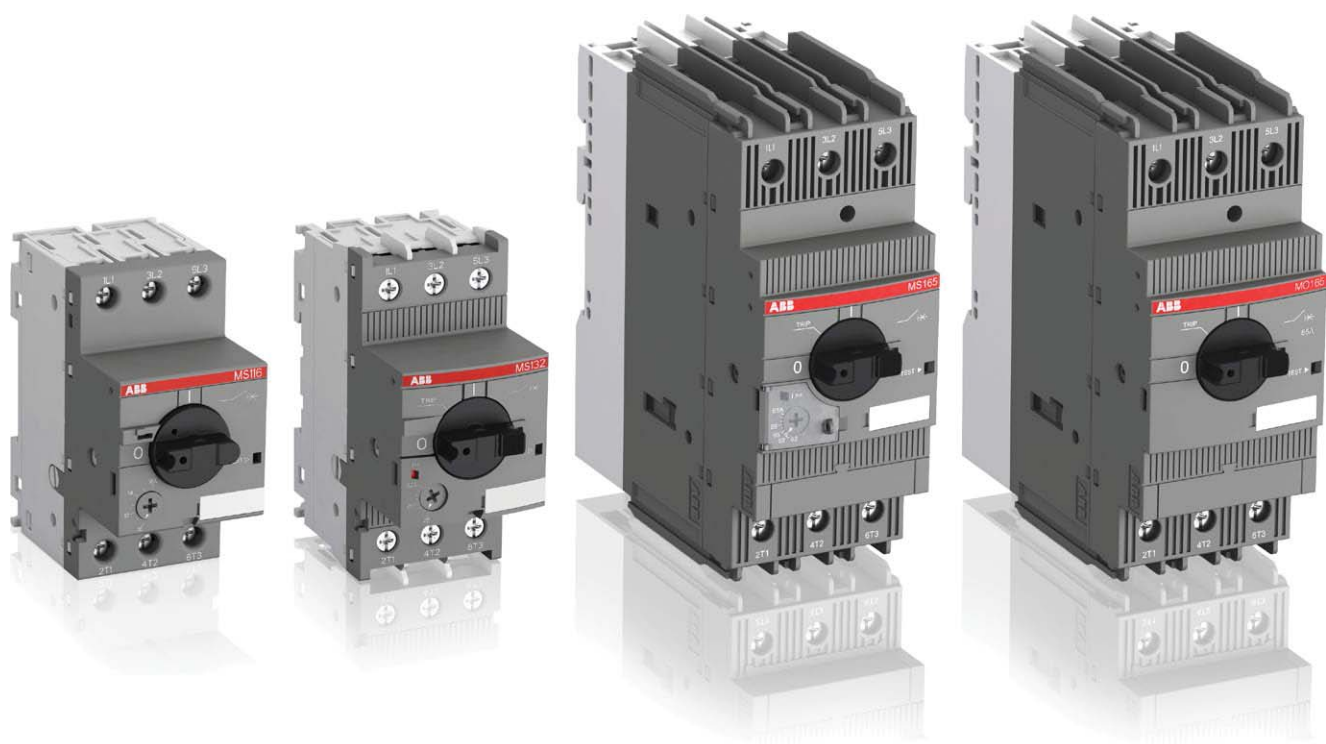




Overview	
Benefits	2/2
Features	2/3
Overview	2/4
0.10 to 65 A – with thermal and electromagnetic protection	
MS116 manual motor starters	2/6
MS132 manual motor starters	2/7
MS165 manual motor starters	2/8
0.16 to 65 A – with electromagnetic protection	
MO132 manual motor starters magnetic only	2/9
MO165 manual motor starters magnetic only	2/10
0.10 to 25 A – with thermal and electromagnetic protection	
MS132-T circuit breakers for transformer protection	2/11
Technical data	2/12
Main accessories	2/22
22 to 100 A – with thermal and electromagnetic protection	
MS5100, MS495, MS497 manual motor starters	2/32
Technical data	2/33
32 to 100 A – with electromagnetic protection	
MO5100, MO495, MO496 manual motor starters magnetic only	2/37
Technical data	2/38
Main accessories	2/42
General accessories	2/47

Manual motor starters

Benefits

2

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.

Safe, compact, and cost-saving solution

Various motor protection functions in one device

- Overload
- Short-circuit
- Phase loss sensitivity

Efficient planning and installation perfectly matching the ABB contactor family, leads to high flexibility and increased exchangeability. Simple connecting links ensure the electrical and mechanical connection.

Products range for different applications available

- Short-circuit breaking capacity up to 100 kA
- Magnetic-only devices (only short-circuit protection)
- Selected types are certified according to ATEX
- Special version for transformer protection

The manual motor starter range is compatible with all major national and international standards.



Product range

Comprehensive accessory range

Manual motor starters can be equipped with busbars, auxiliary contacts, signalling contacts, undervoltage releases and shunt trips. Moreover it is possible to order IP65 (UL/CSA Type 12) door mounting kits, IP65 (UL/CSA Type 12) enclosures and shafts for doors.

MS116, MS132, MS165, MO132, MO165 and MS132-T share almost the same accessory range. Customers can optimize administration costs and inventory costs through reduced number of order codes by benefiting from a compatible range of accessories.



Manual motor starters with busbar connection



Accessory range



Direct-on-line starters



Door mounting kits

Manual motor starters

Features

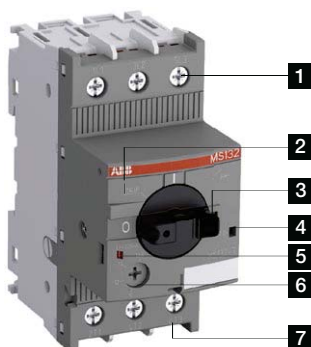
Features

- Manual control
- Disconnect function
- Handle can be locked in the off position
- Remote control via undervoltage release or shunt trip
- Trip indication
- Temperature compensation
- Adjustable current setting

- Magnetic trip indication for several types available (MS132, MS165, and MS132-T)
- One product family in 45 mm width (MS116, MS132, MO132, and MS132-T)
- Variants from 0.1 up to 100 A available
- Short-circuit service breaking capacity I_{cs} up to 100 kA

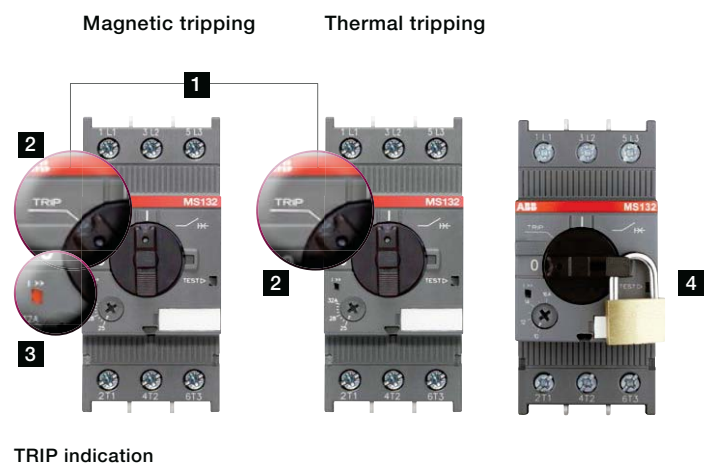
2

- 1 Terminals (1L1, 3L2, 5L3)
- 2 Switch position TRIP
- 3 Lockable handle
- 4 Test function
- 5 Status indication for short-circuit
- 6 Current setting range
- 7 Terminals 2T1, 4T2, 6T3



Features of type MS132

- 1 Clear trip indication
- 2 Handle in TRIP position
- 3 Optical indication for short-circuit
- 4 Easy locking



2CDC131072C0201

Manual motor starters

Overview



2

Type	MS116	MS132	MS165	MS5100
Thermal and electromagnetic protection	Yes	Yes	Yes	Yes
Electromagnetic protection	-	-	-	-
Phase loss sensitivity	Yes	Yes	Yes	
Switch position	ON/OFF	ON/OFF/TRIP	ON/OFF/TRIP	ON/OFF/TRIP
Magnetic trip indication	-	Yes	Yes	
Lockable handle without accessories	-	Yes	Yes	Yes
Disconnecting feature	Yes	Yes	Yes	Yes
Width	45 mm	45 mm	55 mm	90 mm
Rated operational current I_e	0.16 ... 32 A	0.16 ... 32 A	16 ... 65 A	100 A
Setting range	0.1 ... 32 A	0.1 ... 32 A	10 ... 65 A	40 ... 100 A ²⁾
Ambient air temperature	-25 ... +55 °C ¹⁾	-25 ... +60 °C ¹⁾	-20 ... +60 °C ¹⁾	-25 ... +70 °C

¹⁾ Compensated

²⁾ For motor loads only up to 80 A

Accessories

Auxiliary contact	HKF1, HK1			AUX
Signalling contact for tripped alarm	SK1			-
contact for short-circuit alarm	- CK1			-
Shunt trip	AA1			SOR-C
Undervoltage release	UA1			UVR-C

Table for short-circuit ratings for 400/415 V

	Standard range MS116	Performance range MS132, MS165, MS5100
--	-------------------------	---

Selection parameters

Rated operational power	Setting range for thermal release	Type	Short-circuit breaking capacity		Type	Short-circuit breaking capacity	
			I_{cu}	I_{cs}		I_{cu}	I_{cs}
0.03 kW ¹⁾	0.1 ... 0.16 A	MS116-0.16	50 kA	50 kA	MS132-0.16	100 kA	100 kA
0.06 kW	0.16 ... 0.25 A	MS116-0.25	50 kA	50 kA	MS132-0.25	100 kA	100 kA
0.09 kW	0.25 ... 0.4 A	MS116-0.4	50 kA	50 kA	MS132-0.4	100 kA	100 kA
0.18 kW	0.4 ... 0.63 A	MS116-0.63	50 kA	50 kA	MS132-0.63	100 kA	100 kA
0.25 kW	0.63 ... 1.0 A	MS116-1.0	50 kA	50 kA	MS132-1.0	100 kA	100 kA
0.55 kW	1.0 ... 1.6 A	MS116-1.6	50 kA	50 kA	MS132-1.6	100 kA	100 kA
0.75 kW	1.6 ... 2.5 A	MS116-2.5	50 kA	50 kA	MS132-2.5	100 kA	100 kA
1.5 kW	2.5 ... 4.0 A	MS116-4.0	50 kA	50 kA	MS132-4.0	100 kA	100 kA
2.2 kW	4.0 ... 6.3 A	MS116-6.3	50 kA	50 kA	MS132-6.3	100 kA	100 kA
4.0 kW	6.3 ... 10 A	MS116-10	50 kA	50 kA	MS132-10	100 kA	100 kA
5.5 kW	8 ... 12 A	MS116-12	25 kA	25 kA	MS132-12	100 kA	100 kA
7.5 kW	10 ... 16 A	MS116-16	16 kA	16 kA	MS132-16 / MS165-16	100 kA	100 kA
7.5 kW	14 ... 20 A				MS165-20	100 kA	100 kA
7.5 kW	16 ... 20 A	MS116-20	15 kA	10 kA	MS132-20	100 kA	100 kA
11 kW	18 ... 25 A				MS165-25	100 kA	100 kA
11 kW	20 ... 25 A	MS116-25	15 kA	10 kA	MS132-25	50 kA	50 kA
15 kW	25 ... 32 A	MS116-32	10 kA	10 kA	MS132-32	50 kA	25 kA
15 kW	23 ... 32 A				MS165-32	100 kA	75 kA
22 kW	30 ... 42 A				MS165-42	50 kA	25 kA
22 kW	40 ... 54 A				MS165-54	50 kA	25 kA
25 kW	-						
30 kW	52 ... 65 A				MS165-65	50 kA	25 kA
37 kW	40 ... 100 A				MS5100-100	70 kA	70 kA
45 kW	40 ... 100 A				MS5100-100	70 kA	70 kA

¹⁾ 690 V



MO132	MO165	MO5100	MS132-T
-	-	-	Yes
Yes	Yes	Yes	-
-	-	-	Yes
ON/OFF/TRIP	ON/OFF/TRIP	ON/OFF/TRIP	ON/OFF/TRIP
-	-	-	Yes
Yes	Yes	Yes	Yes
Yes	Yes	Yes	Yes
45 mm	55 mm	76.2 mm	45 mm
0.16 ... 32 A	16 ... 65 A	70 ... 100 A	0.16 ... 32 A
-	-	-	0.1 ... 25 A
-25 ... +60 °C	-25 ... +60 °C	-25 ... +70 °C	-25 ... +60 °C ¹⁾

HKF1, HK1	AUX	HKF1
SK1	-	SK1
-	-	CK1
AA1	SOR-C	AA1
UA1	UVR-C	UA1

Standard range MO132	Performance range MO132, MO165, MO5100	Transformer protection MS132-T
-------------------------	---	-----------------------------------

Type	Short-circuit breaking capacity		Type	Short-circuit breaking capacity		Type	Short-circuit breaking capacity
	I _{CU}	I _{CS}		I _{CU}	I _{CS}		I _{CU} / I _{CS}
MO132-0.16	100 kA	100 kA	MO132-0.16	100 kA	100 kA	MS132-0.16T	100 kA
MO132-0.25	100 kA	100 kA	MO132-0.25	100 kA	100 kA	MS132-0.25T	100 kA
MO132-0.4	100 kA	100 kA	MO132-0.4	100 kA	100 kA	MS132-0.4T	100 kA
MO132-0.63	100 kA	100 kA	MO132-0.63	100 kA	100 kA	MS132-0.63T	100 kA
MO132-1.0	100 kA	100 kA	MO132-1.0	100 kA	100 kA	MS132-1.0T	100 kA
MO132-1.6	100 kA	100 kA	MO132-1.6	100 kA	100 kA	MS132-1.6T	100 kA
MO132-2.5	100 kA	100 kA	MO132-2.5	100 kA	100 kA	MS132-2.5T	100 kA
MO132-4.0	100 kA	100 kA	MO132-4.0	100 kA	100 kA	MS132-4.0T	100 kA
MO132-6.3	100 kA	100 kA	MO132-6.3	100 kA	100 kA	MS132-6.3T	100 kA
MO132-10	100 kA	100 kA	MO132-10	100 kA	100 kA	MS132-10T	100 kA
MO132-12	100 kA	100 kA	MO132-12	100 kA	100 kA	MS132-12T	100 kA
MO132-16	100 kA	100 kA	MO132-16 / MO165-16	100 kA	100 kA	MS132-16T	100 kA
			MO165-20	100 kA	100 kA		
MO132-20	100 kA	100 kA	MO132-20	100 kA	100 kA	MS132-20T	100 kA
MO132-25	50 kA	50 kA	MO132-25 / MO165-25	50 kA / 100 kA	50 kA / 100 kA	MS132-25T	50 kA
MO132-32	50 kA	25 kA	MO132-32	50 kA	25 kA	Transformer protection: The instantaneous short-circuit current setting is 20 times the rated operational current.	
			MO165-32	100 kA	50 kA		
			MO165-42	50 kA	25 kA		
			MO165-54	50 kA	25 kA		
			MO5100-70	36 kA	36 kA		
			MO165-65	50 kA	25 kA		
			MO5100-80	36 kA	36 kA		
			MO5100-100	36 kA	36 kA		

MS116 manual motor starters

0.10 to 32 A – with thermal and electromagnetic protection

2



2CDC241010F0011

MS116-16



2CDC241001F0011

MS116-25



2CDC241013F0011

MS116-0.16-HKF1-11



2CDC241012F0011

MS116-32-HKF1-11

Description

MS116 is a compact and economic range for motor protection up to 15 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, signaling contacts, undervoltage releases, shunt trips, power in-feed blocks and locking devices for protection against unauthorized changes are available as accessory. These are suitable throughout the MS116/MS132/MS165-range.

Ordering details

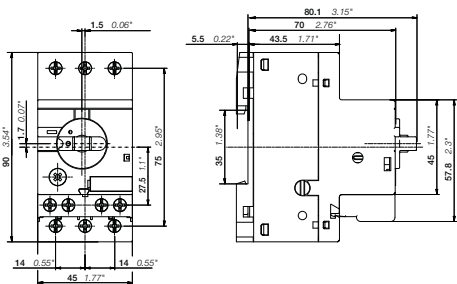
Rated operational power 400 V AC-3	Setting range	Short-circuit breaking capacity I_{cs} at 400 V AC	Rated instantaneous short-circuit current setting I_i	Type	Order code	Weight (1 pc)
kW	A	kA	A			kg
0.03 ²⁾	0.10 ... 0.16	50	2.00 ¹⁾	MS116-0.16	1SAM250000R1001	0.225
0.06	0.16 ... 0.25	50	3.10 ¹⁾	MS116-0.25	1SAM250000R1002	0.225
0.09	0.25 ... 0.40	50	5.00 ¹⁾	MS116-0.4	1SAM250000R1003	0.225
0.18	0.40 ... 0.63	50	7.90 ¹⁾	MS116-0.63	1SAM250000R1004	0.225
0.25	0.63 ... 1.00	50	12.5 ¹⁾	MS116-1.0	1SAM250000R1005	0.225
0.55	1.00 ... 1.60	50	20.0 ¹⁾	MS116-1.6	1SAM250000R1006	0.265
0.75	1.60 ... 2.50	50	31.3 ¹⁾	MS116-2.5	1SAM250000R1007	0.265
1.50	2.50 ... 4.00	50	50.0	MS116-4.0	1SAM250000R1008	0.265
2.20	4.00 ... 6.30	50	78.8	MS116-6.3	1SAM250000R1009	0.265
4.00	6.30 ... 10.0	50	150	MS116-10	1SAM250000R1010	0.265
5.50	8.00 ... 12.0	25	180	MS116-12	1SAM250000R1012	0.265
7.50	10.0 ... 16.0	16	240	MS116-16	1SAM250000R1011	0.265
7.50	16.0 ... 20.0	10	300	MS116-20	1SAM250000R1013	0.310
11.0	20.0 ... 25.0	10	375	MS116-25	1SAM250000R1014	0.310
15.0	25.0 ... 32.0	10	480	MS116-32	1SAM250000R1015	0.310
0.03 ²⁾	0.10 ... 0.16	50	2.00 ¹⁾	MS116-0.16-HKF1-11	1SAM250005R1001	0.240
0.06	0.16 ... 0.25	50	3.10 ¹⁾	MS116-0.25-HKF1-11	1SAM250005R1002	0.240
0.09	0.25 ... 0.40	50	5.00 ¹⁾	MS116-0.4-HKF1-11	1SAM250005R1003	0.240
0.18	0.40 ... 0.63	50	7.90 ¹⁾	MS116-0.63-HKF1-11	1SAM250005R1004	0.240
0.25	0.63 ... 1.00	50	12.5 ¹⁾	MS116-1.0-HKF1-11	1SAM250005R1005	0.240
0.55	1.00 ... 1.60	50	20.0 ¹⁾	MS116-1.6-HKF1-11	1SAM250005R1006	0.280
0.75	1.60 ... 2.50	50	31.3 ¹⁾	MS116-2.5-HKF1-11	1SAM250005R1007	0.280
1.50	2.50 ... 4.00	50	50.0	MS116-4.0-HKF1-11	1SAM250005R1008	0.280
2.20	4.00 ... 6.30	50	78.8	MS116-6.3-HKF1-11	1SAM250005R1009	0.280
4.00	6.30 ... 10.0	50	150	MS116-10.0-HKF1-11	1SAM250005R1010	0.280
5.50	8.00 ... 12.0	25	180	MS116-12.0-HKF1-11	1SAM250005R1012	0.280
7.50	10.0 ... 16.0	16	240	MS116-16.0-HKF1-11	1SAM250005R1011	0.280
7.50	16.0 ... 20.0	10	300	MS116-20-HKF1-11	1SAM250005R1013	0.326
11.0	20.0 ... 25.0	10	375	MS116-25-HKF1-11	1SAM250005R1014	0.326
15.0	25.0 ... 32.0	10	480	MS116-32-HKF1-11	1SAM250005R1015	0.326

Note: Manual motor starters should always be selected so that the actual motor current is within the setting range.

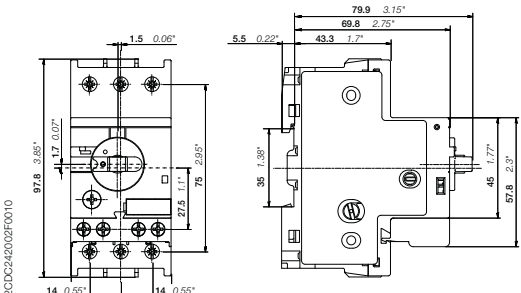
¹⁾ The data is valid for products, produced after week 34, 2014.

²⁾ 690 V

Main dimensions mm, inches



MS116 ≤ 16 A & MS116-HKF1-11 ≤ 16 A



MS116 ≥ 20 A & MS116-HKF1-11 ≥ 20 A

MS132 manual motor starters

0.10 to 32 A – with thermal and electromagnetic protection



MS132-10



MS132-32



MS132-0.16-HKF1-11



MS132-32-HKF1-11

Description

MS132 is a compact and powerful range for motor protection up to 15 kW (400 V) / 32 A in width of 45 mm. This type has also a clear and reliable indication of fault in a separate window in the event of short-circuit tripping. 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, signaling contacts, undervoltage releases, shunt trips, power in-feed blocks are available as accessory. These are suitable throughout the MS116/MS132/MS165-range.

Ordering details

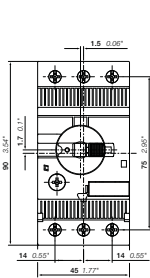
Rated operational power 400 V AC-3	Setting range	Short-circuit breaking capacity I_{cs} at 400 V AC	Rated instantaneous short-circuit current setting I_i	Type	Order code	Weight (1 pc)
kW	A	kA	A			kg
0.03 ²⁾	0.10 ... 0.16	100	2.00 ¹⁾	MS132-0.16	1SAM350000R1001	0.215
0.06	0.16 ... 0.25	100	3.10 ¹⁾	MS132-0.25	1SAM350000R1002	0.215
0.09	0.25 ... 0.40	100	5.00 ¹⁾	MS132-0.4	1SAM350000R1003	0.215
0.18	0.40 ... 0.63	100	7.90 ¹⁾	MS132-0.63	1SAM350000R1004	0.215
0.25	0.63 ... 1.00	100	12.5 ¹⁾	MS132-1.0	1SAM350000R1005	0.215
0.55	1.00 ... 1.60	100	20.0 ¹⁾	MS132-1.6	1SAM350000R1006	0.265
0.75	1.60 ... 2.50	100	31.3 ¹⁾	MS132-2.5	1SAM350000R1007	0.265
1.50	2.50 ... 4.00	100	50.0	MS132-4.0	1SAM350000R1008	0.265
2.20	4.00 ... 6.30	100	78.8	MS132-6.3	1SAM350000R1009	0.265
4.00	6.30 ... 10.0	100	150	MS132-10	1SAM350000R1010	0.265
5.50	8.00 ... 12.0	100	180	MS132-12	1SAM350000R1012	0.310
7.50	10.0 ... 16.0	100	240	MS132-16	1SAM350000R1011	0.310
7.50	16.0 ... 20.0	100	300	MS132-20	1SAM350000R1013	0.310
11.0	20.0 ... 25.0	50	375	MS132-25	1SAM350000R1014	0.310
15.0	25.0 ... 32.0	25	480	MS132-32	1SAM350000R1015	0.310
0.03 ²⁾	0.10 ... 0.16	100	2.00 ¹⁾	MS132-0.16-HKF1-11	1SAM350005R1001	0.231
0.06	0.16 ... 0.25	100	3.10 ¹⁾	MS132-0.25-HKF1-11	1SAM350005R1002	0.231
0.09	0.25 ... 0.40	100	5.00 ¹⁾	MS132-0.4-HKF1-11	1SAM350005R1003	0.231
0.18	0.40 ... 0.63	100	7.90 ¹⁾	MS132-0.63-HKF1-11	1SAM350005R1004	0.231
0.25	0.63 ... 1.00	100	12.5 ¹⁾	MS132-1.0-HKF1-11	1SAM350005R1005	0.231
0.55	1.00 ... 1.60	100	20.0 ¹⁾	MS132-1.6-HKF1-11	1SAM350005R1006	0.281
0.75	1.60 ... 2.50	100	31.3 ¹⁾	MS132-2.5-HKF1-11	1SAM350005R1007	0.281
1.50	2.50 ... 4.00	100	50.0	MS132-4.0-HKF1-11	1SAM350005R1008	0.281
2.20	4.00 ... 6.30	100	78.8	MS132-6.3-HKF1-11	1SAM350005R1009	0.281
4.00	6.30 ... 10.0	100	150	MS132-10.0-HKF1-11	1SAM350005R1010	0.281
5.50	8.00 ... 12.0	100	180	MS132-12.0-HKF1-11	1SAM350005R1012	0.326
7.50	10.0 ... 16.0	100	240	MS132-16.0-HKF1-11	1SAM350005R1011	0.326
7.50	16.0 ... 20.0	100	300	MS132-20-HKF1-11	1SAM350005R1013	0.326
11.0	20.0 ... 25.0	50	375	MS132-25-HKF1-11	1SAM350005R1014	0.326
15.0	25.0 ... 32.0	25	480	MS132-32-HKF1-11	1SAM350005R1015	0.326

Note: Manual motor starters should always be selected so that the actual motor current is within the setting range.

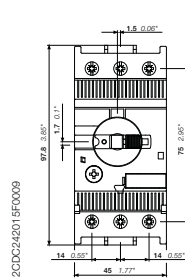
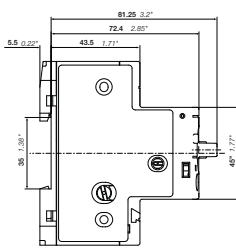
¹⁾ The data is valid for products, produced after week 34, 2014.

²⁾ 690 V

Main dimensions mm, inches



MS132 ≤ 10 A



MS132 ≥ 12 A

MS165 manual motor starters

10 to 65 A – with thermal and electromagnetic protection

2



MS165-65

Description

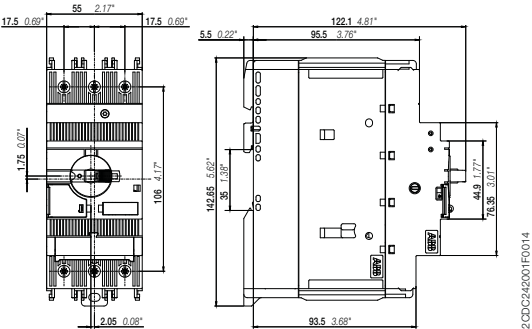
MS165 is a compact and powerful range for motor protection up to 30 kW (400 V) / 65 A in width of 55 mm. This type has also a clear and reliable indication of fault in a separate window in the event of short-circuit tripping. Further features are the build-in disconnect function, temperature compensation, 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, signaling contacts, undervoltage releases, shunt trips, power in-feed blocks are available as accessory. These are suitable throughout the MS116/MS132/MS165-range.

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 pc)
kW	A	kA	A			kg
7.5	10 ... 16	100	240	MS165-16	1SAM451000R1011	0.950
7.5	14 ... 20	100	300	MS165-20	1SAM451000R1012	0.950
11	18 ... 25	100	375	MS165-25	1SAM451000R1013	0.960
15	23 ... 32	75	480	MS165-32	1SAM451000R1014	0.970
22	30 ... 42	25	630	MS165-42	1SAM451000R1015	0.970
22	40 ... 54	25	810	MS165-54	1SAM451000R1016	0.970
30	52 ... 65	25	975	MS165-65	1SAM451000R1017	0.980

Note: Manual motor starters should always be selected so that the actual motor current is within the setting range.

Main dimensions mm, inches



MS165

MO132 manual motor starters magnetic only

0.16 to 32 A – with electromagnetic protection



MO132-6.3



MO132-32

2CDC241008F0011

2CDC241008F0011

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

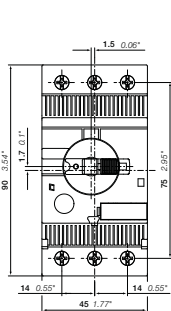
Rated operational power 400 V AC-3 ¹⁾	Rated operational current	Short-circuit breaking capacity I_{cs} at 400 V AC	Rated instantaneous short-circuit current setting I_i	Type	Order code	Weight (1 pc)
kW	A	kA	A			kg
0.03 ³⁾	0.16	100	2.00 ²⁾	MO132-0.16	1SAM360000R1001	0.215
0.06	0.25	100	3.10 ²⁾	MO132-0.25	1SAM360000R1002	0.215
0.09	0.40	100	5.00 ²⁾	MO132-0.4	1SAM360000R1003	0.215
0.12	0.63	100	7.90 ²⁾	MO132-0.63	1SAM360000R1004	0.215
0.25	1.0	100	12.5 ²⁾	MO132-1.0	1SAM360000R1005	0.215
0.55	1.6	100	20.0 ²⁾	MO132-1.6	1SAM360000R1006	0.265
0.75	2.5	100	31.3 ²⁾	MO132-2.5	1SAM360000R1007	0.265
1.5	4.0	100	50.0	MO132-4.0	1SAM360000R1008	0.265
2.2	6.3	100	78.8	MO132-6.3	1SAM360000R1009	0.265
4.0	10	100	125	MO132-10	1SAM360000R1010	0.265
5.5	12	100	150	MO132-12	1SAM360000R1012	0.310
7.5	16	100	200	MO132-16	1SAM360000R1011	0.310
7.5	20	100	250	MO132-20	1SAM360000R1013	0.310
11	25	50	313	MO132-25	1SAM360000R1014	0.310
15	32	25	400	MO132-32	1SAM360000R1015	0.310

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

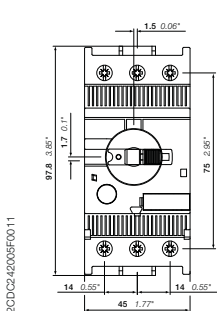
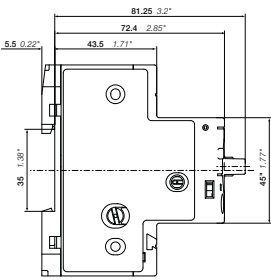
²⁾ The data is valid for products, produced after week 34, 2014.

³⁾ 690 V

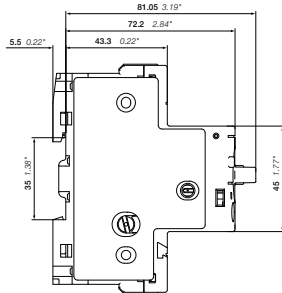
Main dimensions mm, inches



MO132 ≤ 10 A



MO132 ≥ 12 A



MO165 manual motor starters magnetic only

16 to 65 A – with electromagnetic protection

2



MO165-65

2CDC241005V0015

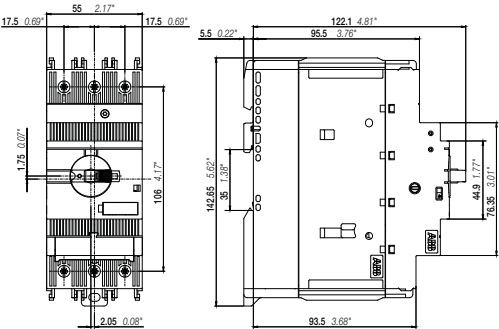
Description

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	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 pc)
kW	A	kA	A				kg
7.5	16	100	240	M0165-16	1SAM461000R1011		0.950
7.5	20	100	300	M0165-20	1SAM461000R1012		0.950
11	25	100	375	M0165-25	1SAM461000R1013		0.960
15	32	50	480	M0165-32	1SAM461000R1014		0.970
22	42	25	630	M0165-42	1SAM461000R1015		0.970
22	54	25	810	M0165-54	1SAM461000R1016		0.970
30	65	25	975	M0165-65	1SAM461000R1017		0.980

Main dimensions mm, inches



MO165

2CDC242002F0014

2CDC131062C0201

MS132-T circuit breakers for transformer protection

0.10 to 25 A – with thermal and electromagnetic protection



MS132-10T



MS132-25T

Description

Circuit breakers for transformer protection are electro mechanical protection devices specially designed to protect control transformers on the primary side. They allow fuse-less protection against overload and short-circuit, saving space and cost and ensuring a quick reaction under short-circuit condition by switching off the transformer within milliseconds. The short-circuit current setting is fixed to 20 times the operating current to handle the high inrush current generated by transformers. The device allows manual connection and disconnection of the transformer from the mains.

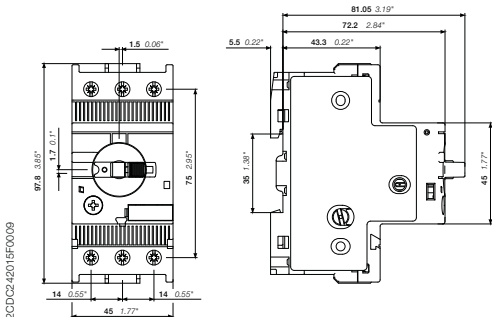
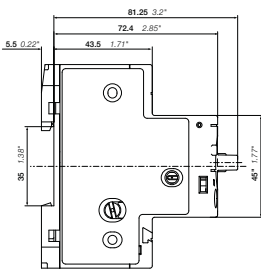
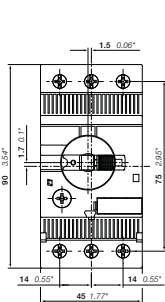
MS132-T is a 45 mm (width) compact and powerful range for transformer protection up to 12.5 kW (400 V) / 25 A. This type has also a clear and reliable indication of fault in a separate window in the event of short-circuit tripping. Further features are the build-in disconnect function, temperature compensation, trip-free mechanism and a rotary handle with a clear switch position indication. The handle is lockable to protect against unauthorized changes. Auxiliary contacts, signaling contacts, undervoltage releases, shunt trips, power in-feed blocks are available as accessory. These are suitable throughout the MS116/MS132/MS165-range. Moreover ABB offers special accessories for fast single-phase setup.

Ordering details

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 pc)
A	kA	A			kg
0.10 ... 0.16	100	3.2	MS132-0.16T	1SAM340000R1001	0.215
0.16 ... 0.25	100	5	MS132-0.25T	1SAM340000R1002	0.215
0.25 ... 0.40	100	8	MS132-0.4T	1SAM340000R1003	0.215
0.40 ... 0.63	100	12.6	MS132-0.63T	1SAM340000R1004	0.215
0.63 ... 1.00	100	20	MS132-1.0T	1SAM340000R1005	0.215
1.00 ... 1.60	100	32	MS132-1.6T	1SAM340000R1006	0.265
1.60 ... 2.50	100	50	MS132-2.5T	1SAM340000R1007	0.265
2.50 ... 4.00	100	80	MS132-4.0T	1SAM340000R1008	0.265
4.00 ... 6.30	100	126	MS132-6.3T	1SAM340000R1009	0.265
6.30 ... 10.0	100	200	MS132-10T	1SAM340000R1010	0.265
8.00 ... 12.0	100	240	MS132-12T	1SAM340000R1012	0.310
10.0 ... 16.0	100	320	MS132-16T	1SAM340000R1011	0.310
16.0 ... 20.0	100	400	MS132-20T	1SAM340000R1013	0.310
20.0 ... 25.0	50	500	MS132-25T	1SAM340000R1014	0.310

Please check for single-phase equipment chapter Main accessories.

Main dimensions mm, inches



MS132T ≤ 10 A

MS132T ≥ 12 A

Technical data

MS116, MS132, MS165, MO132, MO165, MS132-T

Main circuit – Utilization characteristics according to IEC/EN

Type	MS116	MS132	MS165	MO132	MO165	MS132-T
Standards	IEC/EN 60947-2, IEC/EN 60947-4-1, IEC/EN 60947-1					
Rated operational voltage U_e	690 V AC	690 V AC / 250 V DC	690 V AC	690 V AC	690 V AC	690 V AC
Rated frequency	50/60 Hz	DC, 50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz
Trip class	10A	10 (10A for 1SA M350000R1001)	10	-	-	10
Number of poles	3					
Duty time	100 %					
Mechanical durability	100000 cycles	100000 cycles	50000 cycles	100000 cycles	50000 cycles	100000 cycles
Electrical durability	up to 16 A	100000 cycles	50000 cycles	25000 cycles	50000 cycles	50000 cycles
	20 ... 65 A	50000 cycles	50000 cycles	25000 cycles	25000 cycles	50000 cycles
Rated impulse withstand voltage U_{imp}	6 kV	6 kV	8 kV	6 kV	8 kV	6 kV
Rated insulation voltage U_i	690 V	690 V	1000 V	690 V	1000 V	690 V
Rated operational current I_n	See ordering details					
Rated operational current DC-5 I_{DC-5} 3 conducting paths in series up to 250 V	-	See "Rated operational current I_n "	-	-	-	-
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"					
Rated service short-circuit breaking capacity DC I_{cs} 3 conducting paths in series up to 250 V	-	10 kA	-	-	-	-

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	No back-up fuse required up to $I_{cc} = 50$ kA						No back-up fuse required up to $I_{cc} = 30$ kA								
MS116-0.25															
MS116-0.4															
MS116-0.63															
MS116-1.0															
MS116-1.6	No back-up fuse required up to $I_{cc} = 50$ kA						10	10	25	10	10	25	5	5	25
MS116-2.5							6	6	25	6	6	25	2	2	25
MS116-4.0							6	6	63	6	6	63	2	2	40
MS116-6.3							6	6	63	6	6	63	2	2	50
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	125	10	15	125	3	6	125	3	4	125	2	2	80
MS116-25	10	15	125	10	15	125	3	6	125	3	4	125	2	2	100
MS116-32	10	10	125	10	10	125	3	6	125	3	4	125	2	2	100

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 10 kA at 400 V.

Technical data

MS116, MS132, MS165, MO132, MO165, MS132-T

2

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	No back-up fuse required up to $I_{cc} = 100$ kA														
MS132-0.25															
MS132-0.4															
MS132-0.63															
MS132-1.0															
MS132-1.6															
MS132-2.5							20	20	35	20	20	35	3	3	32
MS132-4.0							20	20	63	20	20	63	3	3	50
MS132-6.3							20	20	100	20	20	100	3	3	50
MS132-10							20	20	100	20	20	100	3	3	63
MS132-12							20	20	125	20	20	125	3	3	63
MS132-16							20	20	125	20	20	125	3	3	80
MS132-20							20	20	125	20	20	125	3	3	100
MS132-25	50	50	125	50	50	125	20	20	125	10	10	125	3	3	100
MS132-32	25	50	125	25	50	125	20	20	125	10	10	125	3	3	100

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.

Type	230 V AC			400 V AC			440 V AC			500 V AC			690 V AC		
	I_{CS} kA	I_{CU} kA	gG A	I_{CS} kA	I_{CU} kA	gG A	I_{CS} kA	I_{CU} kA	gG A	I_{CS} kA	I_{CU} kA	gG A	I_{CS} kA	I_{CU} kA	gG A
MS165-16	100	100	-	100	100	-	8	8	125	8	8	125	8	8	63
MS165-20	100	100	-	100	100	-	8	8	125	8	8	125	8	8	63
MS165-25	100	100	-	100	100	-	8	8	125	8	8	125	8	8	80
MS165-32	75	100	-	75	100	-	5	5	125	5	5	125	5	5	100
MS165-42	25	50	125	25	50	125	5	5	125	5	5	125	5	5	100
MS165-54	25	50	125	25	50	125	5	5	125	5	5	125	5	5	100
MS165-65	25	50	125	25	50	125	5	5	125	5	5	125	5	5	100

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							20	20	35	20	20	35	3	3	32
MO132-4.0							20	20	63	20	20	63	3	3	50
MO132-6.3							20	20	100	20	20	100	3	3	50
MO132-10							20	20	100	20	20	100	3	3	63
MO132-12							20	20	125	20	20	125	3	3	63
MO132-16							20	20	125	20	20	125	3	3	80
MO132-20							20	20	125	20	20	125	3	3	100
MO132-25	50	50	125	50	50	125	10	10	125	10	10	125	3	3	100
MO132-32	25	50	125	25	50	125	10	10	125	10	10	125	3	3	100

MO132-20: No need for back-up fuse in networks with a prospective current of up to 100 kA at 400 V.

MO132-32: 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.

Technical data

MS116, MS132, MS165, MO132, MO165, MS132-T

2

Type	230 V AC			400 V AC			440 V AC			500 V AC			690 V AC		
	I _{CS} kA	I _{CU} kA	gG A	I _{CS} kA	I _{CU} kA	gG A	I _{CS} kA	I _{CU} kA	gG A	I _{CS} kA	I _{CU} kA	gG A	I _{CS} kA	I _{CU} kA	gG A
MO165-16	100	100	-	100	100	-	8	8	125	8	8	125	8	8	63
MO165-20	100	100	-	100	100	-	8	8	125	8	8	125	8	8	63
MO165-25	100	100	-	100	100	-	8	8	125	8	8	125	8	8	80
MO165-32	50	100	-	50	100	-	5	5	125	5	5	125	5	5	100
MO165-42	25	50	125	25	50	125	5	5	125	5	5	125	5	5	100
MO165-54	25	50	125	25	50	125	5	5	125	5	5	125	5	5	100
MO165-65	25	50	125	25	50	125	5	5	125	5	5	125	5	5	100

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
MS132-0.16T	No back-up fuse required up to I _{cc} = 100 kA														
MS132-0.25T															
MS132-0.4T															
MS132-0.63T															
MS132-1.0T															
MS132-1.6T															
MS132-2.5T															
MS132-4.0T	30	30	35	20	20	35	3	3	32						
MS132-6.3T	30	30	63	20	20	63	3	3	50						
MS132-10T	30	30	100	20	20	100	3	3	50						
MS132-12T	30	30	100	20	20	100	3	3	63						
MS132-16T	30	30	125	20	20	125	3	3	63						
MS132-20T	30	30	125	20	20	125	3	3	80						
MS132-25T	50	50	125	50	50	125	30	30	125	10	10	125	3	3	100

Main circuit – Utilization characteristics according to UL/CSA

Type	MS116	MS132	MS165	MO132	MO165	MS132-T
Standards	UL 60947-1, UL 60947-4-1 (UL 508), CSA C22.2 No.60947-4-1 (CSA C22.2 No.14)					-
Rated operational voltage U _e acc. to UL/CSA	600 V AC					-
Trip class	10A	10		-		-
Motor ratings ¹⁾	Horsepower					-
	Full Load Amps (FLA)					-
	Locked Rotor Amps (LRA)					-

¹⁾ See product data sheets for UL/CSA single-phase motor and general use (AC-1) ratings.

UL/CSA ratings overview

Type	MS116	MS132	MS165	MO132	MO165	MS132-T
Manual Motor Controller	x	x	x	x	x	-
Manual Motor Controller, Suitable as Motor Disconnect	x	x	x	x	x	-
Manual Motor Controller, Suitable for use in Group Installations	x	x	x	x	x	-
Manual Motor Controller, Suitable for Tap Conductor Protection in Group Installations	-	x	x	x	x	-
Manual self-protected Combination Motor Controller (Type E)	-	x	x	-	-	-
Combination Motor Controller (Type F)	-	with AF contactor	with AF contactor	with AF contactor and EOL	-	-

Technical data

MS116, MS132, MS165, MO132, MO165, MS132-T

UL/CSA Motor ratings, three-phase – MS116

Type	200 V AC			208 V AC			220 ... 240 V AC			440 ... 480 V AC			550 ... 600 V AC		
	hp	FLA	LRA	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	-	0.16	0.96
MS116-0.25	-	0.25	1.5	-	0.25	1.5	-	0.25	1.5	-	0.25	1.5	-	0.25	1.5
MS116-0.40	-	0.4	2.4	-	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	-	0.63	3.78
MS116-1.0	-	1	6	-	1	6	-	1	6	-	1	6	1/2	1	6
MS116-1.6	-	1.6	9.6	-	1.6	9.6	-	1.6	9.6	3/4	1.6	9.6	3/4	1.6	9.6
MS116-2.5	1/2	2.5	15	1/2	2.5	15	1/2	2.5	15	1	2.5	15	1 1/2	2.5	15
MS116-4.0	3/4	4	24	3/4	4	24	1	4	24	2	4	24	3	3.9	25.6
MS116-6.3	1	6.3	37.8	1	6.3	37.8	1 1/2	6.3	37.8	3	4.8	32	5	6.1	36.8
MS116-10	2	7.8	57.5	2	7.5	55	3	9.6	64	5	7.6	46	7 1/2	9	50.8
MS116-12	3	11	73.6	3	10.6	71	3	9.6	64	7 1/2	11	63.5	10	11	64.8
MS116-16	3	11	73.6	3	10.6	71	5	15.2	92	10	14	81	10	11	64.8
MS116-20	5	17.5	105.8	5	16.7	102	5	15.2	92	10	14	81	15	17	93
MS116-25	5	17.5	105.8	7 1/2	24.2	140	7 1/2	22	127	15	21	116	20	22	116
MS116-32	7 1/2	25.3	146	10	30.8	179	10	28	162	20	27	145	25	27	146

UL/CSA Motor ratings, three-phase – MS132

Type	200 V AC			208 V AC			220 ... 240 V AC			440 ... 480 V AC			550 ... 600 V AC		
	hp	FLA	LRA	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	-	0.16	0.96
MS132-0.25	-	0.25	1.5	-	0.25	1.5	-	0.25	1.5	-	0.25	1.5	-	0.25	1.5
MS132-0.40	-	0.4	2.4	-	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	-	0.63	3.78
MS132-1.0	-	1	6	-	1	6	-	1	6	-	1	6	1/2	1	6
MS132-1.6	-	1.6	9.6	-	1.6	9.6	-	1.6	9.6	3/4	1.6	9.6	3/4	1.6	9.6
MS132-2.5	1/2	2.5	15	1/2	2.5	15	1/2	2.5	15	1	2.5	15	1-1/2	2.5	15
MS132-4.0	3/4	4	24	3/4	4	24	1	4	24	2	4	24	3	3.9	25.6
MS132-6.3	1	6.3	37.8	1	6.3	37.8	1 1/2	6.3	37.8	3	4.8	32	5	6.1	36.8
MS132-10	2	7.8	57.5	2	7.5	55	3	9.6	64	5	7.6	46	7 1/2	9	50.8
MS132-12	3	11	73.6	3	10.6	71	3	9.6	64	7 1/2	11	63.5	10	11	64.8
MS132-16	3	11	73.6	3	10.6	71	5	15.2	92	10	14	81	10	11	64.8
MS132-20	5	17.5	105.8	5	16.7	102	5	15.2	92	10	14	81	15	17	93
MS132-25	5	17.5	105.8	7 1/2	24.2	140	7 1/2	22	127	15	21	116	20	22	116
MS132-32	7 1/2	25.3	146	10	30.8	179	10	28	162	20	27	145	25	27	146

UL/CSA Motor ratings, three-phase – MS165

Type	200 V AC			208 V AC			220 ... 240 V AC			440 ... 480 V AC			550 ... 600 V AC		
	hp	FLA	LRA	hp	FLA	LRA	hp	FLA	LRA	hp	FLA	LRA	hp	FLA	LRA
MS165-16	3	11	73.6	3	10.6	71	5	15.2	92	10	14	81	10	11	64.8
MS165-20	5	17.5	105.8	5	16.7	102	5	15.2	92	10	14	81	15	17	93
MS165-25	5	17.5	105.8	7 1/2	24.2	140	7 1/2	22	127	15	21	116	20	22	116
MS165-32	7 1/2	25.3	146	10	30.8	179	10	28	162	20	27	145	30	32	174
MS165-42	10	32.2	186.3	10	30.8	179	15	42	232	30	40	218	40	41	232
MS165-54	15	48.3	267	15	46.2	257	20	54	290	40	52	290	50	52	290
MS165-65	20	62.1	334	20	59.4	321	20	54	290	50	65	363	60	62	348

hp Horsepower
FLA Full Load Amps
LRA Locked Rotor Amps

Note: Manual motor starters should always be selected so that the actual motor current is within the setting range; see ordering detail pages. Horsepower (hp) ratings are for reference only.

2

Technical data

MS116, MS132, MS165, MO132, MO165, MS132-T

UL/CSA Motor ratings, three-phase – MO132

Type	200 V AC			208 V AC			220 ... 240 V AC			440 ... 480 V AC			550 ... 600 V AC		
	hp	FLA	LRA	hp	FLA	LRA	hp	FLA	LRA	hp	FLA	LRA	hp	FLA	LRA
MO132-0.16	-	0.16	0.96	-	0.16	0.96	-	0.16	0.96	-	0.16	0.96	-	0.16	0.96
MO132-0.25	-	0.25	1.5	-	0.25	1.5	-	0.25	1.5	-	0.25	1.5	-	0.25	1.5
MO132-0.40	-	0.4	2.4	-	0.4	2.4	-	0.4	2.4	-	0.4	2.4	-	0.4	2.4
MO132-0.63	-	0.63	3.78	-	0.63	3.78	-	0.63	3.78	-	0.63	3.78	-	0.63	3.78
MO132-1.0	-	1	6	-	1	6	-	1	6	-	1	6	1/2	1	6
MO132-1.6	-	1.6	9.6	-	1.6	9.6	-	1.6	9.6	3/4	1.6	9.6	3/4	1.6	9.6
MO132-2.5	1/2	2.5	15	1/2	2.5	15	1/2	2.5	15	1	2.5	15	1 1/2	2.5	15
MO132-4.0	3/4	4	24	3/4	4	24	1	4	24	2	4	24	3	3.9	25.6
MO132-6.3	1	6.3	37.8	1	6.3	37.8	1 1/2	6.3	37.8	3	4.8	32	5	6.1	36.8
MO132-10	2	7.8	57.5	2	7.5	55	3	9.6	64	5	7.6	46	7 1/2	9	50.8
MO132-12	3	11	73.6	3	10.6	71	3	9.6	64	7 1/2	11	63.5	10	11	64.8
MO132-16	3	11	73.6	3	10.6	71	5	15.2	92	10	14	81	10	11	64.8
MO132-20	5	17.5	105.8	5	16.7	102	5	15.2	92	10	14	81	15	17	93
MO132-25	5	17.5	105.8	7 1/2	24.2	140	7 1/2	22	127	15	21	116	20	22	116
MO132-32	7 1/2	25.3	146	10	30.8	179	10	28	162	20	27	145	25	27	146

UL/CSA Motor ratings, three-phase – MO165

Type	200 V AC			208 V AC			220 ... 240 V AC			440 ... 480 V AC			550 ... 600 V AC		
	hp	FLA	LRA	hp	FLA	LRA	hp	FLA	LRA	hp	FLA	LRA	hp	FLA	LRA
MO165-16	3	11	73.6	3	10.6	71	5	15.2	92	10	14	81	10	11	64.8
MO165-20	5	17.5	105.8	5	16.7	102	5	15.2	92	10	14	81	15	17	93
MO165-25	5	17.5	105.8	7 1/2	24.2	140	7 1/2	22	127	15	21	116	20	22	116
MO165-32	7 1/2	25.3	146	10	30.8	179	10	28	162	20	27	145	30	32	174
MO165-42	10	32.2	186.3	10	30.8	179	15	42	232	30	40	218	40	41	232
MO165-54	15	48.3	267	15	46.2	257	20	54	290	40	52	290	50	52	290
MO165-65	20	62.1	334	20	59.4	321	20	54	290	50	65	363	60	62	348

hp Horsepower
FLA Full Load Amps
LRA Locked Rotor Amps

Technical data

MS116, MS132, MS165, MO132, MO165, MS132-T

UL/CSA Maximum short-circuit current ratings – MS116

Type	Manual Motor Controllers					
	Branch circuit protection, max. size per NEC/CEC ¹⁾		for motor disconnect ²⁾		for group installations	
	Fuses	Circuit breaker	480 V	600 V	480 V	600 V
	A	A	kA	kA	kA	kA
MS116-0.16	100	-	30	5	30	5
MS116-0.25	100	-	30	5	30	5
MS116-0.40	100	-	30	5	30	5
MS116-0.63	100	-	30	5	30	5
MS116-1.0	100	-	30	5	30	5
MS116-1.6	100	-	30	5	30	5
MS116-2.5	100	-	30	5	30	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⁾ NEC: NFPA®70 National Electrical Code®; CEC: CSA C22.1 Canadian Electrical Code.

²⁾ Suitable as motor disconnect only when provide with padlock adaptor SA1 or SA3.

UL/CSA Maximum short-circuit current ratings – MS132

Type	Manual Motor Controllers		for motor disconnect		for group installations		for tap conductor protection in group installations		Manual self-protected Combination Motor Controllers (Type E) ²⁾	
	Branch circuit protection, max. size per NEC/CEC ¹⁾									
	Fuses	Circuit breaker	480 V	600 V	480 V	600 V	480 V	600 V	480Y / 277 V	600Y / 374 V
	A	A	kA	kA	kA	kA	kA	kA	kA	kA
MS132-0.16	Any Listed fuses. Size per NEC/CEC	Any Listed UL489 / CSA C22.2 No.5 circuit breaker. Size per NEC/CEC	65	47	65	47	65	47	65	47
MS132-0.25			65	47	65	47	65	47	65	47
MS132-0.40			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	47	65	47	65	47	65	47
MS132-6.3			65	18	65	35	65	18	65	18
MS132-10			65	18	65	35	65	18	65	18
MS132-12			30	18	35	35	30	18	30	-
MS132-16			30	18	35	35	30	18	30	-
MS132-20			30	18	35	35	30	18	30	-
MS132-25			30	18	35	35	30	18	30	-
MS132-32			30	18	35	35	30	18	30	-

¹⁾ NEC: NFPA®70 National Electrical Code®; CEC: CSA C22.1 Canadian Electrical Code.

²⁾ Requires the use of S1-M3-xx line-side terminal feeder block.

Technical data

MS116, MS132, MS165, MO132, MO165, MS132-T

UL/CSA Maximum short-circuit current ratings – MS132 with AF contactors

Type	Combination Motor Controllers (Type F) ¹⁾		
	Minimum contactor size	480Y / 277 V	600Y / 374 V
		kA	kA
MS132-0.16	AF26 ... AF38	65	47
MS132-0.25	AF26 ... AF38	65	47
MS132-0.40	AF26 ... AF38	65	47
MS132-0.63	AF26 ... AF38	65	47
MS132-1.0	AF26 ... AF38	65	47
MS132-1.6	AF26 ... AF38	65	47
MS132-2.5	AF26 ... AF38	65	47
MS132-4.0	AF26 ... AF38	65	47
MS132-6.3	AF26 ... AF38	65	47
MS132-10	AF26 ... AF38	65	47
MS132-12	AF26 ... AF38	30	-
MS132-16	AF26 ... AF38	30	-
MS132-20	AF26 ... AF38	30	-
MS132-25	AF26 ... AF38	30	-
MS132-32	AF26 ... AF38	30	-

¹⁾ Requires the use of S1-M3-xx line-side terminal feeder block.

UL/CSA Maximum short-circuit current ratings – MS165

Type	Manual Motor Controllers Branch circuit protection, max. size per NEC/CEC ¹⁾		for motor disconnect		for group installations		for tap conductor protection in group installations		Manual self-protected Com- bination Motor Controllers (Type E)	
	Fuses	Circuit breaker	480 V	600 V	480 V	600 V	480 V	600 V	480Y / 277 V	600Y / 374 V
	A	A	kA	kA	kA	kA	kA	kA	kA	kA
MS165-16	Any Listed fuses. Size per NEC/CEC	Any Listed UL489 / CSA C22.2 No.5 circuit breaker. Size per NEC/CEC	65	30	65	30	65	30	65	30
MS165-20			65	30	65	30	65	30	65	30
MS165-25			65	30	65	30	65	30	65	30
MS165-32			65	30	65	30	65	30	65	30
MS165-42			65	30	65	30	65	30	65	-
MS165-54			65	30	65	30	65	30	65	-
MS165-65			65	30	65	30	65	30	65	-

¹⁾ NEC: NFPA®70 National Electrical Code®; CEC: CSA C22.1 Canadian Electrical Code.

UL/CSA Maximum short-circuit current ratings – MS165 with AF contactors

Type	Combination Motor Controllers (Type F)		
	Minimum contactor size	480Y / 277 V	600Y / 374 V
		kA	kA
MS165-16	AF09	65	30
MS165-20	AF26	65	30
MS165-25	AF26	65	30
MS165-32	AF26	65	30
MS165-42	AF40	65	-
MS165-54	AF40	65	-
MS165-65	AF40	65	-

Technical data

MS116, MS132, MS165, MO132, MO165, MS132-T

UL/CSA Maximum short-circuit current ratings – MO132

Type	Manual Motor Controllers		for motor disconnect		for group installations		for tap conductor protection in group installations	
	Branch circuit protection, max. size per NEC/CEC ¹⁾							
	Fuses	Circuit breaker	480 V	600 V	480 V	600 V	480 V	600 V
	A	A	kA	kA	kA	kA	kA	kA
MO132-0.16	Any Listed fuses. Size per NEC/ CEC	Any Listed UL489 / CSA C22.2 No.5 circuit breaker. Size per NEC/ CEC	65	47	65	47	65	47
MO132-0.25			65	47	65	47	65	47
MO132-0.40			65	47	65	47	65	47
MO132-0.63			65	47	65	47	65	47
MO132-1.0			65	47	65	47	65	47
MO132-1.6			65	47	65	47	65	47
MO132-2.5			65	47	65	47	65	47
MO132-4.0			65	47	65	47	65	47
MO132-6.3			65	18	65	35	65	18
MO132-10			65	18	65	35	65	18
MO132-12			30	18	35	35	30	18
MO132-16			30	18	35	35	30	18
MO132-20			30	18	35	35	30	18
MO132-25			30	18	35	35	30	18
MO132-32			30	18	35	35	30	18

¹⁾ NEC: NFPA®70 National Electrical Code®; CEC: CSA C22.1 Canadian Electrical Code.

UL/CSA Maximum short-circuit current ratings – MO165

Type	Manual Motor Controllers		for motor disconnect		for group installations		for tap conductor protection in group installations	
	Branch circuit protection, max. size per NEC/CEC ¹⁾							
	Fuses	Circuit breaker	480 V	600 V	480 V	600 V	480 V	600 V
	A	A	kA	kA	kA	kA	kA	kA
MO165-16	Any Listed fuses. Size per NEC/ CEC	Any Listed UL489 / CSA C22.2 No.5 circuit breaker. Size per NEC/ CEC	65	30	65	30	65	30
MO165-20			65	30	65	30	65	30
MO165-25			65	30	65	30	65	30
MO165-32			65	30	65	30	65	30
MO165-42			65	30	65	30	65	30
MO165-54			65	30	65	30	65	30
MO165-65			65	30	65	30	65	30

¹⁾ NEC: NFPA®70 National Electrical Code®; CEC: CSA C22.1 Canadian Electrical Code.

Technical data

MS116, MS132, MS165, MO132, MO165, MS132-T

General technical data

Type	MS116	MS132	MS165	MO132	MO165	MS132-T
Pollution degree	3	3	3	3	3	3
Phase loss sensitivity	Yes	Yes	Yes	No	No	Yes
Disconnect function acc. to IEC/EN 60947-2	Yes	Yes	Yes	Yes	Yes	Yes
Ambient air temperature						
Operation						
Open - compensated	-25 ... +55 °C	-25 ... +60 °C	-25 ... +60 °C	-	-	-25 ... +60 °C
Open	-25 ... +70 °C	-25 ... +70 °C	-25 ... +60 °C	-25 ... +60 °C	-25 ... +60 °C	-25 ... +70 °C
Enclosed (IB132)	0 ... +40 °C	0 ... +40 °C	-	-	-	0 ... +40 °C
Storage	-50 ... +80 °C	-50 ... +80 °C	-50 ... +80 °C	-50 ... +80 °C	-50 ... +80 °C	-50 ... +80 °C
Ambient air temperature compensation	Acc. to IEC/EN60947-4-1	Acc. to IEC/EN60947-4-1	Acc. to IEC/EN60947-4-1	-	-	Acc. to IEC/EN60947-4-1
Maximum operating altitude permissible	2000 m	2000 m	2000 m	2000 m	2000 m	2000 m
Resistance to shock acc. to IEC 60068-2-27	25g / 11 ms	25g / 11 ms	25g / 11 ms	25g / 11 ms	25g / 11 ms	25g / 11 ms
Resistance to vibrations acc. to IEC 60068-2-6	5g / 3 ... 150 Hz	5g / 3 ... 150 Hz	5g / 3 ... 150 Hz	5g / 3 ... 150 Hz	5g / 3 ... 150 Hz	5g / 3 ... 150 Hz
Mounting position	Position 1-6 (optional for single mounting)	Position 1-6 (optional for single mounting)	Position 1-6 (optional for single mounting)	Position 1-6 (optional for single mounting)	Position 1-6 (optional for single mounting)	Position 1-6 (optional for single mounting)
Mounting	DIN-rail (EN 60715)	DIN-rail (EN 60715)	DIN-rail (EN 60715)	DIN-rail (EN 60715)	DIN-rail (EN 60715)	DIN-rail (EN 60715)
Group mounting	On request	On request	On request	On request	On request	-
Minimum distance to other units same type						
Horizontal	0 mm	0 mm	0 mm	0 mm	0 mm	0 mm
Vertical	150 mm	150 mm	150 mm	150 mm	150 mm	150 mm
Minimum distance to electrical conductive board						
Horizontal, up to 400 V	0 mm	0 mm	0 mm	0 mm	0 mm	0 mm
Horizontal, up to 690 V	> 1.5 mm	> 1.5 mm	> 1.5 mm	> 1.5 mm	> 1.5 mm	> 1.5 mm
Vertical	75 mm	75 mm	75 mm	75 mm	75 mm	75 mm
Degree of protection						
Housing	IP20	IP20	IP20	IP20	IP20	IP20
Main circuit terminals	IP20	IP20	IP10	IP20	IP10	IP20

Connecting characteristics

Main circuit

Type	MS116 ≤ 16 A	MS116 ≥ 20 A
Connecting capacity		
 Rigid	1 or 2 x 1 ... 4 mm²	2.5 ... 6 mm²
 Flexible with ferrule	1 or 2 x 0.75 ... 2.5 mm²	1 ... 6 mm²
 Flexible with insulated ferrule	1 or 2 x 0.75 ... 2.5 mm²	1 ... 6 mm²
 Flexible	1 or 2 x 0.75 ... 2.5 mm²	1 ... 6 mm²
Stranded acc. to UL/CSA	1 or 2 x AWG 16-12	AWG 16-8
Stripping length	9 mm	10 mm
Tightening torque	0.8 ... 1.2 Nm / 10 ... 12 lb.in	2.0 Nm / 18 lb.in
Recommended screw driver	Pozidriv 2	Pozidriv 2

Main circuit

Type	MS132 ≤ 10 A	MS132 ≥ 12 A
Connecting capacity		
 Rigid	1 or 2 x 1 ... 4 mm²	1 ... 2.5 mm² 2.5 ... 6 mm²
 Flexible with ferrule	1 or 2 x 0.75 ... 2.5 mm²	0.75 ... 6 mm²
 Flexible with insulated ferrule	1 or 2 x 0.75 ... 2.5 mm²	0.75 ... 6 mm²
 Flexible	1 or 2 x 0.75 ... 2.5 mm²	1 ... 2.5 mm² 2.5 ... 6 mm²
Stranded acc. to UL/CSA	1 or 2 x AWG 16-12	AWG 16-8
Stripping length	9 mm	10 mm
Tightening torque	0.8 ... 1.2 Nm / 10 ... 12 lb.in	2.0 Nm / 18 lb.in
Recommended screw driver	Pozidriv 2	Pozidriv 2

Technical data

MS116, MS132, MS165, MO132, MO165, MS132-T

Connecting characteristics

Main circuit		
Type	MS165	
Connecting capacity		
 Rigid	1 or 2 x	1 ... 50 mm ²
 Flexible with ferrule	1 or 2 x	1 ... 35 mm ²
 Flexible with insulated ferrule	1 or 2 x	1 ... 35 mm ²
 Flexible	1 or 2 x	1 ... 35 mm ²
Stranded acc. to UL/CSA	1 or 2 x	AWG 16-3
Stripping length	16 mm	
Tightening torque	4.0 Nm / 35 lb.in	
Recommended screw driver	Pozidriv 2	

Main circuit		
Type	MO132 ≤ 10 A	MO132 ≥ 12 A
Connecting capacity		
 Rigid	1 or 2 x	1 ... 4 mm ²
 Flexible with ferrule	1 or 2 x	0.75 ... 2.5 mm ²
 Flexible with insulated ferrule	1 or 2 x	0.75 ... 2.5 mm ²
 Flexible	1 or 2 x	0.75 ... 2.5 mm ²
Stranded acc. to UL/CSA	1 or 2 x	AWG 16-12
Stripping length	9 mm	10 mm
Tightening torque	0.8 ... 1.2 Nm / 10 ... 12 lb.in	2.0 Nm / 18 lb.in
Recommended screw driver	Pozidriv 2	Pozidriv 2

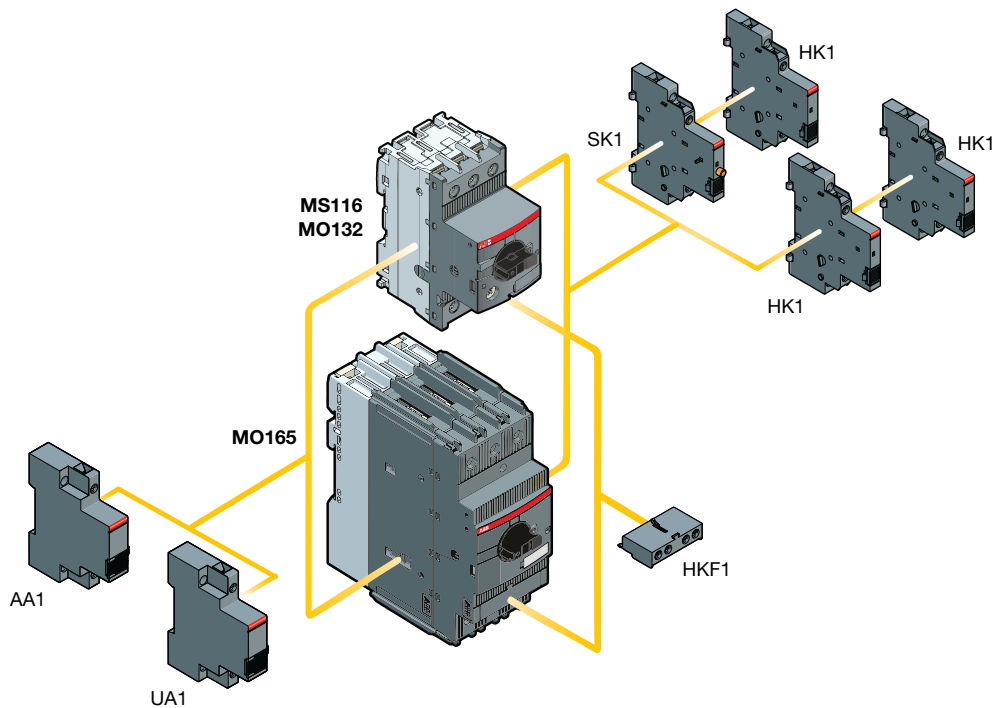
Main circuit		
Type	MO165	
Connecting capacity		
 Rigid	1 or 2 x	1 ... 50 mm ²
 Flexible with ferrule	1 or 2 x	1 ... 35 mm ²
 Flexible with insulated ferrule	1 or 2 x	1 ... 35 mm ²
 Flexible	1 or 2 x	1 ... 35 mm ²
Stranded acc. to UL/CSA	1 or 2 x	AWG 16-3
Stripping length	16 mm	
Tightening torque	4.0 Nm / 35 lb.in	
Recommended screw driver	Pozidriv 2	

Main circuit		
Type	MS132-T ≤ 10 A	MS132-T ≥ 12 A
Connecting capacity		
 Rigid	1 or 2 x	1 ... 4 mm ²
 Flexible with ferrule	1 or 2 x	0.75 ... 2.5 mm ²
 Flexible with insulated ferrule	1 or 2 x	0.75 ... 2.5 mm ²
 Flexible	1 or 2 x	0.75 ... 2.5 mm ²
Stripping length	9 mm	10 mm
Tightening torque	0.8 ... 1.2 Nm / 10 ... 12 lb.in	2.0 Nm / 18 lb.in
Recommended screw driver	Pozidriv 2	Pozidriv 2

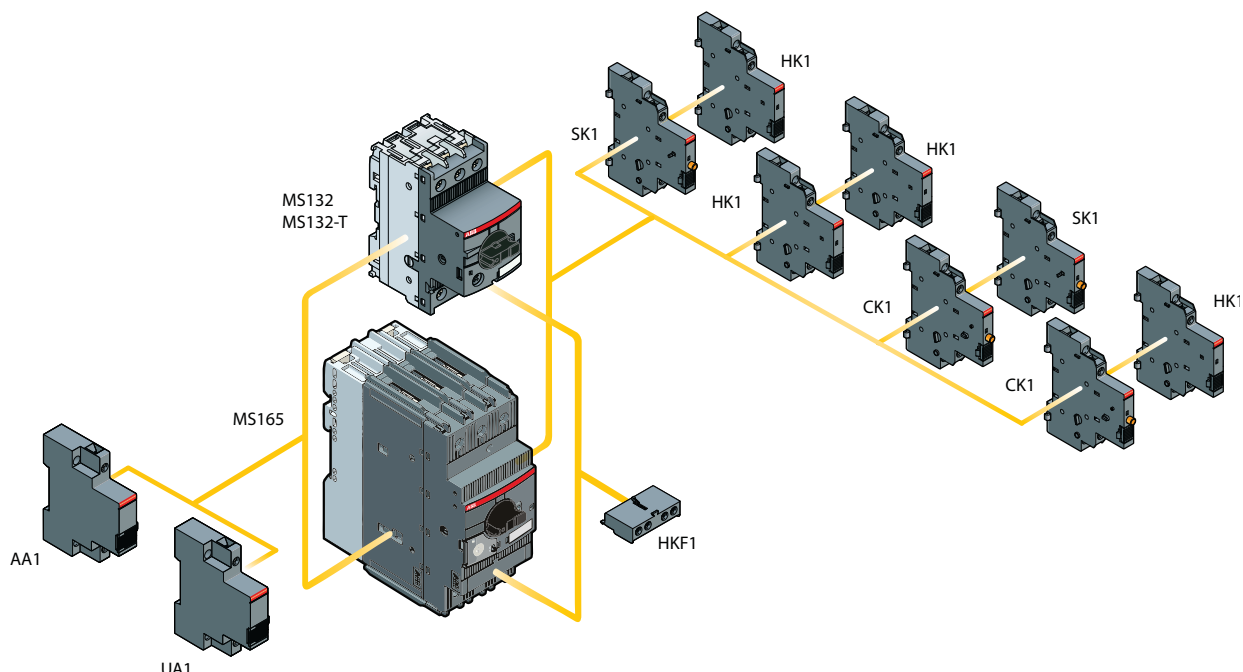
Main accessories MS116, MS132, MS165, MO132, MO165, MS132-T

Manual motor starters with accessories (MS116, MO132, MO165)

2



Manual motor starters with accessories (MS132, MS165) and circuit breaker for transformer protection (MS132-T)



Main accessories

MS116, MS132, MS165, MO132, MO165, MS132-T



HKF1-11



HK1-11



SK1-11



CK1-11

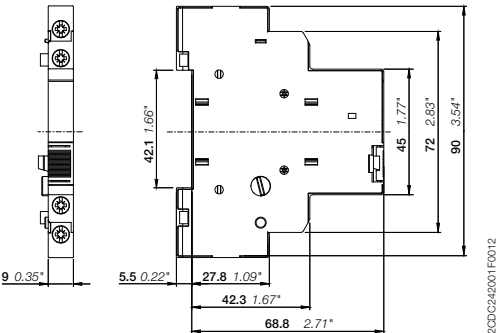
Description

MMS and MS132-T can be equipped with auxiliary contacts for lateral/front mounting, signaling contacts for lateral mounting, undervoltage releases and shunt trips. Two different signaling 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 signaling contact SK signals tripping regardless if it was caused by short-circuit or overload. The signaling contact CK signals tripping in case it was caused by short-circuit. Undervoltage releases are used for remote tripping of the manual motor starters especially for emergency stop circuits. Shunt trips release the MMS used for remote tripping. These main accessories are suitable throughout the MS116/MS132/MS165-range.

Ordering details

Suitable for	Auxiliary contacts N.O.	Auxiliary contacts N.C.	Description	Type	Order code	Pkg qty	Weight (1 pc)
						pcs	kg
Auxiliary contacts – mountable on the front							
MS116,	1	1		HKF1-11	1SAM201901R1001	10	0.015
MS132, MS165	1	0		HKF1-10	1SAM201901R1003	10	0.013
MO132, MO165	0	1		HKF1-01	1SAM201901R1004	10	0.013
MS132-T	2	0		HKF1-20	1SAM201901R1002	10	0.015
Auxiliary contacts – mountable on the right							
MS116,	1	1	max. 2 pieces	HK1-11	1SAM201902R1001	2	0.035
MS132, MS165	2	0	max. 2 pieces	HK1-20	1SAM201902R1002	2	0.035
MO132, MO165	0	2	max. 2 pieces	HK1-02	1SAM201902R1003	2	0.035
MS132-T	2	0	with lead contacts	HK1-20L	1SAM201902R1004	2	0.035
Signaling contacts – mountable on the right							
MS116,	1	1	for tripped alarm, max. 2 pieces	SK1-11	1SAM201903R1001	2	0.035
MS132, MS165	2	0	for tripped alarm, max. 2 pieces	SK1-20	1SAM201903R1002	2	0.035
MO132, MO165	0	2	for tripped alarm, max. 2 pieces	SK1-02	1SAM201903R1003	2	0.035
MS132-T							
MS132, MS165,	1	1	for short-circuit alarm, max. 2 pieces	CK1-11	1SAM301901R1001	2	0.035
MS132-T	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

Main dimensions mm, inches



HK1

Main accessories

MS116, MS132, MS165, MO132, MO165, MS132-T

2



AA1-24

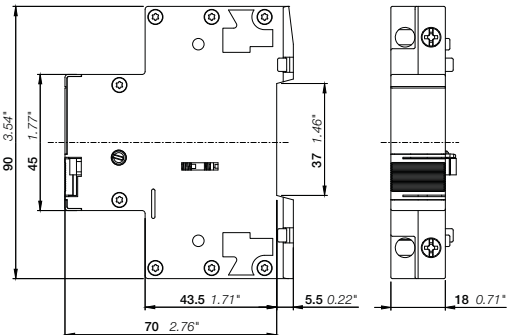


UA1-24

Ordering details

Suitable for	Rated control supply voltage		Type	Order code		Pkg	Weight
	50 Hz V AC	60 Hz V AC				qty	(1 pc)
						pcs	kg
Shunt trips – mountable on the left							
MS116, MS132, MS165, MO132, MO165, MS132-T	20 ... 24	20 ... 24	AA1-24	1SAM201910R1001		1	0.100
	110	110	AA1-110	1SAM201910R1002		1	0.100
	200 ... 240	200 ... 240	AA1-230	1SAM201910R1003		1	0.100
	350 ... 415	350 ... 415	AA1-400	1SAM201910R1004		1	0.100
Undervoltage releases – mountable on the left							
MS116, MS132, MS165, MO132, MO165, MS132-T	20	24	UA1-20	1SAM201904R1010		1	0.100
	24	-	UA1-24	1SAM201904R1001		1	0.100
	48	-	UA1-48	1SAM201904R1002		1	0.100
	60	-	UA1-60	1SAM201904R1003		1	0.100
	110	120	UA1-110	1SAM201904R1004		1	0.100
	-	208	UA1-208	1SAM201904R1008		1	0.100
	230	240	UA1-230	1SAM201904R1005		1	0.100
	400	-	UA1-400	1SAM201904R1006		1	0.100
	415	480	UA1-415	1SAM201904R1007		1	0.100
	-	575	UA1-575	1SAM201904R1009		1	0.100

Main dimensions mm, inches



AA1, UA1

2CDC24202F0012

2CDC131050C0201

Main accessories

MS116, MS132, MS165, MO132, MO165, MS132-T

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_n	690 V AC / 600 DC		250 V AC / 250 V DC
Conventional free-air thermal current I_{th}	6 A		5 A
Rated frequency	50/60 Hz		
Rated impulse withstand voltage U_{imp}	6 kV		
Rated insulation voltage U_i	690 V AC		250 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	25g / 11 ms		
Resistance to vibrations acc. to IEC 60068-2-6	5g / 3 ... 150 Hz		
I_n / Rated operational current AC-15 acc. to IEC/EN 60947-5-1 for utilization category			
	24 V, 120 V	6 A	3 A
	240 V	4 A	1.5 A
	400 V	3 A	-
	440 V, 690 V	1 A	-
I_n / 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 / 5 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 / MS132-T		Front of MMS / MS132-T
Mounting positions	1-6		
Mechanical durability	50000 cycles		-
Electrical durability	50000 cycles		-

Contact utilization characteristics according to UL/CSA

Type	HK1, SK1, CK1	HKF1
Standards	UL 60947-1, UL 60947-4-1 (UL 508), CSA C22.2 No.60947-4-1 (CSA C22.2 No.14)	
Rated operational voltage U_n acc. to UL/CSA	600 V AC / 600 V DC	250 V AC / 250 V DC
Pilot duty	A600, Q600	B300, Q300
AC thermal rated current	10 A	5 A
AC maximum volt-ampere making	7200 VA	3600 VA
AC maximum volt-ampere breaking	720 VA	360 VA
DC thermal rated current	2.5 A	2.5 A
DC maximum volt-ampere making-breaking	69 VA	69 VA

Connecting characteristics

Auxiliary circuit

Type	HK1, SK1, CK1	HKF1
Connecting capacity		
 Rigid	1 or 2 x	1 ... 1.5 mm ²
 Flexible with ferrule	1 or 2 x	0.75 ... 1.5 mm ²
 Flexible with insulated ferrule	1 or 2 x	0.75 ... 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
Stripping length	8 mm	
Tightening torque	0.8 ... 1.2 Nm / 7 lb.in	
Recommended screw driver	Pozidriv 2	

Main accessories

MS116, MS132, MS165, MO132, MO165, MS132-T

General technical data

Type	UA1	AA1
Standards	IEC/EN 60947-1, IEC/EN 60947-4-1, UL 60947-1, UL 60947-4-1 (UL 508), CSA C22.2 No.60947-4-1 (CSA C22.2 No.14)	
Rated control supply voltage	see ordering details	AA1-24: 20-24 V 50/60 Hz; 20-70 V 50/60 Hz KB = 5 s, 20-70 V DC KB = 5 s AA1-100: 110 V 50/60 Hz; 110-200 V 50/60 Hz KB = 5 s, 110-200 V DC KB = 5 s AA1-230: 200-240 V 50/60 Hz, 200-350 V 50/60 Hz KB = 5 s, 200-350 V DC KB = 5 s AA1-400: 350-415 V 50/60 Hz, 350-500 V 50/60 Hz KB = 5 s, 350-500 V DC KB = 5 s
Rated frequency	see ordering details	50/60 Hz, DC
Operating voltage	Tripping 0.35 ... 0.7 x U _s Coil operating voltage 0.85 ... 1.1 x U _s	0.7 ... 1.1 x U _s -
Power consumption	Pull-in AC on request DC on request Holding AC on request DC on request	on request on request - -
Rated impulse withstand voltage U _{imp}	6 kV	6 kV
Rated insulation voltage U _i	690 V	690 V
Pollution degree	3	3
Ambient air temperature	Operation -25 ... +60 °C Storage -50 ... +80 °C	-25 ... +60 °C -50 ... +80 °C
Resistance to shock acc. to IEC 60068-2-27	25g / 11 ms	25g / 11 ms
Resistance to vibrations acc. to IEC 60068-2-6	5g / 3 ... 150 Hz	5g / 3 ... 150 Hz
Mounting	left side of MMS / MS132-T	left side of MMS / MS132-T
Mounting positions	-	-

Connecting characteristics

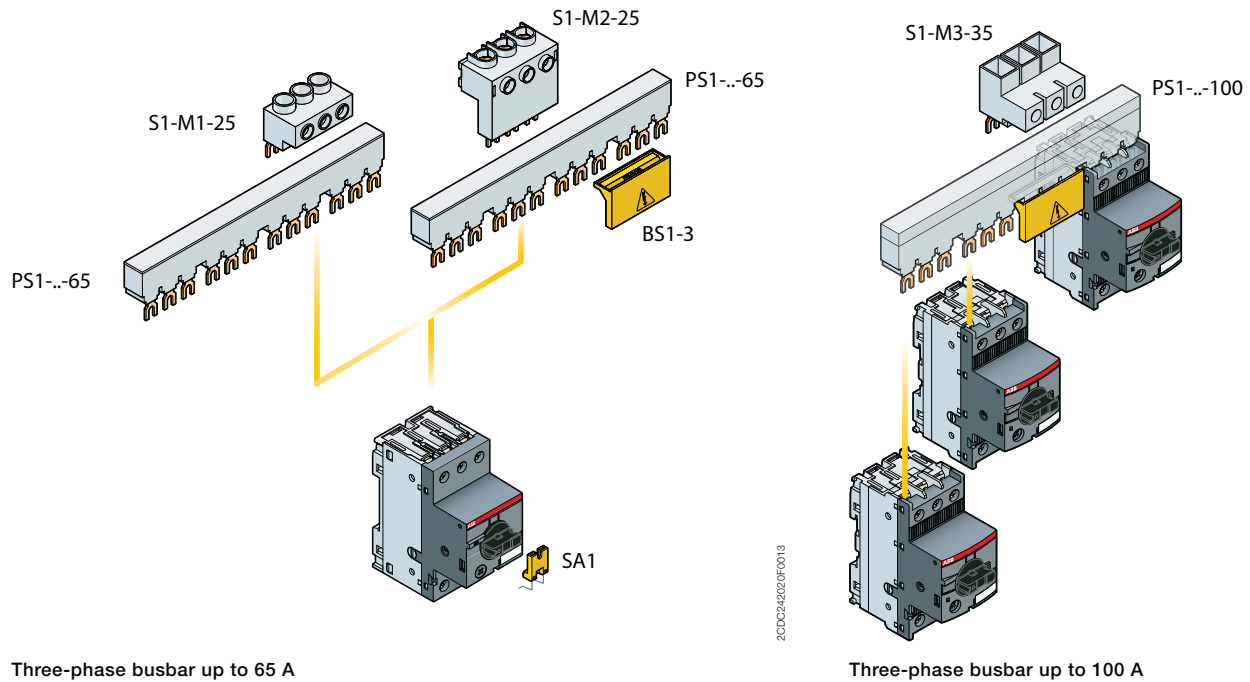
Auxiliary circuit

Type	UA1	AA1
Connecting capacity		
 Rigid	1 or 2 x 1 ... 4 mm ²	
 Flexible with ferrule	1 or 2 x 0.75 ... 2.5 mm ²	
 Flexible with insulated ferrule	1 x 0.75 ... 2.5 mm ² 2 x 0.75 ... 1.5 mm ²	
 Flexible	1 or 2 x 0.75 ... 2.5 mm ²	
Stranded acc. to UL/CSA	1 or 2 x AWG 16-12	
Stripping length	10 mm	
Tightening torque	0.8 ... 1.2 Nm / 7 lb.in	
Recommended screw driver	Pozidriv 2	

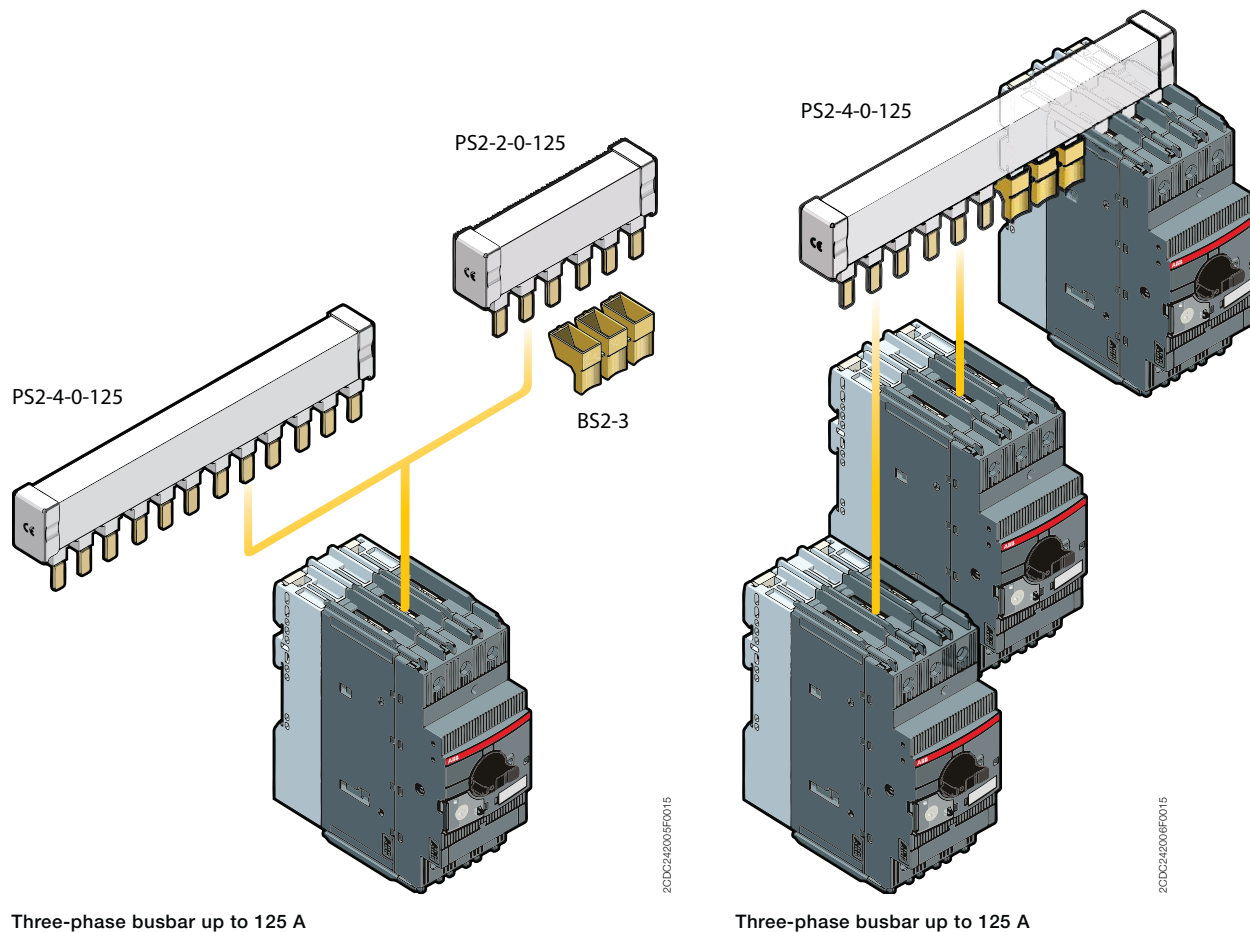
Main accessories

MS116, MS132, MS165, MO132, MO165

Manual motor starter with three-phase busbar systems (MS116, MS132, MO132)



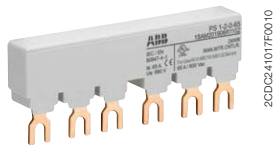
Manual motor starter with three-phase busbar systems (MS165, MO165)



Main accessories

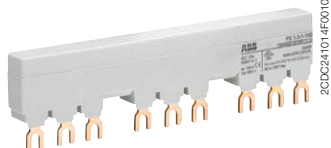
MS116, MS132, MO132, MS132-T

2



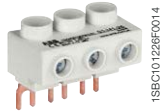
PS1-2-0-65

2CDC241017F0010



PS1-3-1-100

2CDC241014F0010



S1-M1-25

1SBC101226F0014



S1-M2-25

1SBC101266F0014



SA2



2CDC241023F0013



SA1

SK0108B91



PB1-1-32

2CDC241004F0014



S1-PB1-25

2CDC241005S0014

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.

Phase connecting links and phase power infeed blocks are also available for single-phase applications.

Ordering details

Suitable for	Rated operational current A	Number of MMS	Number of lateral aux.	Type	Order code	Pkg qty pcs	Weight (1 pc) kg
Three-phase busbars							
MS116, MS132, MO132	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
MS116, MS132, MO132	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

Suitable for	Rated operational current A	Rated cross section mm ²	Mounting form	Type	Order code	Pkg qty pcs	Weight (1 pc) kg
Three-phase feeder terminals							
MS116, MS132, MO132	65	25	Flat	S1-M1-25	1SAM201907R1101	10	0.038
	65	25	High	S1-M2-25	1SAM201907R1102	10	0.051
	65	25	UL/CSA Type E/F and IEC	S1-M3-25	1SAM201907R1103	10	0.042
	100	35	UL/CSA Type E/F and IEC	S1-M3-35	1SAM201913R1103	10	0.060

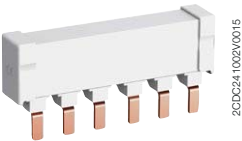
Suitable for	Description	Type	Order code	Pkg qty pcs	Weight (1 pc) kg
MS116, MS132, MO132	Protection cover for busbars	BS1-3	1SAM201908R1001	50	0.003
MS116, MS132, MO132, MS132-T	Screw fixing kit	FS116	1SAM201909R1001	1	0.020
	Padlock + two keys	SA2	GJF1101903R0002	10	0.020
MS116	Lock handle	SA1	GJF1101903R0001	10	0.003
	Lock handle box SA1/SA2	SA3	GJF1101903R0003	10	0.050

Accessories for single-phase connection (IEC only)

MS116, MS132, MO132, MS132-T	Phase connecting link	PB1-1-32	1SAM201914R1001	1	0.009
	Phase power infeed block	S1-PB1-25	1SAM201914R1002	1	0.013

Main accessories

MS165, MO165



PS2-2-0-125



PS2-3-0-125



KA165



BS2-3



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 125 A are in the assortment. Between 2 and 5 manual motor starters with none, one or two lateral auxiliary contacts can be connected.

Ordering details

Suitable for	Rated operational current A	Number of MMS	Number of lateral aux.	Type	Order code	Pkg qty pcs	Weight (1 pc) kg
Three-phase busbars							
MS165, MO165	125	2	0	PS2-2-0-125	1SAM401920R1002	10	0.100
	125	3	0	PS2-3-0-125	1SAM401920R1003	10	0.162
	125	4	0	PS2-4-0-125	1SAM401920R1004	10	0.226
	125	2	2	PS2-2-2-125	1SAM401920R1022	10	0.117
	125	3	2	PS2-3-2-125	1SAM401920R1023	10	0.197
	125	4	2	PS2-4-2-125	1SAM401920R1024	10	0.277

Other busbar types on request.

Suitable for	Description	Type	Order code	Pkg qty pcs	Weight (1 pc) kg
MS165, MO165	Terminal shroud	KA165	1SAM401922R1001	10	0.025
	Protection cover for busbars	BS2-3	1SAM401921R1001	10	0.005
	Padlock + two keys	SA2	GJF1101903R0002	10	0.020

Main accessories

MS116, MS132, MS165, MO132, MO165

General technical data

Type	PS1-xxx-65	PS1-xxx-100	S1-Mx-25	S1-Mx-35
Standards	IEC/EN 60947-4-1, IEC/EN 60947-1, UL 60947-1, UL 60947-4-1 (UL 508), CSA C22.2 No.60947-4-1 (CSA C22.2 No.14)			
Rated operational voltage U _e	690 V			
Rated operational voltage U _e acc. to UL/CSA	600 V AC			
Rated operational current I _e	65 A	100 A	65 A	100 A
Rated operational current I _e acc. to UL/CSA	65 A	92 A	65 A	92 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	25g / 11 ms			
Resistance to vibrations acc. to IEC 60068-2-6	5g / 3 ... 150 Hz			

Electrical connection

Main circuit

Type	S1-Mx-25	S1-Mx-35
Connecting capacity		
 Rigid	1 x 6 ... 25 mm ²	10 ... 35 mm ²
 Flexible with ferrule	1 x 6 ... 16 mm ²	10 ... 35 mm ²
 Flexible with insulated ferrule	1 x 6 ... 16 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
Stripping length	10 mm	12 mm
Tightening torque	2.5 Nm / 22 lb.in	4.5 Nm / 40 lb.in
Recommended screw driver	Pozidriv 2	Hexagon SW4

Technical data for PS2-xxx on request.

Main accessories

MS116, MS132, MO132



IB132-Y

2CDC241004F0010



IB132-G

2CDC241003F0010



DMS132-Y



2CDC241002F0010



DMS132-G



2CDC241001F0010

Description

IB132 are IP65 (UL/CSA Type 12) enclosures for single MMS installation. Additional mounting of auxiliary and signaling contacts, shunt trips and undervoltage release is possible. The handle is lockable in OFF position. For detailed specification see installation instruction.

DMS132 are IP65 (UL/CSA Type 12) door mounting kits for MMS installation in any enclosure. Additional mounting of auxiliary, signaling, shunt trips and undervoltage release is possible. The handle is lockable in OFF position. For detailed specification see installation instruction.

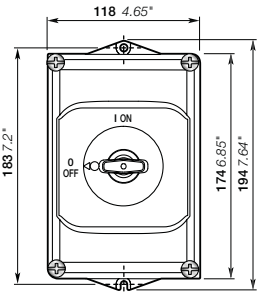
Ordering details

Suitable for	Description	Color	Type	Order code		Pkg qty pcs	Weight (1 pc) kg
IP65 enclosures (UL/CSA Type 12)							
MS116, MS132, MO132	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
IP65 door mounting kits (UL/CSA Type 12)							
MS116, MS132, MO132	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

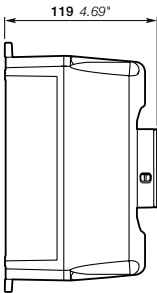
Indication I-O-T and ON-OFF-T

Please check for further equipment chapter General accessories.

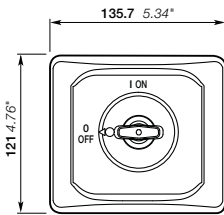
Main dimensions mm, inches



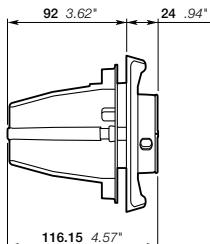
IB132



2CDC242011F0011



DMS132



2CDC242012F0011

2CDC131050C00201

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.

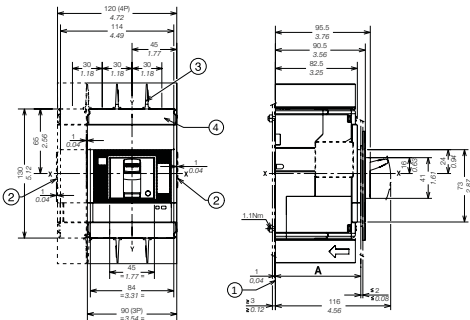
Ordering details

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

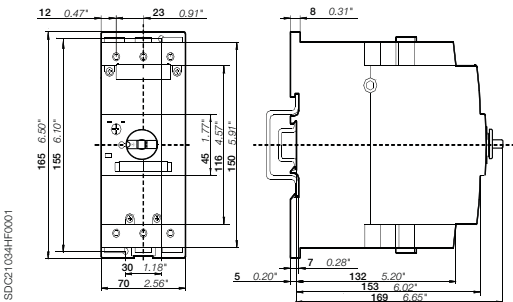
¹⁾ The MS49x range offers phase loss sensitivity

²⁾ For motor loads only up to 80 A

Main dimensions mm, inches



MS5100



MS495, MS497

2CDC242014F0011

2CDC131042C0201

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_{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 MS5100

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

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		7.5	15	160	4	7.5	100
MS497-75		50	100		50	70		5	10	160	3	6	125
MS497-90		50	100		50	70		5	10	160	3	6	160
MS497-100		50	100		50	70		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	Full Load Amps	200 - 208 V AC	230 V AC	460 V AC	575 V AC
	A	FLA	hp	hp	hp	hp
MS495-63	63	63	20	25	50	60
MS495-75	75	75	25	25	60	75
MS495-90	90	90	30	30	75	100
MS495-100	100	100	40	40	75	100
MS497-32	32	32	10	10	25	30
MS497-40	40	40	15	15	30	40
MS497-50	50	50	15	20	40	50
MS497-63	63	63	20	25	50	60
MS497-75	75	75	25	25	60	75
MS497-90	90	90	30	30	75	100
MS497-100	100	100	30	40	75	100

UL 508 – Manual motor controller

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

¹⁾ only with use DX495

Technical data

MS5100, MS495, MS497 manual motor starters

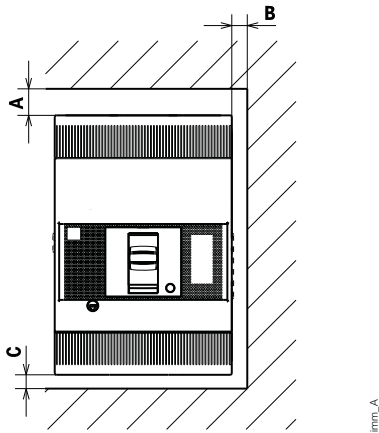
General technical data

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_e > 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 mm²	2.5 ... 16 mm²
 Flexible with ferrule	1 x	10 ... 70 mm²	10 ... 70 mm²
	2 x	10 ... 50 mm²	10 ... 50 mm²
 Flexible	1 x	10 ... 70 mm²	10 ... 70 mm²
	2 x	10 ... 50 mm²	10 ... 50 mm²
Stranded acc. to UL/CSA	1 x	AWG 10-2/0	AWG 10-2/0
	2 x	AWG 10-1/0	AWG 10-1/0
Flexible acc. to UL/CSA	1 x	AWG 10-2/0	AWG 10-2/0
	2 x	AWG 10-1/0	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

MO5100, MO495, MO496 manual motor starters magnetic only 32 to 100 A – with electromagnetic protection



MO5100-100



MO495-75



MO496-100

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.

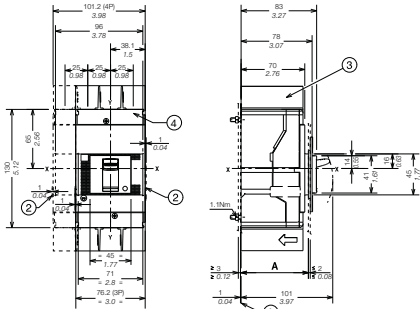
Ordering details

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 pc) kg
MO5100 manual motor starter magnetic only						
25	70	36 ²⁾	210 ... 770	MO5100-70	1SDA082031R1	1.100
30	80	36 ²⁾	240 ... 880	MO5100-80	1SDA082032R1	1.100
45	100	36 ²⁾	300 ... 1100	MO5100-100	1SDA082033R1	1.100
MO495 manual motor starter magnetic only						
30	63	25	819	MO495-63	1SAM560000R1007	2.244
37	75	25	975	MO495-75	1SAM560000R1008	2.247
45	90	25	1170	MO495-90	1SAM560000R1009	2.269
55	100	25	1235	MO495-100	1SAM560000R1010	2.292
MO496 manual motor starter magnetic only						
15	32	50	416	MO496-32	1SAM590000R1004	2.208
18.5	40	50	520	MO496-40	1SAM590000R1005	2.218
22	50	50	650	MO496-50	1SAM590000R1006	2.218
30	63	50	819	MO496-63	1SAM590000R1007	2.248
37	75	50	975	MO496-75	1SAM590000R1008	2.278
45	90	50	1170	MO496-90	1SAM590000R1009	2.266
55	100	50	1235	MO496-100	1SAM590000R1010	2.293

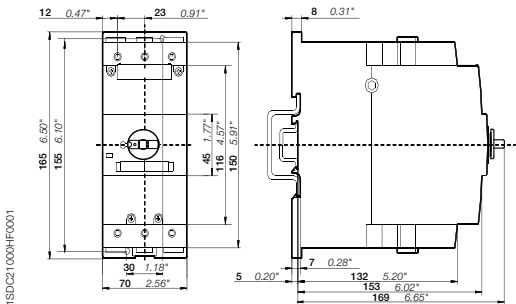
¹⁾ For overload protection of motors, an appropriate thermal or electronic overload relay must be used

²⁾ I_{CS} at 415 V AC

Main dimensions mm, inches



MO5100



MO495, MO496

Technical data

MO5100, MO495, MO496 manual motor starters magnetic only

Main circuit – Utilization characteristics according to IEC/EN

Type	MO5100	MO495, MO496
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 / 500 V DC	690 V AC / 450 V DC
Rated frequency	50/60 Hz	50/60 Hz
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	800 V AC	690 V AC
Rated operational current I_n	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 MO5100															
MO5100-70	48.75	65	-	36	36	-	18	36	-	11	22	-	4.5	6	-
MO5100-80	48.75	65	-	36	36	-	18	36	-	11	22	-	4.5	6	-
MO5100-100	48.75	65	-	36	36	-	18	36	-	11	22	-	4.5	6	-

Short-circuit protection MO495

MO495-63	No back-up fuse required up to $I_{cc} = 100$ kA	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

MO496-32	No back-up fuse required up to $I_{cc} = 100 \text{ kA}$	50	100	No back-up fuse required up to $I_{cc} = 100 \text{ kA}$	50	100	No back-up fuse required up to $I_{cc} = 100 \text{ kA}$	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.

Technical data

MO495, MO496 manual motor starters magnetic only

Main circuit – Utilization characteristics according to UL/CSA

Type	MO495, MO496	
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"

2

Motor ratings, three-phase

hp Horsepower

FLA Full Load Amps

Type	General purpose rating at max. 600 V AC	Full Load Amps	200 - 208 V AC	230 V AC	460 V AC	575 V AC
	A	FLA	hp	hp	hp	hp
MO495-63	63	63	20	25	50	60
MO495-75	75	75	25	25	60	75
MO495-90	90	90	30	30	75	100
MO495-100	100	100	40	40	75	100
MO496-32	32	32	10	10	25	30
MO496-40	40	40	15	15	30	40
MO496-50	50	50	15	20	40	50
MO496-63	63	63	20	25	50	60
MO496-75	75	75	25	25	60	75
MO496-90	90	90	30	30	75	100
MO496-100	100	100	30	40	75	100

UL 508 – Manual motor controller

Type	Circuit breaker or class R fuse per UL/NEC	Max. circuit breaker or fuse per UL/NEC	Maximum short-circuit current for motor disconnect		for group installation	
	480/600 V	480/600 V	480 V	600 V	480 V	600 V
	A	A	kA	kA	kA	kA
MO495-63	60	500	65	30	65	30
MO495-75	250	500	65	30	65	30
MO495-90	300	500	65	30	65	30
MO495-100	350	500	65	10	65	10
MO496-32	120	500	65	30	65	30
MO496-40	160	500	65	30	65	30
MO496-50	200	500	65	30	65	30
MO496-63	250	500	65	30	65	30
MO496-75	300	500	65	30	65	30
MO496-90	350	500	65	10	65	10
MO496-100	400	500	65	10	65	10

Technical data

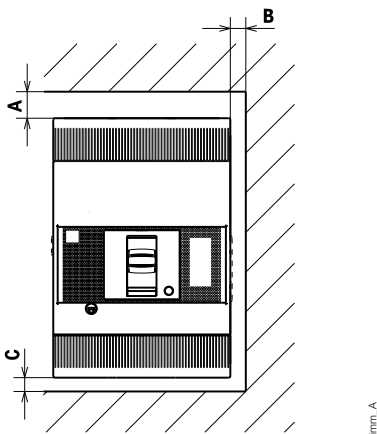
MO5100, MO495, MO496 manual motor starters magnetic only

General technical data

Type	MO5100	MO495	MO496
Pollution degree	3	3	
Phase loss sensitivity		-	
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 (above 60° C, current derating)	
Enclosed	-25 ... +70 °C	-20 ... +35 °C	
Storage	-40 ... +70 °C	-50 ... +80 °C	
Ambient air temperature compensation	-	-	
Maximum operating altitude permissible	2000 m	2000 m	
Resistance to shock acc. to IEC 60068-2-27	12g / 11 ms	25g / 11 ms	
Resistance to vibrations acc. to IEC 60068-2-6	0.7g / 13 ... 100 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	IP20	

Insulation distances for installation in metallic cubicles

Manual motor starter	A mm/in	B mm/in	C mm/in
MO5100			



MO5100, insulation distances

Technical data

MO5100, MO495, MO496 manual motor starters magnetic only

Connecting characteristics

Main circuit			
Type		MO495	MO496
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	10 ... 70 mm ²
	2 x	10 ... 50 mm ²	10 ... 50 mm ²
 Flexible	1 x	10 ... 70 mm ²	10 ... 70 mm ²
	2 x	10 ... 50 mm ²	10 ... 50 mm ²
Stranded acc. to UL/CSA		1 x AWG 10-2/0	AWG 10-2/0
	2 x	AWG 10-1/0	AWG 10-1/0
Flexible acc. to UL/CSA		1 x AWG 10-2/0	AWG 10-2/0
	2 x	AWG 10-1/0	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	16 mm
	H	7.5 mm
	Ø	6.5 mm
	D min	3.5 mm
	D max	5 mm
Cable terminals		
	W	16 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

MS5100, MO5100 manual motor starters

2



AUX-C

XT AUX-Con caw-01



SOR-C

XT SOR-Con caw-01



KLC Ronis

1SDC210C66F0001

Description

Manual motor starters can be equipped with auxiliary contacts, undervoltage release and shunt trips. 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 also offer key lock solutions for customer applications.

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 inside the breaker on the left slot (cabled version)

MS5100,			Changeover	AUX-C 1Q+1SY 250V AC	1SDA066431R1	2	0.06
MO5100			Changeover	AUX-C 2Q+1SY 250V AC	1SDA066433R1	3	0.09
MS5100			Changeover	AUX-C 2Q+2SY+1SA 250V AC	1SDA066438R1	5	0.15
			Changeover	AUX-C 3Q+1SY 250V AC	1SDA066434R1	4	0.12
			Changeover	AUX-C 3Q+2SY 250V AC	1SDA066436R1	5	0.15
MO5100			Changeover	AUX-C 1Q+1SY 24V DC	1SDA066446R1	2	0.06

Suitable for	Rated control supply voltage V	Description	Type	Order code	Pkg qty	Weight (1 pc)
					pcs	kg

Shunt trips units - mountable inside the breaker on the left slot (cabled version)

MS5100,		Normally NON energized	SOR-C 12V DC	1SDA066321R1	1	0.14
MO5100		Normally NON energized	SOR-C 24-30V AC/DC	1SDA066322R1	1	0.14
		Normally NON energized	SOR-C 48-60V AC/DC	1SDA066323R1	1	0.14
		Normally NON energized	SOR-C 110-127V AC / 110-125V DC	1SDA066324R1	1	0.14
		Normally NON energized	SOR-C 220-240V AC / 220-250V DC	1SDA066325R1	1	0.14
		Normally NON energized	SOR-C 380-440V AC	1SDA066326R1	1	0.14
		Normally NON energized	SOR-C 480-525V AC	1SDA066327R1	1	0.14

Undervoltages releases - mountable inside the breaker on the left slot (cabled version)

MS5100,		Normally energized	UVR-C 24-30V AC/DC	1SDA066396R1	1	0.14
MO5100		Normally energized	UVR-C 48V AC/DC	1SDA060965R1	1	0.14
		Normally energized	UVR-C 60V AC/DC	1SDA066397R1	1	0.14
		Normally energized	UVR-C 110-127V AC / 110-125V DC	1SDA066398R1	1	0.14
		Normally energized	UVR-C 220-240V AC / 220-250V DC	1SDA066399R1	1	0.14
		Normally energized	UVR-C 380-440V AC	1SDA066400R1	1	0.14
		Normally energized	UVR-C 480-525V AC	1SDA066401R1	1	0.14

Suitable for	Description	Type	Order code	Pkg qty	Weight (1 pc)
				pcs	kg

Key locks

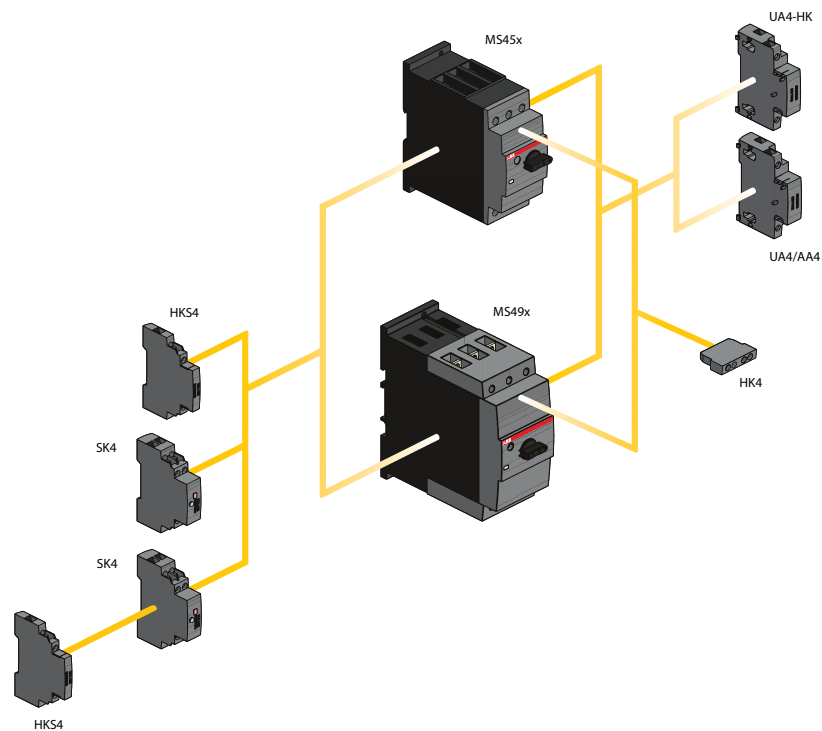
MS5100	Key lock on the circuit breaker, different keys, removable in open position	KLC Ronis ¹⁾	1SDA066599R1	1	NA
MO5100	Key lock on the circuit breaker, different keys, removable in open position	KLC Ronis ¹⁾	1SDA066593R1	1	NA

¹⁾ UL Listed

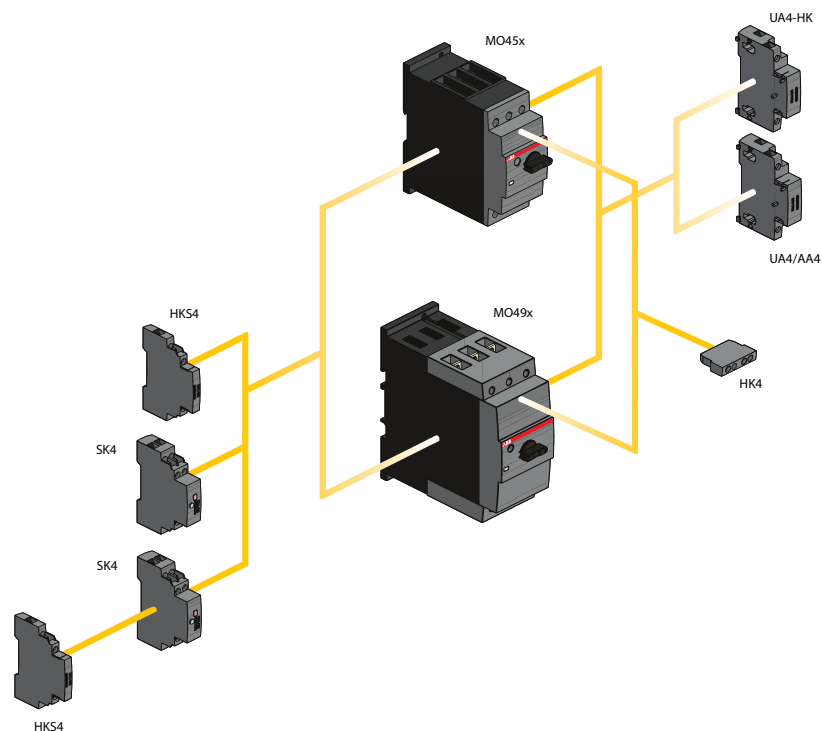
Main accessories

MS49x, MO49x manual motor starters

Manual motor starter MS49x with accessories



Manual motor starter MO49x with accessories



Main accessories

MS49x, MO49x manual motor starters

2



2CDC24102BF0011

HK4-11



2CDC241022F0011

HKS4-20



2CDC241024F0011

SK4-11



2CDC241029F0011

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

Auxiliary contacts – mountable on the left

MS49x,	1	1	Max. 1 piece	HKS4-11	1SAM401902R1001	2	0.045
MO49x	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,	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
MO49x							

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,	20 ... 24	50/60	AA4-24	1SAM401907R1001	1	0.135
MO49x	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,	24	50/60	UA4-24	1SAM401905R1004	1	0.134
MO49x	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	-20 ... +70 °C			
	Storage	-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	6 A
	230 V	0.5 A	3 A	4 A	4 A
	400 V	-	1.5 A	3 A	3 A
	690 V	-	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			

Type	UA4-xxx	AA4-xxx
Power consumption		
Pull-in	AC 20.2/13 VA/W	20.2/13 VA/W
	DC 20 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_s	0.7 ... 1.1 V x U_s
Coil operating voltage	0.85 ... 1.1 V x U_s	-

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 mm²		
		2 x	0.5 ... 1.5 mm² or 0.75 ... 2.5 mm		
	Flexible with ferrule	1 x	0.5 ... 2.5 mm²		
		2 x	0.5 ... 1.5 mm² or 0.75 ... 2.5 mm		
	Flexible	1 x	0.5 ... 2.5 mm²		
		2 x	0.5 ... 1.5 mm² 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		

General accessories

MS1xx, MO1xx, MS5100, MO5100, MS49x, MO49x



MSHD-LB



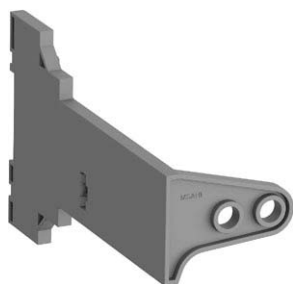
MSHD-LY



MSMN



MSH-AR



MSAH1



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

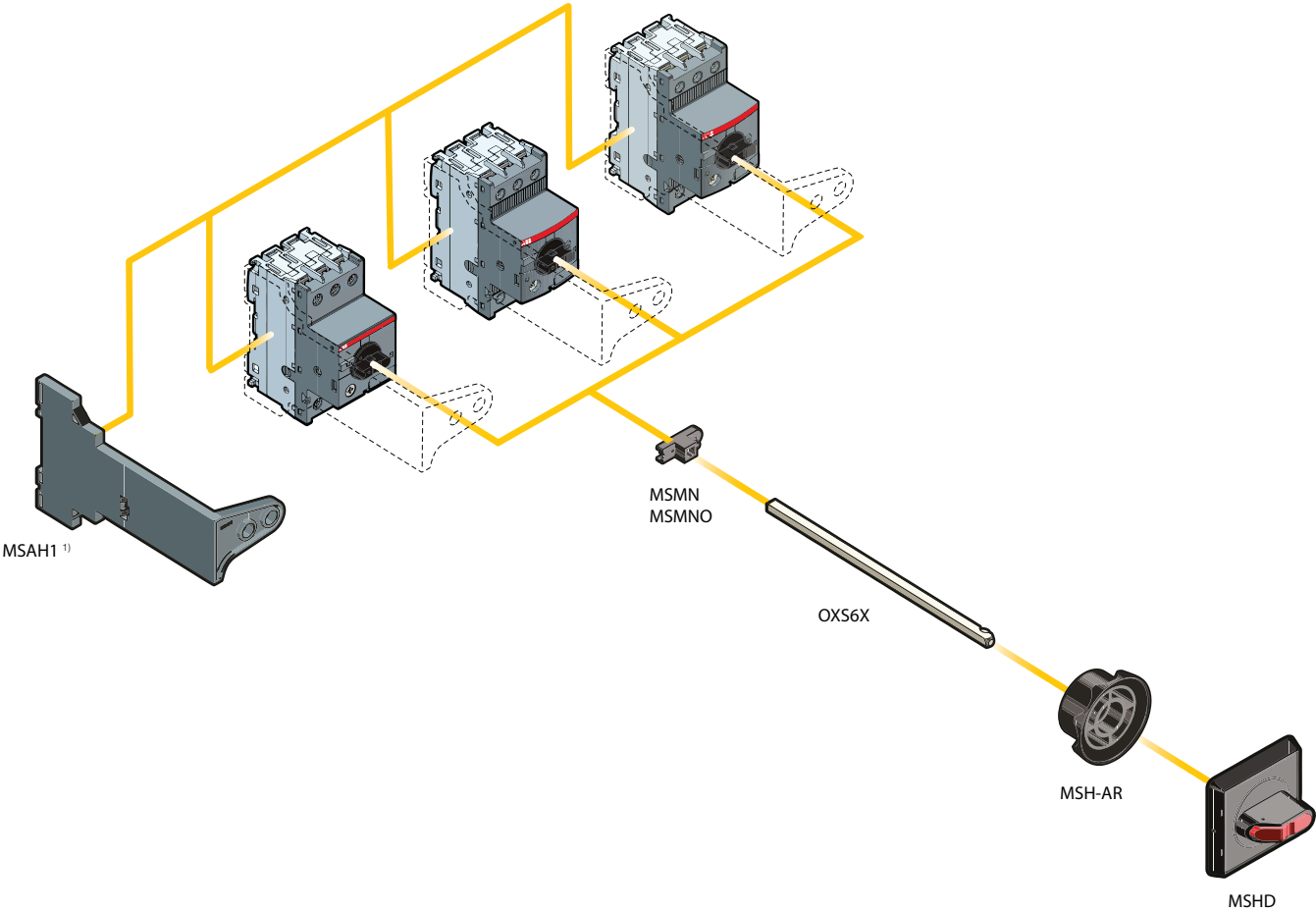
⁴⁾ Uncoded - Positioning of ON indication independent from mounting orientation of the MMS

⁵⁾ UL Listed

General accessories

MS1xx, MO1xx, MS4xx, MO4xx

2



¹⁾ MSAH1 fits to MS116,MS132 and MO132

2CDC024022 F0013