



Short form catalogue

# Motor protection and control

## Manual motor starters

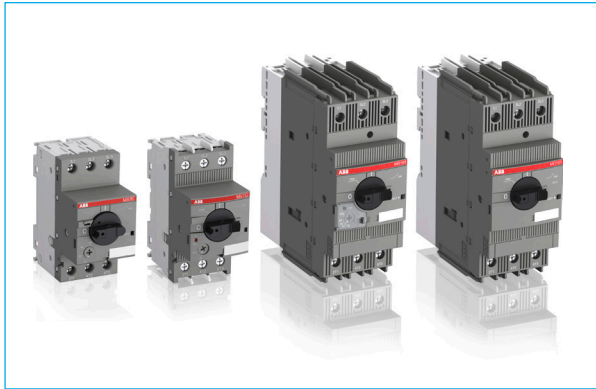
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# Motor protection and control

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# Motor protection and control

## Benefits

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

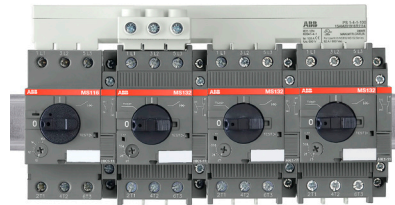
- Short-circuit breaking capacity up to 100 kA
- Magnetic-only devices (only short-circuit protection)
- Selected types are certified according to ATEX
- Special version for transformer protection

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

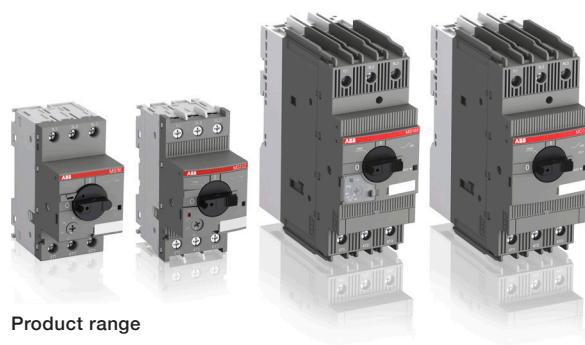
### Comprehensive accessory range

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



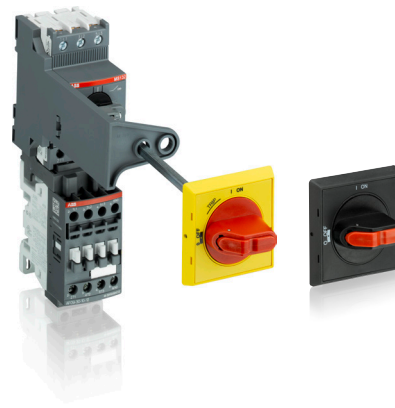
Product range



Accessory range



Direct-on-line starters



Door mounting kits

# Motor protection and control

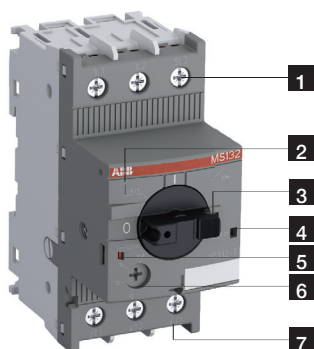
## Features

### 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

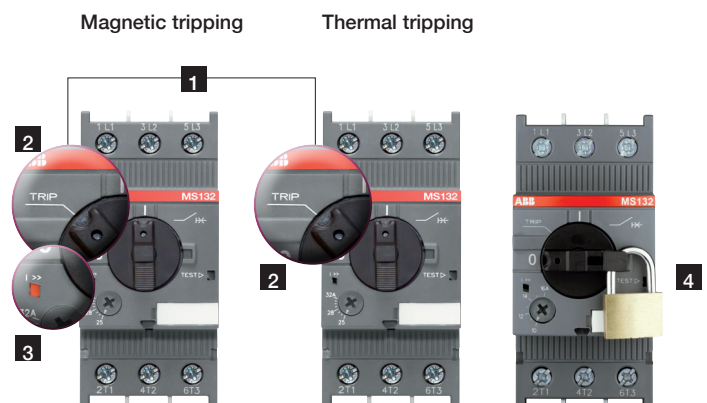
- Magnetic trip indication for several types available (MS132, MS165, and MS132-T)
- One product family in 45 mm width (MS116, MS132, MO132, and MS132-T)
- Setting ranges from 0.1 up to 65 A (MS116, MS132, MS165, MO132, and MO165)
- Short-circuit service breaking capacity  $I_{cs}$  up to 100 kA

- 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

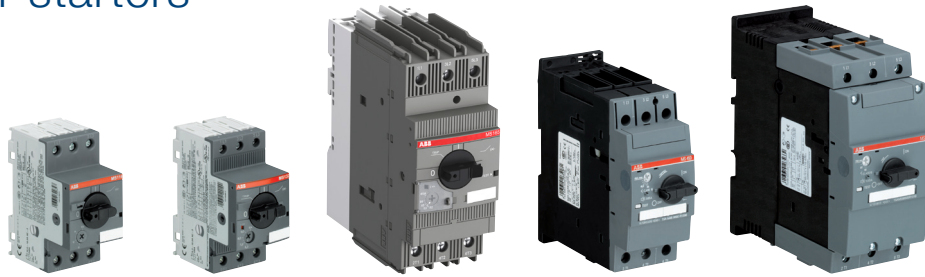
- 1 Clear trip indication
- 2 Handle in TRIP position
- 3 Optical indication for short-circuit
- 4 Easy locking



TRIP indication

# Manual motor starters

## Overview



Type	MS116	MS132	MS165	MS450	MS495	MS497
Thermal and electromagnetic protection	Yes	Yes	Yes	Yes	Yes	
Electromagnetic protection	-	-	-	-	-	
Phase loss sensitivity	Yes	Yes	Yes	Yes	Yes	
Switch position	ON/OFF	ON/OFF/TRIP	ON/OFF/TRIP	ON/OFF/TRIP	ON/OFF/TRIP	
Magnetic trip indication	-	Yes	Yes	-	-	
Lockable handle without accessories	-	Yes	Yes	Yes	Yes	
Disconnecting feature	Yes	Yes	Yes	Yes	Yes	
Width	45 mm	45 mm	55 mm	55 mm	70 mm	
Rated operational current $I_N$	0.16 ... 32 A	0.16 ... 32 A	16 ... 65 A	40 ... 50 A	63 ... 100 A	32 ... 100 A
Setting range	0.1 ... 32 A	0.1 ... 32 A	10 ... 65 A	28 ... 50 A	45 ... 100 A	22 ... 100 A
Ambient air temperature	-25 ... +55 °C *)	-25 ... +60 °C *)	-20 ... +60 °C *)	-20 ... +60 °C *)	-20 ... +60 °C *)	

\*) Compensated

Table for short-circuit ratings for 400/415 V

		Standard range MS116, MS450, MS495			Performance range MS132, MS165, MS497		
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 <sup>1)</sup>	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	22 ... 32 A				MS497-32	100 kA	50 kA
15 kW	23 ... 32 A				MS165-32	100 kA	75 kA
18.5 kW	28 ... 40 A	MS450-40	50 kA	25 kA	MS497-40	100 kA	50 kA
22 kW	30 ... 42 A				MS165-42	50 kA	25 kA
22 kW	36 ... 45 A	MS450-45	50 kA	25 kA			
22 kW	40 ... 50 A	MS450-50	50 kA	25 kA	MS497-50	100 kA	50 kA
22 kW	40 ... 54 A				MS165-54	50 kA	25 kA
30 kW	45 ... 63 A	MS495-63	50 kA	25 kA	MS497-63	100 kA	50 kA
30 kW	52 ... 65 A				MS165-65	50 kA	25 kA
37 kW	57 ... 75 A	MS495-75	50 kA	25 kA	MS497-75	100 kA	50 kA
45 kW	70 ... 90 A	MS495-90	50 kA	25 kA	MS497-90	100 kA	50 kA
55 kW	80 ... 100 A	MS495-100	50 kA	25 kA	MS497-100	100 kA	50 kA

<sup>1)</sup> 690 V

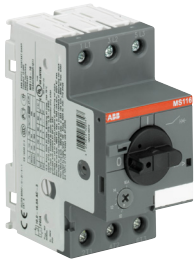


	MO132	MO165	MO450	MO495	MO496	MS132-T
	-	-	-	-	-	Yes
	Yes	Yes	Yes	Yes	-	-
	-	-	-	-	-	Yes
	ON/OFF/TRIP	ON/OFF/TRIP	ON/OFF/TRIP	ON/OFF/TRIP	-	ON/OFF/TRIP
	-	-	-	-	-	Yes
	Yes	Yes	Yes	Yes	-	Yes
	Yes	Yes	Yes	Yes	-	Yes
	45 mm	55 mm	55 mm	70 mm	-	45 mm
	0.16 ... 32 A	16 ... 65 A	40 ... 50 A	63 ... 100 A	32 ... 100 A	0.16 ... 32 A
	-	-	-	-	-	0.1 ... 25 A
	-25 ... +60 °C	-25 ... +60 °C	-20 ... +60 °C	-20 ... +60 °C	-	-25 ... +60 °C *)

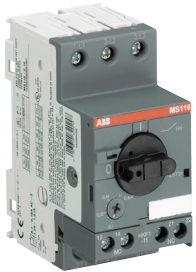
Standard range MO132, MO450, MO495				Performance range MO132, MO165, MO496			Transformer protection MS132-T	
Type	Short-circuit breaking capacity		Type	Short-circuit breaking capacity		Type	Short-circuit breaking capacity	
	$I_{CU}$	$I_{CS}$		$I_{CU}$	$I_{CS}$			$I_{CS} / I_{CU}$
MO132-0.16	100 kA	100 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.		
			MO496-32	100 kA	50 kA			
			MO165-32	100 kA	50 kA			
			MO496-40	100 kA	50 kA			
MO450-40	50 kA	25 kA	MO165-42	50 kA	25 kA			
MO450-45	50 kA	25 kA						
MO450-50	50 kA	25 kA	MO496-50	100 kA	50 kA			
			MO165-54	50 kA	25 kA			
MO495-63	50 kA	25 kA	MO496-63	100 kA	50 kA			
			MO165-65	50 kA	25 kA			
MO495-75	50 kA	25 kA	MO496-75	100 kA	50 kA			
MO495-90	50 kA	25 kA	MO496-90	100 kA	50 kA			
MO495-100	50 kA	25 kA	MO496-100	100 kA	50 kA			

# MS116, MS132 manual motor starters

## 0.10 to 32A with thermal and electromagnetic protection



MS116-16



MS116-0.16-HKF1-11

### MS116

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

MS116 is a compact and economic range for motor protection up to 15.5 kW (400 V) / 32 A in width of 45 mm. Further features are the build-in disconnect function, temperature compensation, trip-free mechanism and a rotary handle with a clear switch position indication. The manual motor starter is suitable for three- and single-phase applications. Auxiliary contacts, signaling contacts, undervoltage releases, shunt trips, three-phase bus bars, power in-feed blocks and locking devices for protection against unauthorized changes are available as accessory.

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	Part Number	Product Hierarchy 1800001 Order Code
0.03	0.10 ... 0.16	50	1.56	MS116-0.16	1SAM250000R1001
0.06	0.16 ... 0.25	50	2.44	MS116-0.25	1SAM250000R1002
0.09	0.25 ... 0.40	50	3.90	MS116-0.4	1SAM250000R1003
0.12	0.40 ... 0.63	50	6.14	MS116-0.63	1SAM250000R1004
0.25	0.63 ... 1.00	50	11.50	MS116-1.0	1SAM250000R1005
0.55	1.00 ... 1.60	50	18.40	MS116-1.6	1SAM250000R1006
0.75	1.60 ... 2.50	50	28.75	MS116-2.5	1SAM250000R1007
1.5	2.50 ... 4.00	50	50.00	MS116-4.0	1SAM250000R1008
2.2	4.00 ... 6.30	50	78.75	MS116-6.3	1SAM250000R1009
4.0	6.30 ... 10.0	50	150	MS116-10	1SAM250000R1010
5.5	8.00 ... 12.0	25	180	MS116-12	1SAM250000R1012
7.5	10.0 ... 16.0	16	240	MS116-16	1SAM250000R1011
9.0	16.0 ... 20.0	10	300	MS116-20	1SAM250000R1013
12.5	20.0 ... 25.0	10	375	MS116-25	1SAM250000R1014
15.5	25.0 ... 32.0	10	480	MS116-32	1SAM250000R1015

### MS132

MS132 is a compact and powerful range for motor protection up to 15.5 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, three-phase bus bars, power in-feed blocks.



MS132-10



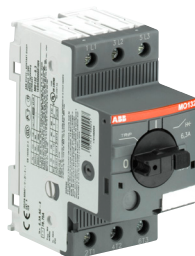
MS132-0.16-HKF1-11

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	Part Number	Product Hierarchy 1800001 Order Code
0.03	0.10 ... 0.16	100	1.56	MS132-0.16	1SAM350000R1001
0.06	0.16 ... 0.25	100	2.44	MS132-0.25	1SAM350000R1002
0.09	0.25 ... 0.40	100	3.90	MS132-0.4	1SAM350000R1003
0.12	0.40 ... 0.63	100	6.14	MS132-0.63	1SAM350000R1004
0.25	0.63 ... 1.00	100	11.50	MS132-1.0	1SAM350000R1005
0.55	1.00 ... 1.60	100	18.40	MS132-1.6	1SAM350000R1006
0.75	1.60 ... 2.50	100	28.75	MS132-2.5	1SAM350000R1007
1.5	2.50 ... 4.00	100	50.00	MS132-4.0	1SAM350000R1008
2.2	4.00 ... 6.30	100	78.75	MS132-6.3	1SAM350000R1009
4.0	6.30 ... 10.0	100	150	MS132-10	1SAM350000R1010
5.5	8.00 ... 12.0	100	180	MS132-12	1SAM350000R1012
7.5	10.0 ... 16.0	100	240	MS132-16	1SAM350000R1011
9.0	16.0 ... 20.0	100	300	MS132-20	1SAM350000R1013
12.5	20.0 ... 25.0	50	375	MS132-25	1SAM350000R1014
15.5	25.0 ... 32.0	25	480	MS132-32	1SAM350000R1015



# MO132, M132-T manual motor starters

## 0.16 to 32A magnetic only protection & transformer protection



MO132-6.3



MO132-32

### MO132 (Magnetic only)

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.

Rated operational power 400 V AC-3 <sup>1)</sup>	Rated operational current	Short-circuit breaking capacity $I_{cs}$ at 400 V AC	Rated instantaneous short-circuit current setting $I_l$	Part Number	Product Hierarchy 1800001 Order Code
0.03	0.16	100	1.56	MO132-0.16	1SAM360000R1001
0.06	0.25	100	2.44	MO132-0.25	1SAM360000R1002
0.09	0.40	100	3.90	MO132-0.4	1SAM360000R1003
0.12	0.63	100	6.14	MO132-0.63	1SAM360000R1004
0.25	1.0	100	11.50	MO132-1.0	1SAM360000R1005
0.55	1.6	100	18.40	MO132-1.6	1SAM360000R1006
0.75	2.5	100	28.75	MO132-2.5	1SAM360000R1007
1.5	4.0	50	50.00	MO132-4.0	1SAM360000R1008
2.2	6.3	50	78.75	MO132-6.3	1SAM360000R1009
4.0	10	50	125.00	MO132-10	1SAM360000R1010
5.5	12	50	150.00	MO132-12	1SAM360000R1012
7.5	16	50	200.00	MO132-16	1SAM360000R1011
9.0	20	50	250.00	MO132-20	1SAM360000R1013
12.5	25	50	312.50	MO132-25	1SAM360000R1014
15.5	32	25	400.00	MO132-32	1SAM360000R1015

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



MS132-10T



MS132-25T

### MS132-T (Transformer protection)

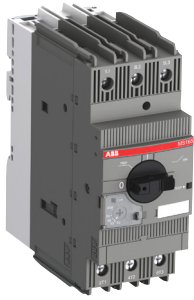
Circuit breakers for transformer protection are electro mechanical protection devices specially designed to protect control transformers on the primary side. They allow fuse-less protection against overload and short-circuit, saving space and cost and ensuring a quick reaction under short-circuit condition 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. Furthermore it is possible to use the existing MS116/MS132 manual motor starter accessories like auxiliary contacts, signaling contacts, undervoltage releases, shunt trips and power in-feed blocks. Moreover ABB offers special accessories for fast single phase setup.

Setting range	Short-circuit breaking capacity $I_{cs}$ at 400 V AC	Rated instantaneous short-circuit current setting $I_l$	Part Number	Product Hierarchy 1800001 Order Code
A	kA	A		
0.10 ... 0.16	100	3.2	MS132-0.16T	1SAM340000R1001
0.16 ... 0.25	100	5	MS132-0.25T	1SAM340000R1002
0.25 ... 0.40	100	8	MS132-0.4T	1SAM340000R1003
0.40 ... 0.63	100	12.6	MS132-0.63T	1SAM340000R1004
0.63 ... 1.00	100	20	MS132-1.0T	1SAM340000R1005
1.00 ... 1.60	100	32	MS132-1.6T	1SAM340000R1006
1.60 ... 2.50	100	50	MS132-2.5T	1SAM340000R1007
2.50 ... 4.00	100	80	MS132-4.0T	1SAM340000R1008
4.00 ... 6.30	100	126	MS132-6.3T	1SAM340000R1009
6.30 ... 10.0	100	200	MS132-10T	1SAM340000R1010
8.00 ... 12.0	100	240	MS132-12T	1SAM340000R1012
10.0 ... 16.0	100	320	MS132-16T	1SAM340000R1011
16.0 ... 20.0	100	400	MS132-20T	1SAM340000R1013
20.0 ... 25.0	50	500	MS132-25T	1SAM340000R1014

# MS165, MO165 manual motor starters

## 0.10 to 65 A – with thermal and electromagnetic protection & magnetic only



MS165-65

### MS165

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.

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 $I_i$	Part Number	Product Hierarchy 1800001 Order Code
7.5	10 ... 16	100	240	MS165-16	1SAM451000R1011
7.5	14 ... 20	100	300	MS165-20	1SAM451000R1012
11	18 ... 25	100	375	MS165-25	1SAM451000R1013
15	23 ... 32	75	480	MS165-32	1SAM451000R1014
22	30 ... 42	25	630	MS165-42	1SAM451000R1015
22	40 ... 54	25	810	MS165-54	1SAM451000R1016
30	52 ... 66	25	975	MS165-65	1SAM451000R1017

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



MO165-65

### MO165 (Magnetic only)

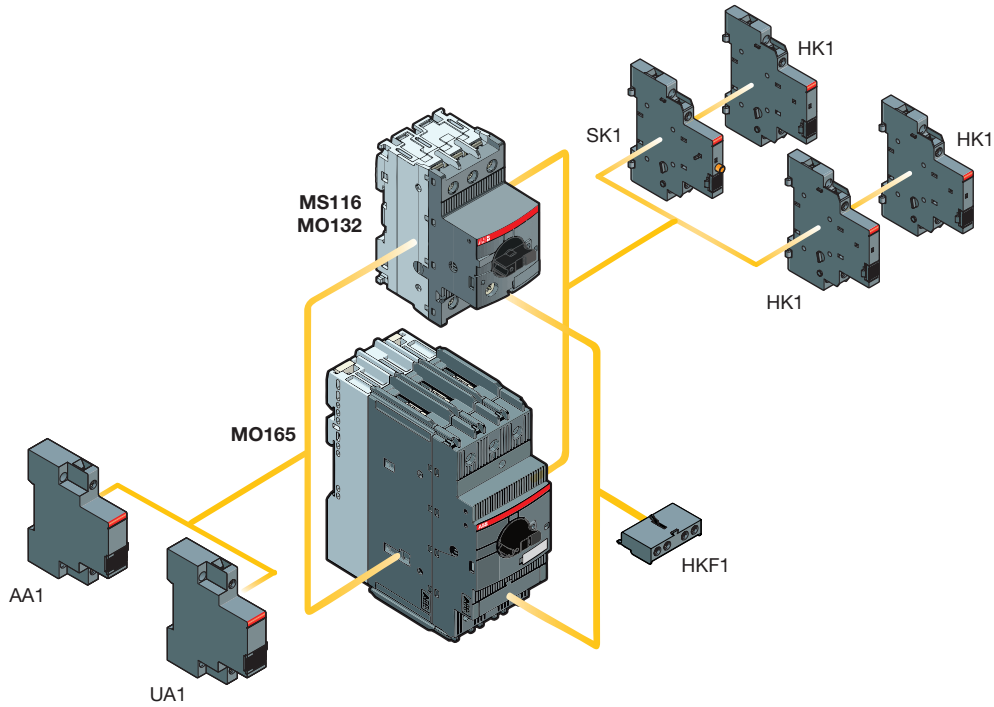
Manual motor starters magnetic only are electromechanical protection devices for the main circuit. They are used mainly to switch motors manually ON/OFF and protect them fuse-less against short-circuit. Fuse-less protection with a manual motor starter saves costs, space and ensures a quick reaction under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

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 $I_i$	Part Number	Product Hierarchy 1800001 Order Code
7.5	10 ... 16	100	240	MO165-16	1SAM461000R1011
7.5	14 ... 20	100	300	MO165-20	1SAM461000R1012
11	18 ... 25	100	375	MO165-25	1SAM461000R1013
15	23 ... 32	50	480	MO165-32	1SAM461000R1014
22	30 ... 42	25	630	MO165-42	1SAM461000R1015
22	40 ... 54	25	810	MO165-54	1SAM461000R1016
30	52 ... 66	25	975	MO165-65	1SAM461000R1017

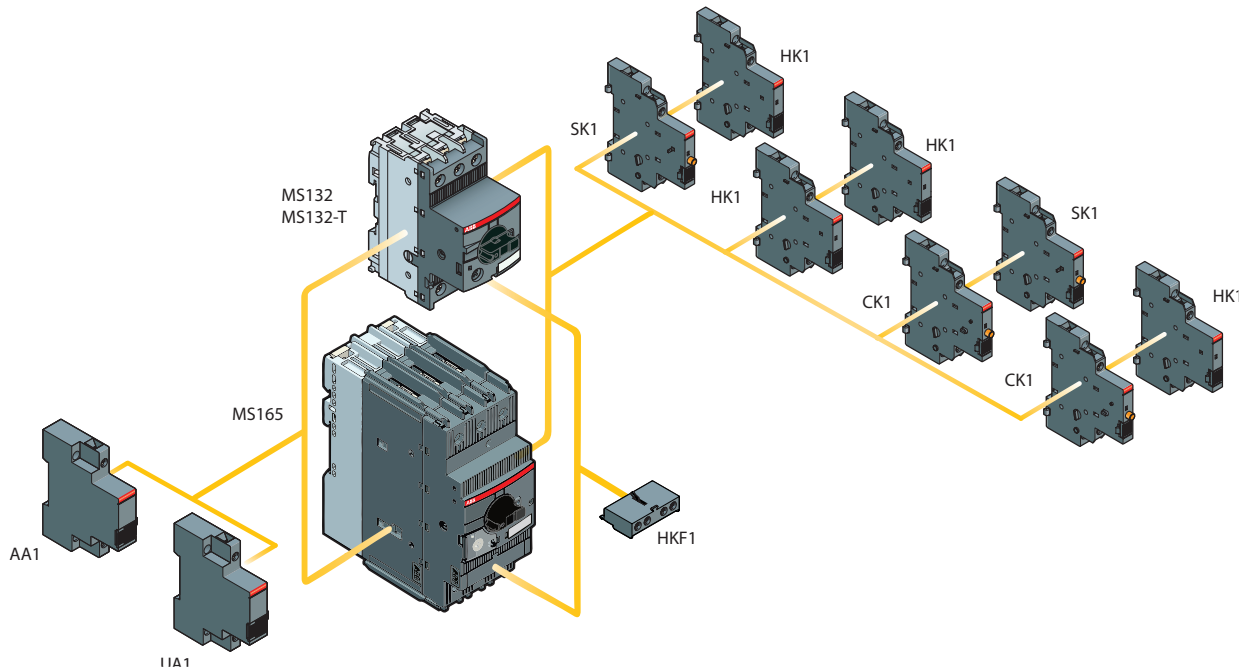
Note: Manual motor starters should always be selected so that the actual motor current is within the setting range.

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

## Manual motor starter with accessories (MS116, MO132, MO165)



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



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

## Main accessories



HKF1-11



HK1-11



SK1-11



CK1-11



AA1-24



UA1-24

## Accessories

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

Suitable for	Auxiliary contacts N.O.	Auxiliary contacts N.C.	Description	Part Number	Product Hierarchy 1800001 Order Code
<b>Auxiliary contacts – mountable on the front</b>					
MS116, MS132, MO132, MO165, MS132-T	1	1		HKF1-11	1SAM201901R1001
	1	0		HKF1-10	1SAM201901R1003
	0	1		HKF1-01	1SAM201901R1004
	2	0		HKF1-20	1SAM201901R1002

<b>Auxiliary contacts – mountable on the right</b>					
MS116, MS132, MO132, MO165, MS132-T	1	1	max. 2 pieces	HK1-11	1SAM201902R1001
	2	0	max. 2 pieces	HK1-20	1SAM201902R1002
	0	2	max. 2 pieces	HK1-02	1SAM201902R1003
	2	0	with lead contacts	HK1-20L	1SAM201902R1004

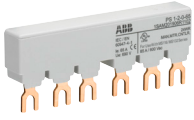
<b>Signaling contacts – mountable on the right</b>					
MS116, MS132, MO132, MO165, MS132-T	1	1	for tripped alarm, max. 2 pieces	SK1-11	1SAM201903R1001
	2	0	for tripped alarm, max. 2 pieces	SK1-20	1SAM201903R1002
	0	2	for tripped alarm, max. 2 pieces	SK1-02	1SAM201903R1003
MS132, MS132-T	1	1	for short-circuit alarm, max. 2 pieces	CK1-11	1SAM301901R1001
	2	0	for short-circuit alarm, max. 2 pieces	CK1-20	1SAM301901R1002
	0	2	for short-circuit alarm, max. 2 pieces	CK1-02	1SAM301901R1003

Suitable for	Rated control supply voltage		Part Number	Product Hierarchy 1800001 Order Code
	50 Hz V AC	60 Hz V AC		
<b>Shunt trips – mountable on the left</b>				
MS116, MS132, MS165, MO132, MO165, MS132-T	20 ... 24	20 ... 24	AA1-24	1SAM201910R1001
	110	110	AA1-110	1SAM201910R1002
	200 ... 240	200 ... 240	AA1-230	1SAM201910R1003
	350 ... 415	350 ... 415	AA1-400	1SAM201910R1004

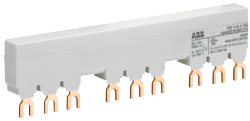
<b>Undervoltage releases – mountable on the left</b>				
MS116, MS132, MS165, MO132, MO165, MS132-T	20	24	UA1-20	1SAM201904R1010
	24	-	UA1-24	1SAM201904R1001
	48	-	UA1-48	1SAM201904R1002
	60	-	UA1-60	1SAM201904R1003
	110	120	UA1-110	1SAM201904R1004
	-	208	UA1-208	1SAM201904R1008
	230	240	UA1-230	1SAM201904R1005
	400	-	UA1-400	1SAM201904R1006
	415	480	UA1-415	1SAM201904R1007
	-	575	UA1-575	1SAM201904R1009

# MS116, MS132, MO132, MS132-T

## Main accessories



PS1-2-0-65



PS1-3-1-100



S1-M1-25



S1-M2-25



SA2



SA1



PB1-1-32



## Accessories

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.

Suitable for	Rated operational current A	Number of MMS	Number of lateral aux.	Part Number	Product Hierarchy 1800001 Order Code
<b>Three-phase busbars</b>					
MS116, MS132, MO132	65	2	0	PS1-2-0-65	1SAM201906R1102
	65	3	0	PS1-3-0-65	1SAM201906R1103
	65	4	0	PS1-4-0-65	1SAM201906R1104
	65	5	0	PS1-5-0-65	1SAM201906R1105
	65	2	1	PS1-2-1-65	1SAM201906R1112
	65	3	1	PS1-3-1-65	1SAM201906R1113
	65	4	1	PS1-4-1-65	1SAM201906R1114
	65	5	1	PS1-5-1-65	1SAM201906R1115
	65	2	2	PS1-2-2-65	1SAM201906R1122
	65	3	2	PS1-3-2-65	1SAM201906R1123
MS116, MS132, MO132	65	4	2	PS1-4-2-65	1SAM201906R1124
	65	5	2	PS1-5-2-65	1SAM201906R1125
	100	3	0	PS1-3-0-100	1SAM201916R1103
	100	4	0	PS1-4-0-100	1SAM201916R1104
	100	5	0	PS1-5-0-100	1SAM201916R1105
	100	3	1	PS1-3-1-100	1SAM201916R1113
	100	4	1	PS1-4-1-100	1SAM201916R1114
	100	5	1	PS1-5-1-100	1SAM201916R1115
	100	3	2	PS1-3-2-100	1SAM201916R1123

Suitable for	Rated operational current A	Rated cross section mm <sup>2</sup>	Mounting form	Part Number	Product Hierarchy 1800001 Order Code
<b>Three-phase feeder terminals</b>					
MS116, MS132, MO132	65	25	Flat	S1-M1-25	1SAM201907R1101
	65	25	High	S1-M2-25	1SAM201907R1102
	65	25	UL type E and IEC	S1-M3-25	1SAM201907R1103
	100	35	UL type E and IEC	S1-M3-35	1SAM201913R1103

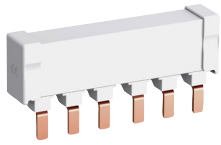
Suitable for	Description	Part Number	Product Hierarchy 1800001 Order Code
MS116, MS132, MO132	Protection cover for busbars	BS1-3	1SAM201908R1001
MS116, MS132, MO132, MS132-T	Screw fixing kit	FS116	1SAM201909R1001
MS116	Padlock + two keys	SA2	GJF1101903R0002
	Lock handle	SA1	GJF1101903R0001
	Lock handle box SA1/SA2	SA3	GJF1101903R0003

### Accessories for single-phase connection

Suitable for	Description	Part Number	Product Hierarchy 1800001 Order Code
MS116, MS132, MO132, MS132-T	Phase connecting link	PB1-1-32	1SAM201914R1001
	Phase power infeed block	S1-PB1-25	1SAM201914R1002

# MS116, MS132, MO132, MS165, MO165

## Main accessories



PS2-2-0-125

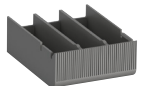


PS2-3-0-125

2CDC24100300015



KA165



BS2-3



SA2

2CDC241026R0013



IB132-Y



IB132-G



DMS132-Y



DMS132-G

### 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.

Suitable for	Rated operational current	Number of MMS	Number of lateral aux.	Part Number	Product Hierarchy 1800001 Order Code
MS165, MO165	125	2	0	PS2-2-0-125	1SAM401920R1002
	125	3	0	PS3-2-0-125	1SAM401920R1003
	125	4	0	PS4-2-0-125	1SAM401920R1004
	125	2	2	PS2-2-2-125	1SAM401920R1022
	125	3	2	PS3-2-2-125	1SAM401920R1023
	125	4	2	PS4-2-2-125	1SAM401920R1024

Suitable for	Description	Part Number	Product Hierarchy 1800001 Order Code
MS165, MO165	Terminal shroud	KA165	1SAM401922R1001
	Protection cover for busbars	BS2-3	1SAM401921R1001
	Padlock + two keys	SA2	GJF1101903R0002

### Accessories

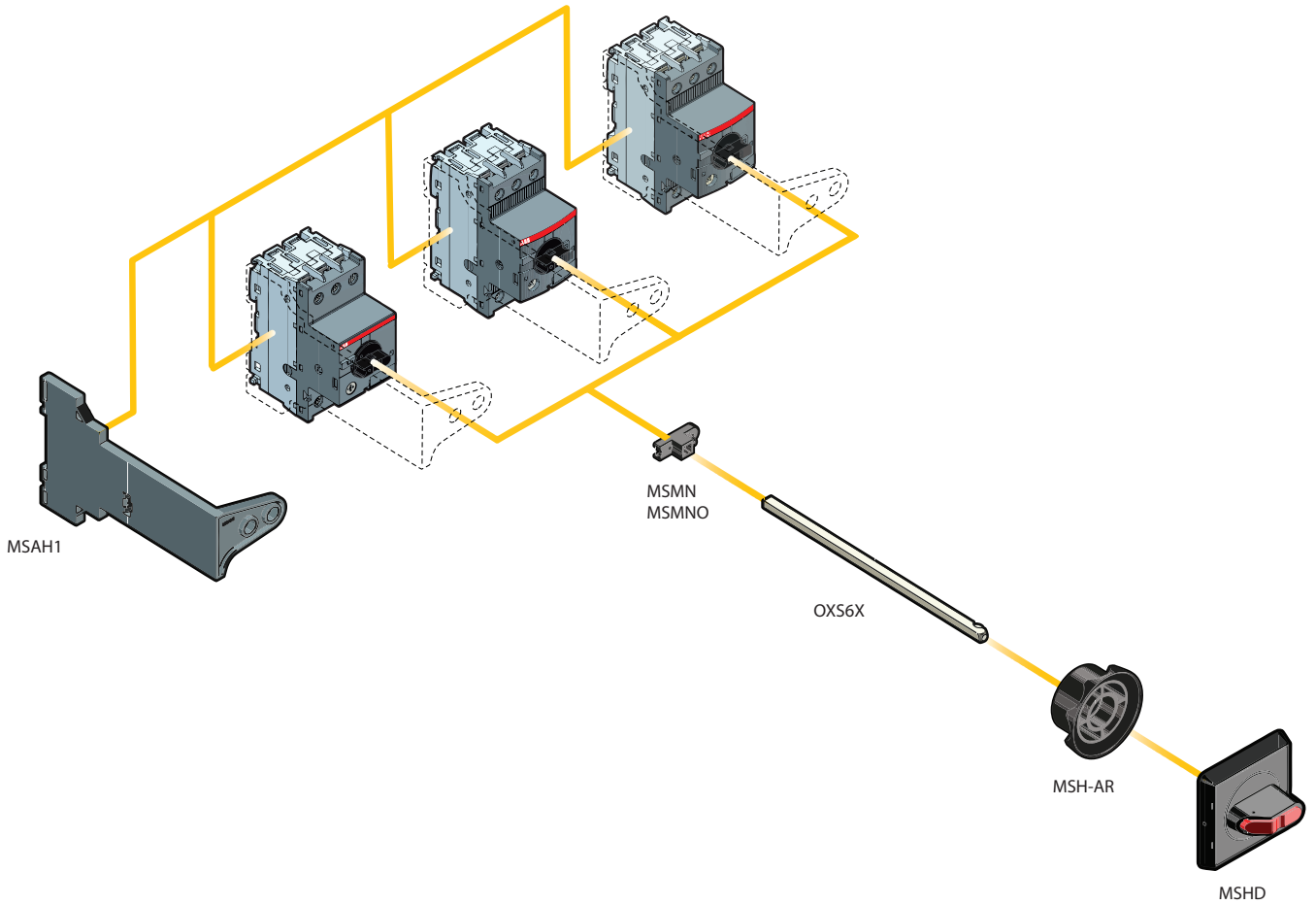
IB132 are IP65 enclosures for single MMS installation. Additional mounting of auxiliary and signaling contacts, shunt trips and undervoltage release is possible. The handle is lockable in OFF position. For detailed specification see installation instruction.

DMS132 are IP65 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.

Suitable for	Description	Color	Part Number	Product Hierarchy 1800001 Order Code
IP65 enclosures (UL: Type 12)				
MS116, MS132, MO132	Padlockable max. 3 padlocks with bail diameter 4 ... 6.5 mm	Yellow/red	IB132-Y	1SAM201911R1011
		Grey/black	IB132-G	1SAM201911R1010
IP65 door mounting kits (UL: Type 12)				
MS116, MS132, MO132	Padlockable max. 3 padlocks with bail diameter 4 ... 6.5 mm	Yellow/red	DMS132-Y	1SAM201912R1011
		Grey/black	DMS132-G	1SAM201912R1010

# MS116, MS132, MO132, MS4xx, MO4xx, MS325, MO325

## General accessories



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