0	PS3-4-0	1SAM101937R0014	10	0.087
63	5	0	PS3-5-0	1SAM101937R0015	10	0.115
63	6	0	PS3-6-0	1SAM101937R0016	10	0.137
63	2	1	PS3-2-1	1SAM101937R0022	10	0.040
63	3	1	PS3-3-1	1SAM101937R0023	10	0.068
63	4	1	PS3-4-1	1SAM101937R0024	10	0.097
63	5	1	PS3-5-1	1SAM101937R0025	10	0.126
63	3	2	PS3-2-2	1SAM101937R0032	10	0.043
63	4	2	PS3-4-2	1SAM101937R0034	10	0.106

Rated operational current A	Rated cross section mm ²	Mounting form	Type	Order code	Pkg qty	Weight (1 pce) kg
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Three-phase feeder terminals

63	25	Flat	S3-M1	1SAM101938R0001	10	0.041
63	25	High	S3-M2	1SAM101938R0002	10	0.053
63	35	UL type E and IEC	S3-M3	1SAM101938R0004	10	0.050

Description	Type	Order code	Pkg qty	Weight (1 pce) kg
Protection cover for busbars	BS3-3	1SAM101938R0003	50	0.001
Lock handle	SA1	GJF1101903R0001	10	0.003
Padlock	SA2	GJF1101903R0002	10	0.020
Lock handle box SA1/SA2	SA3	GJF1101903R0003	10	0.050

MO325 manual motor starters magnetic only

Main accessories



HKF



HK



SK

Description

MS325 manual motor starters can be equipped with auxiliary contacts for lateral/front mounting, signalling contact for lateral mounting, undervoltage release and shunt trips. A variety of combinations is possible as required for the application. The auxiliary contacts change position with the main contacts. The signalling contact signals tripping regardless if it was caused by short-circuit or overload. Undervoltage release are used for remote tripping of the manual motor starter especially for emergency stop circuits. Shunt trips release the MMS used for remote tripping

Ordering details

Auxiliary contacts: N.O.	Auxiliary contacts: N.C.	Description	Type	Order code	Pkg qty	Weight (1 pce)
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Auxiliary contacts – mountable on the front

1	1		HKF-11	1SAM101928R0001	10	0.015
2	0		HKF-20	1SAM101928R0002	10	0.020

Auxiliary contacts – mountable on the left

1	1	Max. 2 pieces	HK-11	1SAM101901R0001	2	0.030
2	0	Max. 2 pieces	HK-20	1SAM101901R0002	2	0.030
0	2	Max. 2 pieces	HK-02	1SAM101901R0003	2	0.030

Signalling contacts – mountable on the left

1	1	For tripped alarm, max. 1 pieces	SK-11	1SAM101904R0003	10	0.030
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Signalling contacts – mountable on the right

1	1	For short-circuit alarm	CK-11	1SAM101943R0001	10	0.035
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Rated control supply voltage	Frequency	Type	Order code	Pkg qty	Weight (1 pce)
V	Hz				kg

Shunt trip units – mountable as slide in

24 ... 60	50/60	AA-24	1SAM101909R0001	10	0.025
110 ... 240	50/60	AA-230	1SAM101909R0002	10	0.025
220 ... 415	50/60	AA-400	1SAM101909R0003	10	0.025

Undervoltage releases – mountable as slide in

24	50	UAF-24	1SAM101903R0024	10	0.02
48	50	UAF-48	1SAM101903R0048	10	0.02
60	50	UAF-60	1SAM101903R0060	10	0.02
110	50	UAF-110	1SAM101903R0110	10	0.02
230	50	UAF-230	1SAM101903R0230	10	0.02
400	50	UAF-400	1SAM101903R0400	10	0.02
415	50	UAF-415	1SAM101903R0415	10	0.02
500	50	UAF-500	1SAM101903R0500	10	0.02

MO325 manual motor starters magnetic only



Main accessories

General technical data

Type	PS3	S3-M1/S3-M2	S3-M3
Standards	IEC/EN 60947-2, IEC/EN 60947-4-1, IEC/EN 60947-1		
Rated operational voltage U_o	690 V AC		
Rated operational current I_o	63 A		
Rated frequency	50/60 Hz		
Rated impulse withstand voltage U_{imp}	6 kV		
Rated insulation voltage U_i	690 V AC		
Pollution degree	3		
Cross-section	10 mm ²	25 mm ²	
Ambient air temperature	Operation	-25 ... +70 °C	
	Storage	-50 ... +80 °C	
Resistance to shock acc. to IEC 60068-2-27	15 g / 11 ms		
Resistance to vibrations acc. to IEC 60068-2-6	3 g / 3 ... 150 Hz		

Electrical connection

Main circuit

Type	PS3, S3-Mx
Connecting capacity	
 Solid	1 x : 6 ... 25 mm ²
 Flexible	1 x : 6 ... 16 mm ²
Stranded acc. to UL/CSA	1 x : AWG 10-4
Flexible acc. to UL/CSA	1 x : AWG 10-6
Stripping length	10 mm
Tightening torques	2.5 Nm / 22 lb.in
Connection screw	PZ2 (6 mm)

MO325 manual motor starters magnetic only

Main accessories



IB325-Y

2CDC241004F0010



IB325-G

2CDC241003F0010



DMS325-Y

2CDC241002F0010



DMS325-G

2CDC241001F0010

Description

IB325 are IP65 enclosures for single MMS installation. Additional mounting of auxiliary and signalling contacts, shunt trips and undervoltage release is possible. The handle is lockable in OFF position. For detailed specification see installation instruction.

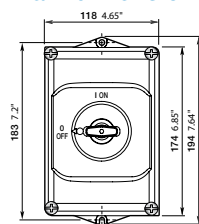
DMS325 are IP65 door mounting kits for MMS installation in any enclosure. Additional mounting of auxiliary, signalling, shunt trips and undervoltage release is possible. The handle is lockable in OFF position. For detailed specification see installation instruction.

Ordering details

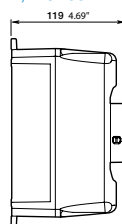
Description	Color	Type	Order code	Pkg qty	Weight (1 pce) kg
Enclosures IP65					
Padlockable max. 3 padlocks with bail diameter 4 ... 6.5 mm	Yellow/red	IB325-G	1SAM101940R1000	1	0.370
	Grey/black	IB325-Y	1SAM101940R1001	1	0.370
Door mounting kit IP65					
Padlockable max. 3 padlocks with bail diameter 4 ... 6.5 mm	Yellow/red	DMS325-G	1SAM101941R1000	1	0.170
	Grey/black	DMS325-Y	1SAM101941R1001	1	0.170

Indication I-O and ON-OFF

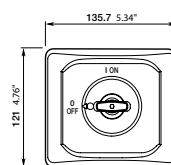
Main dimensions mm, inches



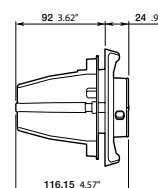
IB325



2CDC242011F0011



DMS325



2CDC242012F0011

MO325 manual motor starters magnetic only

Main accessories

2



2CDC241003F0011

MSHD-LB



2CDC241002S0011

MSHD-LY



2CDC241004S0011

MSMN



2CDC241003S0011

MSOX-30



2CDC241001S0012

MSH-AR

Description

The complete set includes handle, shaft and driver. All accessories fit 6 mm shafts of maximum 180 mm length. The degree of protection for handles MSHD is IP64.

Ordering details

Description	Shaft length mm	Type	Order code	Pkg qty	Weight (1 pce) kg
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Shafts

For selector type handles. Shaft diameter 6 mm. Shaft extension for door coupling driver.

85	OXS6X85	1SCA101647R1001	1	0.020
105	OXS6X105	1SCA108043R1001	1	0.020
130	OXS6X130	1SCA101655R1001	1	0.030
180	OXS6X180	1SCA101659R1001	1	0.040

Description	Color	Type	Order code	Pkg qty	Weight (1 pce) kg
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Selector type handles IP64

Padlockable max. 3 padlocks with bail diameter 5 ... 8 mm, door interlock in ON position defeatable, for use with 6 mm OXS6...types up to 180 mm or driver shafts MSOX.

Black	MSHD-LB ¹⁾	1SAM201920R1001	1	0.065
Yellow	MSHD-LY ²⁾	1SAM201920R1002	1	0.065

¹⁾ Indication I-O and ON-OFF

²⁾ Indication I-O-T and ON-OFF-T

Description	Type	Order code	Pkg qty	Weight (1 pce) kg
-------------	------	------------	------------	-------------------------

Driver

Coupling driver for use with 6 mm OXS6... types up to 180 mm.

MSMN ¹⁾	1SAM101923R0002	1	0.002
MSMNO ²⁾	1SAM101923R0012	1	0.002

¹⁾ Coded - Positioning of ON indication dependent from mounting orientation of the MS

²⁾ Uncoded - Positioning of ON indication independent from mounting orientation of the MS

Description	Shaft length mm	Type	Order code	Pkg qty	Weight (1 pce) kg
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Driver shafts

Driver shaft - combination driver & shaft. Shaft diameter 6 mm.

32	MSOX-32 ¹⁾	1SAM101924R0003	1	0.010
30	MSOX-30 ²⁾	1SAM101924R0013	1	0.010

¹⁾ MSOX-32 is for normal vertical use

²⁾ MSOX-30 is for horizontal use

Description	Type	Order code	Pkg qty	Weight (1 pce) kg
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Shaft alignment ring

The MSH-AR support the long axis for alignment to the handle inlet. It makes closing panel doors more easy.

MSH-AR	1SAM201920R1000	1	0.010
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MS451, MS496 manual motor starters

11 to 100 A – with thermal and electromagnetic protection



2DC241018F0011

MS451-50



2DC241017F0011

MS496-100

Description

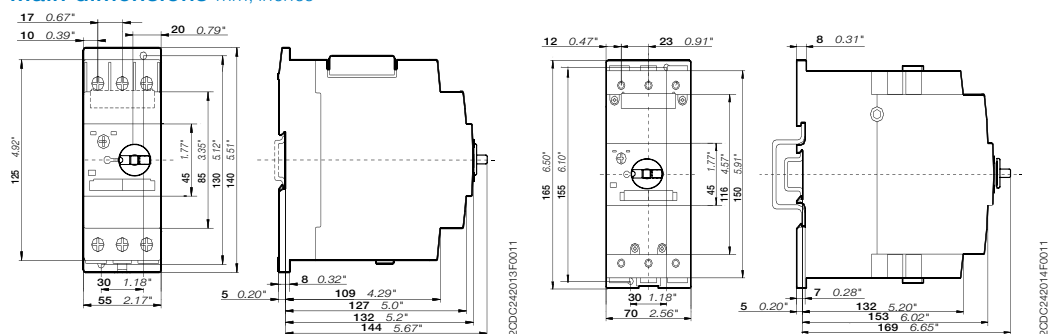
Manual motor starters (MMS) are protection devices for the main circuit. They combine motor control and protection in a single device. MMS are used mainly to switch motors manually ON/OFF and protect them and the installation fuse less against short-circuit, overload and phase failures. Fuse less protection with a manual motor starter saves costs, space and ensures a quick reaction under short-circuit condition, by switching off the motor within milliseconds.

Further features are the build-in disconnect function, temperature compensation, trip-free mechanism and a rotary handle with a clear switch position indication. The manual motor starter is suitable for three- and single-phase applications. The handle is lockable to protect against unauthorized changes. Auxiliary contacts, signalling contacts, undervoltage releases, shunt trips, three-phase busbars, power in-feed blocks are available as accessory.

Ordering details

Rated operational power 400 V AC-3 kW	Setting range A	Short-circuit breaking capacity I_{cs} at 400 V AC kA	Rated instantaneous short-circuit current setting I_i A	Type	Order code	Weight (1 pce) kg
MS451 manual motor starter						
7.5	11.0 ... 16.0	25	208.00	MS451-16	1SAM470000R1001	1.067
9	14.0 ... 20.0	25	260.00	MS451-20	1SAM470000R1002	1.071
11	18.0 ... 25.0	25	325.00	MS451-25	1SAM470000R1003	1.054
15	22.0 ... 32.0	25	416.00	MS451-32	1SAM470000R1004	1.067
18.5	28.0 ... 40.0	25	520.00	MS451-40	1SAM470000R1005	1.076
22	36.0 ... 45.0	25	585.00	MS451-45	1SAM470000R1006	1.073
22	40.0 ... 50.0	25	650.00	MS451-50	1SAM470000R1007	1.071
MS496 manual motor starter						
18.5	28.0 ... 40.0	50	520.00	MS496-40	1SAM570000R1005	2.222
22	36.0 ... 50.0	50	650.00	MS496-50	1SAM570000R1006	2.265
30	45.0 ... 63.0	50	819.00	MS496-63	1SAM570000R1007	2.278
37	57.0 ... 75.0	50	975.00	MS496-75	1SAM570000R1008	2.268
45	70.0 ... 90.0	50	1170.00	MS496-90	1SAM570000R1009	2.313
55	80.0 ... 100.0	50	1300.00	MS496-100	1SAM570000R1010	2.322

Main dimensions mm, inches



MS451

MS496

MS451, MS496 manual motor starters

Technical data

2

Main circuit – Utilization characteristics according to IEC/EN

Type	MS451, MS496
Standards	IEC/EN 60947-2, IEC/EN 60947-4-1, IEC/EN 60947-1
Rated operational voltage U_n	690 V AC / 440 V DC
Rated frequency	50/60 Hz
Trip class	20
Number of poles	3
Duty time	100 %
Rated impulse withstand voltage U_{imp}	6 kV
Rated insulation voltage U_i	690 V AC
Rated operational current I_n	See ordering details
Rated instantaneous short-circuit current setting I_{cs}	See ordering details
Rated service short-circuit breaking capacity I_{cs}	See table "Short-circuit breaking capacity and back-up fuses"
Rated ultimate short-circuit breaking capacity I_{cu}	See table "Short-circuit breaking capacity and back-up fuses"

Short-circuit breaking capacity and back-up fuses

I_{cs} Rated service short-circuit breaking capacity

I_{cu} Rated ultimate short-circuit breaking capacity

I_{cc} Prospective short-circuit current at installation location

Note: Maximum rated current of the back-up fuses if $I_{cc} > I_{cs}$

Type	240 V AC			400 V AC			440 V AC			500 V AC			690 V AC		
	I_{cs} kA	I_{cu} kA	gG, aM A	I_{cs} kA	I_{cu} kA	gG, aM A	I_{cs} kA	I_{cu} kA	gG, aM A	I_{cs} kA	I_{cu} kA	gG, aM A	I_{cs} kA	I_{cu} kA	gG, aM A
Short-circuit protection MS451															
MS451-16				25	50	100	25	50	100	6	12	63	3	5	63
MS451-20				25	50	100	25	50	100	6	12	80	3	5	63
MS451-25				25	50	100	15	50	100	6	12	80	3	5	63
MS451-32	No back-up fuse required up to $I_{cc} = 100$ kA			25	50	125	15	50	125	5	10	100	2	4	63
MS451-40				25	50	160	15	50	125	5	10	100	2	4	63
MS451-45				25	50	160	15	50	125	5	10	100	2	4	63
MS451-50				25	50	160	15	50	125	5	10	100	2	4	80

MS451: No need for back-up fuse in networks with a prospective current of up to 50 kA at 400 V.
With an appropriate 160 A type gG fuse the device can be used in a network with a prospective current of up to 100 kA.

Short-circuit protection MS496

MS496-40	No back-up fuse required up to $I_{cc} = 100$ kA	50	100	No back-up fuse required up to $I_{cc} = 100$ kA	50	100	No back-up fuse required up to $I_{cc} = 100$ kA	9	18	160	6	12	80
MS496-50		50	100		50	100		7.5	15	160	5	10	100
MS496-63		50	100		50	70	200	7.5	15	160	4	7.5	100
MS496-75		50	100		50	70	200	5	10	160	3	6	125
MS496-90		50	100		50	70	200	5	10	160	3	6	160
MS496-100		50	100		50	70	200	5	10	160	3	6	160

MS496-40: No need for back-up fuse in networks with a prospective current of up to 100 kA at 440 V.

MS496-90: No need for back-up fuse in networks with a prospective current of up to 70 kA at 440 V.

With an appropriate 200 A type gG fuse the device can be used in a network with a prospective current of up to 100 kA.



MS451, MS496 manual motor starters

Technical data

General technical data

		MS451	MS496
Type			
Pollution degree		3	
Phase loss sensitive		Yes	
Ambient air temperature			
Operation	Open - compensated without derating	-25 ... +60 °C	
	Open	-25 ... +70 °C	
	Enclosed (IB132)	-25 ... +35 °C	
Storage		-50 ... +80 °C	
Ambient air temperature compensation		Continuous	
Maximum operating altitude permissible		2000 m	
Resistance to shock acc. to IEC 60068-2-27		25 g / 11 ms	
Resistance to vibrations acc. to IEC 60068-2-6		2 g / 5-150 Hz	
Mounting position		Position 1-6 (optional for single mounting)	
Mounting			
Group mounting			
Minimum distance to other units same type	Horizontal	0 mm	0 mm
	Vertical - up to 240 V	-	50 mm
	Vertical - up to 440 V	-	70 mm
	Vertical - up to 500 V	-	110 mm
	Vertical - up to 690 V	-	150 mm
	Vertical	50 mm	-
Minimum distance to electrical conductive board	Horizontal	10 mm	-
	Horizontal - up to 500 V	-	10 mm
	Horizontal - up to 690 V	-	30 mm
	Vertical - up to 240 V	-	50 mm
	Vertical - up to 440 V	-	70 mm
	Vertical - up to 500 V	-	110 mm
	Vertical - up to 690 V	-	150 mm
Vertical	50 mm	-	
Degree of protection	Enclosure / terminals	IP20	

Connecting characteristics

		MS451	MS496
Main circuit			
Type			
Connecting capacity			
 Solid	1 or 2 x	0.75 ... 16 mm ²	2.5 ... 16 mm ²
	1 x	0.75 ... 35 mm ²	2.5 ... 50 mm ²
 Flexible	2 x	0.75 ... 25 mm ²	2.5 ... 35 mm ²
	Stranded acc. to UL/CSA	1 x AWG 18-2	AWG 10-2/0
Flexible acc. to UL/CSA	2 x AWG 18-2	AWG 10-1/0	
	1 x AWG 18-2	AWG 10-2/0	
	2 x AWG 18-2	AWG 10-1/0	
Stripping length		13 mm	17 mm
Tightening torques		3 - 4.5 Nm / 27 ... 40 lb.in	2.0 Nm / 18 lb.in
Connection screw		Pozidriv 2	Hexagon 4

MS451, MS496 manual motor starters

Main accessories

2



SKO109B81

SA2

Description

Three-phase busbars ensure a quick and safe connection and are therefore a cost effective solution. A variety of different three-phase busbars up to 108 A are in the assortment. Between 2 and 4 manual motor starter with none or two lateral auxiliary contacts can be connected.

Ordering details

Rated operational current A	Number of MMS	Number of lateral aux.	Type	Order code	Pkg qty	Weight (1 pce) kg
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Three-phase busbars for MS450 only

108 A	2	0	PS4-2-0	1SAM401911R1001	5	0.134
108 A	3	0	PS4-3-0	1SAM401911R1002	5	0.206
108 A	4	0	PS4-4-0	1SAM401911R1003	5	0.280
108 A	2	1	PS4-2-2	1SAM401911R1004	5	0.148
108 A	3	1	PS4-3-2	1SAM401911R1005	5	0.250
108 A	4	1	PS4-4-2	1SAM401911R1006	5	0.362

Rated operational current A	Rated cross section mm ²	Mounting form	Type	Order code	Pkg qty	Weight (1 pce) kg
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Three-phase feeder terminals for MS450 only

108 A	25	Flat	S4-M1	1SAM401911R1007	2	0.106
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Description	For MMS	Type	Order code	Pkg qty	Weight (1 pce) kg
Protection cover for busbar	PS4	BS4-3	1SAM401911R1008	10	0.001
Disconnecter module	MS451	TB450	1SAM401910R1001	1	0.315
Terminal shroud	MS451	KA450	1SAM401908R1001	1	0.154
Terminal shroud	MS496	KA495	1SAM501901R1001	10	0.018
Terminal shroud	MS496	KA495C ¹⁾	1SAM501902R1001	10	0.038
Terminal insulation barrier for UL508E	MS496	DX495	1SAM401912R1001	1	0.154
Padlock + 2 keys	MS451, MS496	SA2	GJF1101903R0002	10	0.020

¹⁾ Is plugged onto the housing after removing the box terminals, if using cable lugs.

MS451, MS496 manual motor starters

Main accessories



2CDC241022F0011

HK4-11



2CDC241022F0011

HKS4-20



2CDC241022F0011

SK4-11



2CDC241023F0011

AA4-24

Description

MS450, MS495, MS497 manual motor starters can be equipped with auxiliary contacts for lateral/front mounting, signalling contact for lateral mounting, undervoltage release and shunt trips. The accessories can be fitted wiring free and without tools. A variety of combinations is possible as required for the application. The auxiliary contacts change position with the main contacts. Undervoltage release are used for remote tripping of the manual motor starter especially for emergency stop circuits. Shunt trips release the MMS used for remote tripping.

Ordering details

Auxiliary contacts: N.O.	Auxiliary contacts: N.C.	Description	Type	Order code	Pkg qty	Weight (1 pce) kg
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Auxiliary contacts – mountable on the front

1	1		HK4-11	1SAM401901R1001	10	0.017
		Changeover	HK4-W	1SAM401901R1002	10	0.015

Auxiliary contacts – mountable on the left

1	1	Max. 1 pieces	HKS4-11	1SAM401902R1001	2	0.045
2	0	Max. 1 pieces	HKS4-20	1SAM401902R1002	2	0.045
0	2	Max. 1 pieces	HKS4-02	1SAM401902R1003	2	0.045

Signalling contacts – mountable on the right

2	2	Separate signalling acc. UL508E 1 N.O. + 1 N.C. for short circuit and 1NO+NC for general tripping, max. 2 pieces	SK4-11	1SAM401904R1001	1	0.093
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Rated control supply voltage V	Frequency Hz	Type	Order code	Pkg qty	Weight (1 pce) kg
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Shunt trip units – mountable on the left

20 ... 24	50/60	AA4-24	1SAM401907R1001	1	0.135
90 ... 110	50/60	AA4-110	1SAM401907R1002	1	0.135
200 ... 240	50/60	AA4-230	1SAM401907R1003	1	0.128
350 ... 415	50/60	AA4-400	1SAM401907R1004	1	0.125

Undervoltage releases – mountable on the left

24	50/60	UA4-24	1SAM401905R1004	1	0.134
110/120	50/60	UA4-110	1SAM401905R1001	1	0.134
230/240	50/60	UA4-230	1SAM401905R1002	1	0.131
400/440	50/60	UA4-400	1SAM401905R1003	1	0.129
230/240	50/60	UA4-HK-230	1SAM401906R1001	1	0.140
400/440	50/60	UA4-HK-400	1SAM401906R1002	1	0.137

MS451, MS496 manual motor starters

Main accessories



2

General technical data

Type	PS4-xxx	S4-M1
Standards	IEC/EN 60947-1	
Rated operational voltage U_e	690 V AC	
Rated operational current I_e	108 A	
Rated frequency	50/60 Hz	
Rated impulse withstand voltage U_{imp}	6 kV	
Rated insulation voltage U_i	690 V AC	
Pollution degree	3	
Cross-section	10 mm ²	25 mm ²
Ambient air temperature	Operation	-25 ... +70 °C
	Storage	-50 ... +80 °C

Electrical connection

Main circuit

Type	S4-M1
Connecting capacity	
 Solid	1 x : 2.5 ... 50 mm ²
 Flexible	1 x : 4 ... 16 mm ²
Stranded acc. to UL/CSA	1 x : AWG 14-4
Flexible acc. to UL/CSA	1 x : AWG 14-4
Tightening torques	4 Nm
Connection screw	Pozidriv 2

MS451, MS496 manual motor starters



Main accessories

General technical data

Type	HK4-11	HK4-W	HKS4	SK4	
Standards	IEC/EN 60947-1, IEC/EN 60947-5-1, UL 508, CSA22.2 No. 14				
Rated operational voltage U_e	230 V AC / 220 V DC	690 V AC / 220 V DC	690 V AC	690 V AC	
Conventional free-air thermal current I_{th}	2.5 A	5 A	10 A	10 A	
Rated frequency	DC, 50/60 Hz				
Rated impulse withstand voltage U_{imp}	6 kV				
Rated insulation voltage U_i	300 V	300 V	690 V	690 V	
Pollution degree	3				
Ambient air temperature	Operation -20 ... +70 °C Storage -50 ... +80 °C				
Resistance to shock acc. to IEC 60068-2-27	25 g / 11 ms				
Resistance to vibrations acc. to IEC 60068-2-6	2 g / 5 ... 150Hz				
Number of poles	1 N.C. + 1 N.O.	Changeover	1 N.C. + 1 N.O. / 2 N.O. / 2 N.C.	2 N.C. + 2 N.O.	
I_e / Rated operational current AC-15 acc. to IEC/EN 60947-5-1 for utilization category					
	24 V, 50/60 Hz	2 A	4 A	6 A	6 A
	230 V, 50/60 Hz	0.5 A	3 A	4 A	4 A
	400 V, 50/60 Hz	-	1.5 A	3 A	3 A
	690 V, 50/60 Hz	-	0.5 A	1 A	1 A
I_e / Rated operational current DC-13 acc. to IEC/EN 60947-5-1 for utilization category					
	24 V	1 A	1 A	2 A	2 A
	48 V	0.3 A	-	-	-
	60 V	0.15 A	-	-	-
	110 V	-	0.22 A	0.5 A	0.5 A
	230 V	-	0.1 A	0.25 A	0.25 A
Minimum switching capacity	17 V / 1 mA				
Short-circuit protective device	10 A Type gG				
Duty time	100 %				
Mounting	Front of MMS	Front of MMS	Left side of MMS	Left side of MMS	
Mounting positions	1-6				
Mechanical durability	100000 cycles				
Electrical durability	100000 cycles				

Electrical connection

Main circuit

Type	HK4-11	HK4-W	HKS4	SK4
Connecting capacity				
 Solid	1 x	0.5... 2.5 mm ²		
	2 x	0.5 ... 1.5 mm ² or 0.75 ... 2.5 mm		
 Flexible	1 x	0.5 ... 2.5 mm ²		
	2 x	0.5 ... 1.5 mm ² or 0.75 ... 2.5 mm		
Stranded acc. to UL/CSA	1 or 2 x	AWG 18-14		
Flexible acc. to UL/CSA	1 or 2 x	AWG 18-14		
Stripping length	10 mm			
Tightening torques	0.8 ... 1.2 Nm / 7 ... 10.3 lb.in			
Connection screw	Pozidriv 2			

MS451, MS496 manual motor starters

Main accessories

2



2CDC241007F0011

MSHD-LTB



2CDC241008F0011

MSHD-LTY



2CDC241004F0011

MSMN



2CDC241001S0012

MSH-AR

Description

The complete set includes handle, shaft and driver. All accessories fit 6 mm shafts of maximum 180 mm length. The degree of protection for handles MSHD is IP64.

Ordering details

Description	Shaft length mm	Type	Order code	Pkg qty	Weight (1 pce) kg
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Shafts

For selector type handles. Shaft diameter 6 mm. Shaft extension for door coupling driver.

85	OXS6X85	1SCA101647R1001	1	0.020
105	OXS6X105	1SCA108043R1001	1	0.020
130	OXS6X130	1SCA101655R1001	1	0.030
180	OXS6X180	1SCA101659R1001	1	0.040

Description	Color mm	Type	Order code	Pkg qty	Weight (1 pce) kg
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Selector type handles IP64

Padlockable max. 3 padlocks with bail diameter 5 ... 8 mm, door interlock in ON position defeatable, for use with 6 mm OXS6...types up to 180 mm or driver shafts MSOX.

Black	MSHD-LTB ¹⁾	1SAM201920R1011	1	0.065
Yellow	MSHD-LTY ¹⁾	1SAM201920R1012	1	0.065

¹⁾ Indication I-O-T and ON-OFF-T

Description	Type	Order code	Pkg qty	Weight (1 pce) kg
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Driver

Coupling driver for use with 6 mm OXS6... types up to 180 mm.

MSMN ¹⁾	1SAM101923R0002	1	0.002
MSMNO ²⁾	1SAM101923R0012	1	0.002

¹⁾ Coded - Positioning of ON indication dependent from mounting orientation of the MS

²⁾ Uncoded - Positioning of ON indication independent from mounting orientation of the MS

Description	Type	Order code	Pkg qty	Weight (1 pce) kg
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Shaft alignment ring

The MSH-AR support the long axis for alignment to the handle inlet. It makes closing panel doors more easy.

MSH-AR	1SAM201920R1000	1	0.010
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Notes

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Contact us

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