



CONTROL SECTION 5

IEC manual motor starters



Table of contents

	Manual motor starters
5-4	Overview
5-6	MS116 manual motor starters
5-7	MS132 manual motor starters
5-8	MS132-K manual motor starters with push-in spring terminals
5-9	MS165 manual motor starters
5-10	MO132 manual motor starters magnetic only
5-11	MO165 manual motor starters magnetic only
	Circuit breakers for transformer protection
5-12	MS132-T circuit breakers for transformer protection
5-13	MS132-KT circuit breakers for transformer protection with push-in spring terminals
5-14	Accessories
	DRAS09 ... DRAS16 enclosed direct-on-line starters
5-22	4 to 7.5 kW, protected by thermal overload relays, AC or DC operated
5-24	Up to 7.5 kW and 10 hp, protected by thermal overload relays, AC operated
	HF0.6, HF2.4, HF9 electronic compact starters
5-26	Direct-on-line starter
5-27	Reversing starter

Manual motor starters

Overview



Type	MS116	MS132	MS165
Thermal and electromagnetic protection	Yes	Yes	Yes
Electromagnetic protection	–	–	–
Phase loss sensitivity	Yes	Yes	Yes
Switch position	ON/OFF	ON/OFF/TRIP	ON/OFF/TRIP
Magnetic trip indication	–	Yes	Yes
Lockable handle without accessories	–	Yes	Yes
Disconnecting feature	Yes	Yes	Yes
Width	45 mm	45 mm	55 mm
Rated operational current I _e	0.10 ... 32 A	0.10 ... 32 A	10 ... 80 A
Setting range	0.10 ... 32 A	0.10 ... 32 A	10 ... 80 A
Ambient air temperature	-25 ... +55°C ¹	-25 ... +60°C ¹	-25 ... +60°C ¹

¹ Compensated

Accessories

Auxiliary contact	HKF1, HK1
Signaling contact for tripped alarm	SK1
contact for short-circuit alarm	– CK1
Shunt trip	AA1
Undervoltage release	UA1

Table for short-circuit ratings for 400/415 V AC

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

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 ²	0.1 ... 0.16 A	MS116-0.16	100 kA	50 kA	MS132-0.16 ³	100 kA	100 kA
0.06 kW	0.16 ... 0.25 A	MS116-0.25	100 kA	50 kA	MS132-0.25 ³	100 kA	100 kA
0.09 kW	0.25 ... 0.4 A	MS116-0.4	100 kA	50 kA	MS132-0.4 ³	100 kA	100 kA
0.18 kW	0.4 ... 0.63 A	MS116-0.63	100 kA	50 kA	MS132-0.63 ³	100 kA	100 kA
0.25 kW	0.63 ... 1.0 A	MS116-1.0	100 kA	50 kA	MS132-1.0 ³	100 kA	100 kA
0.55 kW	1.0...1.6 A	MS116-1.6	100 kA	50 kA	MS132-1.6 ³	100 kA	100 kA
0.75 kW	1.6...2.5 A	MS116-2.5	75 kA	50 kA	MS132-2.5 ³	100 kA	100 kA
1.5 kW	2.5...4.0 A	MS116-4.0	75 kA	50 kA	MS132-4.0 ³	100 kA	100 kA
2.2 kW	4.0...6.3 A	MS116-6.3	50 kA	50 kA	MS132-6.3 ³	100 kA	100 kA
4.0 kW	6.3...10 A	MS116-10	50 kA	50 kA	MS132-10 ³	100 kA	100 kA
5.5 kW	8...12 A	MS116-12	50 kA	25 kA	MS132-12	100 kA	100 kA
7.5 kW	10...16 A	MS116-16	16 kA	16 kA	MS132-16 ³ / 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	16 kA	10 kA	MS132-20 ³	100 kA	100 kA
11 kW	18 ... 25 A	–	–	–	MS165-25	100 kA	100 kA
11 kW	20...25 A	MS116-25	16 kA	10 kA	MS132-25 ³	50 kA	50 kA
15 kW	25...32 A	MS116-32	16 kA	10 kA	MS132-32 ³	50 kA	25 kA
15 kW	23 ... 32 A	–	–	–	MS165-32	100 kA	100 kA
22 kW	30 ... 42 A	–	–	–	MS165-42	50 kA	50 kA
22 kW	40 ... 54 A	–	–	–	MS165-54	50 kA	30 kA
25 kW	–	–	–	–	–	–	–
30 kW	52 ... 65 A	–	–	–	MS165-65	50 kA	30 kA
37 kW	62 ... 73 A	–	–	–	MS165-73	30 kA	30 kA
45 kW	70 ... 80 A	–	–	–	MS165-80	30 kA	30 kA

² 690 V AC

³ Available with push-in spring terminals.

Manual motor starters

Overview



Type	MO132	MO165	MS132-T
Thermal and electromagnetic protection	–	–	Yes
Electromagnetic protection	Yes	Yes	–
Phase loss sensitivity	–	–	Yes
Switch position	ON/OFF/TRIP	ON/OFF/TRIP	ON/OFF/TRIP
Magnetic trip indication	–	–	Yes
Lockable handle without accessories	Yes	Yes	Yes
Disconnecting feature	Yes	Yes	Yes
Width	45 mm	55 mm	45 mm
Rated operational current I _e	0.16 ... 32 A	16 ... 80 A	0.16 ... 25 A
Setting range	–	–	0.10 ... 25 A
Ambient air temperature	-25 ... +60°C	-25 ... +60°C	-25 ... +60°C ¹

¹ Compensated

Accessories

Auxiliary contact	HKF1, HK1	HKF1, HK1
Signaling contact for tripped alarm	SK1	SK1
Signaling contact for short-circuit alarm	–	CK1
Shunt trip	AA1	AA1
Undervoltage release	UA1	UA1

Table for short-circuit ratings for 400/415 V AC

Performance range MO132, MO165					Transformer protection MS132-T	
Selection parameters			Short-circuit breaking capacity		Type	Short-circuit breaking capacity I _{cu} / I _{cs}
Rated operational power	Setting range for thermal release	Type	I _{cu}	I _{cs}		
0.03 kW ²	0.1 ... 0.16 A	MO132-0.16	100 kA	100 kA	MS132-0.16T ³	100 kA
0.06 kW	0.16 ... 0.25 A	MO132-0.25	100 kA	100 kA	MS132-0.25T ³	100 kA
0.09 kW	0.25 ... 0.4 A	MO132-0.4	100 kA	100 kA	MS132-0.4T ³	100 kA
0.18 kW	0.4 ... 0.63 A	MO132-0.63	100 kA	100 kA	MS132-0.63T ³	100 kA
0.25 kW	0.63 ... 1.0 A	MO132-1.0	100 kA	100 kA	MS132-1.0T ³	100 kA
0.55 kW	1.0...1.6 A	MO132-1.6	100 kA	100 kA	MS132-1.6T ³	100 kA
0.75 kW	1.6...2.5 A	MO132-2.5	100 kA	100 kA	MS132-2.5T ³	100 kA
1.5 kW	2.5...4.0 A	MO132-4.0	100 kA	100 kA	MS132-4.0T ³	100 kA
2.2 kW	4.0...6.3 A	MO132-6.3	100 kA	100 kA	MS132-6.3T ³	100 kA
4.0 kW	6.3...10 A	MO132-10	100 kA	100 kA	MS132-10T ³	100 kA
5.5 kW	8...12 A	MO132-12	100 kA	100 kA	MS132-12T	100 kA
7.5 kW	10...16 A	MO132-16 / MO165-16	100 kA	100 kA	MS132-16T ³	100 kA
7.5 kW	14 ... 20 A	MO165-20	100 kA	100 kA	–	–
7.5 kW	16...20 A	MO132-20	100 kA	100 kA	MS132-20T ³	100 kA
11 kW	18 ... 25 A	–	–	–	–	–
11 kW	20...25 A	MO132-25 / MO165-25	50 kA / 100 kA	50 kA / 100 kA	MS132-25T ³	50 kA
15 kW	25...32 A	MO132-32	50 kA	25 kA	–	–
15 kW	23 ... 32 A	MO165-32	100 kA	100 kA	–	–
22 kW	30 ... 42 A	MO165-42	50 kA	50 kA	–	–
22 kW	40 ... 54 A	MO165-54	50 kA	30 kA	–	–
25 kW	–	–	–	–	–	–
30 kW	52 ... 65 A	MO165-65	50 kA	30 kA	–	–
37 kW	62 ... 73 A	MO165-73	30 kA	30 kA	–	–
45 kW	70 ... 80 A	MO165-80	30 kA	30 kA	–	–

² 690 V AC

³ Available with push-in spring terminals.

Transformer protection:
The instantaneous short-circuit current setting is 20 times the rated operational current.

Manual motor starters

MS116



MS116-16



MS116-25



MS116-0.16-HKF1-11



MS116-32-HKF1-11

0.10 to 32 A – with thermal and electromagnetic protection

Rated operational power 400 V AC-3, AC-3e	Setting range	Short-circuit breaking capacity Ics at 400 V AC	Rated instantaneous short-circuit current setting Ii	Type	Order code	Weight (1 pce)
kW	A	kA	A			kg
0.03 ¹	0.10 ... 0.16	50	2.00	MS116-0.16	1SAM250000R1001	0.225
0.06	0.16 ... 0.25	50	3.10	MS116-0.25	1SAM250000R1002	0.225
0.09	0.25 ... 0.40	50	5.00	MS116-0.4	1SAM250000R1003	0.225
0.18	0.40 ... 0.63	50	7.90	MS116-0.63	1SAM250000R1004	0.225
0.25	0.63 ... 1.00	50	12.5	MS116-1.0	1SAM250000R1005	0.225
0.55	1.00 ... 1.60	50	20.0	MS116-1.6	1SAM250000R1006	0.265
0.75	1.60 ... 2.50	50	31.3	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

Mounted auxiliary contacts 1 N.O. + 1 N.C.

0.03 ¹	0.10 ... 0.16	50	2.00	MS116-0.16-HKF1-11	1SAM250005R1001	0.240
0.06	0.16 ... 0.25	50	3.10	MS116-0.25-HKF1-11	1SAM250005R1002	0.240
0.09	0.25 ... 0.40	50	5.00	MS116-0.4-HKF1-11	1SAM250005R1003	0.240
0.18	0.40 ... 0.63	50	7.90	MS116-0.63-HKF1-11	1SAM250005R1004	0.240
0.25	0.63 ... 1.00	50	12.5	MS116-1.0-HKF1-11	1SAM250005R1005	0.240
0.55	1.00 ... 1.60	50	20.0	MS116-1.6-HKF1-11	1SAM250005R1006	0.280
0.75	1.60 ... 2.50	50	31.3	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.

¹ 690 V

Manual motor starters

MS132



MS132-10



MS132-32



MS132-0.16-HKF1-11



MS132-32-HKF1-11

0.10 to 32 A – with thermal and electromagnetic protection

Rated operational power 400 V AC-3, AC-3e	Setting range	Short-circuit breaking capacity Ics at 400 V AC	Rated instantaneous short-circuit current setting Ii	Type	Order code	Weight (1 pce)
						kg
0.03 ¹	0.10 ... 0.16	100	2.00	MS132-0.16	1SAM350000R1001	0.215
0.06	0.16 ... 0.25	100	3.10	MS132-0.25	1SAM350000R1002	0.215
0.09	0.25 ... 0.40	100	5.00	MS132-0.4	1SAM350000R1003	0.215
0.18	0.40 ... 0.63	100	7.90	MS132-0.63	1SAM350000R1004	0.215
0.25	0.63 ... 1.00	100	12.5	MS132-1.0	1SAM350000R1005	0.215
0.55	1.00 ... 1.60	100	20.0	MS132-1.6	1SAM350000R1006	0.265
0.75	1.60 ... 2.50	100	31.3	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

Mounted auxiliary contacts 1 N.O. + 1 N.C.

0.03 ¹	0.10 ... 0.16	100	2.00	MS132-0.16-HKF1-11	1SAM350005R1001	0.231
0.06	0.16 ... 0.25	100	3.10	MS132-0.25-HKF1-11	1SAM350005R1002	0.231
0.09	0.25 ... 0.40	100	5.0	MS132-0.4-HKF1-11	1SAM350005R1003	0.231
0.18	0.40 ... 0.63	100	7.90	MS132-0.63-HKF1-11	1SAM350005R1004	0.231
0.25	0.63 ... 1.00	100	12.5	MS132-1.0-HKF1-11	1SAM350005R1005	0.231
0.55	1.00 ... 1.60	100	20.0	MS132-1.6-HKF1-11	1SAM350005R1006	0.281
0.75	1.60 ... 2.50	100	31.3	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

Mounted auxiliary contacts 2 N.O. + 0 N.C.

7.50	10 ... 16	100	240	MS132-16-HKF1-20	1SAM350006R1011	0.326
------	-----------	-----	-----	------------------	-----------------	-------

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

¹ 690 V

Manual motor starters

MS132-K with push-in spring terminals



MS132-32K

0.10 to 32 A – with thermal and electromagnetic protection

Rated operational power 400 V AC-3, AC-3e	Setting range	Short-circuit breaking capacity Ics at 400 V AC	Rated instantaneous short-circuit current setting Ii	Type	Order code	Weight (1 pce)
						kg
kW	A	kA	A			
0.03 ¹	0.10 ... 0.16	100	2.00	MS132-0.16K	1SAM350010R1001	0.256
0.06	0.16 ... 0.25	100	3.10	MS132-0.25K	1SAM350010R1002	0.256
0.09	0.25 ... 0.40	100	5.00	MS132-0.4K	1SAM350010R1003	0.256
0.18	0.40 ... 0.63	100	7.90	MS132-0.63K	1SAM350010R1004	0.256
0.25	0.63 ... 1.00	100	12.5	MS132-1.0K	1SAM350010R1005	0.256
0.55	1.00 ... 1.60	100	20.0	MS132-1.6K	1SAM350010R1006	0.298
0.75	1.60 ... 2.50	100	31.3	MS132-2.5K	1SAM350010R1007	0.280
1.50	2.50 ... 4.00	100	50.0	MS132-4.0K	1SAM350010R1008	0.286
2.20	4.00 ... 6.30	100	78.8	MS132-6.3K	1SAM350010R1009	0.289
4.00	6.30 ... 10.0	100	150	MS132-10K	1SAM350010R1010	0.296
7.50	10.0 ... 16.0	100	240	MS132-16K	1SAM350010R1011	0.316
7.50	16.0 ... 20.0	100	300	MS132-20K	1SAM350010R1013	0.317
11.0	20.0 ... 25.0	50	375	MS132-25K	1SAM350010R1014	0.316
15.0	25.0 ... 32.0	25	480	MS132-32K	1SAM350010R1015	0.316

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

¹ 690 V

Manual motor starters

MS165



MS165-65

10 to 80 A – with thermal and electromagnetic protection

Rated operational power 400 V AC-3, AC-3e	Setting range	Short-circuit breaking capacity Ics at 400 V AC	Rated instantaneous short-circuit current setting Ii	Type	Order code	Weight (1 pce)
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	100	480	MS165-32	1SAM451000R1014	0.970
22	30 ... 42	50	630	MS165-42	1SAM451000R1015	0.970
22	40 ... 54	30	810	MS165-54	1SAM451000R1016	0.970
30	52 ... 65	30	975	MS165-65	1SAM451000R1017	0.980
37	62 ... 73	30	1022	MS165-73	1SAM451000R1018	1.000
45	70 ... 80	30	1120	MS165-80	1SAM451000R1019	1.000

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

Manual motor starters

MO132 magnetic only



MO132-6.3



MO132-32

0.16 to 32 A – with electromagnetic protection

Rated operational power 400 V AC-3, AC-3e	Rated operational current	Short-circuit breaking capacity Ics at 400 V AC	Rated instantaneous short-circuit current setting Ii	Type	Order code	Weight (1 pce)
						kg
0.03 ¹	0.16	100	2.00	MO132-0.16	1SAM360000R1001	0.215
0.06	0.25	100	3.10	MO132-0.25	1SAM360000R1002	0.215
0.09	0.40	100	5.00	MO132-0.4	1SAM360000R1003	0.215
0.12	0.63	100	7.90	MO132-0.63	1SAM360000R1004	0.215
0.25	1.0	100	12.5	MO132-1.0	1SAM360000R1005	0.215
0.55	1.6	100	20.0	MO132-1.6	1SAM360000R1006	0.265
0.75	2.5	100	31.3	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

Note: For overload protection of motors, an appropriate thermal or electronic overload relay must be used.

¹ 690 V

Manual motor starters

MO165 magnetic only



MO165-65

16 to 80 A – with electromagnetic protection

Rated operational power 400 V AC-3, AC-3e	Rated operational current	Short-circuit breaking capacity Ics at 400 V AC	Rated instantaneous short-circuit current setting Ii	Type	Order code	Weight (1 pce)
kW	A	kA	A			kg
7.5	16	100	240	MO165-16	1SAM461000R1011	0.950
7.5	20	100	300	MO165-20	1SAM461000R1012	0.950
11	25	100	375	MO165-25	1SAM461000R1013	0.960
15	32	100	480	MO165-32	1SAM461000R1014	0.970
22	42	50	630	MO165-42	1SAM461000R1015	0.970
22	54	30	810	MO165-54	1SAM461000R1016	0.970
30	65	30	975	MO165-65	1SAM461000R1017	0.980
37	73	30	1022	MO165-73	1SAM461000R1018	1.000
45	80	30	1120	MO165-80	1SAM461000R1019	1.000

Note: For overload protection of motors, an appropriate thermal or electronic overload relay must be used.

Circuit breakers for transformer protection

MS132-T



MS132-10T



MS132-25T

0.10 to 25 A – with thermal and electromagnetic protection

Setting range	Short-circuit breaking capacity Ics at 400 V AC	Rated instantaneous short-circuit current setting Ii	Type	Order code	Weight (1 pce)
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

Circuit breakers for transformer protection

MS132-KT with push-in spring terminals



MS132-KT

0.10 to 25 A – with thermal and electromagnetic protection

Setting range	Short-circuit breaking capacity I _{cs} at 400 V AC	Rated instantaneous short-circuit current setting I _i	Type	Order code	Weight (1 pce)
A	kA	A			kg
0.10 ... 0.16	100	3.2	MS132-0.16KT	1SAM340010R1001	0.256
0.16 ... 0.25	100	5	MS132-0.25KT	1SAM340010R1002	0.256
0.25 ... 0.40	100	8	MS132-0.4KT	1SAM340010R1003	0.256
0.40 ... 0.63	100	12.6	MS132-0.63KT	1SAM340010R1004	0.256
0.63 ... 1.00	100	20	MS132-1.0KT	1SAM340010R1005	0.256
1.00 ... 1.60	100	32	MS132-1.6KT	1SAM340010R1006	0.298
1.60 ... 2.50	100	50	MS132-2.5KT	1SAM340010R1007	0.280
2.50 ... 4.00	100	80	MS132-4.0KT	1SAM340010R1008	0.286
4.00 ... 6.30	100	126	MS132-6.3KT	1SAM340010R1009	0.289
6.30 ... 10.0	100	200	MS132-10KT	1SAM340010R1010	0.296
10.0 ... 16.0	100	320	MS132-16KT	1SAM340010R1011	0.316
16.0 ... 20.0	100	400	MS132-20KT	1SAM340010R1013	0.317
20.0 ... 25.0	50	500	MS132-25KT	1SAM340010R1014	0.316

Accessories

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



HKF1-11



HK1-11



SK1-11



CK1-11

Suitable for	Auxiliary contacts N.O.	Auxiliary contacts N.C.	Description	Type	Order code	Pkg qty	Weight (1 pce) kg
Auxiliary contacts – mountable on the front							
MS116, MS132, MS165, MO132, MO165, MS132-T, MS132-K, MS132-KT	1	1	–	HKF1-11	1SAM201901R1001	10	0.015
	1	0	–	HKF1-10	1SAM201901R1003	10	0.013
	0	1	–	HKF1-01	1SAM201901R1004	10	0.013
	2	0	–	HKF1-20	1SAM201901R1002	10	0.015
Auxiliary contacts – mountable on the right							
MS116, MS132, MS165, MO132, MO165, MS132-T, MS132-K, MS132-KT	1	1	max. 2 pieces	HK1-11	1SAM201902R1001	2	0.035
	2	0	max. 2 pieces	HK1-20	1SAM201902R1002	2	0.035
	0	2	max. 2 pieces	HK1-02	1SAM201902R1003	2	0.035
MS116, MS132, MO132, MS132-T, MS132-K, MS132-KT	2	0	max. 2 pieces with leading contacts	HK1-20L	1SAM201902R1004	2	0.035
Signaling contacts – mountable on the right							
MS116, MS132, MS165, MO132, MO165, MS132-T, MS132-K, MS132-KT	1	1	for tripped alarm	SK1-11	1SAM201903R1001	2	0.035
	2	0	for tripped alarm	SK1-20	1SAM201903R1002	2	0.035
	0	2	for tripped alarm	SK1-02	1SAM201903R1003	2	0.035
MS132, MS165, MS132-T, MS132-K, MS132-KT	1	1	for short-circuit alarm	CK1-11	1SAM301901R1001	2	0.035
	2	0	for short-circuit alarm	CK1-20	1SAM301901R1002	2	0.035
	0	2	for short-circuit alarm	CK1-02	1SAM301901R1003	2	0.035

Note : For BEA connecting links with AF, AS and B mini contactors please refer to Control Catalog Section 2.

Accessories

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



AA1-24



UA1-24

Suitable for	Rated control supply voltage		Type	Order code	Pkg qty	Weight
	50 Hz V AC	60 Hz V AC				(1 pce)
						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

Note : For BEA...-4K push-in spring connecting links with AF09..K ... AF38..K please refer to Control Catalog Section 2 - "Connection accessories for starting solutions with push-in spring terminals".

Accessories

With push-in spring terminals



HKF1-11K



HK1-11K



SK1-11K

Suitable for	Auxiliary contacts N.O.	Auxiliary contacts N.C.	Description	Type	Order code	Pkg qty	Weight (1 pce) kg
Auxiliary contacts - mountable on the front							
MS116, MS132, MS165 MO132, MO165, MS132-T, MS132-K, MS132-KT	1	1	–	HKF1-11K	1SAM201901R1201	10	0.016
	2	0	–	HKF1-20K	1SAM201901R1202	10	0.016
Auxiliary contacts - mountable on the right							
MS116, MS132, MS165 MO132, MO165, MS132-T, MS132-K, MS132-KT	1	1	max. 2 pieces	HK1-11K	1SAM201902R1201	2	0.035
	2	0	max. 2 pieces	HK1-20K	1SAM201902R1202	2	0.035
	0	2	max. 2 pieces	HK1-02K	1SAM201902R1203	2	0.035
	2	0	with leading contacts	HK1-20LK	1SAM201902R1204	2	0.035
Signaling contacts - mountable on the right							
MS116, MS132, MS165 MO132, MO165, MS132-T, MS132-K, MS132-KT	1	1	for tripped alarm	SK1-11K	1SAM201903R1201	2	0.035
	2	0	for tripped alarm	SK1-20K	1SAM201903R1202	2	0.035
	0	2	for tripped alarm	SK1-02K	1SAM201903R1203	2	0.035

Accessories

MS116, MS132, MO132, MS132-T



PS1-2-0-65



PS1-3-1-100



S1-M3-35



S1-M2-25

Suitable for	Rated operational current	Number of manual motor starters	Number of lateral auxiliary contacts	Type	Order code	Pkg qty	Weight (1 pce)
	A						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	
	65	4	2	PS1-4-2-65	1SAM201906R1124	10	0.095	
	65	5	2	PS1-5-2-65	1SAM201906R1125	10	0.122	
	MS116, MS132, MO132	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	

Note: busbars are only suitable for screw versions

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

Accessories

MS116, MS132, MO132, MS132-T



TS1-M3-S1



SA2



SA1



PB1-1-32



S1-PB1-25

Terminal spacers, Type E

Suitable for	Mounting form	Type	Order code	Pkg qty	Weight (1 pce) kg
MS132 ≤ 10 A	UL/CSA Type E and IEC	TS1-M3-S1	1SAM301902R1001	2	0.012
MS132 ≥ 12 A	UL/CSA Type E and IEC	TS1-M3-S2	1SAM301902R1002	2	0.012
MS132-K	UL/CSA Type E and IEC	TS1-M3-K	1SAM301903R1001	2	0.012

Note: For product availability, please consult your ABB local sales organization

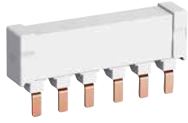
Suitable for	Description	Type	Order code	Pkg qty	Weight (1 pce) kg
MS116, MS132, MO132	Protection cover for busbars	BS1-3	1SAM201908R1001	50	0.003
MS116, MS132, MO132, MS132-T	Screw fixing kit	FS116	1SAM201909R1001	1	0.020
	Padlock + two keys	SA2	GJF1101903R0002	10	0.020
	Lock handle	SA1	GJF1101903R0001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

Accessories

MS165, MO165



PS2-2-0-125



PS2-3-0-125



S2-M3-50



KA165



BS2-3



BS2-3



SA2

Three-phase busbars

Suitable for	Rated operational current	Number of manual motor starters	Number of lateral auxiliary contacts	Type	Order code	Pkg qty	Weight (1 pce)
	A						kg
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.

Feeder block

Suitable for	Rated operational current	Rated cross section	Mounting form	Type	Order code	Pkg qty	Weight (1 pce)
	A	mm ²					kg
MS165, MO165	125	50	UL508A and IEC	S2-M3-50	1SAM401923R1003	1	0.172

Suitable for	Description	Type	Order code	Pkg qty	Weight (1 pce)
					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

Accessories

MS116, MS132, MO132



IB132-Y



IB132-G



DMS132-Y



DMS132-G

Suitable for	Description	Color	Type	Order code	Pkg qty	Weight (1 pce) kg
IP65 enclosures (NEMA 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 (NEMA 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.

Accessories

MS116, MS132, MS165, MO132, MO165



MSHD-LB



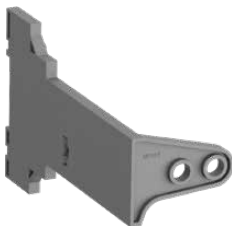
MSHD-LY



MSMN



MSH-AR



MSAH1

Suitable for	Description	Shaft length	Color	Type	Order code	Pkg qty	Weight (1 pce)
		mm				pce	kg
Shafts							
MS116, MS132, MO132, MS165, MO165	For MSHD handles. Shaft diameter 6 mm. Shaft extension for door coupling driver.	85	–	OX56X85	1SCA101647R1001	1	0.020
		105	–	OX56X105	1SCA108043R1001	1	0.020
		130	–	OX56X130	1SCA101655R1001	1	0.030
		180	–	OX56X180	1SCA101659R1001	1	0.040
IP64 handles (NEMA Type 1, 3R, 12)							
MS116, MS132, MO132, MS165, MO165	Padlockable max. 3 padlocks with bail diameter 5 ... 8 mm, door interlock in ON position defeatable, for use with 6 mm OX56...types up to 180 mm or driver shafts MSOX.	–	Black	MSHD-LB ¹	1SAM201920R1001	1	0.065
		–	Yellow	MSHD-LY ¹	1SAM201920R1002	1	0.065
		–	Black	MSHD-LTB ²	1SAM201920R1011	1	0.065
		–	Yellow	MSHD-LTY ²	1SAM201920R1012	1	0.065
Driver							
MS116, MS132, MO132, MS165, MO165	Coupling driver for use with 6 mm OX56... types up to 180 mm.	–	–	MSMN ³	1SAM101923R0002	1	0.002
		–	–	MSMNO ⁴	1SAM101923R0012	1	0.002
Shaft alignment ring							
MS116, MS132, MO132, MS165, MO165	The MSH-AR supports the long shafts for alignment to the handle inlet. It makes closing panel doors more easy. Use for OX56X > 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

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

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

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

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

Enclosed direct-on-line starters

DRAS09 ... DRAS16



DRAS
+ T16 to be
ordered separately

4 to 7.5 kW, protected by thermal overload relays, AC or DC operated

IEC - AC-3				Rated control circuit voltage		Control supply wiring	Type	Order code	Weight Pkg (1 pce)
Rated operational power				Uc	V DC				
220 V	230 V	240 V	max. current $\theta \leq 40^\circ\text{C}$ Ue=400 V	Other control voltages see AS voltage code table					
kW	kW	kW	A	V 50/60 Hz	V DC				kg
AC operated with AS 3-pole contactors									
2.2	4	4	9	24	-	Separate supply	DRAS09-20S	1SBK104235R2000	0.650
				230	-	Phase-to-neutral	DRAS09-26N	1SBK104135R2600	0.650
				240	-	Phase-to-neutral	DRAS09-27N	1SBK104135R2700	0.650
				400	-	Phase-to-phase	DRAS09-28P	1SBK104035R2800	0.650
				415	-	Phase-to-phase	DRAS09-29P	1SBK104035R2900	0.650
3	5.5	5.5	12	24	-	Separate supply	DRAS12-20S	1SBK114235R2000	0.650
				230	-	Phase-to-neutral	DRAS12-26N	1SBK114135R2600	0.650
				240	-	Phase-to-neutral	DRAS12-27N	1SBK114135R2700	0.650
				400	-	Phase-to-phase	DRAS12-28P	1SBK114035R2800	0.650
				415	-	Phase-to-phase	DRAS12-29P	1SBK114035R2900	0.650
4	7.5	7.5	15.5	24	-	Separate supply	DRAS16-20S	1SBK124235R2000	0.650
				230	-	Phase-to-neutral	DRAS16-26N	1SBK124135R2600	0.650
				240	-	Phase-to-neutral	DRAS16-27N	1SBK124135R2700	0.650
				400	-	Phase-to-phase	DRAS16-28P	1SBK124035R2800	0.650
				415	-	Phase-to-phase	DRAS16-29P	1SBK124035R2900	0.650
DC operated with ASL 3-pole contactors									
2.2	4	4	9	-	24	Separate supply	DRASL09-81S	1SBK104335R8100	0.700
				-	48		DRASL09-83S	1SBK104335R8300	0.700
3	5.5	5.5	12	-	24	Separate supply	DRASL12-81S	1SBK114335R8100	0.700
				-	48		DRASL12-83S	1SBK114335R8300	0.700
4	7.5	7.5	15.5	-	24	Separate supply	DRASL16-81S	1SBK124335R8100	0.700
				-	48		DRASL16-83S	1SBK124335R8300	0.700

Enclosed direct-on-line starters

DRAS09 ... DRAS16



T16



Empty enclosure
with push-button

4 to 7.5 kW, protected by thermal overload relays, AC or DC operated - continued

T16 thermal overload relays to be ordered separately

Setting range A	Short-circuit protective device	Trip class	Type	Order code	Weight (1 pce) kg
0.10...0.13	0.5 A, Fuse type T	10	T16-0.13	1SAZ711201R1005	0.100
0.13...0.17	1.0 A, Fuse type T		T16-0.17	1SAZ711201R1008	0.100
0.17...0.23			T16-0.23	1SAZ711201R1009	0.100
0.23...0.31	2.0 A, Fuse type gG		T16-0.31	1SAZ711201R1013	0.100
0.31...0.41			T16-0.41	1SAZ711201R1014	0.100
0.41...0.55	4.0 A, Fuse type gG		T16-0.55	1SAZ711201R1017	0.100
0.55...0.74			T16-0.74	1SAZ711201R1021	0.100
0.74...1.00	6.0 A, Fuse type gG		T16-1.0	1SAZ711201R1023	0.100
1.00...1.30			T16-1.3	1SAZ711201R1025	0.100
1.30...1.70	10.0 A, Fuse type gG		T16-1.7	1SAZ711201R1028	0.100
1.70...2.30			T16-2.3	1SAZ711201R1031	0.100
2.30...3.10	20.0 A, Fuse type gG		T16-3.1	1SAZ711201R1033	0.100
3.10...4.20			T16-4.2	1SAZ711201R1035	0.100
4.20...5.70	35.0 A, Fuse type gG		T16-5.7	1SAZ711201R1038	0.100
5.70...7.60			T16-7.6	1SAZ711201R1040	0.100
7.60...10.0	40.0 A, Fuse type gG		T16-10	1SAZ711201R1043	0.104
10.0...13.0		T16-13	1SAZ711201R1045	0.104	
13.0...16.0		T16-16	1SAZ711201R1047	0.104	

Empty enclosure with push-button

–	–	–	FR16AS-12VARS	1SBN101035R1000	0.394
---	---	---	---------------	-----------------	-------

To be completed with AS or ASL contactor, T16 thermal overload relay and MCB-10B (1SFA611610R2001) contact block.

Enclosed direct-on-line starters

DRAF09 ... DRAF16



DRAF
+ TF42 to be
ordered separately

Up to 7.5 kW and 10 hp, protected by thermal overload relays, AC operated

IEC - AC-3					Control supply wiring	Rated control circuit voltage Uc min ... Uc max ¹ V 50/60 Hz	Type	Order code	Weight Pkg (1 pce) kg
Rated operational power				max. current $\theta \leq 40^\circ\text{C}$ Ue= 400 V					
220 V 230 V 240 V	380 V 400 V	500 V	690 V						
kW	kW	kW	kW	A					
IEC starters type									
2.2	4	5.5	5.5	9	Separate supply	24...60	DRAF09-11S	1SBK134237R1100	0.820
					Phase-to-neutral	100...250	DRAF09-13N	1SBK134137R1300	0.820
					Phase-to-phase	250...500	DRAF09-14P	1SBK134037R1400	0.820
3	5.5	7.5	7.5	12	Separate supply	24...60	DRAF12-11S	1SBK154237R1100	0.820
					Phase-to-neutral	100...250	DRAF12-13N	1SBK154137R1300	0.820
					Phase-to-phase	250...500	DRAF12-14P	1SBK154037R1400	0.820
4	7.5	9	9	18	Separate supply	24...60	DRAF16-11S	1SBK174237R1100	0.820
					Phase-to-neutral	100...250	DRAF16-13N	1SBK174137R1300	0.820
					Phase-to-phase	250...500	DRAF16-14P	1SBK174037R1400	0.820

¹ Select DRAF..S with separate supply for 24...60 V DC control circuit voltage (change A2 - Us wire to blue color acc. to IEC 60947-4-1).

UL starter type with separate control supply wiring

UL / CSA						Rated control circuit voltage Uc min ... Uc max V 50/60 Hz	Type	Order code	Weight Pkg (1 pce) kg
Horse power ratings									
Single phase motor		Three phase motor							
120 V	240 V	200 V 208 V	220 V 240 V	440 V 480 V	550 V 600 V				
hp	hp	hp	hp	hp	hp				
0.75	1.5	2	2	5	7.5	24...60	DRAF09-11U	1SBK134238R1100	0.820
						100...250	DRAF09-13U	1SBK134238R1300	0.820
						250...500	DRAF09-14U	1SBK134238R1400	0.820
1	2	3	3	7.5	10	24...60	DRAF12-11U	1SBK154238R1100	0.820
						100...250	DRAF12-13U	1SBK154238R1300	0.820
						250...500	DRAF12-14U	1SBK154238R1400	0.820
1.5	3	5	5	10	15	24...60	DRAF16-11U	1SBK174238R1100	0.820
						100...250	DRAF16-13U	1SBK174238R1300	0.820
						250...500	DRAF16-14U	1SBK174238R1400	0.820

Enclosed direct-on-line starters

DRAF09 ... DRAF16



TF42

Up to 7.5 kW and 10 hp, protected by thermal overload relays, AC operated - continued

TF42 thermal overload relays to be ordered separately

Setting range	Short-circuit protective device	Trip class	Type	Order code	Weight (1 pce)
A					
kg					
0.10 ... 0.13	0.5 A, Fuse type T	10	TF42-0.13	1SAZ721201R1005	0.130
0.13 ... 0.17	1.0 A, Fuse type T	10	TF42-0.17	1SAZ721201R1008	0.130
0.17 ... 0.23	1.0 A, Fuse type T	10	TF42-0.23	1SAZ721201R1009	0.130
0.23 ... 0.31	1.0 A, Fuse type T	10	TF42-0.31	1SAZ721201R1013	0.130
0.31 ... 0.41	2.0 A, Fuse type gG	10	TF42-0.41	1SAZ721201R1014	0.130
0.41 ... 0.55	2.0 A, Fuse type gG	10	TF42-0.55	1SAZ721201R1017	0.130
0.55 ... 0.74	4.0 A, Fuse type gG	10	TF42-0.74	1SAZ721201R1021	0.130
0.74 ... 1.00	6.0 A, Fuse type gG	10	TF42-1.0	1SAZ721201R1023	0.130
1.00 ... 1.30	6.0 A, Fuse type gG	10	TF42-1.3	1SAZ721201R1025	0.130
1.30 ... 1.70	10.0 A, Fuse type gG	10	TF42-1.7	1SAZ721201R1028	0.130
1.70 ... 2.30	10.0 A, Fuse type gG	10	TF42-2.3	1SAZ721201R1031	0.130
2.30 ... 3.10	10.0 A, Fuse type gG	10	TF42-3.1	1SAZ721201R1033	0.130
3.10 ... 4.20	20.0 A, Fuse type gG	10	TF42-4.2	1SAZ721201R1035	0.130
4.20 ... 5.70	20.0 A, Fuse type gG	10	TF42-5.7	1SAZ721201R1038	0.130
5.70 ... 7.60	35.0 A, Fuse type gG	10	TF42-7.6	1SAZ721201R1040	0.130
7.60 ... 10.0	35.0 A, Fuse type gG	10	TF42-10	1SAZ721201R1043	0.130
10.0 ... 13.0	40.0 A, Fuse type gG	10	TF42-13	1SAZ721201R1045	0.130
13.0 ... 16.0	40.0 A, Fuse type gG	10	TF42-16	1SAZ721201R1047	0.130
16.0 ... 20.0	63.0 A, Fuse type gG	10	TF42-20	1SAZ721201R1049	0.145



Empty enclosure with push-button

Empty enclosure with push-button

mm cable inlet/outlet suitable for IEC starter types	–	FR16AF-12	1SBN101337R1000	0.53
Inch cable inlet/outlet suitable for UL starter types	–	FR16AF-12U	1SBN101338R1000	0.53

To be completed with AF contactor, TF42 thermal overload relay and CB5-10 (1SBN10013R1010) start contact block.

Electronic compact starters

HF0.6, HF2.4, HF9



HF0.6-DOL-24VDC



HF9-DOLE-24VDC

Direct-on-line starter

Rated operational current AC-53a	Rated operational power AC-53a	Rated operational current AC-51	Setting range	Full load amps motor use	Type	Order code	Weight (1 pce)
A	kW	A	A	A			kg

Direct-on-line starter with overload protection

0.6	0.18 (400V)	0.6	0.075 ... 0.6	0.6	HF0.6-DOL-24VDC	1SAT112000R1011	0.205
2.4	0.75 (400V)	2.4	0.18 ... 2.4	2.4	HF2.4-DOL-24VDC	1SAT122000R1011	0.218
6.5	3.00 (400V)	9.0	1.5 ... 9.0	6.5	HF9-DOL-24VDC	1SAT142000R1011	0.206

Direct-on-line starter with overload protection and emergency stop

0.6	0.18 (400V)	0.6	0.075 ... 0.6	0.6	HF0.6-DOLE-24VDC	1SAT113000R1011	0.205
2.4	0.75 (400V)	2.4	0.18 ... 2.4	2.4	HF2.4-DOLE-24VDC	1SAT123000R1011	0.218
6.5	3.00 (400V)	9.0	1.5 ... 9.0	6.5	HF9-DOLE-24VDC	1SAT143000R1011	0.206

Electronic compact starters

HF0.6, HF2.4, HF9



HF9-R-24VDC



HF9-ROL-24VDC



HF9-ROLE-24VDC

Reversing starter

Rated operational current AC-53a	Rated operational power AC-53a	Rated operational current AC-51	Setting range	Full load amps motor use	Type	Order code	Weight (1 pce)
A	kW	A	A	A			kg

Reversing starter with no monitoring and no overload functionality

6.5	3.00 (400V)	9.0	–	6.5	HF9-R-24VDC	1SAT144000R1011	0.174
-----	-------------	-----	---	-----	-------------	-----------------	-------

Reversing starter with overload protection

0.6	0.18 (400V)	0.6	0.075 ... 0.6	0.6	HF0.6-ROL-24VDC	1SAT115000R1011	0.217
2.4	0.75 (400V)	2.4	0.18 ... 2.4	2.4	HF2.4-ROL-24VDC	1SAT125000R1011	0.219
6.5	3.00 (400V)	9.0	1.5 ... 9.0	6.5	HF9-ROL-24VDC	1SAT145000R1011	0.218

Reversing starter with overload protection and emergency stop

0.6	0.18 (400V)	0.6	0.075 ... 0.6	0.6	HF0.6-ROLE-24VDC	1SAT116000R1011	0.218
2.4	0.75 (400V)	2.4	0.18 ... 2.4	2.4	HF2.4-ROLE-24VDC	1SAT126000R1011	0.270
6.5	3.00 (400V)	9.0	1.5 ... 9.0	6.5	HF9-ROLE-24VDC	1SAT146000R1011	0.289

