

MS5100, MS495, MS497 manual motor starters

22 to 100 A – with thermal and electromagnetic protection

2



MS5100-100 no mirror

MS5100-100



1SBC101184F0014

MS495-40



2CDC241020F0011

MS497-100

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 ¹⁾. 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.

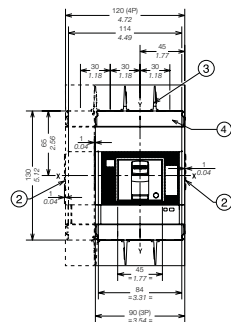
Ordering details

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 pc) kg
MS5100 manual motor starters						
45	40 ... 100 ²⁾	70	240 ... 1300	MS5100-100	1SDA082034R1	1.200
MS495 manual motor starters						
30	45 ... 63	25	819	MS495-63	1SAM550000R1007	2.247
37	57 ... 75	25	975	MS495-75	1SAM550000R1008	2.253
45	70 ... 90	25	1170	MS495-90	1SAM550000R1009	2.280
55	80 ... 100	25	1235	MS495-100	1SAM550000R1010	2.295
MS497 manual motor starters						
15	22 ... 32	50	416	MS497-32	1SAM580000R1004	2.222
18.5	28 ... 40	50	520	MS497-40	1SAM580000R1005	2.203
22	36 ... 50	50	650	MS497-50	1SAM580000R1006	2.230
30	45 ... 63	50	819	MS497-63	1SAM580000R1007	2.255
37	57 ... 75	50	975	MS497-75	1SAM580000R1008	2.266
45	70 ... 90	50	1170	MS497-90	1SAM580000R1009	2.268
55	80 ... 100	50	1235	MS497-100	1SAM580000R1010	2.275

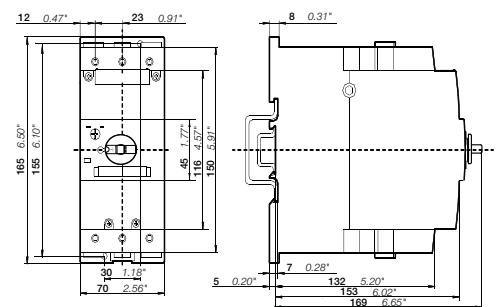
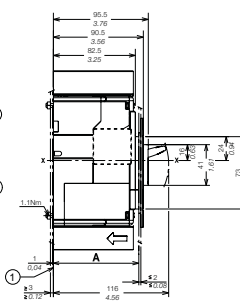
¹⁾ The MS49x range offers phase loss sensitivity

²⁾ For motor loads only up to 80 A

Main dimensions mm, inches



MS5100



MS495, MS497

Technical data

MS5100, MS495, MS497 manual motor starters

Main circuit – Utilization characteristics according to IEC/EN

Type	MS5100	MS495, MS497
Standards	IEC/EN 60947-2	IEC/EN 60947-2, IEC/EN 60947-4-1, IEC/EN 60947-1
Rated operational voltage U_n	690 V AC	690 V AC / 450 V DC
Rated frequency	50/60 Hz	50/60 Hz
Trip class	3E, 5E, 10E, 20E	10
Number of poles	3	3
Duty time		100 %
Mechanical durability	25000 cycles	50000 cycles
Electrical durability	8000 cycles	25000 cycles
Rated impulse withstand voltage U_{imp}	8 kV	6 kV
Rated insulation voltage U_i	1000 V AC	690 V AC
Rated operational current I_n	See ordering details	
Rated instantaneous short-circuit current setting I_{sc}	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 MS5100

MS5100-100	100	100	-	70	70	-	65	65	-	30	30	-	15	15	-
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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.

Technical data

MS495, MS497 manual motor starters

Main circuit – Utilization characteristics according to UL/CSA

Type	MS495, MS497	
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	Horsepower	See table "Motor ratings, three-phase"
	Full Load Amps (FLA)	See table "Motor ratings, three-phase"

Motor ratings, three-phase

hp Horsepower

FLA Full Load Amps

Type	General purpose rating at max. 600 V AC		200 - 208 V AC		230 V AC	460 V AC	575 V AC
	A	FLA	hp	hp	hp	hp	hp
MS495-63	63	63	20	25	25	50	60
MS495-75	75	75	25	25	25	60	75
MS495-90	90	90	30	30	30	75	100
MS495-100	100	100	40	40	40	75	100
MS497-32	32	32	10	10	10	25	30
MS497-40	40	40	15	15	15	30	40
MS497-50	50	50	15	20	20	40	50
MS497-63	63	63	20	25	25	50	60
MS497-75	75	75	25	25	25	60	75
MS497-90	90	90	30	30	30	75	100
MS497-100	100	100	30	40	40	75	100

UL 508 – Manual motor controller

Type	Circuit breaker or class R fuse per UL/NEC		Maximum short-circuit current for motor disconnect				for tap conductor		for protection		UL 508	
	480/600 V		480 V		600 V		480Y/277V		600Y/347V		Type E ¹⁾	Type E
	A	A	kA	kA	kA	kA	kA	kA	kA	kA	kA	kA
MS495-63	250	500	65	30	65	30	65	30	65	30	65	30
MS495-75	300	500	65	30	65	30	65	30	65	30	65	30
MS495-90	350	500	65	10	65	10	65	-	65	-	65	-
MS495-100	400	500	65	10	65	10	65	-	65	-	65	-
MS497-32	120	500	65	30	65	30	65	30	65	30	65	30
MS497-40	160	500	65	30	65	30	65	30	65	30	65	30
MS497-50	200	500	65	30	65	30	65	30	65	30	65	30
MS497-63	250	500	65	30	65	30	65	30	65	30	65	30
MS497-75	300	500	65	30	65	30	65	30	65	30	65	30
MS497-90	350	500	65	10	65	10	-	-	65	-	65	-
MS497-100	400	500	65	10	65	10	-	-	65	-	65	-

¹⁾ only with use DX495

Technical data

MS5100, MS495, MS497 manual motor starters

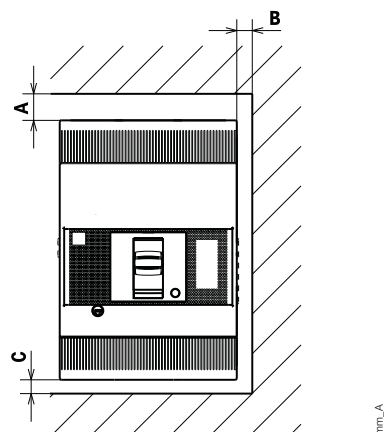
General technical data

Type	MS5100 ¹⁾	MS495	MS497
Pollution degree	3	3	
Phase loss sensitivity		Yes	
Disconnect function acc. to IEC/EN 60947-2	Yes	Yes	
Ambient air temperature			
Operation			
Open - compensated	-	-20 ... +60 °C	
Open	-25 ... +70 °C	-20 ... +70 °C	
Enclosed	-25 ... +70 °C	-20 ... +35 °C	
Storage	-40 ... +70 °C	-50 ... +80 °C	
Ambient air temperature compensation	Acc. to IEC/EN60947-4-1	Acc. to IEC/EN60947-4-1	
Maximum operating altitude permissible	2000 m	2000 m	
Resistance to shock acc. to IEC 60068-2-27	12g / 11 ms	-	
Resistance to vibrations acc. to IEC 60068-2-6	0.7g / 13 ... 100 Hz	2g / 5-150 Hz	
Mounting position	Horizontal, vertical, or lying down position	Position 1-6 (optional for single mounting)	
Mounting	-	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		-	
Minimum distance to electrical conductive board			
Horizontal	See "Insulation distances for installation in metallic cubicles"	-	
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		-	
Degree of protection			
Housing	IP40 (on the lever)	IP20	
Main circuit terminals	IP00	IP00	

¹⁾ For $U_n > 440$ V power supply only from the upper terminal/lugs

Insulation distances for installation in metallic cubicles

Manual motor starter	A mm/in	B mm/in	C mm/in
MS5100			






MS5100, insulation distances

Technical data

MS5100, MS495, MS497 manual motor starters

Connecting characteristics

Main circuit

Type	MS495	MS497
Connecting capacity		
 Rigid	1 or 2 x 2.5 ... 16 mm ²	2.5 ... 16 mm ²
 Flexible with ferrule	1 x 10 ... 70 mm ² 2 x 10 ... 50 mm ²	10 ... 70 mm ² 10 ... 50 mm ²
 Flexible	1 x 10 ... 70 mm ² 2 x 10 ... 50 mm ²	10 ... 70 mm ² 10 ... 50 mm ²
Stranded acc. to UL/CSA	1 x AWG 10-2/0 2 x AWG 10-1/0	AWG 10-2/0 AWG 10-1/0
Flexible acc. to UL/CSA	1 x AWG 10-2/0 2 x AWG 10-1/0	AWG 10-2/0 AWG 10-1/0
Stripping length	17 mm	17 mm
Tightening torque	4 - 6 Nm / 35 - 53 lb.in	4 - 6 Nm / 35 - 53 lb.in
Recommended screw driver	Hexagon 4	Hexagon 4

Front terminals - F (UL Listed)

Type	MS5100
Vers.	F
Busbar dimensions	
W min	13 mm
W max	20 mm
H	7.5 mm
Ø	6.5 mm
D min	2.5 mm
D max	5 mm
Cable terminals	
W	20 mm
Ø	6.5 mm
Tightening torque	6 Nm / 53.1 lb.in
Recommended screw driver	M6



Front terminal - F



F terminal with cable lug

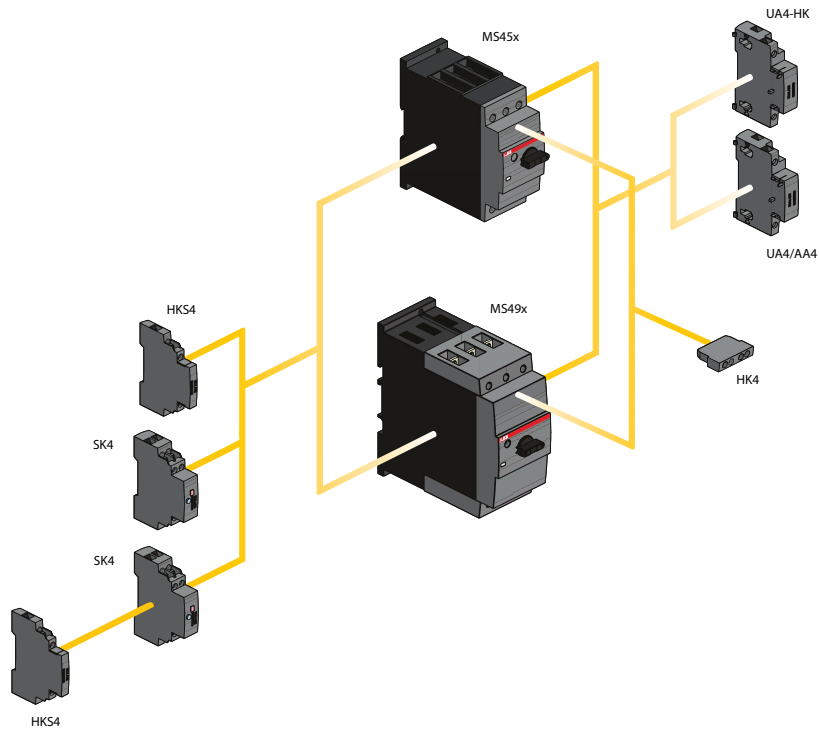


F terminal with busbar

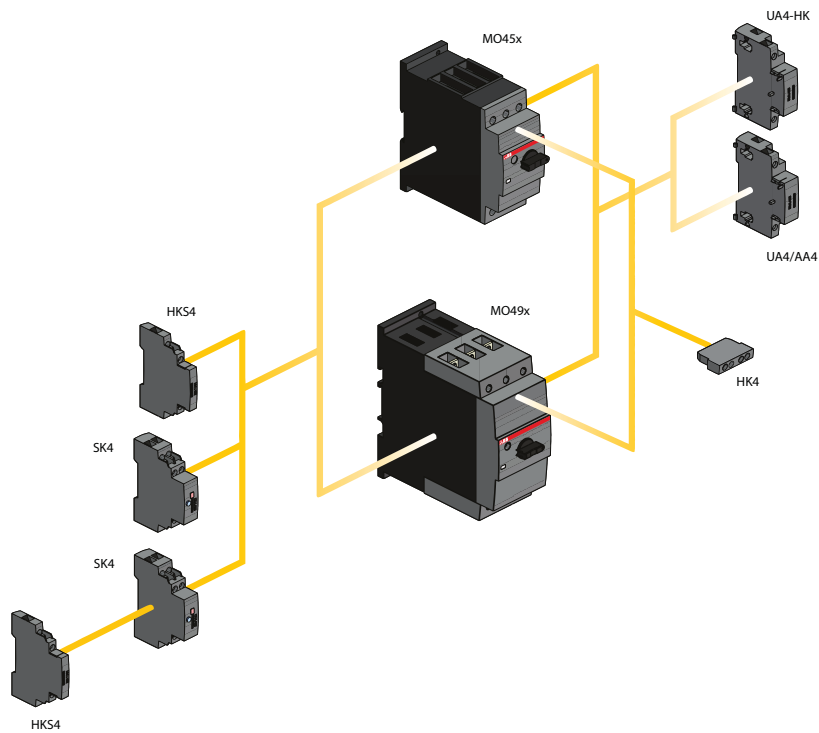
Main accessories

MS49x, MO49x manual motor starters

Manual motor starter MS49x with accessories



Manual motor starter MO49x with accessories



Main accessories

MS49x, MO49x manual motor starters

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2CDC241022F0011

HK4-11



2CDC241022F0011

HKS4-20



2CDC241024F0011

SK4-11



2CDC241028F0011

AA4-24



2CDC241025F0011

UA4-110



2CDC241023F0013

SA2

Description

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. For this manual motor starter range we offer terminal shrouds, terminal insulation barriers and different lock/key solutions for customer solutions.

Ordering details

Suitable for	Auxiliary con- tacts N.O.	Auxiliary con- tacts N.C.	Description	Type	Order code	Pkg qty	Weight (1 pc)
						pcs	kg

Auxiliary contacts – mountable on the front

MS49x, MO49x	1	1		HK4-11	1SAM401901R1001	10	0.017
			Changeover	HK4-W	1SAM401901R1002	10	0.015

Auxiliary contacts – mountable on the left

MS49x, MO49x	1	1	Max. 1 piece	HKS4-11	1SAM401902R1001	2	0.045
	2	0	Max. 1 piece	HKS4-20	1SAM401902R1002	2	0.045
	0	2	Max. 1 piece	HKS4-02	1SAM401902R1003	2	0.045

Signalling contacts – mountable on the left

MS49x, MO49x	2	2	Separate signalling acc. UL508E 1 N.O. + 1 N.C. for short circuit alarm and 1 N.O. + 1 N.C. for tripped alarm, max. 1x SK4-11 + 1 x HKS4-xx	SK4-11	1SAM401904R1001	1	0.093
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Suitable for	Rated control supply voltage	Frequency	Type	Order code	Pkg qty	Weight (1 pc)
	V	Hz			pcs	kg

Shunt trip units – mountable on the right

MS49x, MO49x	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 right

MS49x, MO49x	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

Suitable for	Description	Type	Order code	Pkg qty	Weight (1 pc)
				pcs	kg
MS495, MS497, MO495, MO496	Terminal shroud	KA495	1SAM501901R1001	10	0.018
	Terminal shroud	KA495C ¹⁾	1SAM501902R1001	10	0.038
	Terminal insulation barrier for UL508E	DX495	1SAM401912R1001	1	0.154
MS495, MS497, MO495, MO496	Padlock + two keys	SA2	GJF1101903R0002	10	0.020

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

Main accessories

MS49x, MO49x manual motor starters

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 Storage			
	-20 ... +70 °C -50 ... +80 °C			
Resistance to shock acc. to IEC 60068-2-27	25g / 11 ms			
Resistance to vibrations acc. to IEC 60068-2-6	2g / 5 ... 150 Hz			
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	2 A	4 A	6 A
	230 V	0.5 A	3 A	4 A
	400 V	-	1.5 A	3 A
	690 V	-	0.5 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
	48 V	0.3 A	-	-
	60 V	0.15 A	-	-
	110 V	-	0.22 A	0.5 A
	230 V	-	0.1 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			




Type	UA4-xxx	AA4-xxx
Power consumption		
Pull-in	AC 20.2/13 VA/W DC 20 W	20.2/13 VA/W 13 ... 80 W
Holding	AC 7.2/2.4 VA/W DC 2.1 W	- -
Operating voltage		
Tripping	0.35 ... 0.7 V x U_e	0.7 ... 1.1 V x U_e
Coil operating voltage	0.85 ... 1.1 V x U_e	-

Main accessories

MS49x, MO49x manual motor starters

Connecting characteristics

Auxiliary circuit

Type		HK4-11	HK4-W	HKS4	SK4
Connecting capacity					
 Rigid	1 x	0.5... 2.5 mm ²			
	2 x	0.5 ... 1.5 mm ² or 0.75 ... 2.5 mm			
 Flexible with ferrule	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 torque					
0.8 ... 1.2 Nm / 7 ... 10.3 lb.in					
Recommended screw driver					
Pozidriv 2					

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General accessories

MS1xx, MO1xx, MS5100, MO5100, MS49x, MO49x



2CDC241003F0011

MSHD-LB



2CDC241002S0011

MSHD-LY



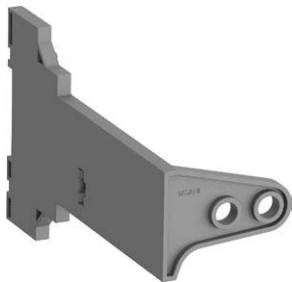
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MSMN



2CDC241001F0012

MSH-AR



2CDC241017V0013

MSAH1



RHD-01

RHD Normal Direct Handle

Description

With this solution of door coupling rotary mechanism it is possible to operate a manual motor starter in the back of a switch cabinet from outside. The door coupling mechanism prevents opening of the door of a switch cabinet with the manual motor starter in ON position.

The complete mechanism includes handle, shaft, driver, shaft alignment ring and shaft supporter.

Most accessories fit for 6 mm shafts with a maximum length of 180 mm. The degree of protection for handles MSHD is IP64 (UL/CSA Type 1, 3R, 12).

Ordering details

Suitable for	Description	Shaft length mm	Color	Type	Order code	Pkg qty pcs	Weight (1 pc) kg
Shafts							
MS116, MS132, MO132, MS165, MO165, MS4xx, MO4xx	For MSHD handles. Shaft diameter 6 mm. Shaft extension for door coupling driver.	85 105 130 180		OXS6X85 OXS6X105 OXS6X130 OXS6X180	1SCA101647R1001 1SCA108043R1001 1SCA101655R1001 1SCA101659R1001	1 1 1 1	0.020 0.020 0.030 0.040
IP64 handles (UL/CSA Type 1, 3R, 12)							
MS116, MS132, MO132, MS165, MO165, MS4xx, MO4xx	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 Yellow Black Yellow	MSHD-LB ¹⁾ MSHD-LY ¹⁾ MSHD-LTB ²⁾ MSHD-LTY ²⁾	1SAM201920R1001 1SAM201920R1002 1SAM201920R1011 1SAM201920R1012	1 1 1 1	0.065 0.065 0.065 0.065
Driver							
MS116, MS132, MO132, MS165, MO165, MS4xx, MO4xx	Coupling driver for use with 6 mm OXS6... types up to 180 mm.			MSMN ³⁾ MSMNO ⁴⁾	1SAM101923R0002 1SAM101923R0012	1 1	0.002 0.002
Shaft alignment ring							
MS116, MS132, MO132, MS165, MO165, MS4xx, MO4xx	The MSH-AR supports the long shafts for alignment to the handle inlet. It makes closing panel doors more easy. Use for OXS6X > 105 mm.			MSH-AR	1SAM201920R1000	1	0.010
Shaft supporter							
MS116, MS132, MO132	With the MSAH1 it is possible to support the shaft in the extension of handle (MSHD). It is mandatory for the usage of shafts >130 mm.			MSAH1	1SAM201909R1021	1	0.035
Rotary handle operating mechanism							
MS5100	Rotary handle operating mechanism			RHD Normal Direct Handle ⁵⁾	1SDA069053R1	1	0.4
MO5100	Rotary handle operating mechanism			RHD Normal Direct Handle ⁵⁾	1SDA066475R1	1	0.4

¹⁾ Indication I-O and ON-OFF (recommended for MS116, MS4xx, MO4xx)

²⁾ Indication I-O and ON-OFF + Trip indication

³⁾ Coded - Positioning of ON indication dependent from mounting orientation of the MMS

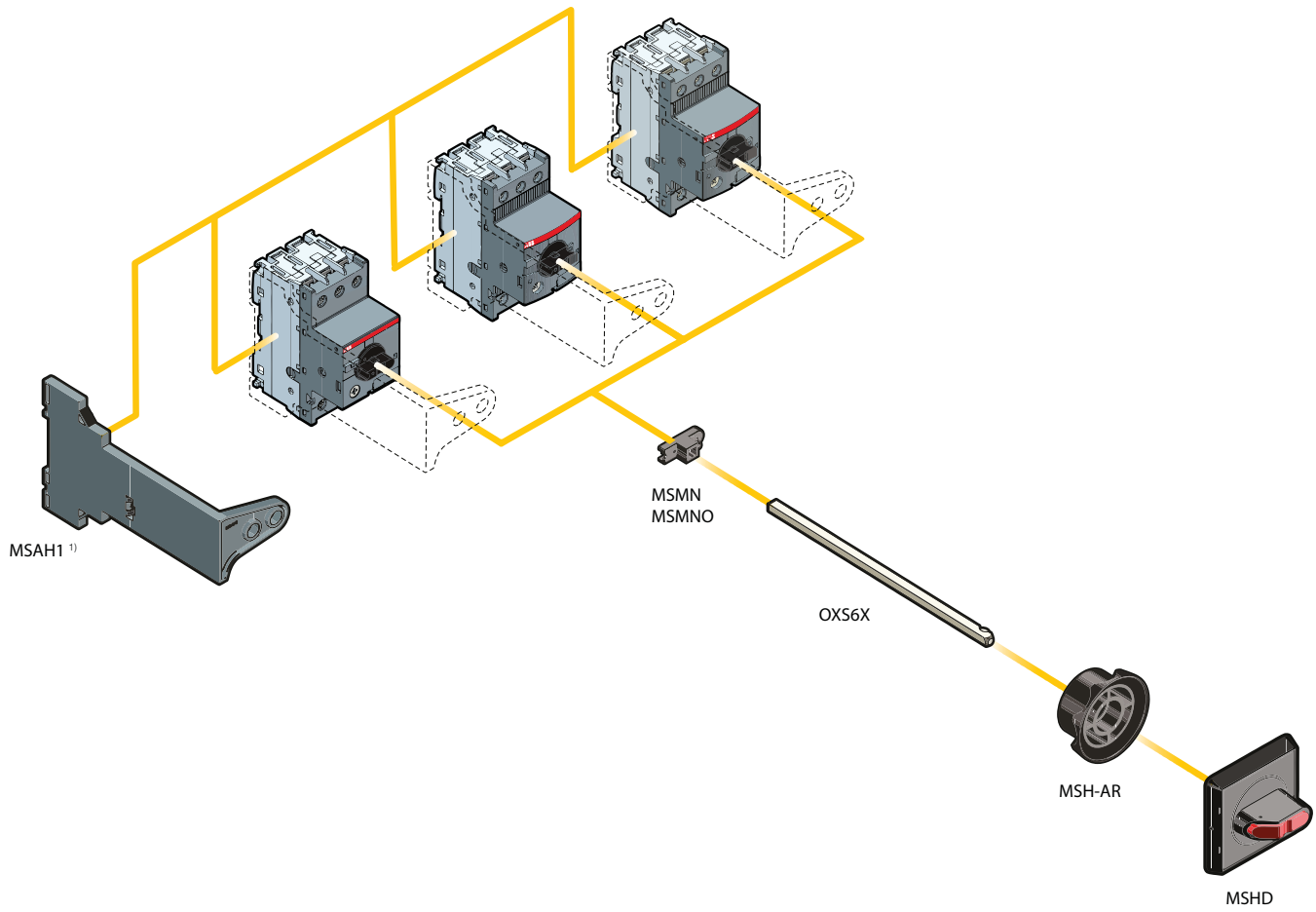
⁴⁾ Uncoded - Positioning of ON indication independent from mounting orientation of the MMS

⁵⁾ UL Listed

General accessories

MS1xx, MO1xx, MS4xx, MO4xx

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¹⁾ MSAH1 fits to MS116,MS132 and MO132

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