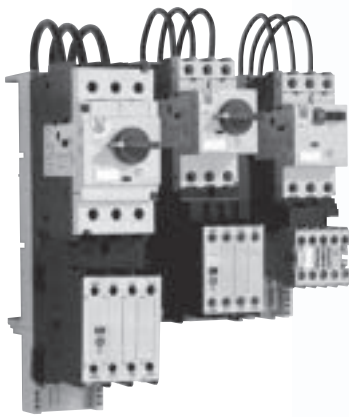


# Control and Automation

For industrial applications ED.03

Motorstarters



GE imagination at work

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## ASTAT S - Softstarters

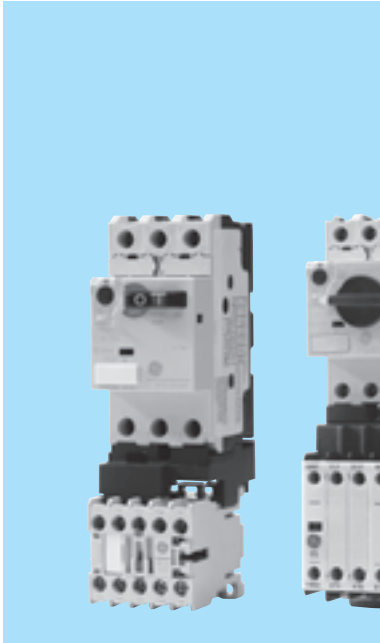
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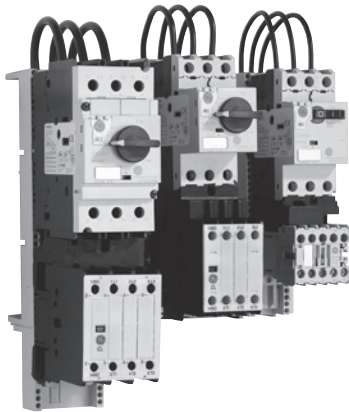
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**NEW**





## Fuseless starters and busbar adapter plates



### Product range

- Link modules for mechanical and electrical connection of the manual motor starter and the M / CL contactor range
- Base plates for Din rail and busbar adapters
- Wiring kits for reversing applications
- Link connection for two base plates for three phase busbar system with 40 and 60mm center line spacing and 5 to 10mm thickness
- Accessories

### Technical performances

- Compact and high performance solution
- Easy accessibility to the contactor coil terminal A1-A2
- Save spacing only using 45 and 55mm width base plates for busbar adapters
- Quick "clip on" and secure connections
- Minimum 50kA short-circuit breaking capacity applies throughout

#### Thermal and magnetic protection

- GPS1B ● pg. B.8
- GPS2B ● pg. B.10
- GPS1M ● pg. B.12
- GPS2M ● pg. B.14

#### Contactors

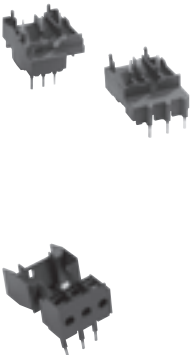



- Serie M ● pg. C.2
- Serie CL ● pg. C.10

- Coordination tables ● pg. D.5
- Dimensions ● pg. D.14

For fuseless starter application turn the contactor 180° to have direct accessibility to the A1-A2 coil terminals when contactor is assembled to the manual motor starter. Then fit the contactor plastic cover into the contactor front to have the terminal numbering in the correct position.

Note: when turning the contactor 180° the built-in auxiliary contact (in case) will be located on the first left side terminal.

### Fuseless starters

	Description	For use with contactor	ac/dc	Frame size	Cat. no.	Ref. no.	Pack.
 <p><b>Link modules</b></p>	For mechanical and electrical connection between contactors and manual motor starters	MC0...MC1..	ac/dc	GPS1	<b>GPF1LMCBA</b>	101410	5
		CL00A...CL01A...CL02A..	ac	GPS1	<b>GPF1L02AA</b>	101411	5
		CL00D...CL01D...CL02D..	dc	GPS1	<b>GPF1L02DA</b>	101412	5
		CL25A..	ac	GPS1	<b>GPF1L25AA</b>	101413	5
		CL25D..	dc	GPS1	<b>GPF1L25DA</b>	101414	5
		CL03A...CL04A	ac	GPS1	<b>GPF1L04AA</b>	107165	5
		CL03D...CL04D	dc	GPS1	<b>GPF1L04DA</b>	107166	5
		CL03A...CL04A..	ac	GPS2	<b>GPF2L04AA</b>	107190	5
		CL45A..	ac	GPS2	<b>GPF2L45AA</b>	101415	5
		CL03D...CL04D..	dc	GPS2	<b>GPF2L04DA</b>	107191	5
		CL45D..	dc	GPS2	<b>GPF2L45DA</b>	101416	5
		CL06A...CL07A..	ac	GPS2	<b>GPF2L07AA</b>	101417	5
		For use with MCCB Record Plus with CL09/10A	-	-	-	<b>GPF3L09AA</b>	107252
	For mechanical and electrical connection between contactor and thermal overload relays RT1	CL00...CL25	ac/dc	GPS1	<b>GPF1L25CT1</b>	101512	5
CL03...CL45		ac/dc	GPS2	<b>GPF1L45CT1</b>	101513	5	
 <p><b>Base plates</b></p>	Plastic plates for mounting the fuseless starter in panels or in 35 mm DIN rail	CL00...CL01...CL02...CL25..	ac/dc	GPS1	<b>GPF1B1A</b>	101418	5
		CL03...CL04...and CL45..	ac/dc	GPS2	<b>GPF2B2A</b>	101419	5
		CL06...CL07..	ac/dc	GPS2	<b>GPF2B3A</b>	101420	5
		CL03...CL04..	ac/dc	GP	<b>GPF1B4A</b>	107163	5
<p><b>Base plates</b></p> <p><b>Link connector</b></p>	For use with MCCB Record Plus	-	-	-	<b>GPF3B5A</b>	107253	1
	For two base plates for reversing applications	-	-	-	<b>GPF1CBA</b>	101427	10
 <p><b>Wiring kits for reversing starters</b></p>	Suitable to be used with link modules Upper and lower connections without overload relays	MC0...MC1...MC2..	ac/dc		<b>WKMIU</b>	101421	1
		CL00...CL01...CL02..	ac/dc		<b>WKLI02P</b>	101422	1
		CL25..	ac/dc		<b>WKLI25P</b>	101423	1
		CL03...CL04...	ac/dc		<b>WKLI04P</b>	101424	1
		CL45..	ac/dc		<b>WKLI45P</b>	101425	1
		CL06A...CL07A..	ac		<b>WKLI07P</b>	101426	1
 <p><b>Plastic cover</b></p>	Fit the plastic cover into the front of the correspondent contactor to allow a clear identification of the terminal numbering	For use with contactor					
		CL00...CL01.. and CL02 without built-in auxiliary contact		<b>GPF00C02</b>	107098	5	
		CL00...CL01.. and CL02 with built-in 1NO auxiliary contact		<b>GPF10C02</b>	107099	5	
		CL00...CL01.. and CL02 with built-in 1NC auxiliary contact		<b>GPF01C02</b>	107100	5	
		CL25..		<b>GPF00C25</b>	107101	2	
		CL03...CL04.. without built-in auxiliary contact		<b>GPF00C04</b>	107102	5	
		CL03...CL04.. with built-in 1NO auxiliary contact		<b>GPF10C04</b>	107103	5	
		CL03...CL04.. with built-in 1NC auxiliary contact		<b>GPF01C04</b>	107105	5	
		CL45..		<b>GPF00C45</b>	107106	5	
		CL06...CL07..		<b>GPF00C08</b>	107107	5	

Order codes

A

B

C

D

E

F

G

H

I

X



Notes

Manual motorstarter

A

B

C

D

E

F

G

H

I

X

Grid area for notes



Technical data

Surion GPS-B: Coordination Type 1 65kA at 380/400V and 415V

MOTOR (1)			MANUAL MOTOR STARTER				CONTACTOR			LINKS
Rated power (kW)	Rated current		Cat. no.	Rated current In (A)	Thermal current Setting range (A)	Magnetic current (A)	Series	Smallest wire Cu (PVC)(2) 380/415V (mm <sup>2</sup> )	Minimum frontal electrical safety clearance (mm)	Cat. no. (3)
	380/400V (A)	415V (A)								
0.06	0.23	0.21	GPS1BSAB	0.25	0.16 - 0.25	3.2	MC0 / CL00	1	20	GPF1LMCBA / GPF1L02*
0.09	0.34	0.31	GPS1BSAC	0.4	0.25 - 0.4	5.2	MC0 / CL00	1	20	GPF1LMCBA / GPF1L02*
0.12	0.44	0.4	GPS1BSAD	0.63	0.4 - 0.63	8.2	MC0 / CL00	1	20	GPF1LMCBA / GPF1L02*
0.18	0.65	0.63	GPS1BSAE	1	0.63 - 1	13	MC0 / CL00	1	20	GPF1LMCBA / GPF1L02*
0.25	0.9	0.8	GPS1BSAE	1	0.63 - 1	13	MC0 / CL00	1	20	GPF1LMCBA / GPF1L02*
0.37	1.25	1.1	GPS1BSAF	1.6	1 - 1.6	20.5	MC0 / CL00	1	20	GPF1LMCBA / GPF1L02*
0.55	1.6	1.5	GPS1BSAF	1.6	1 - 1.6	20.5	MC0 / CL00	1	20	GPF1LMCBA / GPF1L02*
0.75	2	1.9	GPS1BSAG	2.5	1.6 - 2.5	32.5	MC0 / CL00	1	20	GPF1LMCBA / GPF1L02*
1.1	2.6	2.5	GPS1BSAH	4	2.5 - 4	52	MC0 / CL00	1	20	GPF1LMCBA / GPF1L02*
1.5	3.5	3.4	GPS1BSAH	4	2.5 - 4	52	MC0 / CL00	1	20	GPF1LMCBA / GPF1L02*
2.2	5	4.5	GPS1BSAJ	6.3	4 - 6.3	82	MC0 / CL00	1	20	GPF1LMCBA / GPF1L02*
3	7	6.5	GPS1BSAK	10	6.3 - 10	130	MC1 / CL00	1.5	20	GPF1LMCBA / GPF1L02*
4	9	8	GPS1BSAK	10	6.3 - 10	130	MC1 / CL00	1.5	20	GPF1LMCBA / GPF1L02*
5.5	12	11	GPS1BHAL	13	9 - 13	169	CL01	2.5	20	GPF1L02*
7.5	16	14	GPS1BHAM	16	11 - 16	208	CL02	2.5	20	GPF1L02*
11	22.5	21	GPS1BHAP	25	19 - 25	325	CL25	4	20	GPF1L25*
15	30	28	GPS1BHAR	32	24 - 32	416	CL04	6	20	GPF1L04*
11	22.5	21	GPS2BHAP	25	19 - 25	325	CL04	4	20	GPF2L04*
15	30	28	GPS2BHAR	32	24 - 32	416	CL04	6	20	GPF2L04*
18.5	37	35	GPS2BHAS	40	28 - 40	520	CL45	10	20	GPF2L45*
22	44	41	GPS2BHAT	50	35 - 50	650	CL06	10	25	GPF2L07AA
30	60	55	GPS2BHAU	63	45 - 63	820	CL07	16	25	GPF2L07AA

Surion GPS-B: Coordination Type 2 65kA at 380/400V and 415V

MOTOR (1)			MANUAL MOTOR STARTER				CONTACTOR			LINKS
Rated power (kW)	Rated current		Cat. no.	Rated current In (A)	Thermal current Setting range (A)	Magnetic current (A)	Series	Smallest wire Cu (PVC)(2) 380/415V (mm <sup>2</sup> )	Minimum frontal electrical safety clearance (mm)	Cat. no. (3)
	380/400V (A)	415V (A)								
0.06	0.23	0.21	GPS1BHAB	0.25	0.16 - 0.25	3.2	CL00	1	20	GPF1L02*
0.09	0.34	0.31	GPS1BHAC	0.4	0.25 - 0.4	5.2	CL00	1	20	GPF1L02*
0.12	0.44	0.4	GPS1BHAD	0.63	0.4 - 0.63	8.2	CL00	1	20	GPF1L02*
0.18	0.65	0.63	GPS1BHAE	1	0.63 - 1	13	CL00	1	20	GPF1L02*
0.25	0.9	0.8	GPS1BHAE	1	0.63 - 1	13	CL00	1	20	GPF1L02*
0.37	1.25	1.1	GPS1BHAF	1.6	1 - 1.6	20.5	CL00	1	20	GPF1L02*
0.55	1.6	1.5	GPS1BHAF	1.6	1 - 1.6	20.5	CL00	1	20	GPF1L02*
0.75	2	1.9	GPS1BHAG	2.5	1.6 - 2.5	32.5	CL00	1	20	GPF1L02*
1.1	2.6	2.5	GPS1BHAH	4	2.5 - 4	52	CL25	1	20	GPF1L25*
1.5	3.5	3.4	GPS1BHAH	4	2.5 - 4	52	CL25	1	20	GPF1L25*
2.2	5	4.5	GPS1BHAJ	6.3	4 - 6.3	82	CL25	1	20	GPF1L25*
3	7	6.5	GPS1BHAK	10	6.3 - 10	130	CL25	1.5	20	GPF1L25*
4	9	8	GPS1BHAK	10	6.3 - 10	130	CL25	1.5	20	GPF1L25*
5.5	12	11	GPS1BHAL	13	9 - 13	169	CL25	2.5	20	GPF1L25*
7.5	16	14	GPS1BHAM	16	11 - 16	208	CL25	2.5	20	GPF1L25*
11	22.5	21	GPS1BHAP	25	19 - 25	325	CL25	4	20	GPF1L25*
15	30	28	GPS1BHAR	32	24 - 32	416	CL04	6	20	GPF1L04*
11	22.5	21	GPS2BHAP (4)	25	19 - 25	325	CL04	4	20	GPF2L04*
15	30	28	GPS2BHAR (4)	32	24 - 32	416	CL04	6	20	GPF2L04*
18.5	37	35	GPS2BHAS (4)	40	28 - 40	520	CL45	10	20	GPF2L45*
22	44	41	GPS2BHAT (4)	50	35 - 50	650	CL06	10	25	GPF2L07*
30	60	55	GPS2BHAU (4)	63	45 - 63	820	CL07	16	25	GPF2L07*

- (1) Currents are relevant to four pole motors not having special characteristics of torque. Inrush currents: 8 time rated current for 1s.
- (2) The minimum cycle cross-sections are referred to an ambient temperature of 30°C max. in free air. Cables are to withstand the maximum let-through energy and the motor rated current. Besides the user should consider the drop voltage on the cables, the type of laying and the ambient temperature.
- (3) Complete cat. nrs., see page D.3
- (4) Test running.



Technical data

A

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**Surion GPS-B: Coordination Type 1 50kA at 500V and 525V**

MOTOR (1)			MANUAL MOTOR STARTER				CONTACTOR			LINKS
Rated power (kW)	Rated current		Cat. no.	Rated current In (A)	Thermal current Setting range (A)	Magnetic current (A)	Series	Smallest wire Cu (PVC)(2) 380/415V (mm <sup>2</sup> )	Minimum frontal electrical safety clearance (mm)	Cat. no. (3)
	500V	525V								
0.06	0.17	0.16	GPS1BSAB	0.25	0.16 - 0.25	3.2	MC0 / CL00	1	20	GPF1LMCBA / GPF1L02*
0.09	0.24	0.22	GPS1BSAB	0.25	0.16 - 0.25	3.2	MC0 / CL00	1	20	GPF1LMCBA / GPF1L02*
0.12	0.33	0.3	GPS1BSAC	0.4	0.25 - 0.4	5.2	MC0 / CL00	1	20	GPF1LMCBA / GPF1L02*
0.18	0.48	0.46	GPS1BSAD	0.63	0.4 - 0.63	8.2	MC0 / CL00	1	20	GPF1LMCBA / GPF1L02*
0.25	0.66	0.64	GPS1BSAE	1	0.63 - 1	13	MC0 / CL00	1	20	GPF1LMCBA / GPF1L02*
0.37	0.9	0.85	GPS1BSAE	1	0.63 - 1	13	MC0 / CL00	1	20	GPF1LMCBA / GPF1L02*
0.55	1.2	1.15	GPS1BSAF	1.6	1 - 1.6	20.5	MC0 / CL00	1	20	GPF1LMCBA / GPF1L02*
0.75	1.5	1.45	GPS1BSAF	1.6	1 - 1.6	20.5	MC0 / CL00	1	20	GPF1LMCBA / GPF1L02*
1.1	2.1	1.9	GPS1BSAG	2.5	1.6 - 2.5	32.5	MC0 / CL00	1	20	GPF1LMCBA / GPF1L02*
1.5	2.8	2.6	GPS1BSAH	4	2.5 - 4	52	MC0 / CL00	1	20	GPF1LMCBA / GPF1L02*
2.2	3.9	3.6	GPS1BSAH	4	2.5 - 4	52	MC0 / CL00	1	20	GPF1LMCBA / GPF1L02*
3	5.3	5	GPS1BSAJ	6.3	4 - 6.3	82	MC0 / CL00	1	20	GPF1LMCBA / GPF1L02*
4	6.8	6.5	GPS1BHAV	10	6.3 - 10	130	MC1 / CL00	1	20	GPF1LMCBA / GPF1L02*
5.5	9.1	8.6	GPS1BHAV	10	6.3 - 10	130	CL00	1.5	20	GPF1L02*
7.5	12	11.4	GPS1BHAL	13	9 - 13	169	CL01	2.5	20	GPF1L02*
10	15.5	14.8	GPS1BHAM	16	11 - 16	208	CL02	2.5	20	GPF1L02*
11	17.6	17	GPS1BHAN	20	14 - 20	260	CL25	2.5	20	GPF1L25*
15	23	22	GPS1BHAP	25	19 - 25	325	CL25	4	20	GPF2L25*
18.5	28.5	27	GPS1BHAR	32	24 - 32	416	CL04	6	20	GPF1L04*
11	17.6	17	GPS2BHAN	20	14 - 20	260	CL04	2.5	20	GPF2L04*
15	23	22	GPS2BHAP	25	19 - 25	325	CL04	4	20	GPF2L04*
18.5	28.5	27	GPS2BHAR	32	24 - 32	416	CL04	6	20	GPF2L04*
22	33	31.5	GPS2BHAS	40	28 - 40	520	CL45	6/10	20	GPF2L45*
30	45	43	GPS2BHAT	50	35 - 50	650	CL06	10	25	GPF2L07*
37	53	52	GPS2BHAU	63	45 - 63	820	CL07	16	25	GPF2L07*

**Surion GPS-B: Coordination Type 2 50kA at 500V and 525V**

MOTOR (1)			MANUAL MOTOR STARTER				CONTACTOR			LINKS
Rated power (kW)	Rated current		Cat. no.	Rated current In (A)	Thermal current Setting range (A)	Magnetic current (A)	Series	Smallest wire Cu (PVC)(2) 380/415V (mm <sup>2</sup> )	Minimum frontal electrical safety clearance (mm)	Cat. no. (3)
	500V	525V								
0.06	0.17	0.16	GPS1BS/HAB	0.25	0.16 - 0.25	3.2	MC1 / CL00	1	20	GPF1LMCBA / GPF1L02*
0.09	0.24	0.22	GPS1BS/HAB	0.25	0.16 - 0.25	3.2	MC1 / CL00	1	20	GPF1LMCBA / GPF1L02*
0.12	0.33	0.3	GPS1BS/HAC	0.4	0.25 - 0.4	5.2	MC1 / CL00	1	20	GPF1LMCBA / GPF1L02*
0.18	0.48	0.46	GPS1BS/HAD	0.63	0.4 - 0.63	8.2	MC1 / CL00	1	20	GPF1LMCBA / GPF1L02*
0.25	0.66	0.64	GPS1BS/HAE	1	0.63 - 1	13	MC1 / CL00	1	20	GPF1LMCBA / GPF1L02*
0.37	0.9	0.85	GPS1BS/HAE	1	0.63 - 1	13	MC1 / CL00	1	20	GPF1LMCBA / GPF1L02*
0.55	1.2	1.15	GPS1BS/HAF	1.6	1 - 1.6	20.5	MC1 / CL00	1	20	GPF1LMCBA / GPF1L02*
0.75	1.5	1.45	GPS1BS/HAF	1.6	1 - 1.6	20.5	MC1 / CL00	1	20	GPF1LMCBA / GPF1L02*
1.1	2.1	1.9	GPS1BS/HAG	2.5	1.6 - 2.5	32.5	CL00	1	20	GPF1L02*
1.5	2.8	2.6	GPS1BS/HAH	4	2.5 - 4	52	CL25	1	20	GPF1L25*
2.2	3.9	3.6	GPS1BS/HAH	4	2.5 - 4	52	CL25	1	20	GPF1L25*
3	5.3	5	GPS1BS/HAJ	6.3	4 - 6.3	82	CL25	1	20	GPF1L25*
4	6.8	6.5	GPS1BHAK	10	6.3 - 10	130	CL25	1	20	GPF1L25*
5.5	9.1	8.6	GPS1BHAK	10	6.3 - 10	130	CL25	1.5	20	GPF1L25*
7.5	12	11.4	GPS1BHAL	13	9 - 13	169	CL25	2.5	20	GPF1L25*
10	15.5	14.8	GPS1BHAM	16	11 - 16	208	CL25	2.5	20	GPF1L25*
11	17.6	17	GPS1BHAN	20	14 - 20	260	CL25	2.5	20	GPF1L25*
15	23	22	GPS1BHAP	25	19 - 25	325	CL04	4	20	GPF1L04*
18.5	28.5	27	GPS1BHAR	32	24 - 32	416	CL04	6	20	GPF1L04*
11	17.6	17	GPS2BHAN	20	14 - 20	260	CL04	2.5	20	GPF2L04*
15	23	22	GPS2BHAP	25	19 - 25	325	CL04	4	20	GPF2L04*
18.5	28.5	27	GPS2BHAR	32	24 - 32	416	CL45	6	20	GPF2L45*
22	33	31.5	GPS2BHAS	40	28 - 40	520	CL06	6/10	25	GPF2L07*
30	45	43	GPS2BHAT	50	35 - 50	650	CL06	10	25	GPF2L07*
37	53	52	GPS2BHAU	63	45 - 63	820	CL07	16	25	GPF2L07*

- (1) Currents are relevant to four pole motors not having special characteristics of torque. Inrush currents: 8 time rated current for 1s.
- (2) The minimum cycle cross-sections are referred to an ambient temperature of 30°C max. in free air. Cables are to withstand the maximum let-through energy and the motor rated current. Besides the user should consider the drop voltage on the cables, the type of laying and the ambient temperature.
- (3) Complete cat. nrs., see page D.3



**Surion GPS-M and Record Plus: Coordination Type 1 65kA at 380/400V and 415V**

MOTOR (1)			BREAKER				CONTACTOR	OVERLOAD RELAY			
Rated power (kW)	Rated current		Cat. no.	Rated current In (A)	Magnetic setting Im Pick-up band ± 20% Im (A)	Magnetic current (A)	Series	Series	Setting range	Smallest wire Cu (PVC) (2) 380/415V (mm <sup>2</sup> )	Min frontal safety clearance (mm)
	380/400V (A)	415V									
0.06	0.23	0.21	GPS1MSAB	0.25	-	3.3	CL00	RT1B	0.16-0.26	1	20
0.09	0.34	0.31	GPS1MSAC	0.4	-	5.2	CL00	RT1C	0.25-0.41	1	20
0.12	0.44	0.4	GPS1MSAD	0.63	-	8.2	CL00	RT1D	0.4-0.65	1	20
0.18	0.65	0.63	GPS1MSAE	1	-	13	CL00	RT1D	0.4-0.65	1	20
0.25	0.9	0.8	GPS1MSAE	1	-	13	CL00	RT1F	0.65-1.1	1	20
0.37	1.25	1.1	GPS1MSAF	1.6	-	20.8	CL00	RT1G	1-1.5	1	20
0.55	1.6	1.5	GPS1MSAF	1.6	-	20.8	CL00	RT1H	1.3-1.9	1	20
0.75	2	1.9	GPS1MSAG	2.5	-	32.5	CL00	RT1J	1.8-2.7	1	20
1.1	2.6	2.5	GPS1MSAH	4	-	52	CL00	RT1K	2.5-4	1	20
1.5	3.5	3.4	GPS1MSAH	4	-	52	CL00	RT1K	2.5-4	1	20
2.2	5	4.5	GPS1MSAJ	6.3	-	81.9	CL00	RT1L	4-6.3	1	20
3	7	6.5	GPS1MSAK	10	-	130	CL00	RT1M	5.5-8.5	1.5	20
4	9	8	GPS1MSAK	10	-	130	CL00	RT1N	8-12	1.5	20
5.5	12	11	GPS1MHAL	13	-	169	CL01	RT1P	10-16	2.5	20
7.5	-	14	GPS1MHAM	16	-	208	CL02	RT1P	10-16	2.5	20
7.5	16	-	GPS1MHAM	16	-	208	CL02	RT1S	14.5-18	2.5	20
11	22.5	21	GPS1MHAP	25	-	325	CL25	RT1U	21-26	4	20
15	30	28	GPS1MHAR	32	-	416	CL04	RT1V	25-32	6	20
11	22.5	21	GPS2MHAP	25	-	325	CL04	RT1U	21-26	4	20
15	30	28	GPS2MHAR	32	-	416	CL04	RT1V	25-32	6	20
18.5	37	35	GPS2MHAS	40	-	520	CL45	RT1W	30-40	10	20
22	-	40	GPS2MHAT	50	-	650	CL06	RT2E	30-43	10	25
22	44	-	GPS2MHAT	50	-	650	CL06	RT2G	42-55	10	25
30	60	55	GPS2MHAU	63	-	819	CL07	RT2H	54-65	16	25
45	85	80	FDH36MC100GD	100	1000 - 1500	1140	CL09	RT2L	78 - 97	35	30
55	-	100	FDH36MC160JF	160	1600 - 2400	1400	CL10	RT2M	90 - 110	35	30
55	105	-	FDH36MC160JF	160	1600 - 240	1400	CL10	RT2M	90 - 110	35	30

Technical data

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**Surion GPS-M and Record Plus: Coordination Type 2 65kA at 380/400V and 415V**

MOTOR (1)			BREAKER				CONTACTOR	OVERLOAD RELAY			
Rated power (kW)	Rated current		Cat. no.	Rated current In (A)	Magnetic setting Im Pick-up band ± 20% Im (A)	Magnetic current (A)	Series	Series	Setting range	Smallest wire Cu (PVC) (2) 380/415V (mm <sup>2</sup> )	Min frontal safety clearance (mm)
	380/400V (A)	415V									
0.06	0.23	0.21	GPS1MHAB	0.25	-	3.3	CL00	RT1B	0.16-0.26	1	20
0.09	0.34	0.31	GPS1MHAC	0.4	-	5.2	CL00	RT1C	0.25-0.41	1	20
0.12	0.44	0.4	GPS1MHAD	0.63	-	8.2	CL00	RT1D	0.4-0.65	1	20
0.18	0.65	0.63	GPS1MHA E	1	-	13	CL00	RT1D	0.4-0.65	1	20
0.25	0.9	0.8	GPS1MHA E	1	-	13	CL00	RT1F	0.65-1.1	1	20
0.37	1.25	1.1	GPS1MHAF	1.6	-	20.8	CL00	RT1G	1-1.5	1	20
0.55	1.6	1.5	GPS1MHAF	1.6	-	20.8	CL00	RT1H	1.3-1.9	1	20
0.75	2	1.9	GPS1MHAG	2.5	-	32.5	CL00	RT1J	1.8-2.7	1	20
1.1	2.6	2.5	GPS1MHAH	4	-	52	CL25	RT1K	2.5-4	1	20
1.5	3.5	3.4	GPS1MHAH	4	-	52	CL25	RT1K	2.5-4	1	20
2.2	5	4.5	GPS1MHAJ	6.3	-	81.9	CL25	RT1L	4-6.3	1	20
3	7	6.5	GPS1MHAK	10	-	130	CL25	RT1M	5.5-8.5	1.5	20
4	9	8	GPS1MHAK	10	-	130	CL25	RT1N	8-12	1.5	20
5.5	12	11	GPS1MHAL	13	-	169	CL25	RT1P	10-16	2.5	20
7.5	-	14	GPS1MHAM	16	-	208	CL25	RT1P	10-16	2.5	20
7.5	16	-	GPS1MHAM	16	-	208	CL25	RT1S	14.5-18	2.5	20
11	22.5	21	GPS2MHAP	25	-	325	CL25	RT1U	21-26	4	20
15	30	28	GPS2MHAR	32	-	416	CL04	RT1V	25-32	6	20
11	22.5	21	GPS2MHAP	25	-	325	CL04	RT1U	21-26	4	20
15	30	28	GPS2MHAR	32	-	416	CL04	RT1V	25-32	6	20
18.5	37	35	GPS2MHAS	40	-	520	CL45	RT1W	30-40	10	20
22	-	40	GPS2MHAT	50	-	650	CL06	RT2E	30-43	10	25
22	44	-	GPS2MHAT	50	-	650	CL06	RT2G	42-55	10	25
30	60	55	GPS2MHAU	63	-	819	CL07	RT2H	54-65	16	25
45	85	80	FDH36MC100GD	100	1000 - 1500	1140	CL09	RT2L	78 - 97	35	30
55	-	100	FDH36MC100GD	100	1000 - 1500	1400	CL10	RT2M	90 - 110	35	30
55	105	-	FDH36MC160JF	160	1600 - 2400	1400	CL10	RT2M	90 - 110	35	30

(1) Current are relevant to four pole motors not having special characteristics of torque. Inrush currents: ≤ 8 time rated current for ≤ 1s.  
 (2) The minimum cycle cross-sections are referred to an ambient temperature of 30°C max. in free air and are selected to withstand the maximum let-through energy and the motor rated current. Besides the user has to consider the drop voltage, the type of laying and ambient temperature.





**Surion GPS-B: Coordination Type 2 50kA at 380/400V and 415V**

Manual motorstarter

MOTOR (1)			MANUAL MOTOR STARTER				CONTACTOR			LINKS
Rated power (kW)	Rated current		Cat. no.	Rated current In (A)	Thermal current Setting range (A)	Magnetic current (A)	Series	Smallest wire Cu (PVC)(2) 380/415V (mm <sup>2</sup> )	Minimum frontal electrical safety clearance (mm)	Cat. no. (3)
	380/400V (A)	415V								
0.06	0.23	0.21	GPS1BS/HAB	0.25	0.16 - 0.25	3.2	MC1 / CL00	1	20	GPF1LMCBA / GPF1L02*
0.09	0.34	0.31	GPS1BS/HAC	0.4	0.25 - 0.4	5.2	MC1 / CL00	1	20	GPF1LMCBA / GPF1L02*
0.12	0.44	0.4	GPS1BS/HAD	0.63	0.4 - 0.63	8.2	MC1 / CL00	1	20	GPF1LMCBA / GPF1L02*
0.18	0.65	0.63	GPS1BS/HAE	1	0.63 - 1	13	MC1 / CL00	1	20	GPF1LMCBA / GPF1L02*
0.25	0.9	0.8	GPS1BS/HAE	1	0.63 - 1	13	MC1 / CL00	1	20	GPF1LMCBA / GPF1L02*
0.37	1.25	1.1	GPS1BS/HAF	1.6	1 - 1.6	20.5	MC1 / CL00	1	20	GPF1LMCBA / GPF1L02*
0.55	1.6	1.5	GPS1BS/HAF	1.6	1 - 1.6	20.5	MC1 / CL00	1	20	GPF1LMCBA / GPF1L02*
0.75	2	1.9	GPS1BS/HAG	2.5	1.6 - 2.5	32.5	MC1 / CL00	1	20	GPF1LMCBA / GPF1L02*
1.1	2.6	2.5	GPS1BS/HAH	4	2.5 - 4	52	CL01	1	20	GPF1L02*
1.5	3.5	3.4	GPS1BS/HAH	4	2.5 - 4	52	CL01	1	20	GPF1L02*
2.2	5	4.5	GPS1BS/HAJ	6.3	4 - 6.3	82	CL02	1	20	GPF1L02*
3	7	6.5	GPS1BS/HAK	10	6.3 - 10	130	CL25	1.5	20	GPF1L25*
4	9	8	GPS1BS/HAK	10	6.3 - 10	130	CL25	1.5	20	GPF1L25*
5.5	12	11	GPS1BHAL	13	9 - 13	169	CL25	2.5	20	GPF1L25*
7.5	16	14	GPS1BHAM	16	11 - 16	208	CL25	2.5	20	GPF1L25*
11	22.5	21	GPS1BHAP	25	19 - 25	325	CL25	4	20	GPF1L25*
15	30	28	GPS1BHAR	32	24 - 32	416	CL04	6	20	GPF1L04*
11	22.5	21	GPS2BHAP	25	19 - 25	325	CL04	4	20	GPF2L04*
15	30	28	GPS2BHAR	32	24 - 32	416	CL04	6	20	GPF2L04*
18.5	37	35	GPS2BHAS	40	28 - 40	520	CL45	10	20	GPF2L45*
22	44	41	GPS2BHAT	50	35 - 50	650	CL06	10	25	GPF2L07*
30	60	55	GPS2BHAU	63	45 - 63	820	CL07	16	25	GPF2L07*

- (1) Currents are relevant to four pole motors not having special characteristics of torque.  
Inrush currents: ≤ 8 time rated current for ≤ 1s.
- (2) The minimum cycle cross-sections are referred to an ambient temperature of 30°C max. in free air. Cables are to withstand the maximum let-through energy and the motor rated current. Besides the user should consider the drop voltage on the cables, the type of laying and the ambient temperature.
- (3) Complete cat. nrs., see page D.3

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**Surion GPS-M and Record Plus: Coordination Type 1 65kA at 380/400V and 415V**

MOTOR (1)			BREAKER			CONTACTOR	OVERLOAD RELAY				
Rated power (kW)	Rated current		Cat. no.	Rated current In (A)	Thermal current (A)	Magnetic current (A)	Series	Series	Setting range	Smallest wire Cu (PVC) (2) 380/415V (mm <sup>2</sup> )	Min frontal safety clearance (mm)
	380/400V (A)	415V									
0.06	0.23	0.21	GPS1MS/HAB	0.25	-	3.3	CL00	RT1B	0.16-0.26	1	20
0.09	0.34	0.31	GPS1MS/HAC	0.4	-	5.2	CL00	RT1C	0.25-0.41	1	20
0.12	0.44	0.4	GPS1MS/HAD	0.63	-	8.2	CL00	RT1D	0.4-0.65	1	20
0.18	0.65	0.63	GPS1MS/HAE	1	-	13	CL00	RT1D	0.4-0.65	1	20
0.25	0.9	0.8	GPS1MS/HAE	1	-	13	CL00	RT1F	0.65-1.1	1	20
0.37	1.25	1.1	GPS1MS/HAF	1.6	-	20.8	CL00	RT1G	1-1.5	1	20
0.55	1.6	1.5	GPS1MS/HAF	1.6	-	20.8	CL00	RT1H	1.3-1.9	1	20
0.75	2	1.9	GPS1MS/HAG	2.5	-	32.5	CL00	RT1J	1.8-2.7	1	20
1.1	2.6	2.5	GPS1MS/HAH	4	-	52	CL00	RT1K	2.5-4	1	20
1.5	3.5	3.4	GPS1MS/HAH	4	-	52	CL00	RT1K	2.5-4	1	20
2.2	5	4.5	GPS1MS/HAJ	6.3	-	81.9	CL00	RT1L	4-6.3	1	20
3	7	6.5	GPS1MS/HAK	10	-	130	CL00	RT1M	5.5-8.5	1.5	20
4	9	8	GPS1MS/HAK	10	-	130	CL00	RT1N	8-12	1.5	20
5.5	12	11	GPS1MHAL	13	-	169	CL01	RT1P	10-16	2.5	20
7.5	-	14	GPS1MHAM	16	-	208	CL02	RT1P	10-16	2.5	20
7.5	16	-	GPS1MHAM	16	-	208	CL02	RT1S	14.5-18	2.5	20
11	22.5	21	GPS1MHAP	25	-	325	CL25	RT1U	21-26	4	20
15	30	28	GPS1MHAR	32	-	416	CL04	RT1V	25-32	6	20
11	22.5	21	GPS2MHAP	25	-	325	CL25	RT1U	21-26	4	20
15	30	28	GPS2MHAR	32	-	416	CL04	RT1V	25-32	6	20
18.5	37	35	GPS2MHAS	40	-	520	CL45	RT1W	30-40	10	20
22	-	40	GPS2MHAT	50	-	650	CL06	RT2E	30-43	10	25
22	44	-	GPS2MHAT	50	-	650	CL06	RT2G	42-55	10	25
30	60	55	GPS2MHAU	63	-	819	CL07	RT2H	54-65	16	25
37	72	68	FDN36MC080GD	80	-	950	CL08	RT2J	64-82	25	25
45	85	80	FDN36MC100GD	100	-	1140	CL09	RT2L	78-97	35	30
55	105	100	FDN36MC100GD	100	-	1400	CL10	RT2M	90-110	35	30

**Surion GPS-M and Record Plus: Coordination Type 2 50kA at 380/400V and 415V**

MOTOR (1)			BREAKER			CONTACTOR	OVERLOAD RELAY				
Rated power (kW)	Rated current		Cat. no.	Rated current In (A)	Thermal current (A)	Magnetic current (A)	Series	Series	Setting range	Smallest wire Cu (PVC) (2) 380/415V (mm <sup>2</sup> )	Min frontal safety clearance (mm)
	380/400V (A)	415V									
0.06	0.23	0.21	GPS1MS/HAB	0.25	-	3.3	CL00	RT1B	0.16-0.26	1	20
0.09	0.34	0.31	GPS1MS/HAC	0.4	-	5.2	CL00	RT1C	0.25-0.41	1	20
0.12	0.44	0.4	GPS1MS/HAD	0.63	-	8.2	CL00	RT1D	0.4-0.65	1	20
0.18	0.65	0.63	GPS1MS/HAE	1	-	13	CL00	RT1D	0.4-0.65	1	20
0.25	0.9	0.8	GPS1MS/HAE	1	-	13	CL00	RT1F	0.65-1.1	1	20
0.37	1.25	1.1	GPS1MS/HAF	1.6	-	20.8	CL00	RT1G	1-1.5	1	20
0.55	1.6	1.5	GPS1MS/HAF	1.6	-	20.8	CL00	RT1H	1.3-1.9	1	20
0.75	2	1.9	GPS1MS/HAG	2.5	-	32.5	CL00	RT1J	1.8-2.7	1	20
1.1	2.6	2.5	GPS1MS/HAH	4	-	52	CL01	RT1K	2.5-4	1	20
1.5	3.5	3.4	GPS1MS/HAH	4	-	52	CL01	RT1K	2.5-4	1	20
2.2	5	4.5	GPS1MS/HAJ	6.3	-	81.9	CL02	RT1L	4-6.3	1	20
3	7	6.5	GPS1MS/HAK	10	-	130	CL25	RT1M	5.5-8.5	1.5	20
4	9	8	GPS1MS/HAK	10	-	130	CL25	RT1N	8-12	1.5	20
5.5	12	11	GPS1MHAL	13	-	169	CL25	RT1P	10-16	1.5	20
7.5	-	14	GPS1MHAM	16	-	208	CL25	RT1P	10-16	2.5	20
7.5	16	-	GPS1MHAM	16	-	208	CL25	RT1S	14.5-18	2.5	20
11	22.5	21	GPS1MHAP	25	-	325	CL25	RT1U	21-26	4	20
15	30	28	GPS1MHAR	32	-	416	CL04	RT1V	25-32	6	20
11	22.5	21	GPS2MHAP	25	-	325	CL04	RT1U	21-26	4	20
15	30	28	GPS2MHAR	32	-	416	CL04	RT1V	25-32	6	20
18.5	37	35	GPS2MHAS	40	-	520	CL45	RT1W	30-40	6	20
22	-	40	GPS2MHAT	50	-	650	CL06	RT2E	30-43	10	25
22	44	-	GPS2MHAT	50	-	650	CL06	RT2G	42-55	10	25
30	60	55	GPS2MHAU	63	-	819	CL07	RT2H	54-65	16	25
37	72	68	FDN36MC080GD	80	-	950	CL08	RT2J	64-82	25	25
45	85	80	FDN36MC100GD	100	-	1140	CL09	RT2L	78-97	35	30
55	105	100	FDN36MC100GD	100	-	1400	CL10	RT2M	90-110	35	30

(1) Current are relevant to four pole motors not having special characteristics of torque. Inrush currents: ≤ 8 time rated current for ≤ 1s.  
 (2) The minimum cycle cross-sections are referred to an ambient temperature of 30°C max. in free air and are selected to withstand the maximum let-through energy and the motor rated current. Besides the user has to consider the drop voltage, the type of laying and ambient temperature.



**Surion GPS-M and Record Plus: Coordination Type 1 50kA at 500 and 525V**

MOTOR (1)			BREAKER				CONTACTOR	OVERLOAD RELAY			
Rated power (kW)	Rated current (A)		Cat. no.	Rated current In (A)	Magnetic setting Im Pick-up band ± 20% Im (A)	Magnetic current (A)	Series	Series	Setting range	Smallest wire Cu (PVC) (2) 380/415V (mm <sup>2</sup> )	Min frontal safety clearance (mm)
	500V	525V									
0.06	0.17	0.16	GPS1MSAB	0.25	-	3.2	CL00	RT1B	0.16-0.26	1	20
0.09	0.24	0.22	GPS1MSAB	0.25	-	3.2	CL00	RT1B	0.16-0.26	1	20
0.12	0.33	0.3	GPS1MSAC	0.4	-	5.2	CL00	RT1C	0.25-0.41	1	20
0.18	0.48	0.46	GPS1MSAD	0.63	-	8.2	CL00	RT1D	0.4-0.65	1	20
0.25	-	0.64	GPS1MSAE	1	-	13	CL00	RT1D	0.4-0.65	1	20
0.25	0.66	-	GPS1MSAE	1	-	13	CL00	RT1F	0.65-1.1	1	20
0.37	0.9	0.85	GPS1MSAE	1	-	13	CL00	RT1F	0.65-1.1	1	20
0.55	1.2	1.15	GPS1MSAF	1.6	-	20.5	CL00	RT1G	1.0-1.5	1	20
0.75	1.5	1.45	GPS1MSAF	1.6	-	20.5	CL00	RT1H	1.3-1.9	1	20
1.1	2.1	1.9	GPS1MSAG	2.5	-	32.5	CL00	RT1J	1.8-2.7	1	20
1.5	2.8	2.6	GPS1MSAH	4	-	52	CL00	RT1K	2.5-4	1	20
2.2	3.9	3.6	GPS1MSAH	4	-	52	CL00	RT1K	2.5-4	1	20
3	5.3	5	GPS1MSAJ	6.3	-	82	CL00	RT1L	4.0-6.3	1	20
4	6.8	6.5	GPS1MHAK	10	-	130	CL00	RT1M	5.5-8.5	1	20
5.5	9.1	8.6	GPS1MHAK	10	-	130	CL00	RT1N	8.0-12.0	1.5	20
7.5	12	11.4	GPS1MHAL	13	-	169	CL01	RT1P	10-16	2.5	20
10	15.5	14.8	GPS1MHAM	16	-	208	CL02	RT1S	14.5-18	2.5	20
11	17.6	17	GPS1MHAN	20	-	260	CL25	RT1S	14.5-18	2.5	20
15	23	22	GPS1MHAP	25	-	325	CL25	RT1U	21-26	4	20
18.5	28.5	27	GPS1MHAR	32	-	416	CL04	RT1V	25-32	6	20
11	17.6	17	GPS2MHAN	20	-	260	CL04	RT1S	14.5-18	2.5	20
15	23	22	GPS2MHAP	25	-	325	CL04	RT1U	21-26	4	20
18.5	28.5	27	GPS2MHAR	32	-	416	CL04	RT1V	25-32	6	20
22	33	31.5	GPS2MHAS	40	-	520	CL45	RT2E	30-43	6/10	20
30	45	43	GPS2MHAT	50	-	650	CL06	RT2G	42-55	10	25
37	53	52	GPS2MHAU	63	-	820	CL07	RT2G	42-55	16	25
45	-	62	FDN36MC080GD	80	800 - 1200	1000	CL08	RT2H	54 - 65	16	30
45	65	-	FDN36MC080GD	80	800 - 1200	1000	CL08	RT2J	64 - 82	25	30
55	80	76	FDN36MC100GD	100	1000 - 1500	1200	CL09	RT2J	64 - 82	25	30

**Surion GPS-M and Record Plus: Coordination Type 2 50kA at 500 and 525V**

MOTOR (1)			BREAKER				CONTACTOR	OVERLOAD RELAY			
Rated power (kW)	Rated current (A)		Cat. no.	Rated current In (A)	Magnetic setting Im Pick-up band ± 20% Im (A)	Magnetic current (A)	Series	Series	Setting range	Smallest wire Cu (PVC) (2) 380/415V (mm <sup>2</sup> )	Min frontal safety clearance (mm)
	500V	525V									
0.06	0.17	0.16	GPS1MS/HAB	0.25	-	3.2	CL00	RT1B	0.16-0.26	1	20
0.09	0.24	0.22	GPS1MS/HAB	0.25	-	3.2	CL00	RT1B	0.16-0.26	1	20
0.12	0.33	0.3	GPS1MS/HAC	0.4	-	5.2	CL00	RT1C	0.25-0.41	1	20
0.18	0.48	0.46	GPS1MS/HAD	0.63	-	8.2	CL00	RT1D	0.4-0.65	1	20
0.25	-	0.64	GPS1MS/HAE	1	-	13	CL00	RT1D	0.4-0.65	1	20
0.25	0.66	-	GPS1MS/HAE	1	-	13	CL00	RT1F	0.65-1.1	1	20
0.37	0.9	0.85	GPS1MS/HAE	1	-	13	CL00	RT1F	0.65-1.1	1	20
0.55	1.2	1.15	GPS1MS/HAF	1.6	-	20.5	CL00	RT1G	1.0-1.5	1	20
0.75	1.5	1.45	GPS1MS/HAF	1.6	-	20.5	CL00	RT1H	1.3-1.9	1	20
1.1	2.1	1.9	GPS1MS/HAG	2.5	-	32.5	CL01	RT1J	1.8-2.7	1	20
1.5	2.8	2.6	GPS1MS/HAH	4	-	52	CL25	RT1K	2.5-4	1	20
2.2	3.9	3.6	GPS1MS/HAH	4	-	52	CL25	RT1K	2.5-4	1	20
3	5.3	5	GPS1MS/HAJ	6.3	-	82	CL25	RT1L	4.0-6.3	1	20
4	6.8	6.5	GPS1MHAK	10	-	130	CL25	RT1M	5.5-8.5	1	20
5.5	9.1	8.6	GPS1MHAK	10	-	130	CL25	RT1N	8.0-12	1.5	20
7.5	12	11.4	GPS1MHAL	13	-	169	CL25	RT1P	10-16	2.5	20
10	15.5	14.8	GPS1MHAM	16	-	208	CL25	RT1S	14.5-18	2.5	20
11	17.6	17	GPS1MHAN	20	-	260	CL25	RT1S	14.5-18	2.5	20
15	23	22	GPS1MHAP	25	-	325	CL04	RT1U	21-26	4	20
18.5	28.5	27	GPS1MHAR	32	-	416	CL04	RT1V	25-32	6	20
11	17.6	17	GPS2MHAN	20	-	260	CL04	RT1S	14.5-18	2.5	20
15	23	22	GPS2MHAP	25	-	325	CL04	RT1U	21-26	4	20
18.5	28.5	27	GPS2MHAR	32	-	416	CL45	RT1V	25-32	6	20
22	33	31.5	GPS2MHAS	40	-	520	CL06	RT2E	30-43	6/10	25
30	45	43	GPS2MHAT	50	-	650	CL06	RT2G	42-55	10	25
37	53	52	GPS2MHAU	63	-	820	CL07	RT2G	42-55	16	25
45	-	62	FDN36MC080GD	80	800 - 1200	1000	CL09	RT2H	54 - 65	16	30
45	65	-	FDN36MC080GD	80	800 - 1200	1000	CL09	RT2J	64 - 82	25	30
55	80	76	FDN36MC100GD	100	1000 - 1500	1200	CL10	RT2J	64 - 82	25	30



**Surion GPS-B and Record Plus: Coordination Type 2 65kA at 380/400V and 415V**

MOTOR			MOTOR PROTECTION CIRCUITBREAKER			CONTACTOR	THERMAL RELAY
Rated power (kW)	le	le	Cat. no.	Setting range In	Magnetic setting Im	Series	Class 10
	380/400V (A)	415V (A)		(A)	(A)		
0.25	0.9	0.8	GPS1BHAE	0.63-1	13	CL00	Integrated into the motor protection circuit breaker
0.37	1.25	1.1	GPS1BHAF	1-1.6	20.5	CL00	Integrated into the motor protection circuit breaker
0.55	1.6	1.5	GPS1BHAF	1-1.6	20.5	CL00	Integrated into the motor protection circuit breaker
0.75	2	1.9	GPS1BHAG	1.6-2.5	32.5	CL00	Integrated into the motor protection circuit breaker
1.1	2.6	2.5	GPS1BHAH	2.5-4	52	CL25	Integrated into the motor protection circuit breaker
1.5	3.5	3.45	GPS1BHAH	2.5-4	52	CL25	Integrated into the motor protection circuit breaker
2.2	5	4.7	GPS1BHAJ	4-6.3	82	CL25	Integrated into the motor protection circuit breaker
3	7	6.5	GPS1BHAK	6.3-10	130	CL25	Integrated into the motor protection circuit breaker
4	9	8	GPS1BHAK	6.3-10	130	CL25	Integrated into the motor protection circuit breaker
5.5	12	11	GPS1BHAL	9.0-13	169	CL25	Integrated into the motor protection circuit breaker
7.5	16	14	GPS1BHAM	11.0-16	208	CL25	Integrated into the motor protection circuit breaker
11	22.5	21	GPS1BHAP	19-25	325	CL25	Integrated into the motor protection circuit breaker
15	30	28	GPS1BHAR	24-32	416	CL04	Integrated into the motor protection circuit breaker
18.5	37	35	GPS2BHAS	28-40	520	CL45	Integrated into the motor protection circuit breaker
22	44	41	GPS2BHAT	25-50	650	CL06	Integrated into the motor protection circuit breaker
30	60	55	GPS2BHAU	45-63	820	CL07	Integrated into the motor protection circuit breaker
37	72.5	65	FDH36MC080	80	950	CL08	RT2J (64-82A)
45	85	79	FDH36MC100	100	1140	CL09	RT2L (78-97A)

**Surion GPS-B and Record Plus: Coordination Type 2 80kA at 380/400V and 415V**

MOTOR			MOTOR PROTECTION CIRCUITBREAKER			CONTACTOR	THERMAL RELAY
Rated power (kW)	le	le	Cat. no.	Setting range In	Magnetic setting Im	Series	Class 10
	380/400V (A)	415V (A)		(A)	(A)		
0.25	0.9	0.8	GPS1BHAE	0.63-1	13	CL00	Integrated into the motor protection circuit breaker
0.37	1.25	1.1	GPS1BHAF	1-1.6	20.5	CL00	Integrated into the motor protection circuit breaker
0.55	1.6	1.5	GPS1BHAF	1-1.6	20.5	CL00	Integrated into the motor protection circuit breaker
0.75	2	1.9	GPS1BHAG	1.6-2.5	32.5	CL00	Integrated into the motor protection circuit breaker
1.1	2.6	2.5	GPS1BHAH	2.5-4	52	CL25	Integrated into the motor protection circuit breaker
1.5	3.5	3.45	GPS1BHAH	2.5-4	52	CL25	Integrated into the motor protection circuit breaker
2.2	5	4.7	GPS1BHAJ	4-6.3	82	CL25	Integrated into the motor protection circuit breaker
3	7	6.5	GPS1BHAK	6.3-10	130	CL25	Integrated into the motor protection circuit breaker
4	9	8	GPS1BHAK	6.3-10	130	CL25	Integrated into the motor protection circuit breaker
5.5	12	11	GPS1BHAL	9.0-13	169	CL05	Integrated into the motor protection circuit breaker
7.5	16	14	FDH36MC020	20	210	CL04	RT1S (14.5-18A)
11	22.5	21	FDH36MC030	30	300	CL45	RT1U (21-26A)
15	30	28	FDH36MC030	30	450	CL45	RT1V (25-32A)
18.5	37	35	FDH36MC050	50	500	CL45	RT1W (30-40A)
22	44	41	FDH36MC050	50	580	CL06	RT2G (42-55A)
30	66	55	FDH36MC080	80	800	CL07	RT2H (54-65A)
37	72.5	65	FDH36MC080	80	950	CL08	RT2J (64-82A)
45	85	79	FDH36MC100	100	1140	CL09	RT2L (78-97A)

- (1) Current are relevant to four pole motors not having special characteristics of torque. Inrush currents: ≤ 8 time rated current for ≤ 1s.
- (2) The minimum cycle cross-sections are referred to an ambient temperature of 30°C max. in free air and are selected to withstand the maximum let-through energy and the motor rated current. Besides the user has to consider the drop voltage, the type of laying and ambient temperature.

Technical data

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**Record Plus: Coordination Type 2 150kA at 380/400V and 415V (Class 10 protection)**

MOTOR (1)			THERMAL-MAGNETIC CIRCUIT BREAKER					CONTACTOR		
Rated power (kW)	Rated current		Cat. no. (3)	Magnetic setting I <sub>m</sub> pick-up band ± 20% I <sub>m</sub> (A)	Magnetic current Setpoint (A)	Thermal setting range (A)	Thermal setpoint (400V) (A)	Series	Smallest wire Cu (PVC) (2) 380/415V (mm <sup>2</sup> )	Min frontal safety clearance (mm)
	380/400V (A)	415V								
7.5	16	14	FD*36TD016ED	160	160	12.8 - 16	16	CL45	2.5	20
11	22.5	21	FD*36TD025ED	250	250	20 - 25	22.5	CL45	4	20
15	30	28	FD*36TD032ED	320	320	26 - 32	30	CL45	6	20
18.5	37	35	FD*36TD040ED	400	400	32 - 40	37	CL45	10	20
22	44	40	FD*36TD050ED	500	500	40 - 50	40	CL06	10	25
30	60	55	FD*36TD063ED	630	630	50 - 63	55	CL07	16	25
37	72	68	FD*36TD080GD	800	800	64 - 80	68	CL08	25	25
45	85	80	FD*36TD100GD	1000	1000	80 - 100	80	CL09	35	30
55	105	100	FD*36TD125GD	1250	1250	100 - 125	100	CL10	35	30
75	138	135	FD*36TD160GD	1280	1280	128 - 160	135	CK75	50	40
90	170	165	FE*36TD200KF	1000 - 2000	1700	160 - 200	165	CK08	70	40
110	211	200	FE*36TD250KF	1250 - 2500	2100	200 - 250	200	CK85	95	40
132	245	240	FE*36TD250KF	1250 - 2500	2500	200 - 250	240	CK09	120	40

(\*) Max I<sub>q</sub> rating in kA: type N = 50 kA, type H = 80 kA, type L = 150 kA.

- (1) Current are relevant to four pole motors not having special characteristics of torque.  
Inrush currents: ≤ 8 times rated current for ≤ 1s (Normal starting) or H 5s (Heavy starting).
- (2) The minimum cycle cross-sections are referred to an ambient temperature of 30°C max. in free air and are selected to withstand the maximum let-through energy and the motor rated current. Besides the user has to consider the drop voltage, the type of laying and ambient temperature.
- (3) Foreseen values for E-frame.

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**Record Plus: Coordination Type 2 Up to 150kA at 380/400V and 415V (Class 10 protection)**

MOTOR (1)			ONLY MAGNETIC CIRCUIT BREAKER			CONTACTOR	OVERLOAD RELAY			
Rated power (kW)	Rated current		Cat. no. (3)	Magnetic setting I <sub>m</sub> pick-up band ± 20% I <sub>m</sub> (A)	Magnetic current Setpoint (A)	Series	Series	Setting range (A)	Smallest wire Cu (PVC) (2) 380/415V (mm <sup>2</sup> )	Min frontal safety clearance (mm)
	380/400V (A)	415V								
4	9	8	FD*36MC012ED	125 - 188	120	CL04	RT1N	8 - 12	1.5	20
5.5	12	11	FD*36MC012ED	125 - 188	150	CL04	RT1P	10 - 16	2.5	20
7.5	-	14	FD*36MC020ED	200 - 300	200	CL04	RT1P	10 - 16	2.5	20
7.5	16	-	FD*36MC020ED	200 - 300	210	CL04	RT1S	14.5 - 18	2.5	20
11	22.5	21	FD*36MC030ED	300 - 450	450	CL45	RT1U	21 - 26	4	20
15	30	28	FD*36MC030ED	300 - 450	500	CL45	RT1V	25 - 32	6	20
18.5	37	35	FD*36MC050ED	500 - 750	500	CL45	RT1W	30 - 40	10	20
22	-	40	FD*36MC050ED	500 - 750	540	CL06	RT2E	30 - 43	10	25
22	44	-	FD*36MC050ED	500 - 750	580	CL06	RT2G	42 - 55	10	25
30	60	55	FD*36MC080GD	800 - 1200	800	CL07	RT2H	54 - 65	16	25
37	72	68	FD*36MC080GD	800 - 1200	950	CL08	RT2J	64 - 82	25	25
45	85	80	FD*36MC100GD	1000 - 1500	1140	CL09	RT2L	78 - 97	35	30
55	-	100	FD*36MC100GD	1000 - 1500	1400	CL10	RT2M	90 - 110	35	30
55	105	-	FE*36MC160JF	1600 - 2400	1400	CL10	RT2M	90 - 110	35	30
75	138	135	FE*36MC160JF	1600 - 2400	1900	CK75	RT3E	110 - 140	50	40
90	170	165	FE*36MC250KF	2500 - 3750	2500	CK08	RT3F	140 - 190	70	40
110	211	200	FE*36MC250KF	2500 - 3750	2800	CK85	RT4P	175 - 280	95	40
132	245	240	FE*36MC250KF	2500 - 3750	3150	CK09	RT4P	175 - 280	120	40

**Record Plus: Coordination Type 2 Up to 150kA at 380/400V and 415V (Class 30 protection)**

MOTOR (1)			ONLY MAGNETIC CIRCUIT BREAKER			CONTACTOR	OVERLOAD RELAY			
Rated power (kW)	Rated current		Cat. no. (3)	Magnetic setting I <sub>m</sub> pick-up band ± 20% I <sub>m</sub> (A)	Magnetic current Setpoint (A)	Series	Series	Setting range (A)	Smallest wire Cu (PVC) (2) 380/415V (mm <sup>2</sup> )	Min frontal safety clearance (mm)
	380/400V (A)	415V								
2.2	5	4.5	FD*36MC008ED	80 - 120	80	CL25	RT4LB	4 - 6.5	1.5	20
3	7	6.5	FD*36MC008ED	80 - 120	90	CL04	RT4LC	5.5 - 8.5	1.5	20
4	9	8	FD*36MC012ED	125 - 188	120	CL04	RT4aLD	7.5 - 11	1.5	20
5.5	12	11	FD*36MCa012ED	125 - 188	150	CL45	RT4LE	10 - 16	2.5	20
7.5	-	14	FD*36MC020EaD	200 - 300	200	CL45	RT4LE	10 - 16	2.5	20
7.5	16	-	FD*36MC020ED	200 - 300	210	CL45	RT4LF	12.5 - 20	2.5	20
11	22.5	21	FD*36MC030ED	300 - 450	450	CL45	RT4LG	17 - 27	4	20
15	30	28	FD*36MC030ED	300 - 450	500	CL45	RT4LH	26 - 40	6	20
18.5	37	35	FD*36MC050ED	500 - 750	500	CL06	RT4LH	26 - 40	10	25
22	-	40	FD*36MC050ED	500 - 750	540	CL06	RT4LJ	32 - 52	10	25
22	44	-	FD*36MC050ED	500 - 750	580	CL06	RT4LJ	32 - 52	10	25
30	60	55	FD*36MC080GD	800 - 1200	800	CL07	RT4LK	45 - 70	16	25
37	72	68	FD*36MC080GD	800 - 1200	950	CL08	RT4LL	60 - 90	25	25
45	85	80	FD*36MC100GD	1000 - 1500	1140	CL09	RT4LL	60 - 90	35	30
55	-	100	FD*36MC100GD	1000 - 1500	1400	CL10	RT4LM	80 - 125	35	30
55	105	-	FE*36MC160JF	1600 - 2400	1400	CL10	RT4LM	80 - 125	35	30
75	138	135	FE*36MC160JF	1600 - 2400	1900	CK75	RT4LN	120 - 190	50	40a
90	170	165	FE*36MC250KF	2500 - 3750	2500	CK08	RT4LN	120 - 190	70	40
110	211	200	FE*36MC250KF	2500 - 3750	2800	CK85	RT4LR	200 - 310	95	40
132	245	240	FE*36MC250KF	2500 - 3750	3150	CK09	RT4LR	200 - 310	120	40

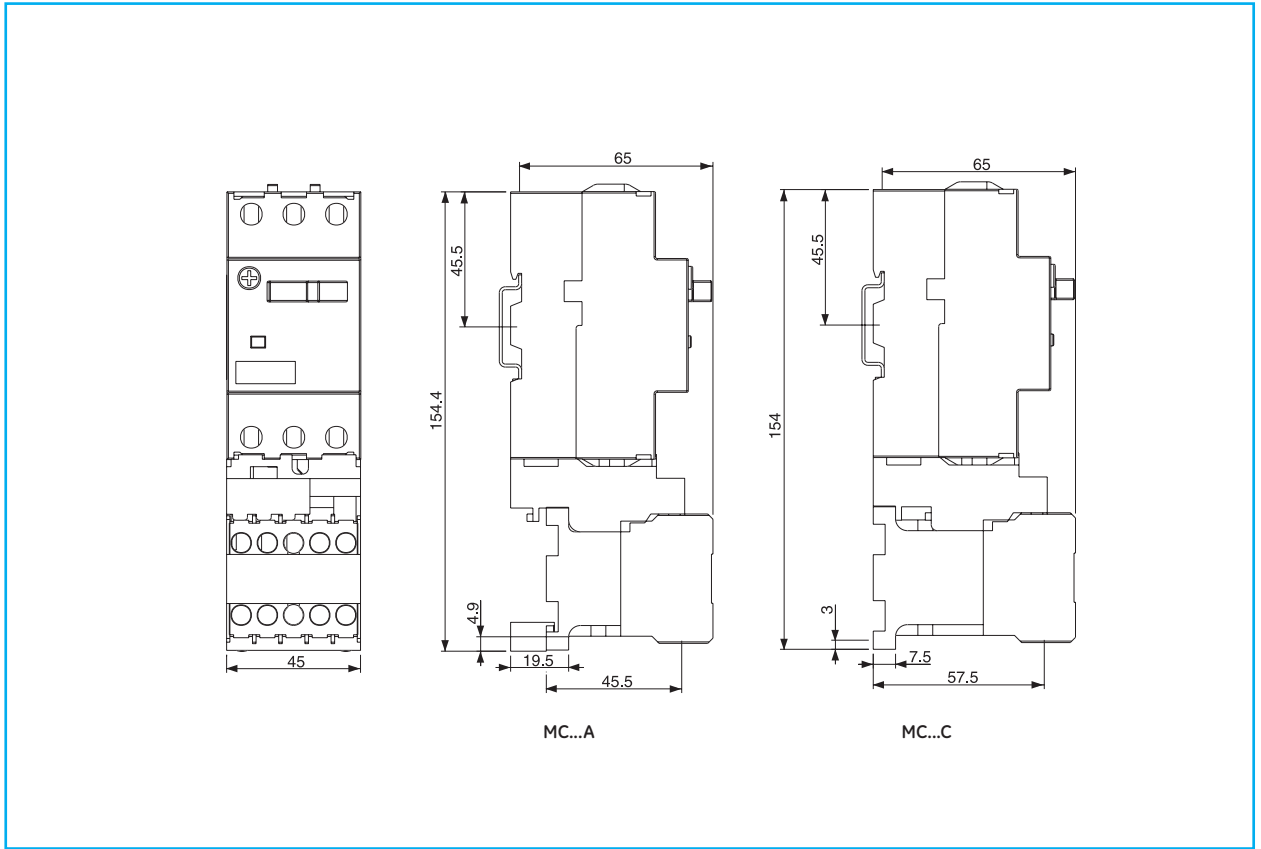
(\*) Max I<sub>q</sub> rating in kA: type N = 50 kA, type H = 80 kA, type L = 150 kA.

- (1) Current are relevant to four pole motors not having special characteristics of torque.  
Inrush currents: ≤ 8 times rated current for ≤ 1s (Normal starting) or H 5s (Heavy starting).
- (2) The minimum cycle cross-sections are referred to an ambient temperature of 30°C max. in free air and are selected to withstand the maximum let-through energy and the motor rated current. Besides the user has to consider the drop voltage, the type of laying and ambient temperature.
- (3) Foreseen values for E-frame.

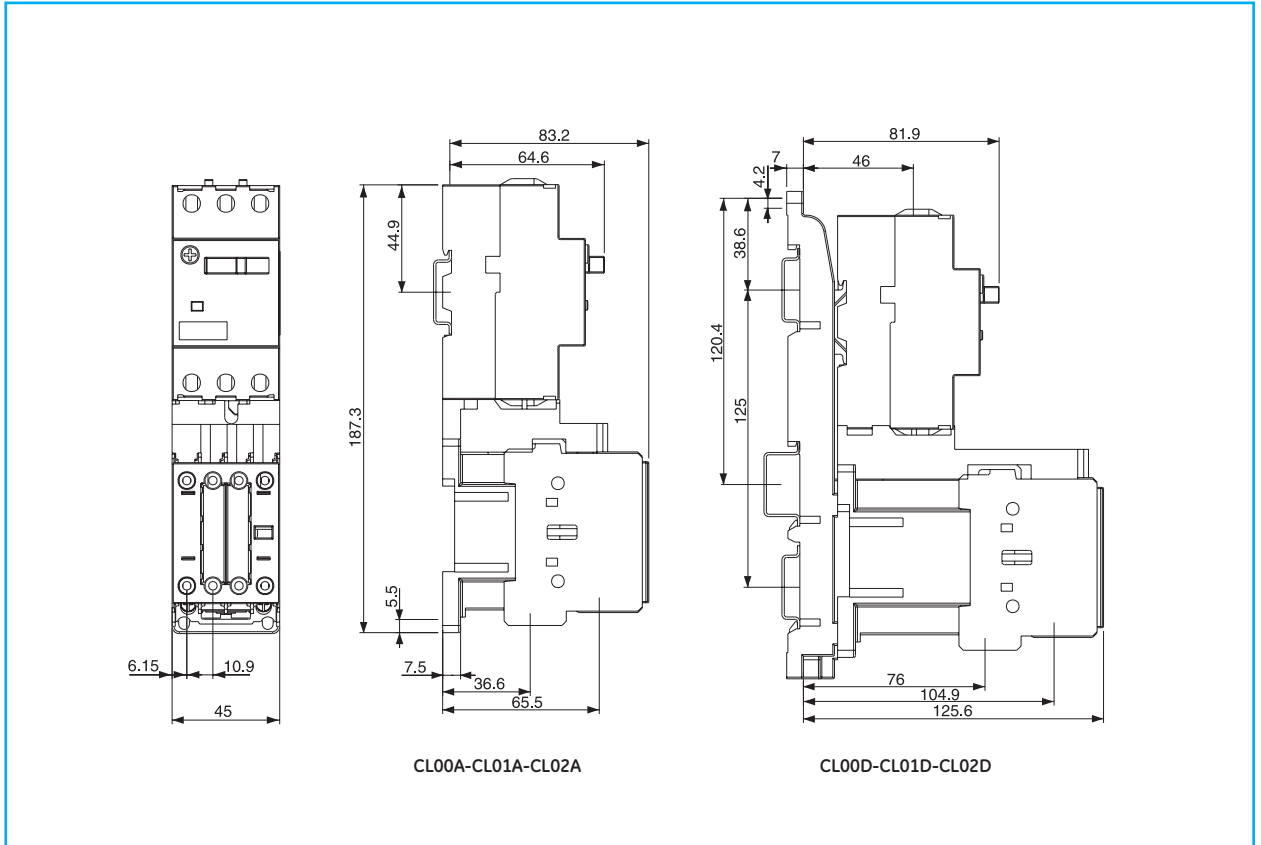


**Dimensional drawings**

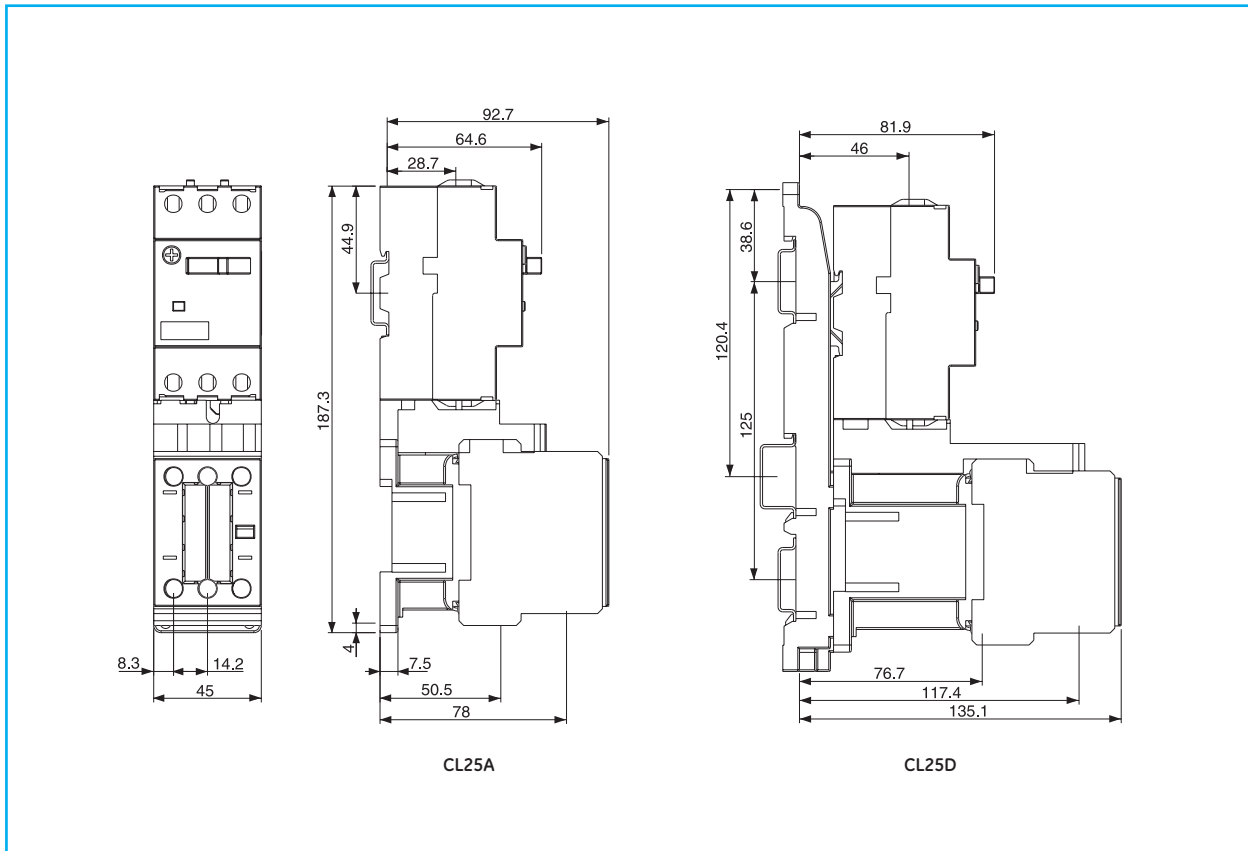
**Fuseless starter - GPS1 rocker + Minicontactor MC**



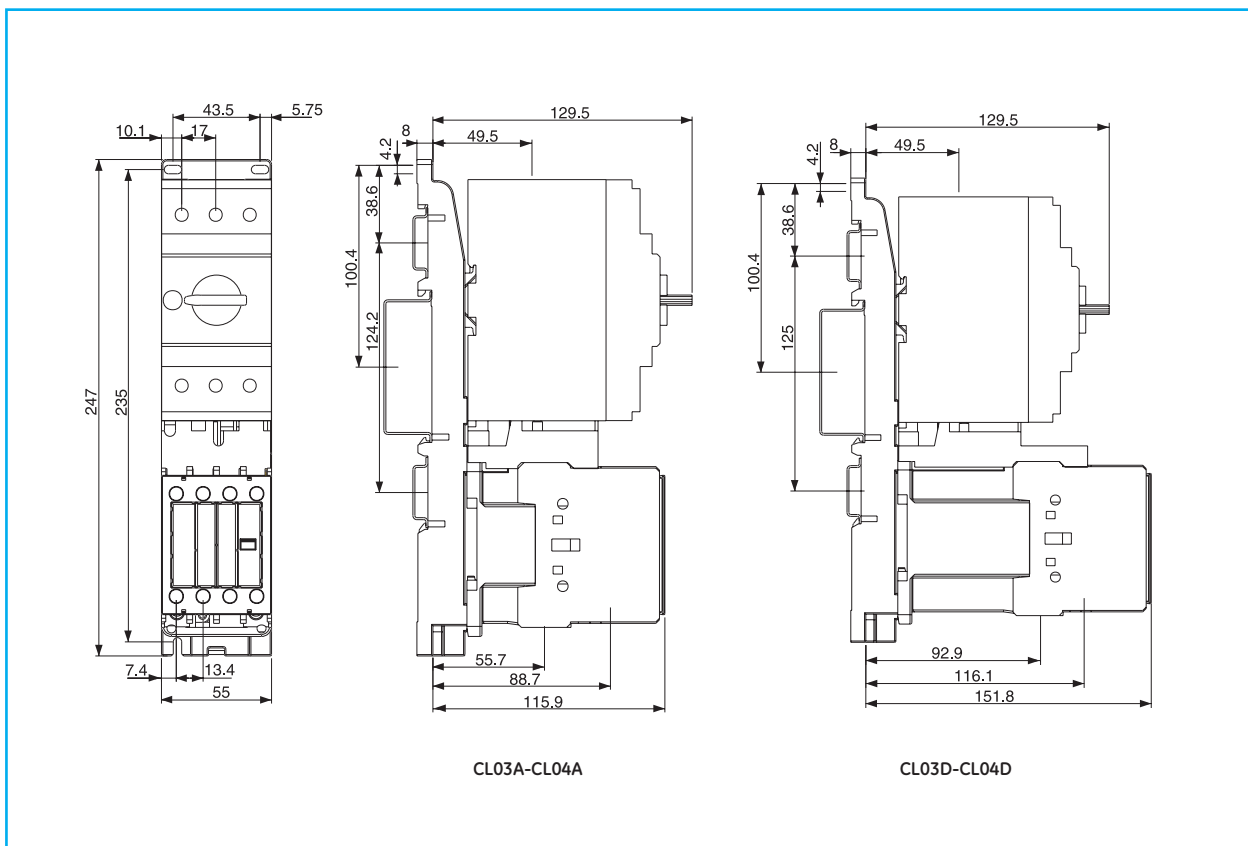
**Fuseless starter - GPS1 rocker + Contactor CL00-CL01-CL02**



Fuseless starter - GPS1 rocker + Contactor CL25



Fuseless starter - GPS2 + Contactor CL03-CL04



Dimensions

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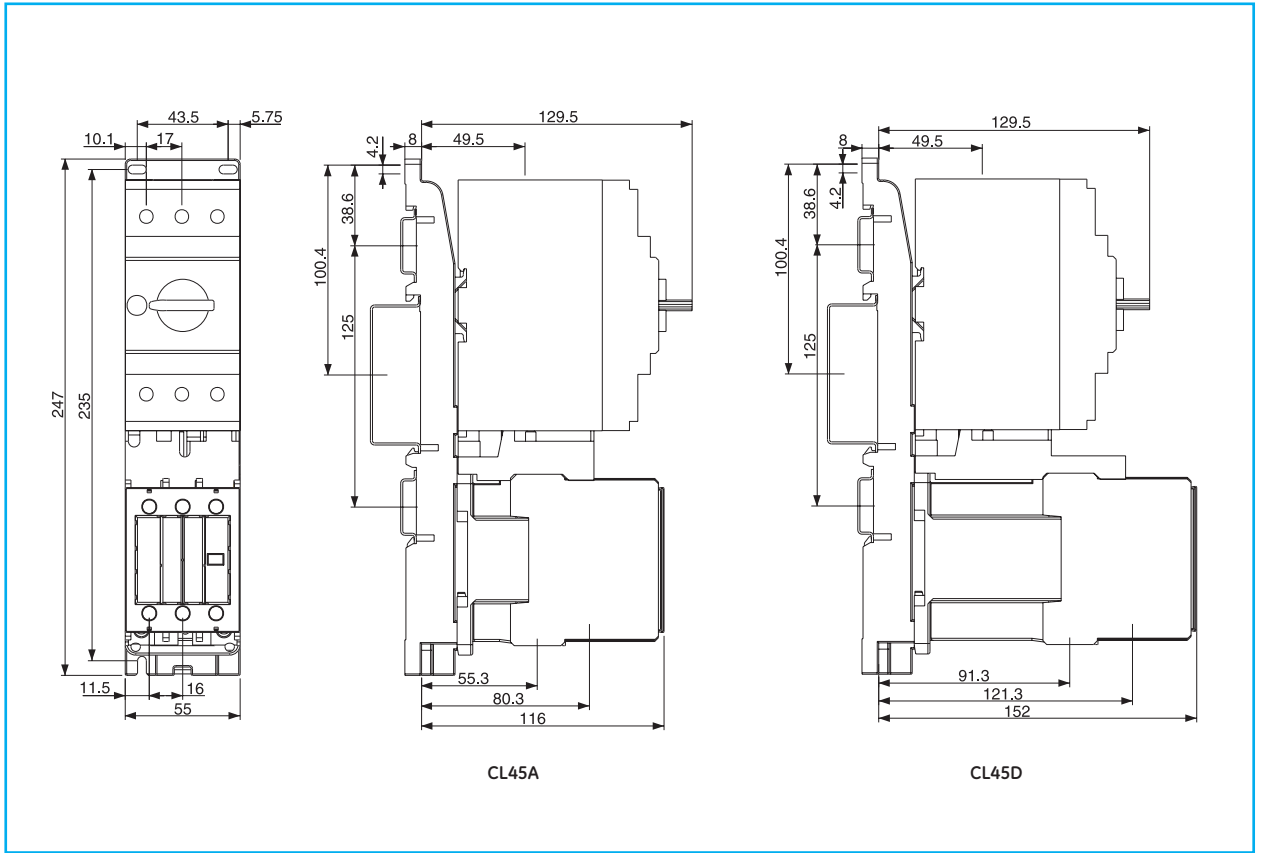
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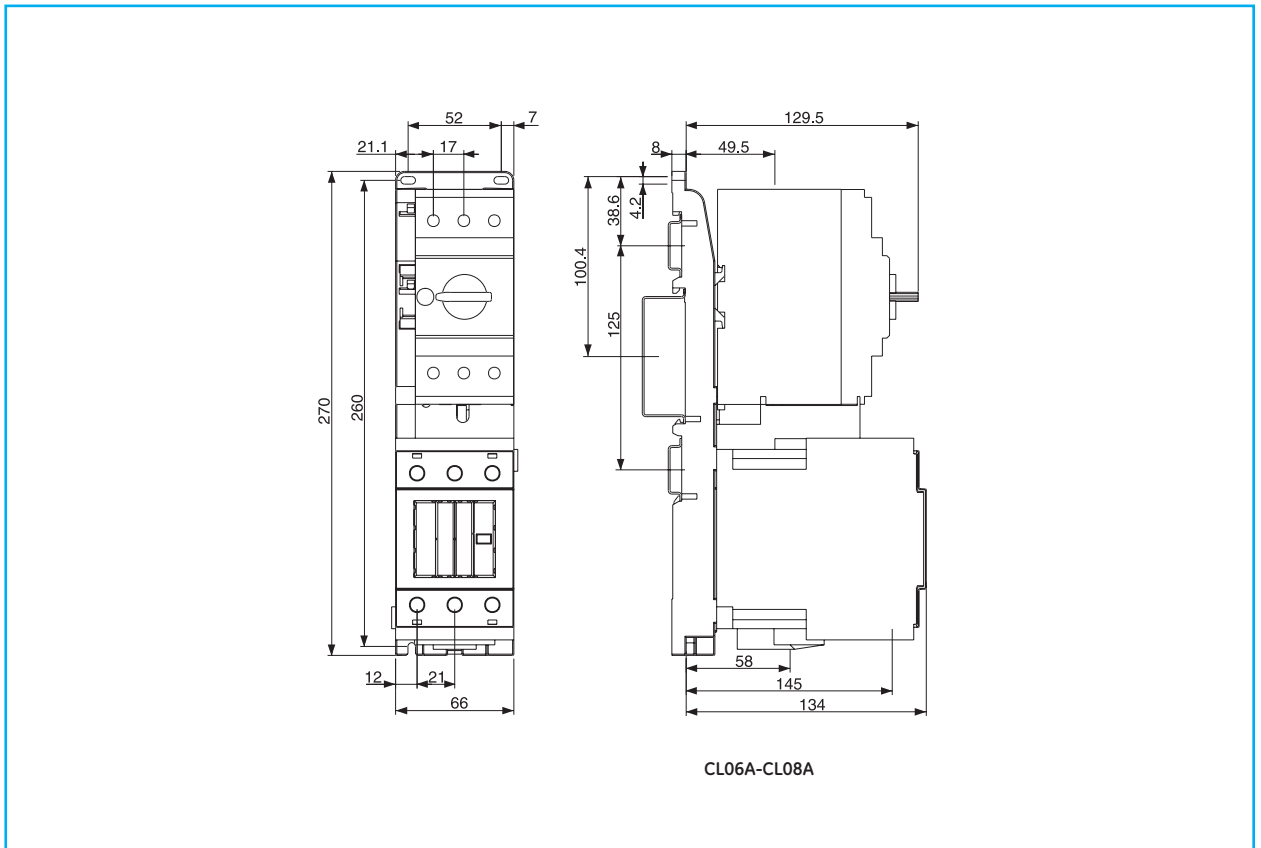


**Dimensional drawings**

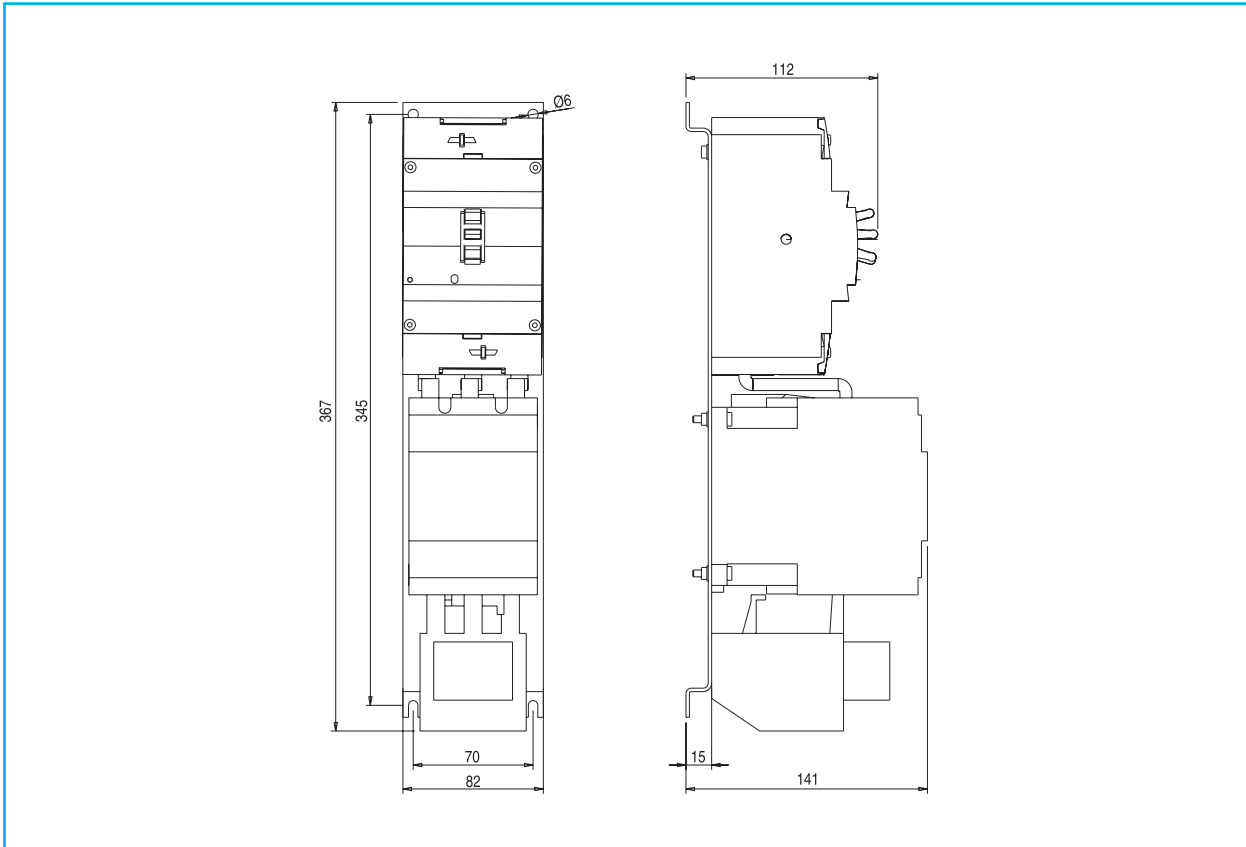
**Fuseless starter - GPS2 + Contactor CL45**



**Fuseless starter - GPS2 + Contactor CL06-CL08**



Fuseless starter - Record Plus + Contactor CL09 + Thermal overload relay RT2



Dimensions

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Order codes ● page D.19  
 Wiring diagrams ● page D.24  
 Dimensions ● page D.32

## Direct-on-line starters

### Series M 6 to 12A (AC-3)

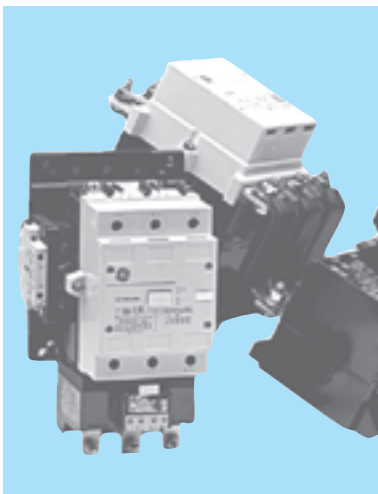
- Power circuit: up to 690V AC
- Control circuit: up to 600V AC
- Polycarbonate enclosure (IP40 - IP65)
  - Shock resistance
  - Total insulation  $\square$
  - 4 knock-out input holes PG13.5
  - Cable entry in the base
- Terminals protected against accidental contact
- 16 setting ranges from 0.11 up to 14A
- Start contact block



Order codes ● page D.19  
 Wiring diagrams ● page D.25  
 Dimensions ● page D.32

### Series CL 9 to 40A (AC-3)

- Power circuit: up to 690V AC
- Control circuit: up to 690V AC
- IP00 version
- Polycarbonate enclosure (IP40 - IP65)
  - Shock resistance
  - Total insulation  $\square$
  - 4 knock-out input holes
- Empty enclosures version
- Start contact block



Order codes ● page D.19  
 Wiring diagrams ● page D.26  
 Dimensions ● page D.33





### Series CK 150 to 825A (AC-3)

- Power circuit: up to 1000V AC
- Control circuit: up to 690V AC
- Protection degree IP00
- Terminals protected against accidental contact: IP20
  - KG75 to KG12: Coil and auxiliary terminals with built-in protection  
Main terminals protector on request
  - KG13: Coil and auxiliary terminals with built-in protection

**Series M - Direct-on-line starters**

		Push-buttons	Protection degree		Cat. no.	Ref. no	Pack
Empty boxes		Start/Stop + Reset	IP40		MG0004PATO	209780	1
			IP65		MG0006PATO	209781	1
		Reset only	IP40		MG0004RATO	137567	1
			IP65		MG0006RATO	116402	1
		Start/Emergency stop	IP40		MG0004QATO	137566	1
			IP65		MG0006QATO	116074	1
Start contact block	Laterally mounted to the contactor, allowing the electrical operation the box push-button which incises on it.				MAGL110AT	100608	1

**Series CL - Direct-on-line starters**

	For use with	Push-buttons	Protection degree		Cat. no.	Ref. no	Pack
	CL00, CL01, CL02	Start/Stop + Reset	IP40		LG0004P1B0	209344	1
			IP65		LG0006P1B0	200004	1
		Without push-buttons	IP40		LG0004S1B0	209347	1
			IP65		LG0006S1B0	116011	1
		Only Reset	IP40		LG0004R1B0	116651	1
			IP65		LG0006R1B0	116652	1
	CL25	Start/Stop + Reset	IP40		LG2504P1B0	100885	1
			IP65		LG2506P1B0	101095	1
		Only Reset	IP40		LG2504R1B0	116226	1
			IP65		LG2506R1B0	133611	1
	CL04	Start/Stop + Reset	IP40		LG0404P1B0	116653	1
			IP65		LG0406P1B0	116656	1
	Only Reset	IP40		LG0404R1B0	133264	1	
		IP65		LG0406R1B0	133265	1	
CL25, CL04	Without push-buttons	IP40		LG0404S1B0	116996	1	
		IP65		LG0406S1B0	116997	1	
Neutral terminal					BNL	104797	10
							
Conversion to permanent control	Pressure-fixed between push-buttons in direct-on-line enclosures for mechanical interlocking into permanent control.				EPL	104798	10
							
Start contact block	Pressure-fixed onto the front of direct-on-line starters allowing electrical operation using the start push-button on the enclosure				BMLF	104800	10
							

**Series CK - Direct-on-line starters. IP00**

				Cat. no.	Ref. no.	Pack
Connection sets	Busbar set for power circuit	CK85, CK09, CK95		KVP85G	104770	1
		CK10, CK11		KVP10G	104771	1
		CK12		KVP12G	104767	1
Plate	Metallic plate	CK85, CK09, CK95		PVP85G	241747	1
		CK10, CK11		PVP10G	241748	1
		CK12		PCP12G	241749	1

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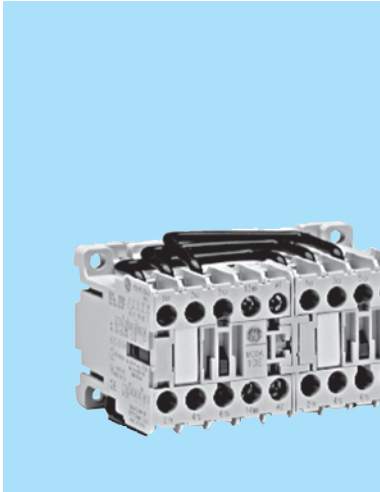
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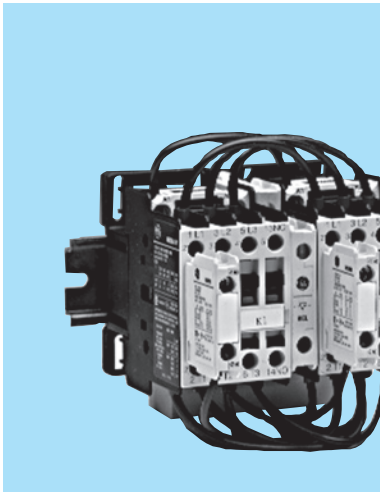


Order codes ● page D.21  
 Wiring diagrams ● page D.28  
 Dimensions ● page D.34

## Reversing starters

### Series M 6 to 12A (AC-3)

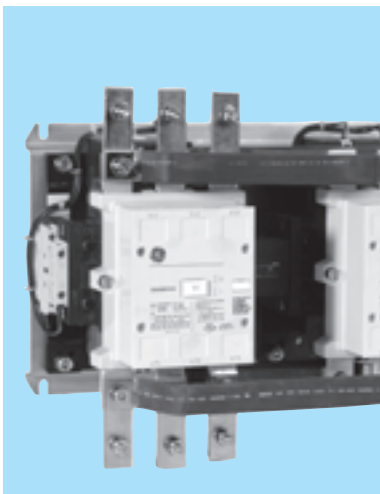
- Power circuit: up to 690V AC
- Control circuit: up to 600V AC  
up to 250V DC
- Assembled versions on request.
- Screw and push-on terminals protected against accidental contact.
- Protection degree IP20 in accordance with EN 60529.
- Facility to mount instant and timed auxiliary contact blocks and voltage suppressor blocks.



Order codes ● page D.21  
 Wiring diagrams ● page D.28  
 Dimensions ● page D.34

### Series CL 9 to 105A (AC-3)

- Power circuit: up to 690V AC
- Control circuit: up to 690V AC
- Protection degree IP00




Order codes ● page D.21  
 Wiring diagrams ● page D.29  
 Dimensions ● page D.35

### Series CK 150 to 825A (AC-3)

- Power circuit: up to 1000V AC
- Control circuit: up to 690V AC
- Protection degree IP00

**Series M and CL - Reversing starters**

Wiring kits for reversing starters	Description	For use with contactor	ac/dc	Cat. no.	Ref. no.	Pack.
		Suitable to be used with link modules	MC0., MC1., MC2..	ac/dc	WKMIU	101421
CL00., CL01., CL02..			ac/dc	WKLI02P	101422	1
Upper and lower connections without overload relays		CL25..	ac/dc	WKLI25P	101423	1
		CL03., CL04...	ac/dc	WKLI04P	101424	1
		CL45..	ac/dc	WKLI45P	101425	1
		CL06A., CL07A.	ac	WKLI07P	101426	1
Plate	Metallic plate	CL06, CL07, CL08		WKI0910	241751	1
		CL08, CL09, CL10		WKI0608	241752	1

**Series CK - Reversing starters. IP00**

Connection sets	Description	For use with contactor	ac/dc	Cat. no.	Ref. no.	Pack.
	Busbar set for power circuit		CK75, CK08		KVP75U	113627
CK85, CK09, CK95				KVP85U	113628	1
CK10, CK11				KVP10U	133374	1
Busbar set for power circuit For assembly with thermal overload relay.		CK12		KVP12U	113630	1
		CK75, CK08		KVP75I	133370	1
		CK85, CK09, CK95		KVP85I	113631	1
Plate	Metallic plate	CK10, CK11		KVP10I	133371	1
		CK12		KVP12I	113633	1
		CK75, CK08		KVB75I	104690	1
		CK85, CK95		KVB95I	104691	1
		CK10, CK11		KVB10I	104692	1
		CK12		KVB12I	104693	1

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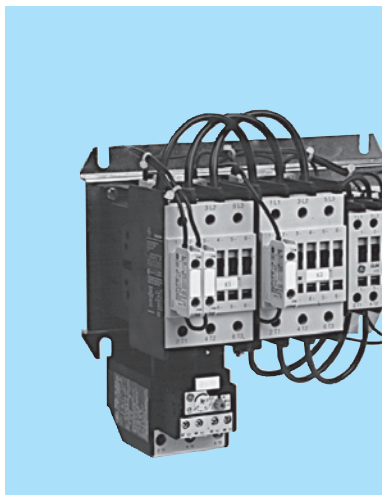
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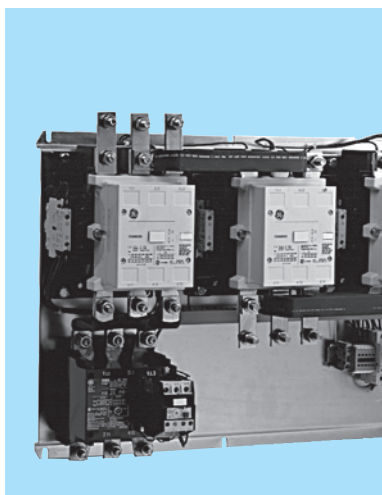
Order codes ● page D.23  
 Wiring diagrams ● page D.30  
 Dimensions ● page D.37

## Star-delta starters

### Series CL

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- Power circuit: up to 690V AC
- Control circuit: up to 690V AC
- Protection degree IP00
- Use delay setting by electronic relay NMET
- Terminals protected against accidental contact



Order codes ● page D.23  
 Wiring diagrams ● page D.30  
 Dimensions ● page D.37

### Series CK

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- Power circuit: up to 1000V AC
- Control circuit: up to 690V AC
- Protection degree IP00
- Protection against accidental contacts: IP20
  - KE75: Built-in protection
  - KE08 - KE12: Coil and auxiliary terminals with built-in protection  
Main terminals protector on request
  - KE13: Coil and auxiliary terminals with built-in protection

**Series CL - Star-delta starters**

		Line-delta contactor		Cat. no.	Ref. no.	Pack
Busbar sets for power circuit		CL00		WKLE00	103238	1
		CL01, CL02		WKLE02	103241	1
		CL25		WKLE25	103243	1
Plate	Metallic plate	CL06, CL07, CL08		WLSD	103247	1
		CL09, CL10		WLSD1	241750	1

**Series CK - Star-delta starters. IP00**

		Line-delta contactor	Star contactor	Cat. no.	Ref. no.	Pack
Busbar sets for power circuit		CK75, CK08	CK75, CK08	KVP75E	133378	1
		CK85, CK09, CK95	CK75, CK08	KVP08E	116212	1
		CK95	CK85, CK09, CK95	KVP85E	133379	1
		CK10, CK11	CK85, CK09, CK95	KVP95E	113637	1
		CK10, CK11	CK10, CK11	KVP10E	133380	1
		CK12	CK10, CK11	KVP12E	116235	1
Plate	Metallic plate	CK75, CK08		KVB75E	104694	1
		CK85, CK95		KVB95E	104695	1
		CK10, CK11		KVB10E	104597	1
		CK12		KVB12E	104587	1

Star-delta starters

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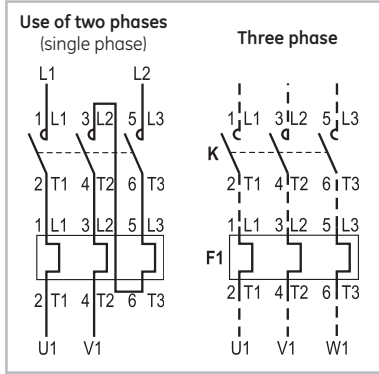




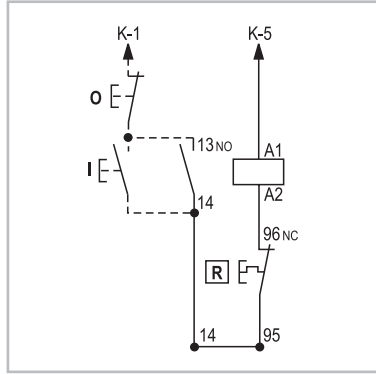
Wiring diagrams

Series M. Direct-on-line starter with reset

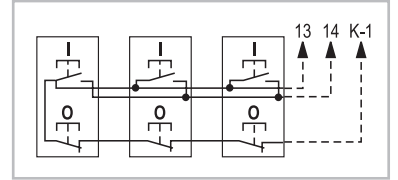
Power circuit



Control circuit

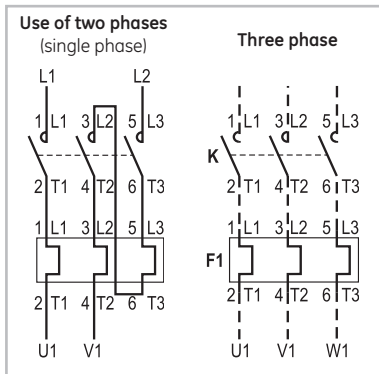


Control by two or more push-buttons

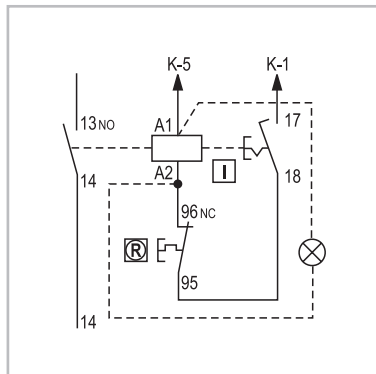


Series M. Direct-on-line starter with start/emergency stop push-button

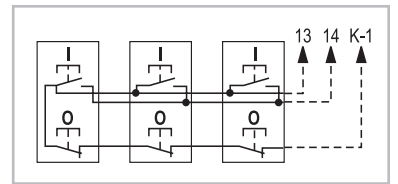
Power circuit



Control circuit

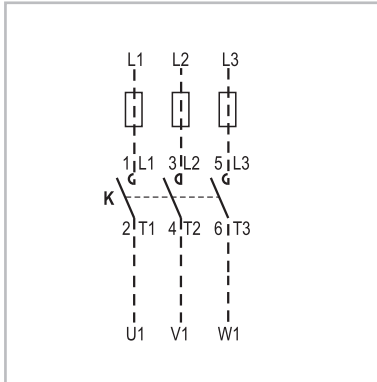


Control by two or more push-buttons

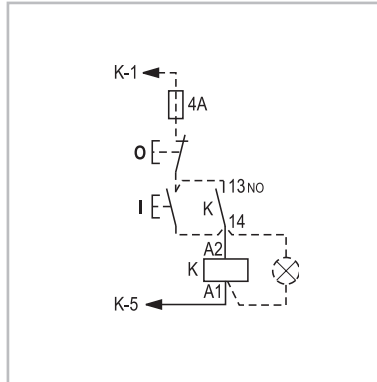


Series CL. Direct-on-line starter

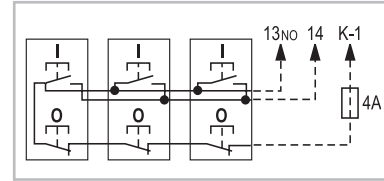
Power circuit



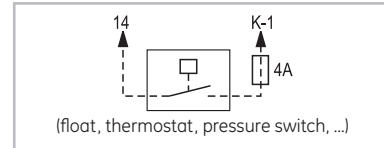
Control circuit



Control by two or more push-buttons

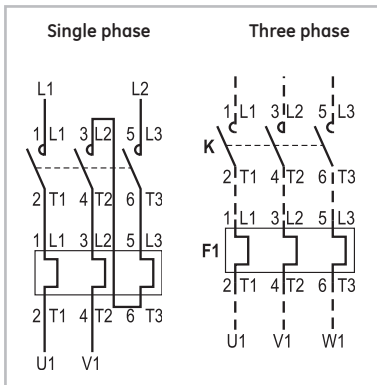


Control by permanent contact

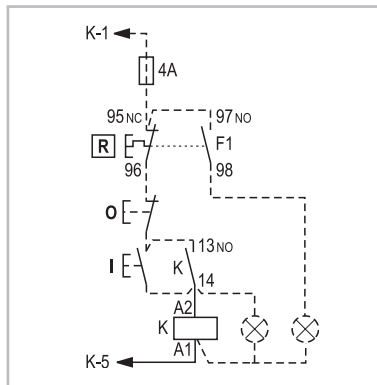


Series CL. Direct-on-line starter with reset push-button

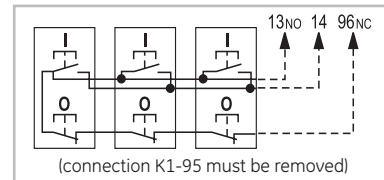
Power circuit



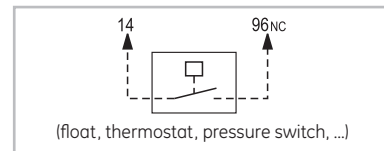
Control circuit



Control by two or more push-buttons

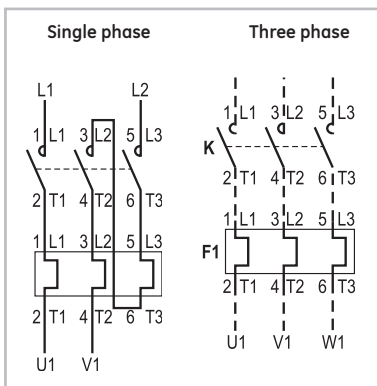


Control by permanent contact

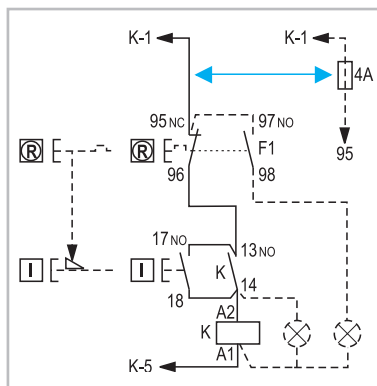


Series CL. Direct-on-line starter with start/stop/reset push-button

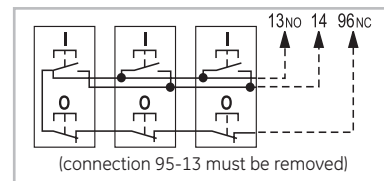
Power circuit



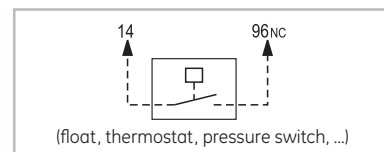
Control circuit



Control by two or more push-buttons



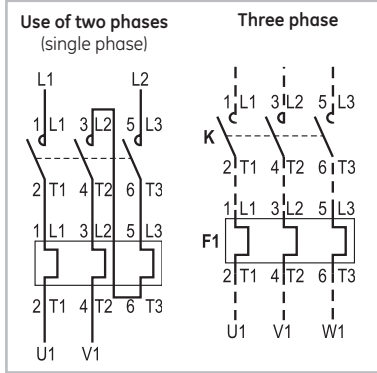
Control by permanent contact



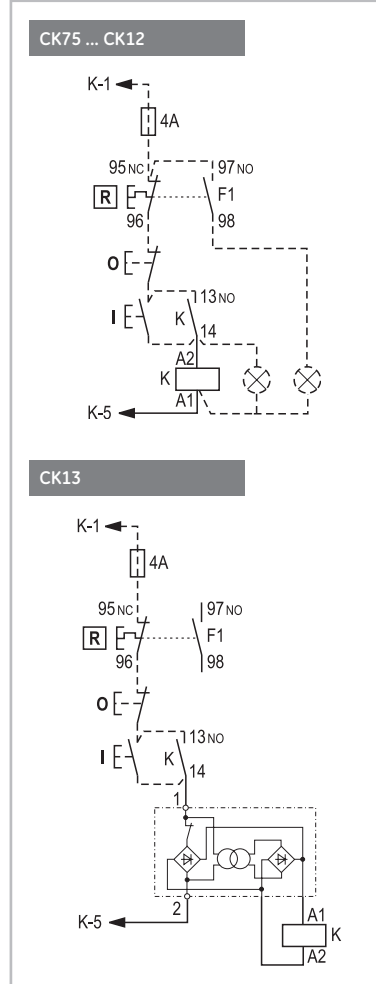
## Wiring diagrams

### Series CK. Direct-on-line starter

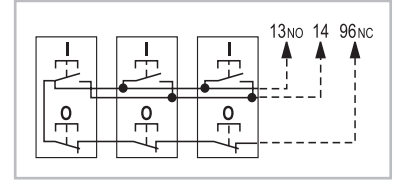
#### Power circuit



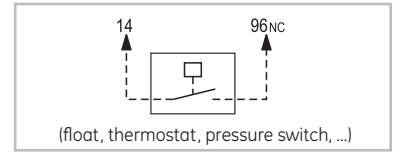
#### Control circuit



#### Control by two or more push-buttons



#### Control by permanent contact



Notes

Grid area for notes.

Direct-on-line starters

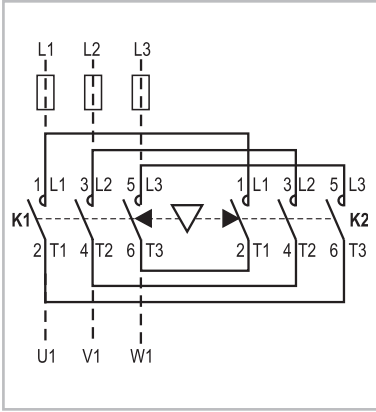
A
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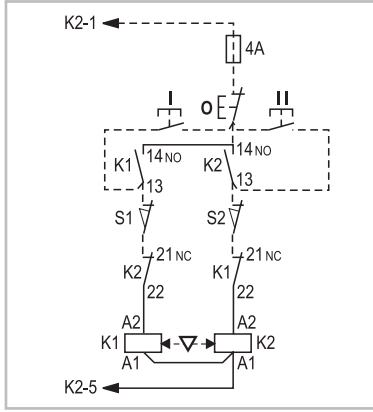
Wiring diagrams

Series M. Reversing starter without thermal overload relay

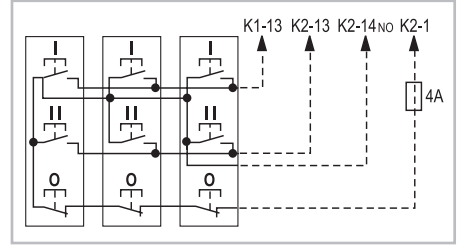
Power circuit



Control circuit

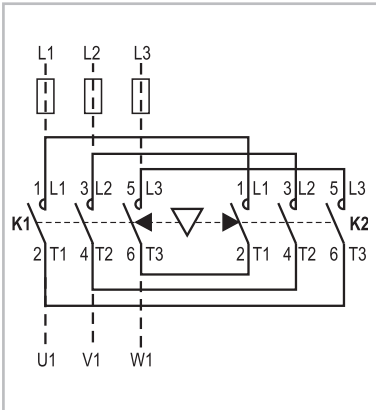


Control by two or more push-buttons

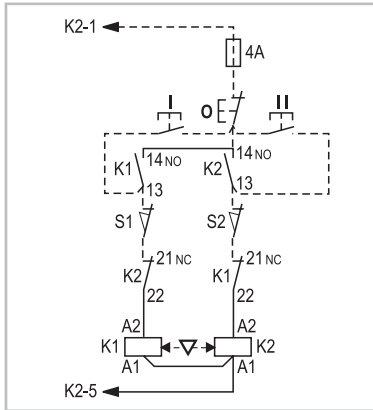


Series CL. Reversing starter without thermal overload relay

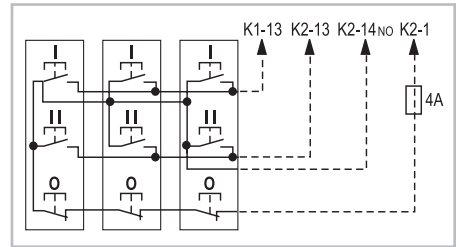
Power circuit



Control circuit

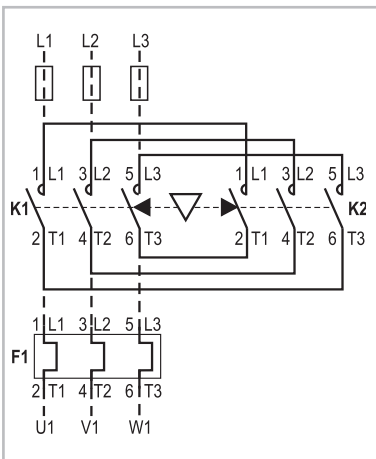


Control by two or more push-buttons

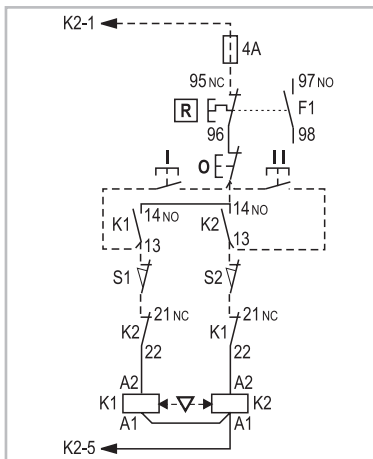


Series CL. Reversing starter with thermal overload relay

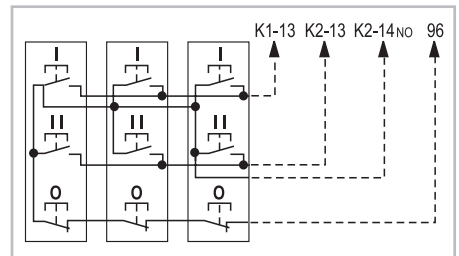
Power circuit



Control circuit

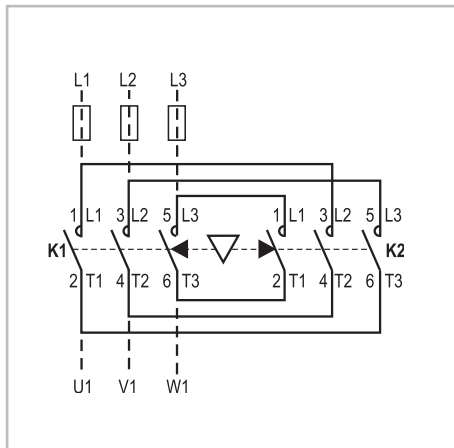


Control by two or more push-buttons

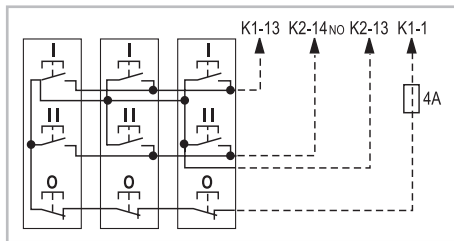


Series CK. Reversing starter without thermal overload relay

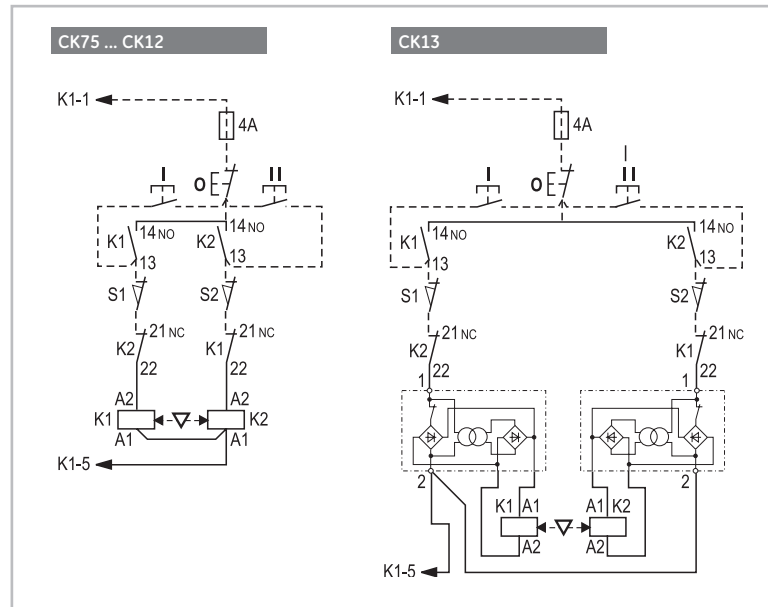
Power circuit



Control by two or more push-buttons

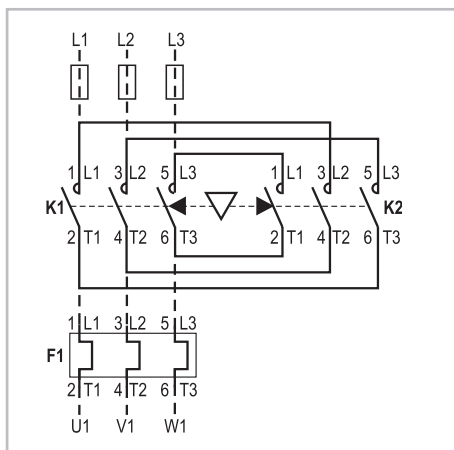


Control circuit

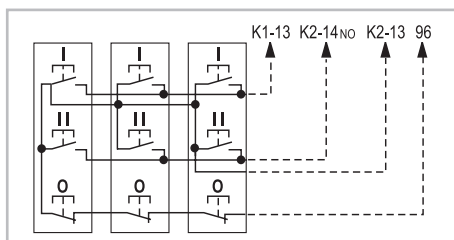


Series CK. Direct-on-line starters with thermal overload relay

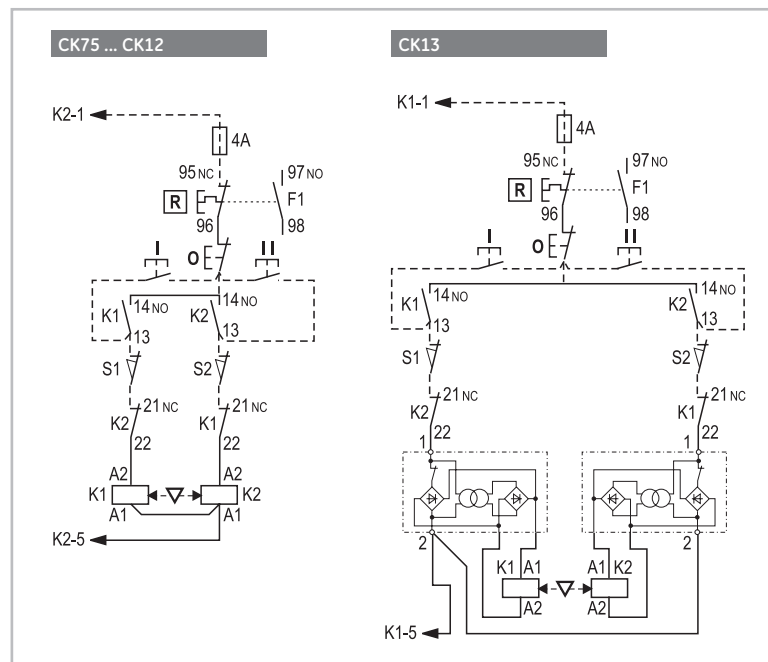
Power circuit



Control by two or more push-buttons



Control circuit



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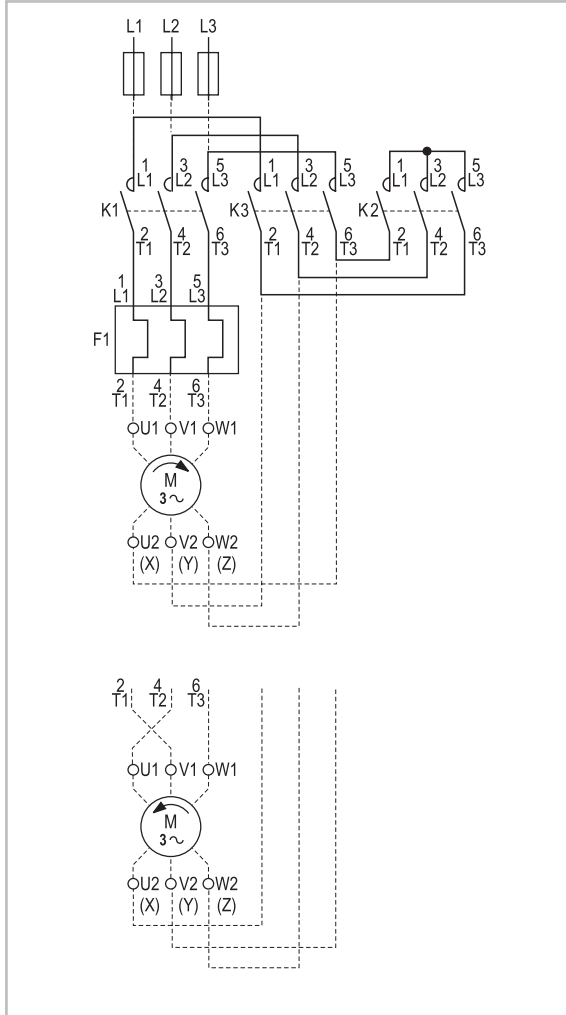
X



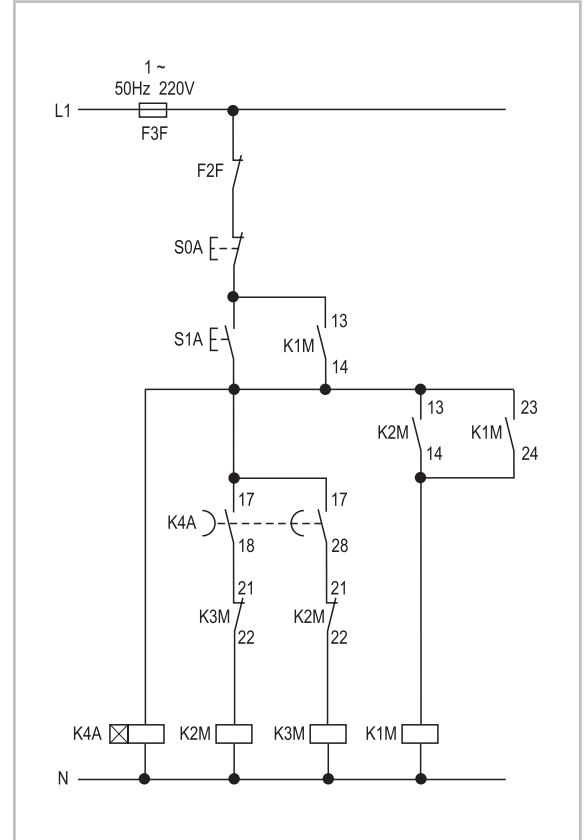
## Wiring diagrams

### Series CL and CK. Star-delta starters

Power circuit



Control circuit



Notes

Grid area for notes.

Star-delta starters

A

B

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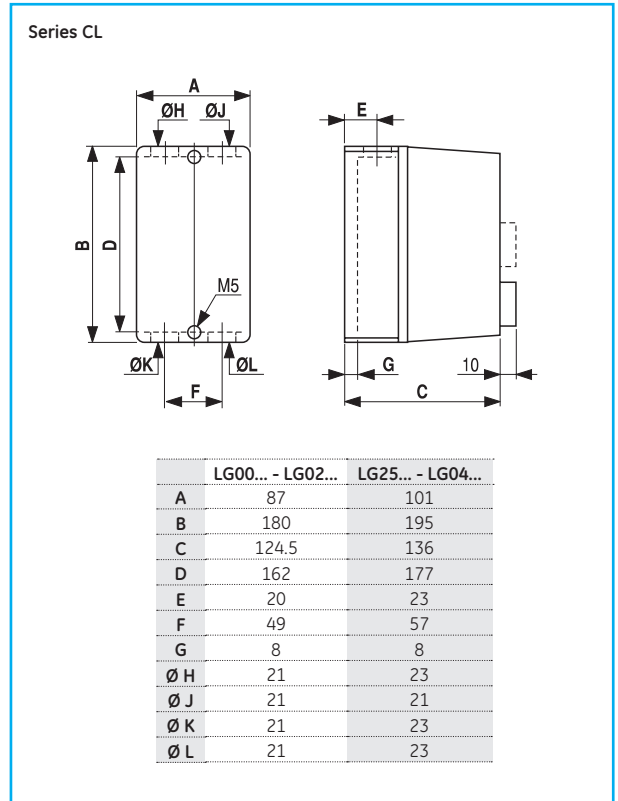
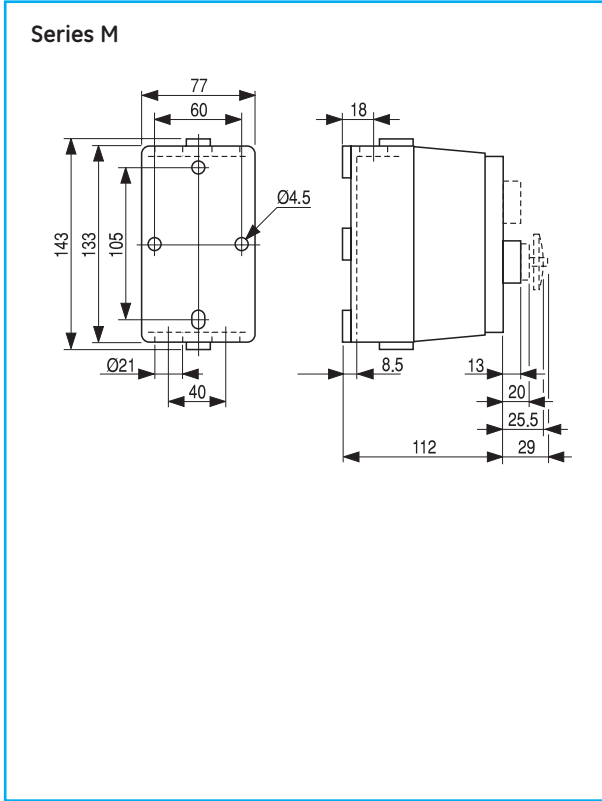
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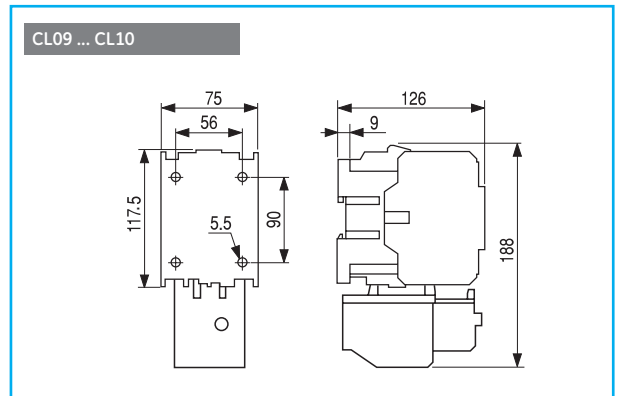
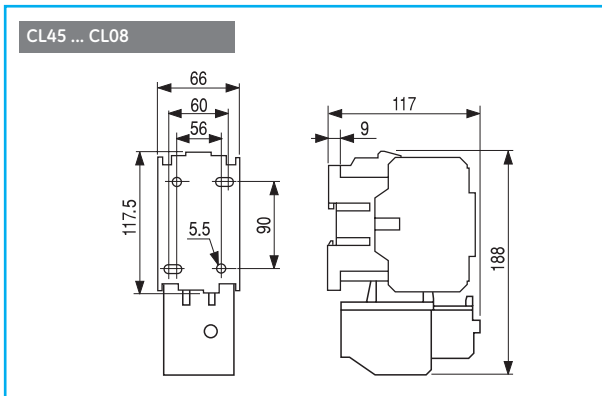
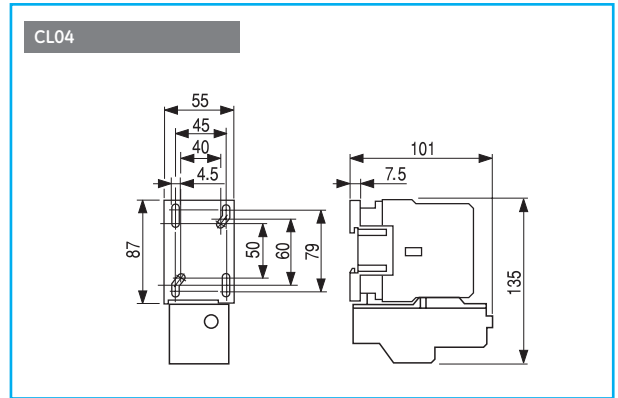
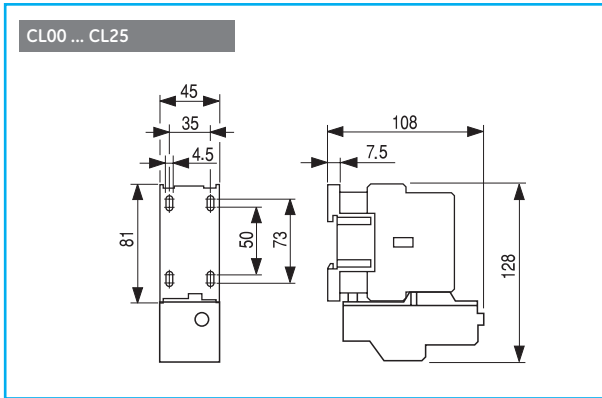


## Dimensional drawings

### Direct-on-line starters. IP40 / IP65

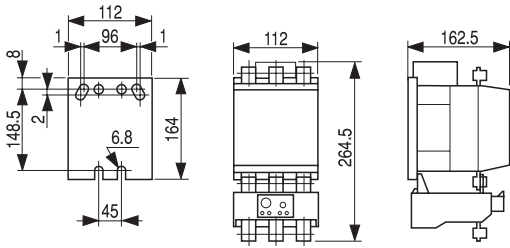


### Series CL - Direct-on-line starters

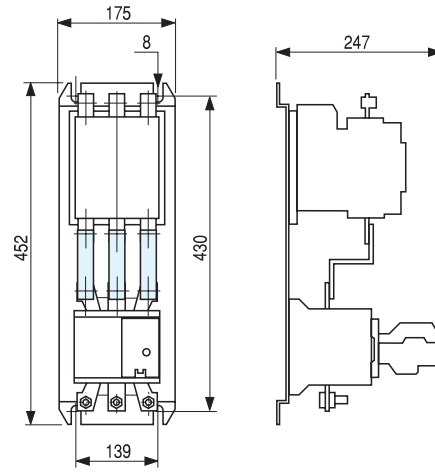


Series CK - Direct-on-line starters

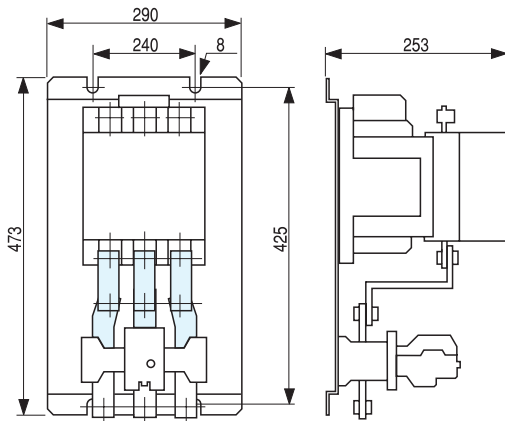
CK75 ... CK08



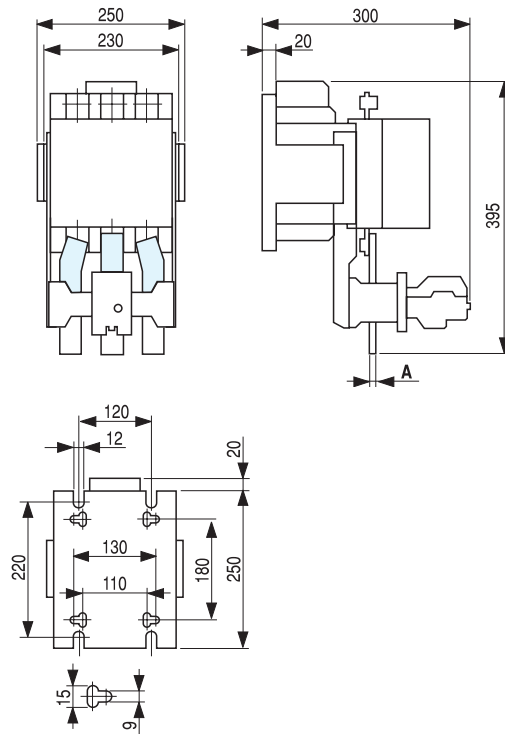
CK85 ... CK95



CK10 ... CK11



CK12



Direct-on-line starters

A

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C

D

E

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G

H

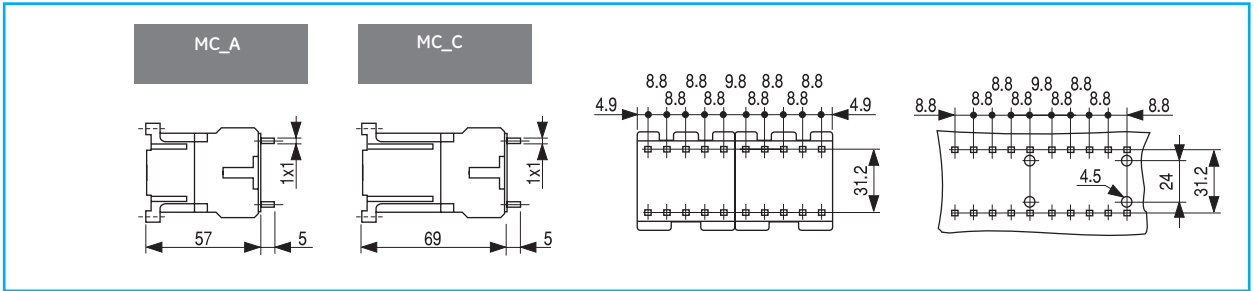
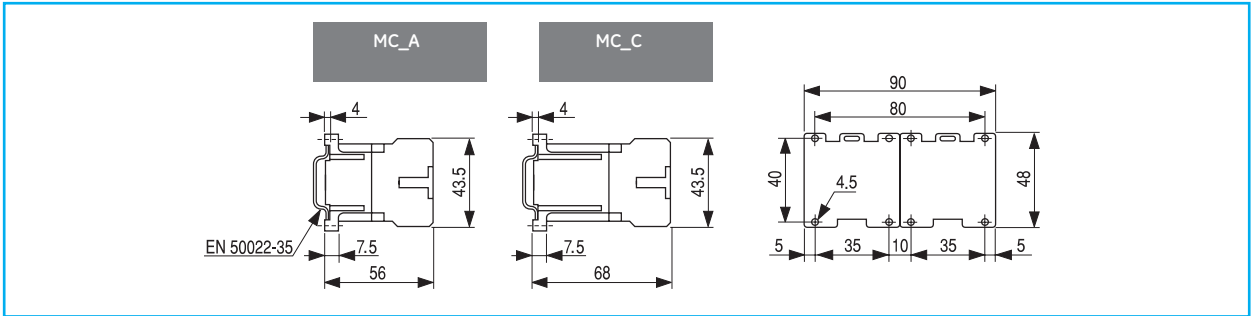
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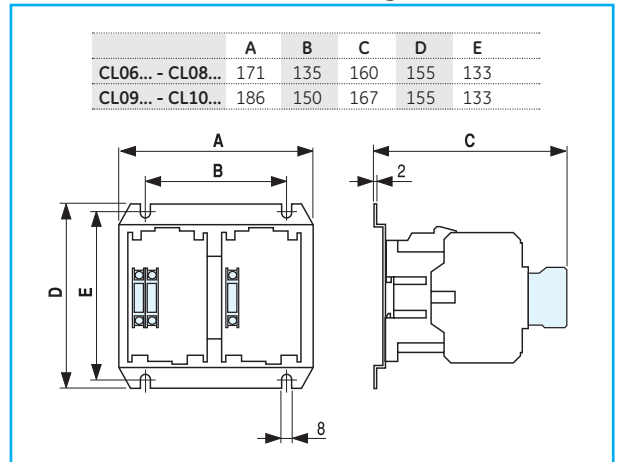
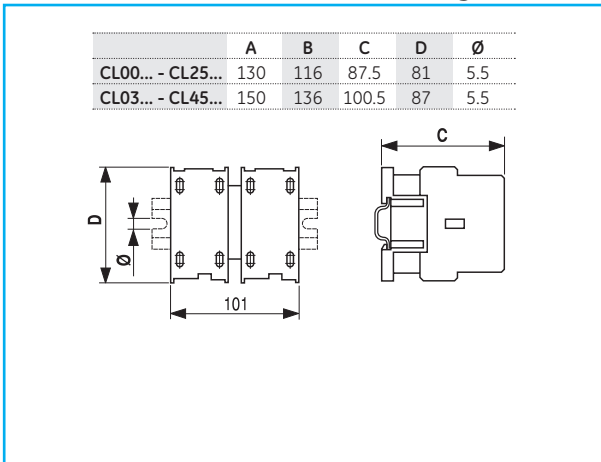


## Dimensional drawings

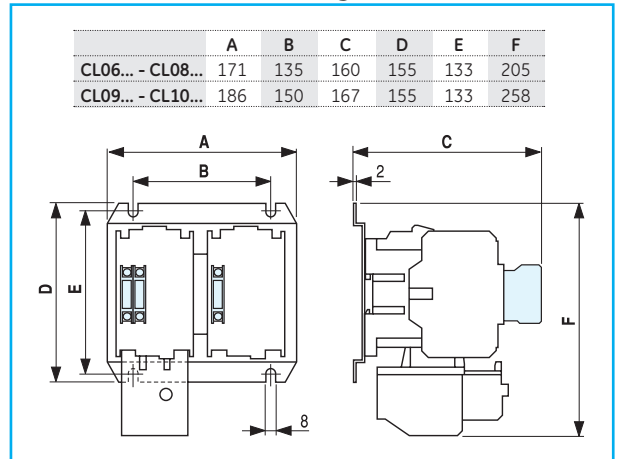
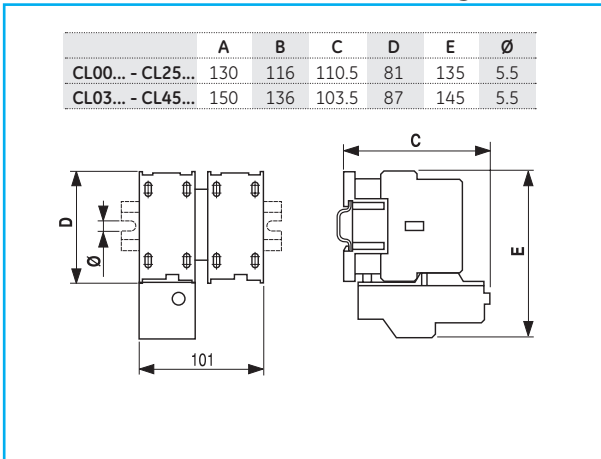
### Series M. Direct-on-line reversing starters



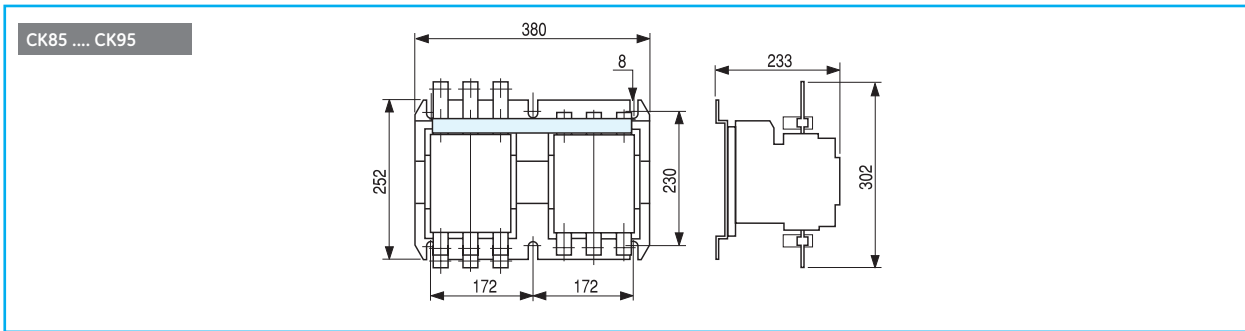
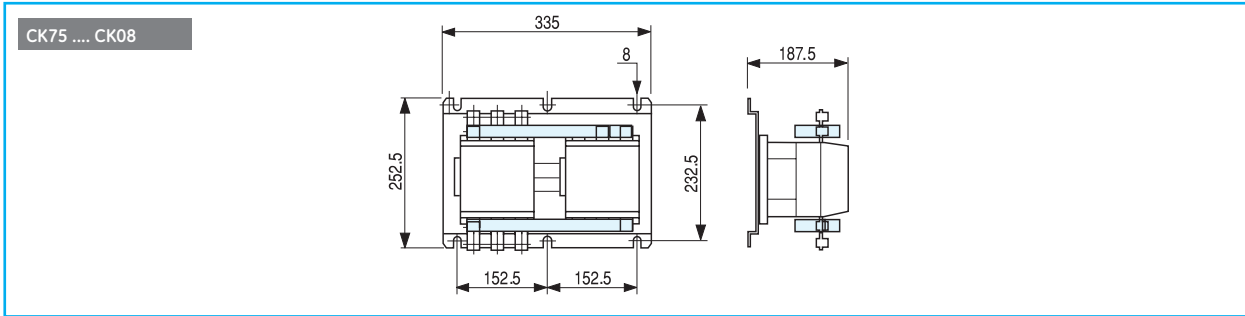
### Series CL. Direct-on-line reversing starters without thermal overload relay



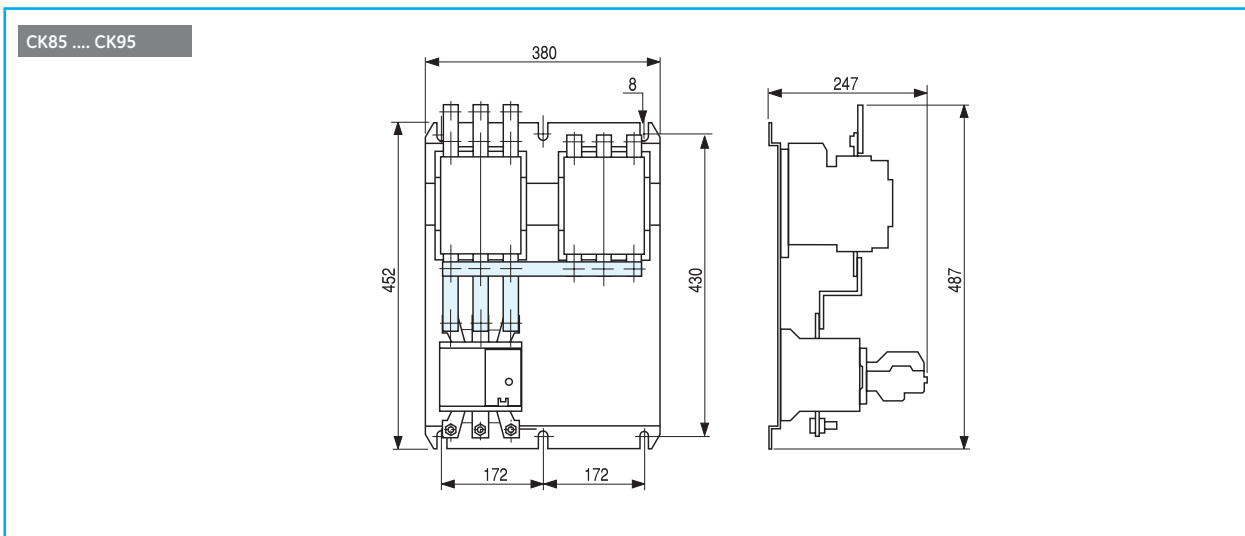
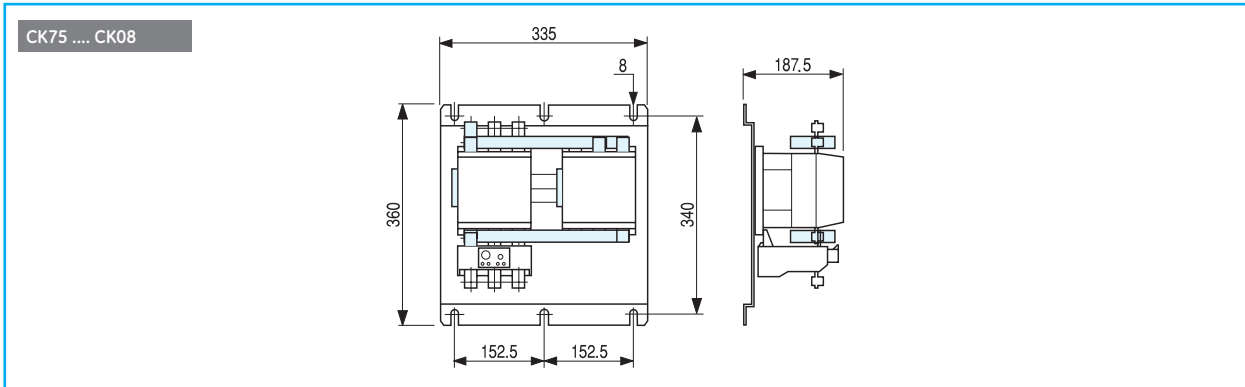
### Series CL. Direct-on-line reversing starters with thermal overload relay



**Series CK. Direct-on-line reversing starters without thermal overload relay**

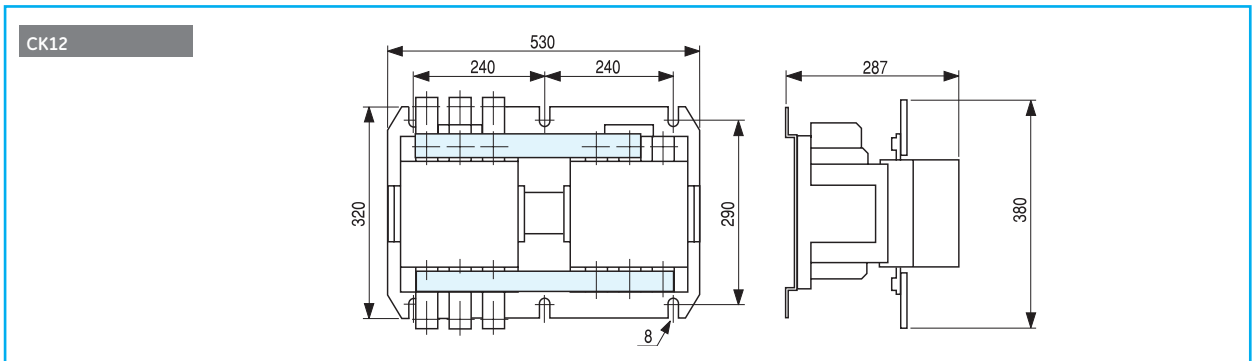
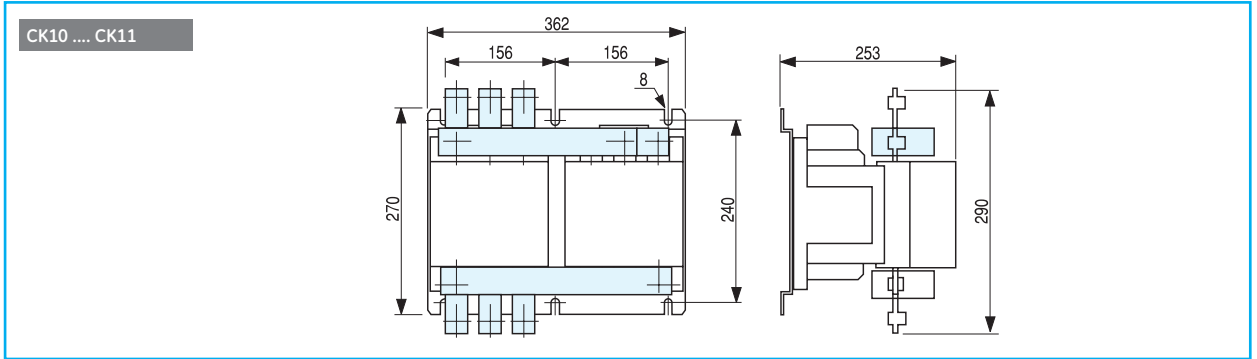


**Series CK. Direct-on-line reversing starters with thermal overload relay**

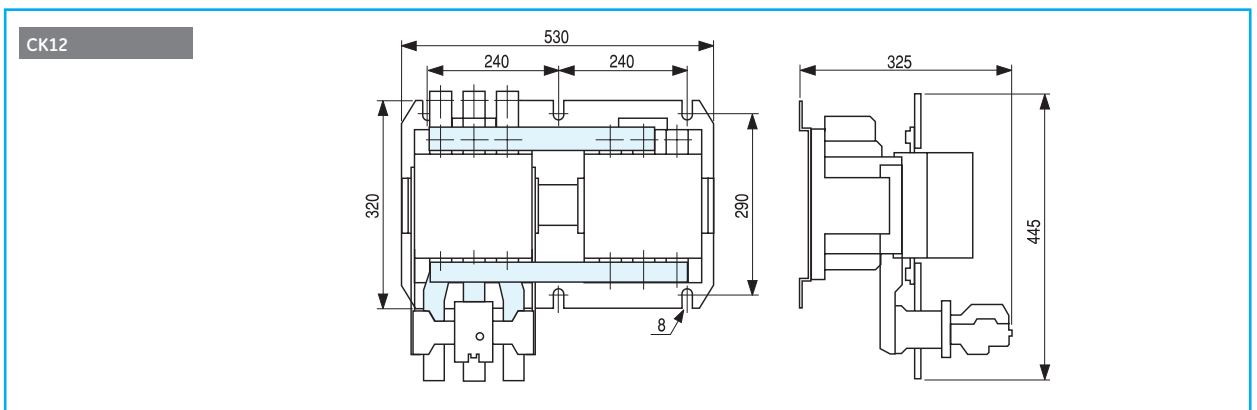
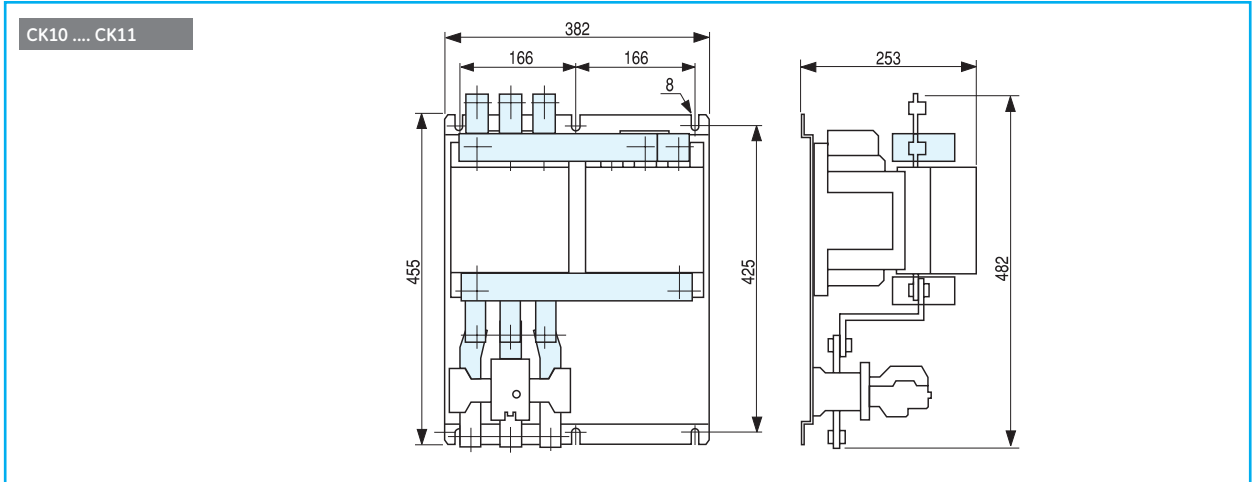


**Dimensional drawings**

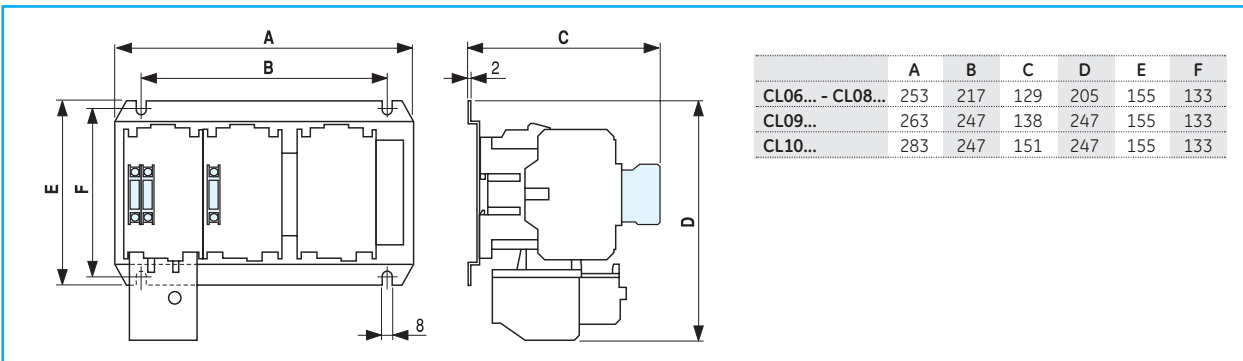
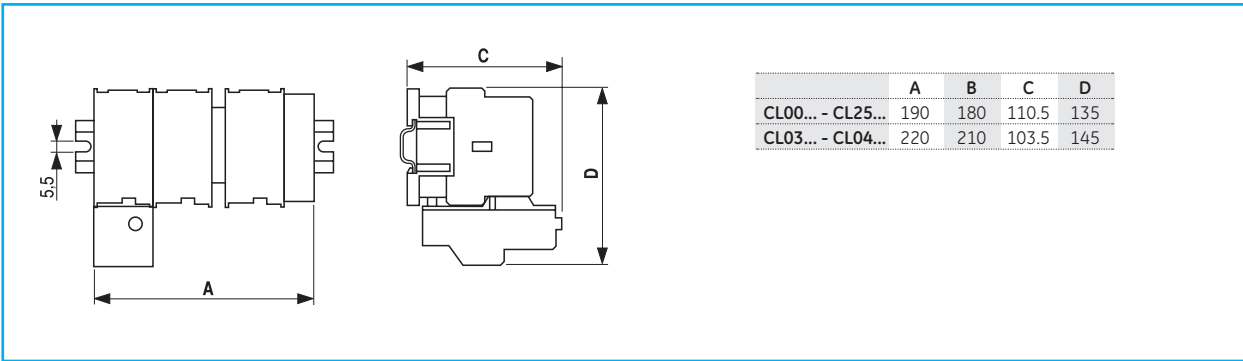
**Series CK - Direct-on-line reversing starters without thermal overload relay**



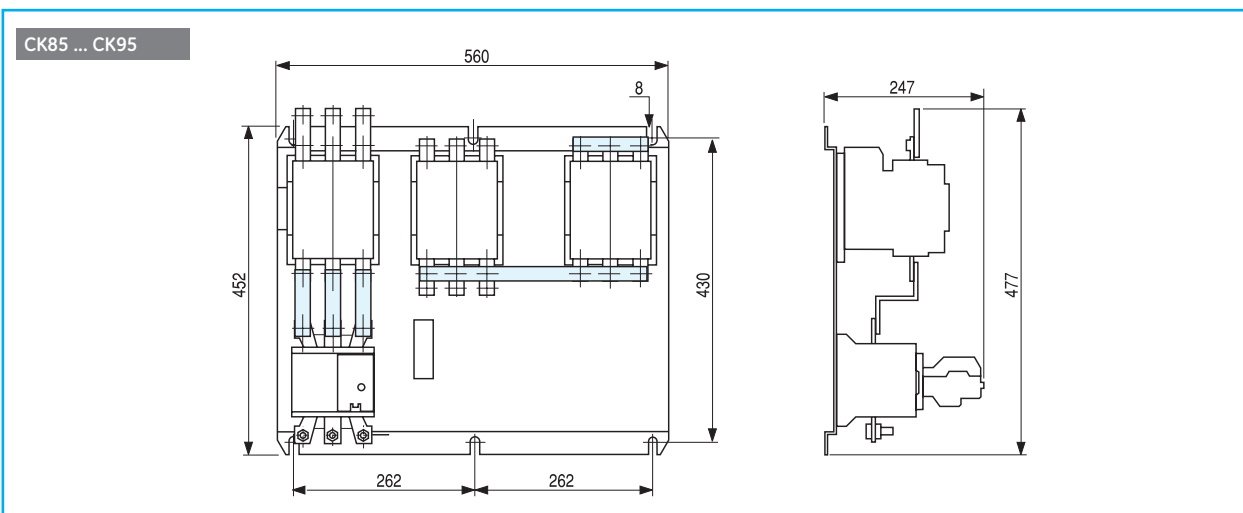
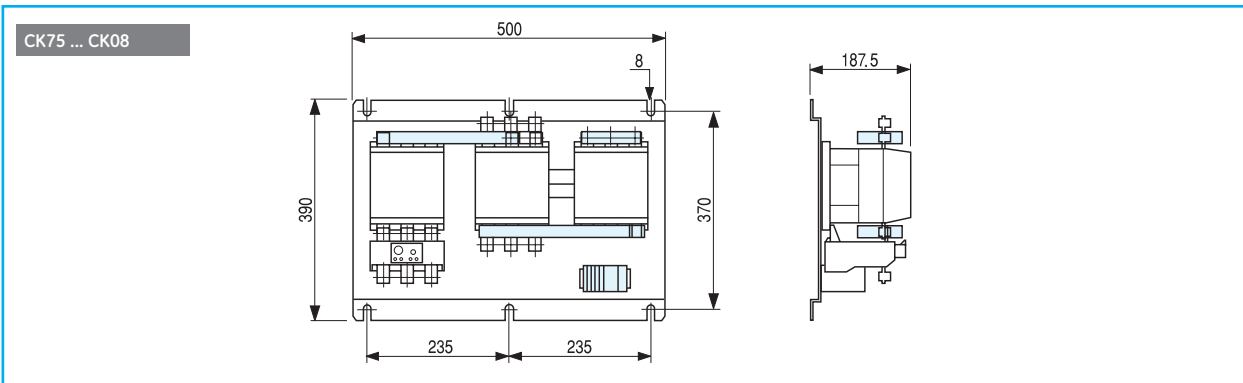
**Series CK - Direct-on-line reversing starters with thermal overload relay**



Series CL - Star-delta starters



Series CK - Star-delta starters



A

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D

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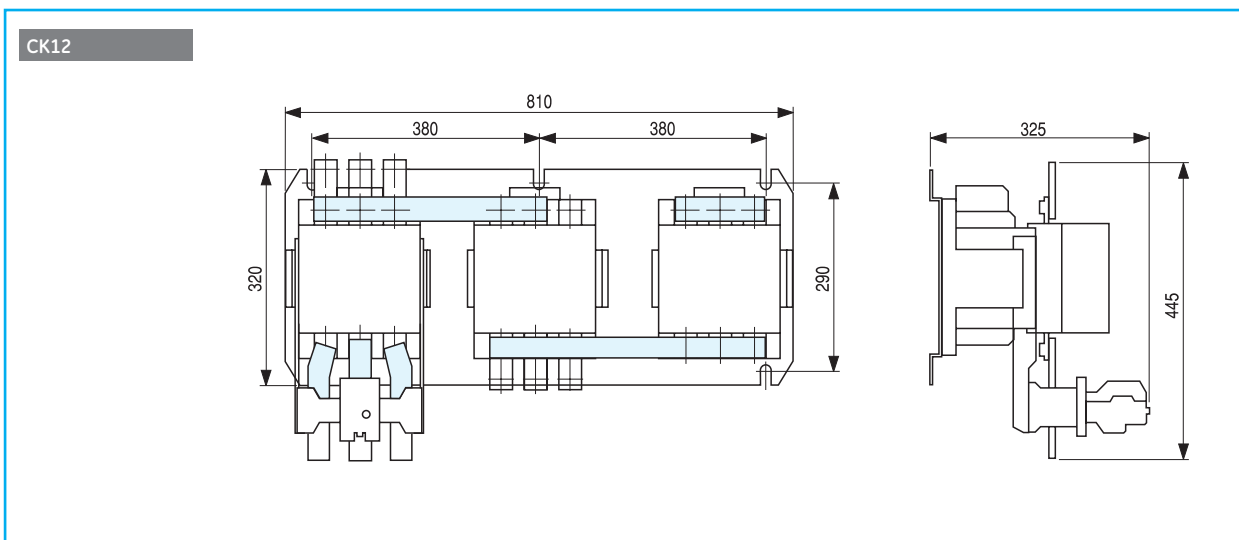
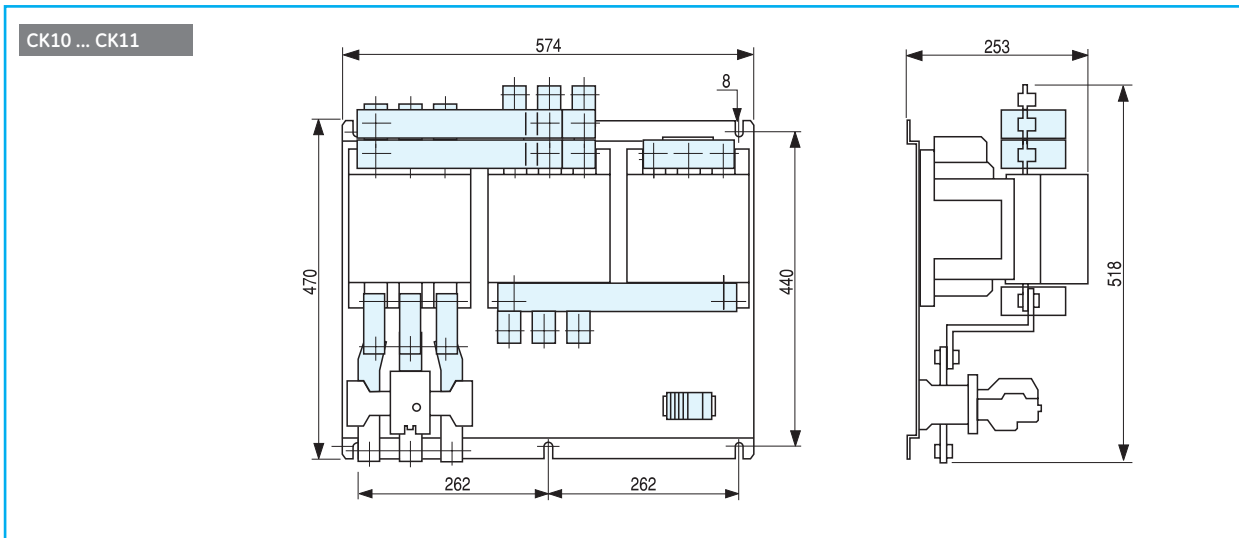
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## Dimensional drawings

### Series CK - Star-delta starters



## Utilisation categories according to IEC 60947-4-1

### Standard utilisation categories AC

Category	Typical applications
AC-1	Non-inductive or slightly loads. Resistance furnaces
AC-2	Slip-ring motors: starting, plugging
AC-3	Squirrel-cage motors (1): starting, switching off motors during running.
AC-4	Squirrel-cage motors: starting, plugging, inching.
AC-5 a	Discharge lamps
AC-5 b	Incandescent lamps
AC-6 a	Transformers
AC-6 b	Cos $\varphi$ capacitors
AC-7 a	Slightly inductive loads for domestic applications
AC-7 b	Motors in domestic applications
AC-8 a	Drive motors for cooling compressors (2) with manual reset and thermal overload relay
AC-8 b	Drive motors for cooling compressors (2) with manual reset and automatic reset

### Standard utilisation categories DC

Category	Typical applications
DC-1	Non-inductive or slightly inductive loads. Resistance furnaces
DC-3	Shunt motors: starting, plugging, inching
DC-5	Series motors: starting, plugging, inching
DC-6	Incandescent lamps

- (1) Category AC-3 can be used for accidental not continuous short period service, while mounting and testing machines. The number of operations shall not be greater than 5 per minute or 10 per 10 minutes.
- (2) The drive motor of a hermetic cooling compressor is an assembly of a motor and compressor in the same housing, without any axle; the motor is working in the cooling liquid.
- (3) Making conditions in alternating current are expressed by effective value. Moreover the asymmetrical current high value, referred to  $\cos \varphi$ , can assume a higher value.
- (4) Tolerance for  $\cos \varphi = \pm 0.05$
- (5) Tolerance for  $L/R = \pm 15\%$

## Making and breaking capacity

### IEC 60947-4-1

Values given for closing and opening by intermittent use

Cat.	Rated current	Closing (3)			Opening		
		Ic/Ie	Ur/Ue	cos $\varphi$ (4)	Ic/Ie	Ur/Ue	cos $\varphi$ (4)
AC-1	All values	1.5	1.05	0.80	1.5	1.05	0.80
AC-2	All values	4	1.05	0.65	4	1.05	0.65
AC-3	Ie $\leq$ 100A	10	1.05	0.45	8	1.05	0.45
	Ie > 100A	10	1.05	0.35	8	1.05	0.35
AC-4	Ie $\leq$ 100A	12	1.05	0.45	10	1.05	0.45
	Ie > 100A	12	1.05	0.35	10	1.05	0.35

Cat.	Rated current	Closing			Opening		
		Ic/Ie	Ur/Ue	L/R(5) (ms)	Ic/Ie	Ur/Ue	L/R(5) (ms)
DC-1	All values	1.5	1.05	1	1.5	1.05	1
DC-3	All values	4	1.05	2.5	4	1.05	2.5
DC-5	All values	4	1.05	15	4	1.05	15

## Electrical endurance

### IEC 60947-4-1

Values given for closing and opening intermittent use

Cat.	Rated current	Closing (3)			Opening		
		Ic/Ie	Ur/Ue	cos $\varphi$ (4)	Ic/Ie	Ur/Ue	cos $\varphi$ (4)
AC-1	All values	1	1	0.95	1	1	0.95
AC-2	All values	2.5	1	0.65	2.5	1	0.65
AC-3	Ie $\leq$ 17A	6	1	0.65	1	0.17	0.65
	Ie > 17A	6	1	0.35	1	0.17	0.35
AC-4	Ie $\leq$ 17A	6	1	0.65	6	1	0.65
	Ie > 17A	6	1	0.35	6	1	0.35

Cat.	Rated current	Closing			Opening		
		Ic/Ie	Ur/Ue (ms)	L/R(5)	Ic/Ie	Ur/Ue (ms)	L/R(5)
DC-1	All values	1	1	1	1	1	1
DC-3	All values	2.5	1	2	2.5	1	2
DC-5	All values	2.5	1	7.5	2.5	1	7.5

<b>Ue</b>	Rated operational voltage
<b>Ie</b>	Rated operational current
<b>Ur</b>	Feed-back voltage
<b>Ic</b>	Current made or broken



Utilisation category AC-1

Three pole contactors

Type		MC0	MC1	MC2	CL00	CL01	CL02	CL25	CL03	CL04	CL45	CL06	CL07	CL08	CL09	CL10
Max. operat. current at ambient temp. of	40°C (A)	20	20	20	25	25	32	45	45	60	60	90	110	110	140	140
	55°C (A)	20	20	20	25	25	32	45	45	60	60	90	110	110	140	140
(for all voltages)	70°C (A)	16	16	16	20	20	25	32	32	48	48	72	88	88	110	110
Max. operat. power	230/220V (kW)	7.5	7.5	7.5	9.5	9.5	12	17	17	22.5	22.5	30	42	42	53	53
Three-phase resistors	400/380V (kW)	13	13	13	16.5	16.5	22	29	29	39.5	39.5	55	72.5	72.5	92	92
	440/415V (kW)	15	15	13	18	18	23	32	32	43	43	57	79	79	100	100
	500V (kW)	17	17	17	21.5	21.5	27.5	39	39	52	52	69	95	95	121	121
	690/660V (kW)	22.5	22.5	22.5	28.5	28.5	38	51	51	68.5	68.5	95	125	125	160	160
Cable size	(mm <sup>2</sup> )	2.5	2.5	2.5	4	4	6	10	10	16	16	35	35	35	50	50
Percentage of the max. operational current at	120 ops./h (%)	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
	300 ops./h (%)	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
	600 ops./h (%)	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
	1200 ops./h (%)	100	100	100	100	100	100	100	100	100	100	100	100	100	80	80
	3000 ops./h (%)	50	50	50	50	50	50	50	50	50	50	50	50	50	40	40

Type		CK75C	CK08C	CK85B	CK09B	CK95B	CK10C	CK11C	CK12B	CK13B						
Max. operat. current at ambient temp. of	40°C (A)	250	250	315	315	450	600	700	1000	1250						
	55°C (A)	200	200	252	252	382	510	546	736	1125						
(for all voltages)	70°C (A)	155	155	195	195	300	402	468	680	1060						
Max. operat. power	230/220V (kW)	90	90	114	114	170	191	234	289	450						
Three-phase resistors	400/380V (kW)	155	155	196	196	310	329	406	500	780						
	440/415V (kW)	180	180	227	227	343	329	470	578	904						
	500V (kW)	200	200	259	259	389	415	533	657	1027						
	690/660V (kW)	270	270	341	341	537	572	705	867	1354						
	1000V (kW)	400	400	517	517	780	866	1060	1314	2054						
Cable size	(mm <sup>2</sup> )	120	120	185	185	2x (30X5)	2x (30X8)	2x (30X8)	2x (30X10)	2x (30X10)						
Percentage of the max. operational current at	120 ops./h (%)	100	100	100	100	100	100	100	100	100						
	300 ops./h (%)	100	100	100	100	100	100	100	100	90						
	600 ops./h (%)	100	100	100	100	100	80	80	80	70						
	1200 ops./h (%)	80	80	80	80	80	-	-	-	-						
	3000 ops./h (%)	40	40	40	40	-	-	-	-	-						

Four pole contactors

Type		MC0	MC1	MC2	CL01	CL02	CL03	CL04	CL05	CL07	CL08(1)	CL09(2)
Max. operat. current at ambient temp. of	40°C (A)	20	20	20	25	32	45	60	90	110	110	140
	55°C (A)	20	20	20	25	32	45	60	90	110	110	140
(for all voltages)	70°C (A)	16	16	16	20	25	32	48	72	88	88	110
Max. operat. power	230/220V (kW)	7.5	7.5	7.5	9.5	12	17	22.5	30	42	42	53
Three-phase resistors	400/380V (kW)	13	13	13	16.5	22	29	39.5	55	72.5	72.5	92
	440/415V (kW)	15	15	15	18	23	32	43	57	79	79	100
	500V (kW)	17	17	17	21.5	27.5	39	52	69	95	95	121
	690/660V (kW)	22.5	22.5	22.5	28.5	38	51	68.5	95	125	25	160
Cable size	(mm <sup>2</sup> )	2.5	2.5	2.5	4	6	10	16	35	35	35	50
Percentage of the max. operational current at	120 ops./h (%)	100	100	100	100	100	100	100	100	100	100	100
	300 ops./h (%)	100	100	100	100	100	100	100	100	100	100	100
	600 ops./h (%)	100	100	100	100	100	100	100	100	100	100	100
	1200 ops./h (%)	100	100	100	100	100	100	100	100	100	100	80
	3000 ops./h (%)	50	50	50	50	50	50	50	50	50	50	40

Type		CK07B	CK08B	CK09B	CK95B	CK10C	CK11C	CK12B	CK13B		
Max. operat. current at ambient temp. of	40°C (A)	200	325	400	500	600	700	1000	1250		
	55°C (A)	170	260	320	425	510	546	736	1125		
(for all voltages)	70°C (A)	140	201	272	335	402	468	680	1060		
Max. operat. power	230/220V (kW)	76	123	152	191	228	266	381	476		
Three-phase resistors	400/380V (kW)	131	214	263	329	395	460	658	822		
	440/415V (kW)	143	233	287	359	431	503	719	898		
	500V (kW)	173	281	346	415	519	606	866	1082		
	690/660V (kW)	228	371	457	572	686	800	1143	1428		
	1000V (kW)	-	562	692	866	1039	1212	1732	2165		
Cable size	(mm <sup>2</sup> )	95	185	2x (25X5)	2x (30X5)	2x (30X8)	2x (30X8)	2x (30X10)	2x (40X10)		
Percentage of the max. operational current at	120 ops./h (%)	100	100	100	100	100	100	100	100		
	300 ops./h (%)	100	100	100	100	100	100	100	90		
	600 ops./h (%)	100	100	100	100	80	80	80	70		
	1200 ops./h (%)	80	80	80	80	-	-	-	-		
	3000 ops./h (%)	40	40	40	40	-	-	-	-		

Increase in maximum operational current through connection poles in parallel:  
 - 2 poles in parallel: Ie x 1.8  
 - 3 poles in parallel: Ie x 2.4  
 - 4 poles in parallel: Ie x 3.2

(1) Only types (2NO + 2NC)  
 (2) Only types (4NO)



### Utilisation category AC-3

#### Three pole contactors

Types		MC0	MC1	MC2	CL00	CL01	CL02	CL25	CL03	CL04	CL45	CL06	CL07	CL08	CL09	CL10
<b>Operational current Ie for Ue ≤ 400V</b>	(A)	6	9	12	9	12	18	25	25	32	40	50	65	80	95	105
<b>Max. operat. power</b> 230/220V	(kW)	1.5	3	3	2.2	3	4	7.5	7.5	9	11	15	18.5	22	25	30
	(HP)	2	4	4	3	4	5.5	10	10	12	15	20	25	30	34	40
Three-phase motors 50/60Hz	400/380V (kW)	2.2	4	5.5	4	5.5	7.5	12	12	16	18.5	22	30	37	45	55
	(HP)	3	5.5	7.3	5.5	7.5	10	16	16	22	25	30	40	50	60	75
440/415V	(kW)	2.2	4	5.5	4	5.5	7.5	12	12	16	22	25	30	37	45	55
	(HP)	3	5.5	7.3	5.5	7.5	10	16	16	22	30	34	50	60	68	75
500V	(kW)	3	4	5.5	5.5	7.5	10	15	15	18.5	25	30	40	45	55	65
	(HP)	4	5.5	7.3	7.5	10	13.5	20	20	25	34	40	55	60	75	88
690/660V	(kW)	3	4	5.5	5.5	7.5	10	15	15	18.5	30	35	45	45	55	65
	(HP)	4	5.5	7.3	7.5	10	13.5	20	20	25	40	48	60	60	75	88
<b>Percentage of the max. operational current at</b>	120 ops./h (%)	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
	300 ops./h (%)	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
	600 ops./h (%)	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
	1200 ops./h (%)	100	100	100	100	100	100	100	100	100	100	100	100	100	75	75
	3000 ops./h (%)	35	35	35	35	35	35	35	35	35	35	35	35	35	35	25

Type		CK75C	CK08C	CK85B	CK09B	CK95B	CK10C	CK11C	CK12B	CK13B
<b>Operational current Ie for Ue ≤ 400V</b>	(A)	150	185	205	250	309	420	550	700	825
<b>Max. operat. power</b> 230/220V	(kW)	45	55	65	75	90	125	160	220	250
	(HP)	60	75	88	100	125	170	220	300	340
Three-phase motors 50/60Hz	400/380V (kW)	75	90	110	132	160	220	280	375	450
	(HP)	100	125	150	180	220	300	380	510	610
440/415V	(kW)	80	100	125	132	185	230	315	400	450
	(HP)	108	135	170	180	250	312	425	540	610
500V	(kW)	100	110	132	160	200	300	400	480	500
	(HP)	135	150	180	220	270	405	540	650	680
690/660V	(kW)	100	132	155	200	250	375	450	500	550
	(HP)	135	180	205	270	335	510	610	680	750
1000V	(kW)	65	100	110	150	200	300	375	450	500
	(HP)	88	135	150	205	270	405	510	610	680
<b>Percentage of the max. operational current</b>	120 ops./h (%)	100	100	100	100	100	100	100	100	100
	300 ops./h (%)	100	100	100	100	100	100	100	100	80
	600 ops./h (%)	100	100	100	100	100	75	75	75	65
	1200 ops./h (%)	75	75	75	75	75	-	-	-	-
	3000 ops./h (%)	25	25	25	25	-	-	-	-	-

### Utilisation category AC-4

#### Three pole contactors

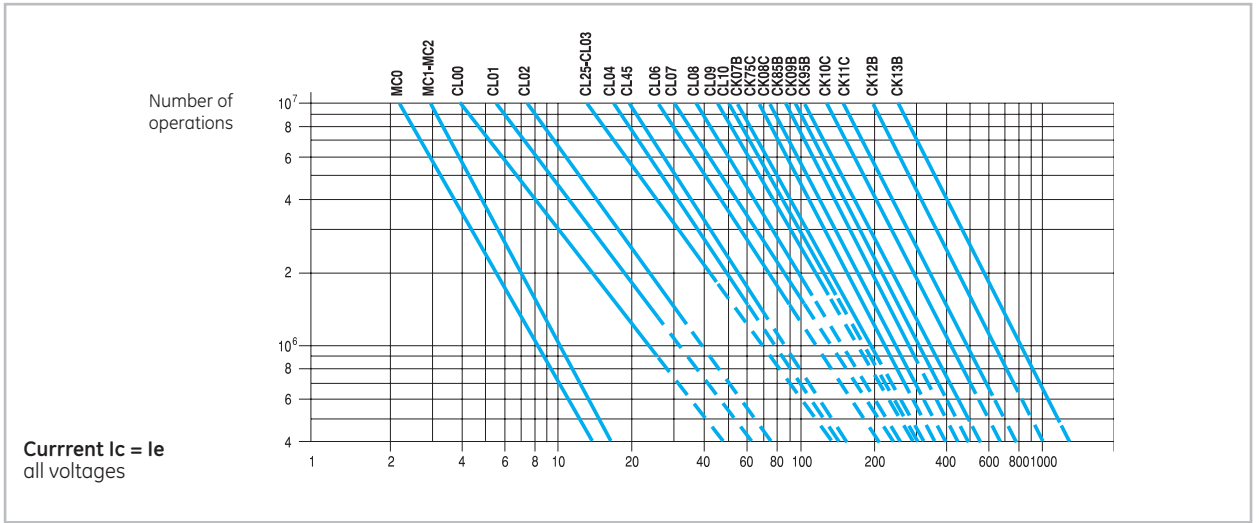
Type		MC0	MC1	MC2	CL00	CL01	CL02	CL25	CL03	CL04	CL45	CL06	CL07	CL08	CL09	CL10
<b>Operational current Ue ≤ 690V</b>	(A)	2.75	3.5	3.5	5	7	8	12	12	16	18.5	23	30	37	44	50
<b>Operational power</b> 230/220V (200.000 operations)	(kW)	0.55	0.75	0.75	1.1	1.5	1.8	3	3	3.7	4	5.5	7.5	10	11	13
	(HP)	0.73	1	1	1.5	2	2.4	4	4	5	5.3	7.3	9.7	13	14.6	17.3
400/380V	(kW)	1.1	1.5	1.5	2.2	3	3.7	5.5	5.5	7.5	9	11	15	18.5	22	25
	(HP)	1.5	2	2	3	4	5	7.3	7.3	9.7	12	14.6	20	24.6	29.2	33
500V	(kW)	1.5	2.2	2.2	3	4	5.5	7.5	7.5	10	11	15	18.5	22	25	30
	(HP)	2	3	3	4	5.3	7.3	9.7	9.7	13	14.6	20	24.6	29.2	33	40
690/660V	(kW)	2.2	3	3	4	5.5	7.5	10	10	11	15	18.5	22	25	30	37
	(HP)	3	4	4	5.3	7.3	9.7	13	13	14.6	20	24.6	29.2	33	40	49
<b>Max. operational current ≤ 400V</b> (35.000 operations)	(A)	6	9	9	9	12	18	25	25	32	40	50	65	80	95	105
<b>Max. operational power 400/380V</b>	(kW)	2.2	4	4	4	5.5	7.5	11	12	16	18.5	22	30	37	45	55

Type		CK75C	CK08C	CK85B	CK09B	CK95B	CK10C	CK11C	CK12B	CK13B
<b>Operational current Ue ≤ 400V</b>	(A)	65	75	90	110	125	150	165	250	350
<b>Operational power</b> 230/220V	(kW)	18.5	22	25	33	37	45	50	80	110
	(HP)	24.6	29.2	33	44	49	60	66.5	106	146
Three-phase motors 50/60Hz (200.000 operations)	400/380V (kW)	33	40	45	55	63	80	90	132	165
	(HP)	44	53	60	73	83.8	106	119	175	219
500V	(kW)	45	50	63	75	90	100	110	225	250
	(HP)	60	66.5	83.8	100	119	133	146	300	332
690/660V	(kW)	55	63	80	100	110	132	150	250	315
	(HP)	73	83.8	106	133	146	175	200	332	419
<b>Max. operational current ≤ 400V</b> (35.000 operations)	(A)	150	185	205	250	309	420	550	700	825
<b>Max. operational power 400/380V</b>	(kW)	75	90	110	132	160	220	280	375	450

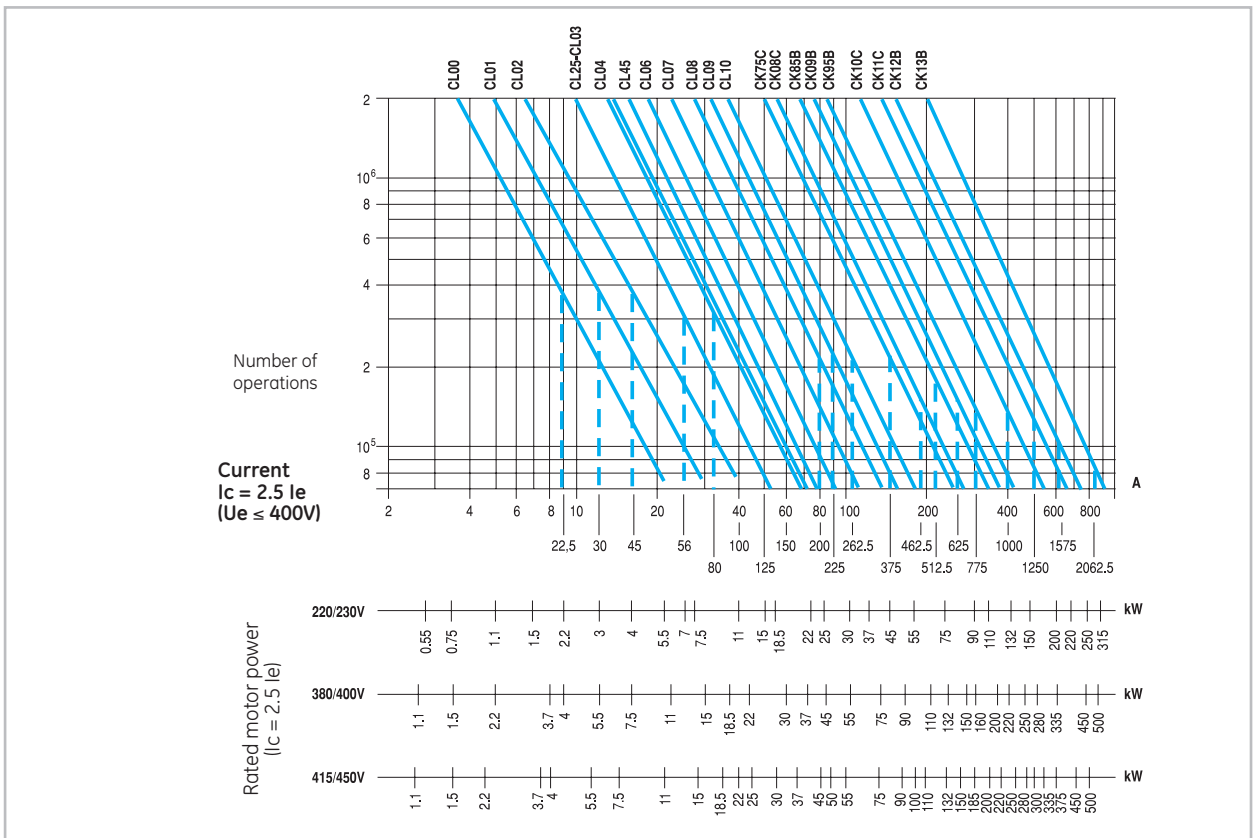


## Electrical endurance

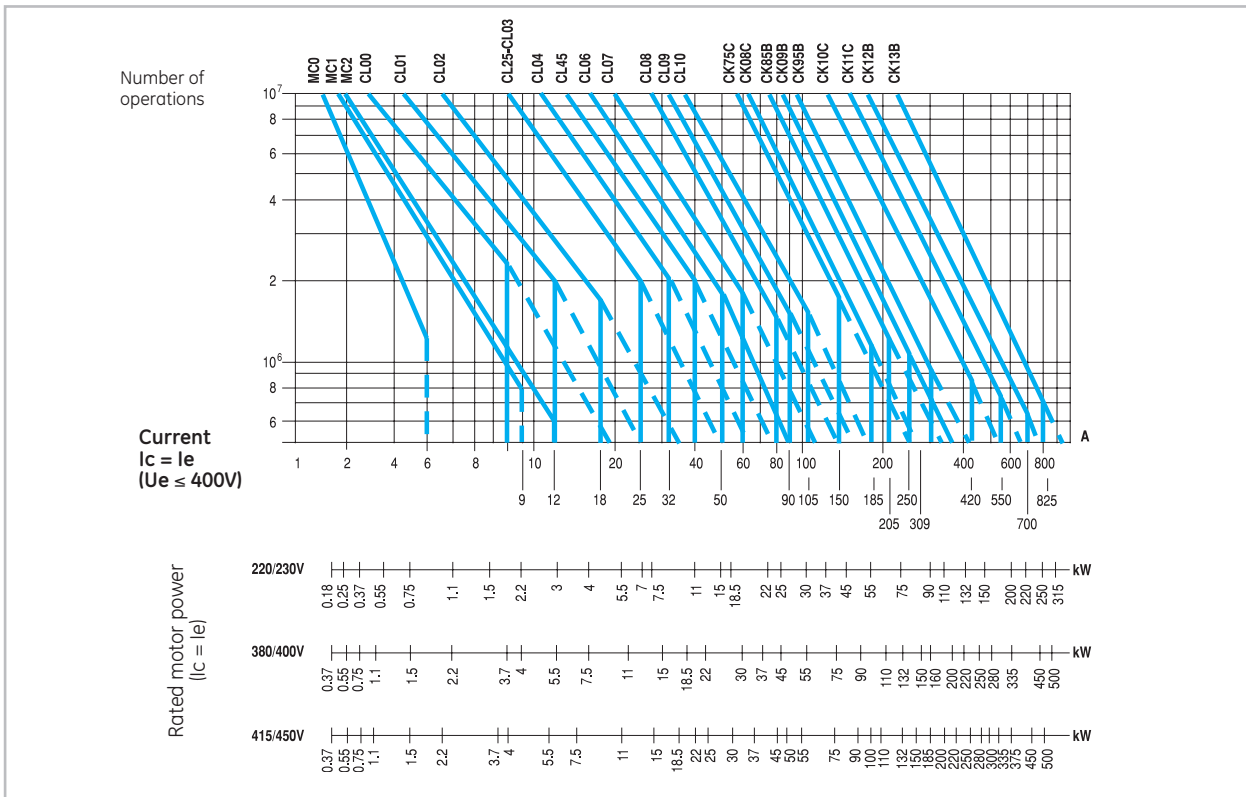
### Category AC1



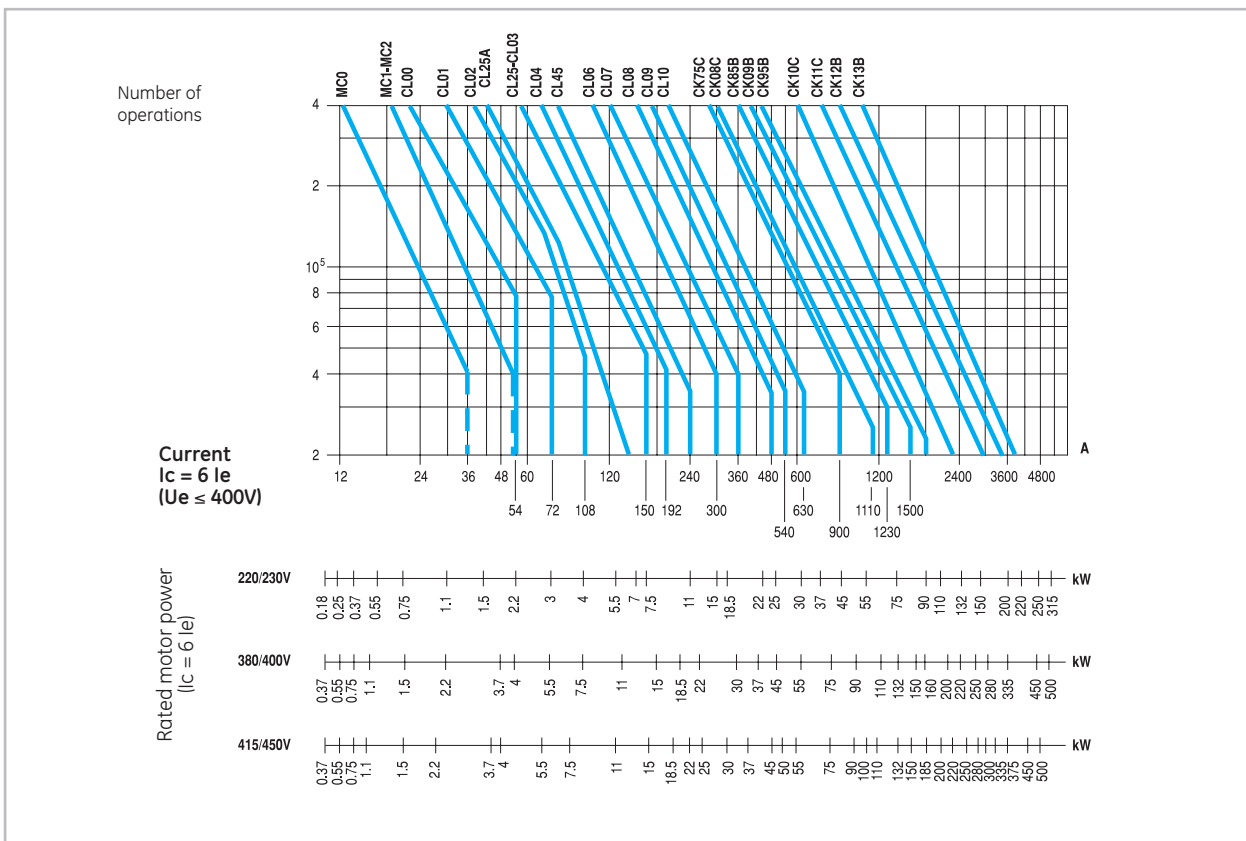
### Category AC2



Category AC3



Category AC4



Applications

A

B

C

D

E

F

G

H

I

X



## Electrical endurance

### Mixed category AC2 / AC'2

Graph to determine the coefficient which when multiplied by the contactor electrical endurance in category AC'2, will give the electrical endurance in mixed category AC2/AC'2.

Example:

- % of operations in AC2:  
35% (or 65% as AC'2)
- Breaking current  $I_c = 2.54 I_e$
- Contactor considered: CK08BA  
Resultant coefficient from the graph: 0.35  
Electrical endurance in AC'2 for contactor CK085A, to drive a motor of 45kW at 380V:  
 $I_e = 85A; 5.5 \times 10^6$  operations.

Resultant electrical endurance for mixed service considered:

$$0.35 \times 5.5 \times 10^6 = 1.92 \times 10^6 \text{ operations.}$$

### Mixed category AC4 / AC3

Electrical endurance for mixed category (AC3/AC4) is calculated with the following formula:

$$\text{Electrical endurance (AC3/AC4)} = \frac{\text{Electrical endurance (AC3)}}{1 + \frac{\% \text{ ops. AC4}}{100} \times \left( \frac{\text{Electr. endur. (AC3)}}{\text{Electr. endur. (AC4)}} - 1 \right)}$$

Notes

Grid area for notes.

Applications

A
B
C
D
E
F
G
H
I
X



Series M and CL. Max. operational current  $I_e$  (A) - DC utilisation categories

Category DC1.  $L/R \leq 1ms$

Ue	Poles in serie	MC0	MC1	MC2	CL00	CL01	CL02	CL25	CL03	CL04	CL45	CL05	CL06	CL07	CL08	CL09	CL10
24V	1	6	9	9	18	18	18	25	25	32	40	50	50	65	65	80	80
	2	8	12	12	25	25	32	45	45	60	60	90	90	110	110	140	140
	3	15	20	20	25	25	32	45	45	60	60	90	90	110	110	140	140
	4	15	20	20	-	25	32	-	45	60	-	90	-	110	-	140	-
48V	1	5	7.5	7.5	15	15	15	20	20	25	35	45	45	55	55	70	70
	2	8	12	12	25	25	32	45	45	60	60	90	90	110	110	140	140
	3	12	16	16	25	25	32	45	45	60	60	90	90	110	110	140	140
	4	15	20	20	-	25	32	-	45	60	-	90	-	110	-	140	-
60V	1	4	6	6	12	12	12	18	18	18	32	40	40	50	50	65	65
	2	6	9	9	25	25	32	45	45	60	60	90	90	110	110	140	140
	3	12	16	16	25	25	32	45	45	60	60	90	90	110	110	140	140
	4	15	20	20	-	25	32	-	45	60	-	90	-	110	-	140	-
125V	1	1.6	2.5	2.5	6	6	6	8	8	8	16	16	16	16	16	16	16
	2	4	6	6	18	18	18	25	25	45	45	80	80	90	90	110	110
	3	5	10	10	25	25	25	32	45	60	60	90	90	110	110	140	140
	4	5	10	10	-	25	32	-	45	60	-	90	-	110	-	140	-
220V	1	0.2	0.36	0.36	0.8	0.8	0.8	1	1	1	2	2	2	2	2	2	2
	2	1.7	2.6	2.6	7.5	7.5	7.5	7.5	8	8	8	20	20	20	20	20	20
	3	4	8	8	25	25	25	32	45	50	50	90	90	110	110	140	140
	4	4	8	8	-	25	32	-	45	60	-	90	-	110	-	140	-
440V	1	0.09	0.13	0.13	0.4	0.4	0.4	0.4	0.5	0.5	0.8	0.8	0.8	0.8	0.8	0.8	0.8
	2	0.26	0.4	0.4	0.8	0.8	0.8	0.8	1	1	1	2	2	2	2	2	2
	3	0.5	1	1	8	8	8	10	10	10	10	15	15	15	15	15	15
	4	0.5	1	1	-	15	15	-	20	25	-	80	-	90	-	110	-
600V	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2	-	-	-	0.4	0.4	0.4	0.4	0.5	0.5	0.5	1	1	1	1	1	1
	3	-	-	-	4	4	4	5	5	5	5	7.5	7.5	7.5	7.5	7.5	7.5
	4	-	-	-	-	8	10	-	12	12	-	50	-	65	-	75	-

Category DC3.  $L/R \leq 2.5ms$

Ue	Poles in serie	MC0	MC1	MC2	CL00	CL01	CL02	CL25	CL03	CL04	CL45	CL05	CL06	CL07	CL08	CL09	CL10	
24V	1	-	-	-	12	12	12	18	18	25	32	40	40	50	50	65	65	
	2	4	9	9	18	18	18	25	25	40	40	65	65	80	80	105	105	
	3	8	12	12	18	18	18	25	25	40	40	65	65	80	80	105	105	
	4	-	-	-	-	18	18	-	25	40	-	65	-	80	-	105	-	
48V	1	-	-	-	9	9	9	12	12	18	20	30	30	35	35	45	45	
	2	3	6	6	18	18	18	25	25	40	40	65	65	80	80	105	105	
	3	6	9	9	18	18	18	25	25	40	40	65	65	80	80	105	105	
	4	-	-	-	-	18	18	-	25	40	-	65	-	80	-	105	-	
60V	1	-	-	-	7.5	7.5	7.5	10	10	15	15	25	25	30	30	35	35	
	2	3	6	6	18	18	18	25	25	40	40	65	65	80	80	105	105	
	3	6	9	9	18	18	18	25	25	40	40	65	65	80	80	105	105	
	4	-	-	-	-	18	18	-	25	40	-	65	-	80	-	105	-	
125V	1	-	-	-	2	2	2	2	3	3	3	3	3	3	3	3	3	
	2	0.85	4.5	4.5	10	10	12	18	18	25	32	40	35	35	80	60	80	80
	3	1.7	6	6	15	15	18	25	25	32	40	35	35	80	80	105	105	
	4	-	-	-	-	15	18	-	25	32	-	35	-	80	-	105	-	
220V	1	-	-	-	0.6	0.6	0.6	0.6	0.6	0.6	0.8	0.8	0.8	0.8	0.8	0.8	0.8	
	2	0.35	1.2	1.2	2	2	2	2	2	2	7	7	7	7	7	7	7	
	3	0.7	2.5	2.5	12	12	12	18	18	25	32	50	50	65	65	95	95	
	4	-	-	-	-	15	18	-	32	32	-	65	-	80	-	105	-	
440V	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	2	0.05	0.15	0.15	0.3	0.3	0.3	0.3	0.5	0.5	0.5	1	1	1	1	1	1	
	3	0.13	0.3	0.3	1.5	1.5	1.5	1.5	3	3	3	3	3	3	3	3	3	
	4	-	-	-	-	6	6	-	6	6	-	50	-	65	-	75	-	
600V	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	3	-	-	-	0.8	0.8	0.8	0.8	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	
	4	-	-	-	-	2.5	2.5	-	2.5	2.5	-	25	-	30	-	35	-	

Category DC5.  $L/R \leq 15ms$

Ue	Poles in serie	MC0	MC1	MC2	CL00	CL01	CL02	CL25	CL03	CL04	CL45	CL05	CL06	CL07	CL08	CL09	CL10
24V	1	-	-	-	12	12	12	18	18	25	32	40	40	50	50	65	65
	2	3	4.5	4.5	18	18	18	25	25	40	40	65	65	80	80	105	105
	3	6	9	9	18	18	18	25	25	40	40	65	65	80	80	105	105
	4	-	-	-	-	18	18	-	25	40	-	65	-	80	-	105	-
48V	1	-	-	-	9	9	9	12	12	18	20	30	30	35	35	45	45
	2	2.5	4	4	18	18	18	25	25	40	40	65	65	80	80	105	105
	3	6.5	8	8	18	18	18	25	25	40	40	65	65	80	80	105	105
	4	-	-	-	-	18	18	-	25	40	-	65	-	80	-	105	-
60V	1	-	-	-	7.5	7.5	7.5	10	10	15	15	25	25	30	30	35	35
	2	2	3	3	18	18	18	25	25	40	40	65	65	80	80	105	105
	3	5	7	7	18	18	18	25	25	40	40	65	65	80	80	105	105
	4	-	-	-	-	18	18	-	25	40	-	65	-	80	-	105	-
125V	1	-	-	-	0.8	0.8	0.8	0.8	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
	2	0.65	1.5	1.5	5	5	5	5	5	5	5	50	50	60	60	85	85
	3	1.3	2	2	15	15	15	20	20	25	32	60	60	70	70	95	95
	4	-	-	-	-	15	18	-	25	32	-	65	-	80	-	105	-
220V	1	-	-	-	-	-	-	-	-	-	-	0.5	0.5	0.5	0.5	0.5	0.5
	2	0.16	0.26	0.26	0.8	0.8	0.8	0.8	0.8	0.8	0.8	3	3	3	3	4	4
	3	0.5	0.8	0.8	3	3	3	3	3	3	3	7	7	7	7	7	7
	4	-	-	-	-	10	10	-	15	15	-	65	-	75	-	95	-
440V	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	3	0.4	0.1	1.1	0.5	0.5	0.5	0.5	0.7	0.7	0.7	1	1	1	1	1	1
	4	-	-	-	-	2	2	-	4	4	-	40	-	50	-	60	-
600V	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	4	-	-	-	-	0.75	0.75	-	2.5	2.5	-	20	-	25	-	30	-

Motorstarters

A

B

C

D

E

F

G

H

I

X



Max. operational current  $I_e$  (A) - DC utilisation categories (continued)

Category DC1.  $L/R \leq 1ms$

Ue	Poles in serie	CK07	CK75	CK08	CK85	CK09	CK95	CK10	CK11	CK12	CK13
24V	1	150	200	200	250	250	350	500	600	800	1000
	2	200	250	250	315	315	450	600	700	1000	1250
	3	200	250	250	315	315	450	600	700	1000	1250
	4	200	-	250	-	315	450	600	700	1000	1250
48V	1	125	170	170	200	200	295	425	500	600	850
	2	140	175	175	220	220	315	425	480	700	850
	3	200	250	250	315	315	500	600	700	1000	1250
	4	200	-	250	-	315	500	600	700	1000	1250
60V	1	100	140	140	175	175	245	350	420	560	700
	2	140	175	175	220	220	315	425	480	700	850
	3	200	250	250	315	315	500	600	700	1000	1250
	4	200	-	250	-	315	500	600	700	1000	1250
125V	1	20	25	25	30	30	50	60	70	100	125
	2	110	200	200	250	250	300	400	500	600	1000
	3	200	250	250	315	315	500	600	700	1000	1250
	4	200	-	250	-	315	500	600	700	1000	1250
220V	1	-	-	-	-	-	-	-	-	-	-
	2	65	110	110	150	150	200	250	250	300	400
	3	200	250	250	315	315	500	600	700	1000	1250
	4	200	-	250	-	315	500	600	700	1000	1250
440V	1	-	-	-	-	-	-	-	-	-	-
	2	-	-	-	-	-	-	-	-	-	-
	3	60	120	120	150	150	180	240	300	400	480
	4	110	-	200	-	250	315	400	500	700	800
600V	1	-	-	-	-	-	-	-	-	-	-
	2	-	-	-	-	-	-	-	-	-	-
	3	32	65	65	80	80	95	130	160	215	250
	4	85	-	100	-	130	170	215	265	375	430

Category DC3.  $L/R \leq 2.5ms$

Ue	Poles in serie	CK07	CK75	CK08	CK85	CK09	CK95	CK10	CK11	CK12	CK13
24V	1	105	150	185	205	250	309	420	550	700	825
	2	105	150	185	205	250	309	420	550	700	825
	3	105	150	185	205	250	309	420	550	700	825
	4	105	-	185	-	250	309	420	550	700	825
48V	1	70	105	130	140	175	215	290	385	490	575
	2	105	150	185	205	250	309	420	550	700	825
	3	105	150	185	205	250	309	420	550	700	825
	4	105	-	185	-	250	309	420	550	700	825
60V	1	55	85	105	110	140	175	230	300	390	460
	2	105	150	185	205	250	309	420	550	700	825
	3	105	150	185	205	250	309	420	550	700	825
	4	105	-	185	-	250	309	420	550	700	825
125V	1	20	25	25	30	30	50	60	70	100	125
	2	105	150	185	205	250	309	420	550	700	825
	3	105	150	185	205	250	309	420	550	700	825
	4	105	-	185	-	250	309	420	550	700	825
220V	1	-	-	-	-	-	-	-	-	-	-
	2	10	60	70	80	85	95	140	185	225	400
	3	105	150	185	205	250	309	420	550	700	825
	4	105	-	185	-	250	309	420	550	700	825
440V	1	-	-	-	-	-	-	-	-	-	-
	2	-	-	-	-	-	-	-	-	-	-
	3	8	50	55	65	70	80	120	150	180	320
	4	80	-	105	-	185	205	250	300	400	700
600V	1	-	-	-	-	-	-	-	-	-	-
	2	-	-	-	-	-	-	-	-	-	-
	3	4	25	25	30	35	40	60	75	90	165
	4	40	-	50	-	90	100	125	150	200	350

Category DC5.  $L/R \leq 15ms$

Ue	Poles in serie	CK07	CK75	CK08	CK85	CK09	CK95	CK10	CK11	CK12	CK13
24V	1	105	150	185	205	250	309	420	550	700	825
	2	105	150	185	205	250	309	420	550	700	825
	3	105	150	185	205	250	309	420	550	700	825
	4	105	-	185	-	250	309	420	550	700	825
48V	1	60	90	110	120	150	185	250	330	420	495
	2	105	150	185	205	250	309	420	550	700	825
	3	105	150	185	205	250	309	420	550	700	825
	4	105	-	185	-	250	309	420	550	700	825
60V	1	55	85	105	110	140	175	230	300	390	460
	2	105	150	185	205	250	309	420	550	700	825
	3	105	150	185	205	250	309	420	550	700	825
	4	105	-	185	-	250	309	420	550	700	825
125V	1	15	20	20	25	25	40	50	60	80	100
	2	80	95	105	150	185	205	250	300	400	700
	3	105	150	185	205	250	309	420	550	700	825
	4	105	-	185	-	250	309	420	550	700	825
220V	1	-	-	-	-	-	-	-	-	-	-
	2	8	50	55	65	70	80	120	150	180	320
	3	80	95	105	150	185	205	250	300	400	700
	4	105	-	185	-	250	309	420	550	700	825
440V	1	-	-	-	-	-	-	-	-	-	-
	2	-	-	-	-	-	-	-	-	-	-
	3	5	40	40	50	50	60	90	100	100	200
	4	65	-	95	-	150	185	205	250	300	400
600V	1	-	-	-	-	-	-	-	-	-	-
	2	-	-	-	-	-	-	-	-	-	-
	3	40	45	50	75	90	100	125	150	200	350
	4	35	-	45	-	75	90	100	125	150	200



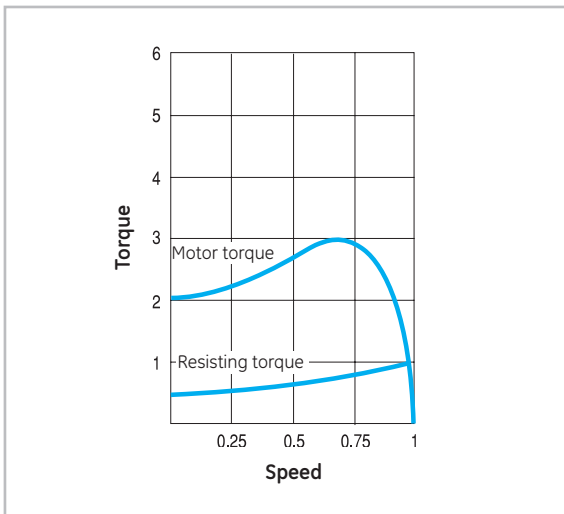


## Direct-on-line starters

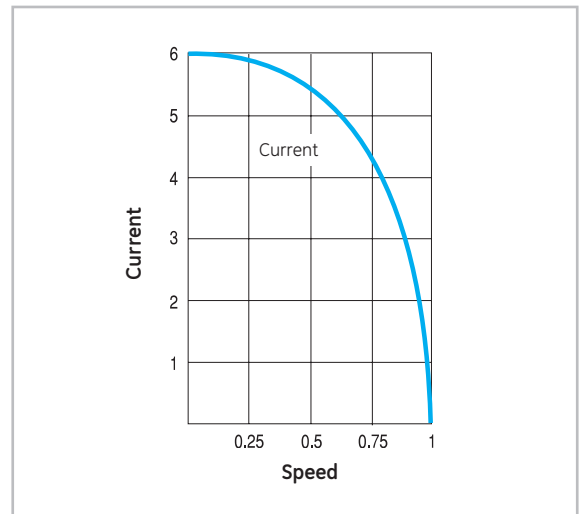
- Motors connected directly on-line with a contactor and a thermal overload relay.
- Simple installation with high starting torque and current.
- For use with motors of medium power that do not need a progressive star

AC-3	Switching off motors during running	$I_c = I_e$
AC-4	Switching off motors during starting	$I_c = 6 I_e$

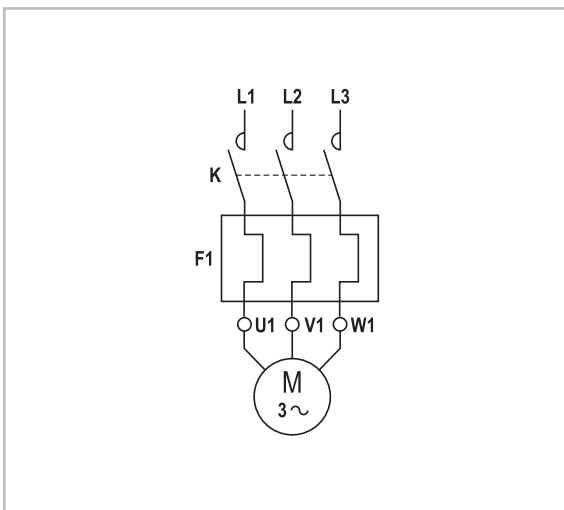
### Torque-speed curve



### Current-speed curve



### Diagram



Selection table

Motor										Contactor	Thermal relay	Fuse				
230/200V		400/380V		440/415V		500V		690/660V				1000V		aM	gG-gL	
kW	A	kW	A	kW	A	kW	A	kW	A	kW	A	A	A			
-	-	-	-	-	-	-	-	0.06	0.13	-	-	MC0	MT03A	0.5	1	
-	-	0.06	0.23	0.06	0.21	0.06	0.17	0.09	0.2	-	-		MT03B	0.5	1	
-	-	-	-	-	-	-	-	0.12	0.25	-	-		MT03B	0.5	1	
0.06	0.39	0.09	0.34	0.09	0.31	0.09	0.26	0.18	0.35	-	-		MT03C	1	2	
-	-	-	-	0.12	0.4	0.12	0.33	-	-	-	-		MT03C	1	2	
0.09	0.58	0.12	0.44	-	-	0.18	0.46	0.25	0.46	-	-		MT03D	1	2	
-	-	0.18	0.61	0.18	0.56	0.25	0.6	-	-	-	-		MT03D	1	2	
-	-	-	-	-	-	-	-	0.37	0.7	-	-		MT03E	2	4	
0.12	0.76	0.25	0.78	0.25	0.7	0.37	0.9	0.55	0.9	-	-		MT03E	2	4	
0.18	1.05	0.37	1.13	0.37	1.1	0.55	1.2	0.75	1.1	-	-		MT03F	2	4	
0.25	1.4	-	-	-	-	-	-	-	-	-	-		MT03G	2	4	
-	-	0.55	1.6	0.55	1.5	0.75	1.5	1.1	1.5	-	-		MT03H	4	6	
0.37	2	0.75	2	0.75	2	1.1	2	1.5	2	-	-		MT03I	4	6	
-	-	1.1	2.6	1.1	2.5	1.5	2.6	-	-	-	-		MT03J	4	6	
0.56	2.75	-	-	-	-	-	-	2.2	2.9	-	-		MT03J	4	6	
0.75	3.5	1.5	3.5	1.5	3.4	2.2	3.8	3	3.5	-	-		MT03K	6	10	
1.1	5	2.2	5	2.2	4.5	3	5	-	-	-	-		MT03L	10	16	
1.5	7	-	-	-	-	-	-	-	-	-	-		MT03M	10	16	
-	-	-	-	-	-	-	-	3.7	4.6	-	-		MC1	MT03L	10	16
-	-	-	-	-	-	-	-	4	5	-	-		MT03L	10	16	
-	-	3	7	3	6.5	3.7	6	-	-	-	-		MT03M	10	16	
-	-	-	-	3.7	7.3	4	6.5	-	-	-	-		MT03M	10	16	
-	-	3.7	8	4	8	-	-	-	-	-	-		MT03N	12	20	
2.2	9	4	9	-	-	-	-	-	-	-	-		MT03N	12	20	
-	-	-	-	-	-	-	-	5.5	6.7	-	-		MC2	MT03M	12	20
-	-	-	-	-	-	5.5	9	-	-	-	-		MT03N	16	20	
3	12	5.5	12	5.5	11	-	-	-	-	-	-		MT03P	16	20	
-	-	0.06	0.23	0.06	0.21	0.06	0.17	0.09	0.2	-	-		CL00	RT1B	2	4
-	-	-	-	-	-	0.09	0.26	0.12	0.25	-	-		RT1C	2	4	
0.06	0.39	0.09	0.34	0.09	0.31	0.12	0.33	0.18	0.35	-	-		RT1C	2	4	
0.09	0.58	0.12	0.44	0.12	0.4	0.18	0.46	0.25	0.46	-	-		RT1D	2	4	
-	-	0.18	0.61	0.18	0.56	0.25	0.6	-	-	-	-		RT1D	2	4	
-	-	-	-	-	-	-	-	0.37	0.7	-	-		RT1F	2	4	
0.12	0.76	0.25	0.78	0.25	0.7	0.37	0.9	0.55	0.9	-	-		RT1F	2	4	
0.18	1.05	0.37	1.13	0.37	1.1	0.55	1.2	0.75	1.1	-	-		RT1G	2	4	
0.25	1.4	0.55	1.6	0.55	1.5	0.75	1.5	1.1	1.5	-	-		RT1H	2	6	
0.37	2	0.75	2	0.75	2	1.1	2	1.5	2	-	-		RT1J	4	6	
0.55	2.75	1.1	2.6	1.1	2.5	1.5	2.6	2.2	2.9	-	-		RT1K	4	6	
0.75	3.5	1.5	3.5	1.5	3.4	2.2	3.8	-	-	-	-		RT1K	6	10	
-	-	-	-	-	-	-	-	3.7	4.6	-	-		RT1L	6	16	
1.1	5	2.2	5	2.2	4.5	-	-	-	-	-	-		RT1L	6	16	
1.5	7	-	-	3.7	7.3	3.7	6	5.5	7	-	-		RT1M	10	20	
-	-	3.7	8	-	-	-	-	-	-	-	-		RT1M	12	25	
2.2	9	4	9	4	9	5.5	9	-	-	-	-		RT1N	16	25	
-	-	-	-	-	-	-	-	7.5	9	-	-		RT1N	16	25	
3	12	5.5	12	5.5	11	7.5	12	-	-	-	-		CL01	RT1P	16	35
3.7	14	-	-	7.5	14	-	-	-	-	-	-		CL02	RT1P	20	40
4	16	7.5	16	-	-	10	15.5	-	-	-	-		RT1S	20	40	
-	-	-	-	-	-	-	-	11	13	-	-		CL25	RT1P	20	40
-	-	-	-	-	-	11	17	13	16	-	-		RT1S	20	40	
5.5	21	-	-	11	21	13	20	-	-	-	-		RT1T	32	50	
-	-	11	22.5	-	-	15	23	-	-	-	-		RT1U	32	50	

Direct-on-line starters

A

B

C

D

E

F

G

H

I

X



## Direct-on-line starters

Selection table (continued)

	Motor										Contactor	Thermal relay	Fuse			
	230/200V		400/380V		440/415V		500V		690/660V				1000V		aM	gG-gL
	kW	A	kW	A	kW	A	kW	A	kW	A			kW	A	A	A
	-	-	-	-	-	-	-	-	17	20	-	-	CL04	RT1T	32	50
	7.5	27	15	30	15	28	17.5	26.5	-	-	-	-		RT1V	40	63
	-	-	-	-	-	-	-	-	18.5	23	-	-	CL45	RT1U	32	50
	-	-	-	-	-	-	-	-	22	25	-	-		RT1V	40	63
	-	-	-	-	-	-	18.5	28.5	-	-	-	-	CL06	RT1V	40	63
	-	-	18.5	37	18.5	35	22	33	-	-	-	-		RT1W	50	80
	-	-	-	-	-	-	25	37.5	30	35	-	-	CL07	RT1W	50	80
	11	40	-	-	22	40	-	-	-	-	-	-		RT2E (1)	50	80
	-	-	-	-	-	-	-	-	33	38	-	-	CL08	RT2E	50	80
	-	-	22	44	25	45	-	-	-	-	-	-		RT2G	63	80
	15	50	-	-	-	-	-	-	-	-	-	-	CL09	RT2G	63	80
	-	-	-	-	-	-	-	37	41	-	-	-		RT2E	63	80
	-	-	-	-	-	-	30	45	40	43	-	-	CL10	RT2G	63	80
	-	-	30	60	30	55	37	55	-	-	-	-		RT2H	80	125
	18.5	65	-	-	37	66	-	-	-	-	-	-	CL08	RT2J	80	125
	-	-	-	-	-	-	-	-	45	49	-	-		RT2G	80	125
	-	-	37	72	-	-	45	65	-	-	-	-	CL09	RT2J	100	125
	22	75	-	-	-	-	-	-	-	-	-	-		RT2J	100	125
	-	-	-	-	45	80	-	-	-	-	-	-	CL10	RT2L	100	160
	-	-	-	-	-	-	-	-	55	60	-	-		RT2H	80	125
	-	-	-	-	-	-	50	73	-	-	-	-	CL07	RT2J	100	125
	25	84	45	85	50	88	55	80	-	-	-	-		RT2L	100	160
	30	105	55	105	55	100	-	-	-	-	-	-	CL10	RT2M	125	200
	-	-	-	-	-	-	-	-	-	-	55	40	CK75	RT4J	63	80
	-	-	-	-	-	-	-	-	75	80	-	-		RT3C	125	160
	-	-	-	-	-	-	-	-	90	97	-	-	CK85	RT3D	125	160
	-	-	-	-	-	-	75	105	-	-	-	-		RT3D	160	200
	37	126	-	-	-	-	-	-	-	-	-	-	CK08	RT3E	160	200
	-	-	75	138	75	135	90	129	-	-	-	-		RT3E	200	224
	45	150	-	-	-	-	-	-	-	-	-	-	CK09	RT3F	200	224
	-	-	-	-	-	-	-	-	-	75	54	-		RT4 K	80	125
	-	-	-	-	-	-	-	-	-	-	90	64	CK85	RT3B	100	160
	-	-	-	-	-	-	-	-	110	118	-	-		RT3E	160	200
	-	-	-	-	-	-	-	-	132	141	-	-	CK09	RT3F	200	250
	-	-	90	170	90	165	110	156	-	-	-	-		RT3F	200	250
	55	182	-	-	100	182	-	-	-	-	-	-	CK85	RT3F	200	250
	-	-	-	-	-	-	-	-	-	110	78	-		RT4L (1)	100	160
	-	-	-	-	-	-	-	-	150	166	-	-	CK09	RT4N (1)	250	315
	-	-	-	-	110	200	132	188	-	-	-	-		RT4P (1)	250	315
	-	-	110	211	-	-	-	-	-	-	-	-	CK09	RT4P (1)	250	315
	-	-	-	-	-	-	-	-	-	132	94	-		RT4M (1)	125	160
	-	-	-	-	-	-	-	-	-	150	105	-	CK95	RT4M (1)	160	200
	-	-	-	-	-	-	-	-	160	170	-	-		RT4N (1)	200	250
	-	-	-	-	-	-	-	-	185	193	-	-	CK95	RT4P (1)	250	315
	-	-	-	-	-	-	-	-	-	160	113	-		RT4M (1)	160	200
	-	-	-	-	-	-	-	-	-	185	130	-	CK10	RT4N (1)	160	200
	-	-	-	-	-	-	-	-	-	200	141	-		RT4N (1)	200	250
	-	-	-	-	-	-	-	-	-	220	155	-	CK95	RT5A (1)	200	250
	-	-	-	-	-	-	-	-	-	250	175	-		RT5A (1)	250	315
	-	-	-	-	-	-	-	-	220	230	-	-	CK95	RT4P (1)	315	400
	-	-	-	-	150	269	185	261	250	262	-	-		RT4R (1)	355	400
	-	-	150	283	160	285	-	-	-	-	-	-	CK95	RT4R (1)	400	425
	90	309	160	309	-	-	200	281	-	-	-	-		RT4R (1)	400	425

(1) Separate mounting; type RT2XP.

Motorstarters

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Selection table (continued)

Motor										Contactor	Thermal relay	Fuse			
230/200V		400/380V		440/415V		500V		690/660V				1000V		aM	gG-gL
kW	A	kW	A	kW	A	kW	A	kW	A	kW	A	A	A		
-	-	-	-	-	-	220	310	280	292	-	-	CK10	RT5C	400	425
-	-	-	-	185	325	-	-	300	307	-	-	CK10	RT5C	425	500
-	-	-	-	-	-	-	-	315	322	-	-	CK10	RT5C	425	500
110	356	185	355	200	350	250	348	335	344	-	-	CK10	RT5D	425	500
-	-	220	370	220	385	-	-	355	366	-	-	CK10	RT5D	500	500
-	-	-	-	-	-	280	385	375	390	-	-	CK10	RT5D	500	500
-	-	220	408	-	-	300	409	-	-	-	-	CK10	RT5D	500	500
-	-	-	-	-	-	-	-	-	-	280	197	CK11	RT5B	250	315
-	-	-	-	-	-	-	-	-	-	300	211	CK11	RT5B	315	355
-	-	-	-	-	-	-	-	-	-	315	221	CK11	RT5B	315	355
-	-	-	-	-	-	-	-	-	-	335	234	CK11	RT5B	315	355
-	-	-	-	-	-	-	-	-	-	355	245	CK11	RT5B	315	355
-	-	-	-	-	-	-	-	400	412	-	-	CK11	RT5D	500	500
132	425	-	-	250	437	315	426	-	-	-	-	CK11	RT5D	630	630
-	-	-	-	-	-	335	456	425	442	-	-	CK11	RT5D	630	630
-	-	250	475	280	480	355	485	450	462	-	-	CK11	RT5E	630	630
150	500	-	-	300	508	375	513	-	-	-	-	CK11	RT5E	630	630
160	520	280	530	315	530	400	543	-	-	-	-	CK11	RT5E	630	630
-	-	-	-	-	-	-	-	-	-	375	256	CK12	RT5B	315	355
-	-	-	-	-	-	-	-	-	-	400	273	CK12	RT5C	400	425
-	-	-	-	-	-	-	-	-	-	425	290	CK12	RT5C	400	425
-	-	-	-	-	-	-	-	-	-	450	307	CK12	RT5C	400	425
-	-	-	-	-	-	-	-	475	488	-	-	CK12	RT5E	630	630
-	-	-	-	-	-	-	-	500	514	-	-	CK12	RT5E	630	630
-	-	300	563	335	565	-	-	-	-	-	-	CK12	RT5E	630	630
185	609	315	580	355	600	-	-	-	-	-	-	CK12	RT5E	630	630
200	630	335	630	375	630	450	613	-	-	-	-	CK12	RT5E	800	800
220	710	355	650	-	-	475	647	-	-	-	-	CK12	RT5E	800	800
-	-	375	680	400	673	-	-	-	-	-	-	CK12	RT5E	800	800
-	-	-	-	-	-	-	-	-	-	475	324	CK13	RT5C	500	630
-	-	-	-	-	-	-	-	-	-	500	341	CK13	RT5C	500	630
-	-	400	720	425	714	500	680	-	-	-	-	CK13	RT6A	1000	1000
-	-	425	763	450	756	-	-	-	-	-	-	CK13	RT6A	1000	1000
250	823	450	800	-	-	-	-	-	-	-	-	CK13	RT6A	1000	1000

Direct-on-line starters

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## Star-delta starters

### For AC squirrel cage motors

In order to use this type of starting, the following conditions must be met:

The ends of the three stator windings should terminate in a terminal box (6 terminals, see diagram).

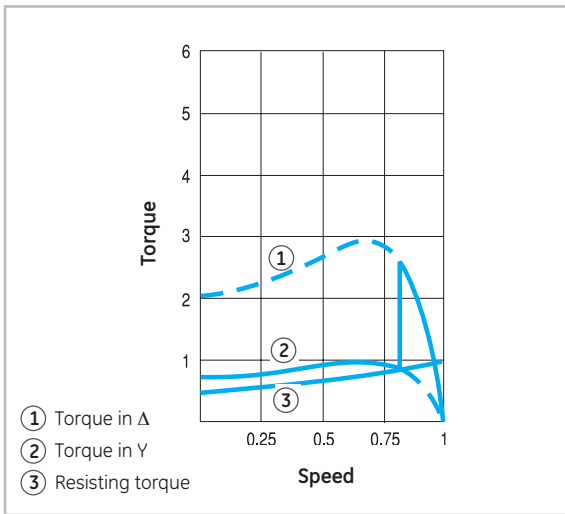
The line voltage should be the same as the motor delta connection voltage.

This starting system is suitable for machines where the resisting torque during starting is less than 1/3 of the motor torque (see torque speed curves).

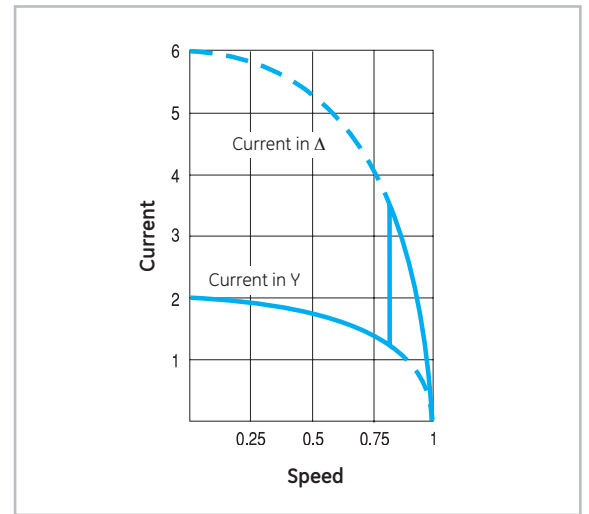
The target of this type of starting is to reduce the current during starting to 1/3, there by reducing the linedrop (see current speed curves).

Reduce the motor torque to 1/3 to smooth out mechanical stress on the machine and on the load (see torque speed curves).

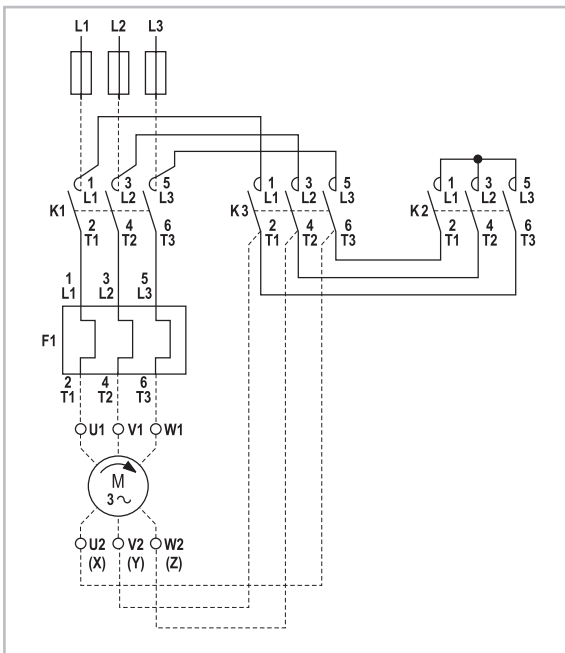
### Torque-speed curve



### Current-speed curve



### Diagram



Selection table

		Motor										Contactors		Thermal	Fuse	
230/200V		400/380V		440/415V		500V		690/660V		1000V		Line and	Star	relay	aM	gG-gL
kW	A	kW	A	kW	A	kW	A	kW	A	kW	A	Delta			A	A
2.2	9	4	9	-	-	5.5	9	7.5	9	-	-	CL00	CL00	RT1L	16	25
3	12	5.5	12	5.5	11	7.5	12	-	-	-	-	CL00	CL00	RT1M	16	35
3.7	14	-	-	-	-	-	-	-	-	-	-	CL00	CL00	RT1N	20	40
4	16	7.5	16	7.5	14	-	-	-	-	-	-	CL01	CL00	RT1N	20	40
-	-	-	-	-	-	-	-	11	13	-	-	CL01	CL00	RT1M	20	40
-	-	-	-	-	-	11	17	-	-	-	-	CL01	CL00	RT1N	20	40
5.5	21	11	22.5	11	21	-	-	-	-	-	-	CL02	CL01	RT1P	32	50
-	-	-	-	-	-	-	-	15	18	-	-	CL02	CL01	RT1P	32	50
-	-	-	-	-	-	15	23	-	-	-	-	CL02	CL01	RT1P	32	50
-	-	-	-	-	-	-	-	18.5	23	-	-	CL25	CL02	RT1P	32	50
7.5	27	15	30	15	28	-	-	-	-	-	-	CL25	CL02	RT1S	40	63
-	-	-	-	-	-	18.5	28.5	22	26	-	-	CL25	CL02	RT1S	40	63
-	-	-	-	18.5	35	22	33	-	-	-	-	CL25	CL02	RT1T	50	80
11	40	18.5	37	-	-	-	-	-	-	-	-	CL25	CL25	RT1U	50	63
-	-	-	-	-	-	-	-	30	35	-	-	CL03	CL25	RT1T	50	63
-	-	22	44	22	40	30	45	-	-	-	-	CL03	CL25	RT1U	63	80
15	50	25	50	-	-	-	-	-	-	-	-	CL04	CL03	RT1V	63	80
-	-	-	-	-	-	-	-	37	41	-	-	CL45	CL03	RT1U	50	80
-	-	30	60	30	55	-	-	-	-	-	-	CL45	CL03	RT1W	63	80
18.5	65	-	-	-	-	-	-	-	-	-	-	CL45	CL03	RT1W	80	125
-	-	-	-	-	-	37	55	45	49	-	-	CL45	CL03	RT1V	63	80
22	75	-	-	-	-	-	-	-	-	-	-	CL06	CL04	RT2G	100	160
-	-	33	65	37	66	-	-	-	-	-	-	CL06	CL04	RT1W	80	100
-	-	-	-	-	-	45	65	55	60	-	-	CL06	CL04	RT2E	100	160
-	-	37	72	-	-	-	-	-	-	-	-	CL06	CL04	RT2E	100	160
-	-	45	85	45	80	55	80	-	-	-	-	CL06	CL04	RT2G	100	160
-	-	-	-	-	-	-	-	75	80	-	-	CL07	CL06	RT2G	100	160
30	105	55	105	55	100	-	-	-	-	-	-	CL07	CL06	RT2H	125	160
-	-	-	-	-	-	75	105	-	-	-	-	CL08	CL06	RT2H	125	160
37	126	-	-	-	-	-	-	-	-	-	-	CL08	CL06	RT2J	160	200
-	-	-	-	75	135	-	-	-	-	-	-	CL08	CL06	RT2J	160	200
-	-	-	-	-	-	-	-	90	97	-	-	CL09	CL06	RT2H	125	160
40	138	-	-	-	-	-	-	-	-	-	-	CL09	CL07	RT2L	160	250
-	-	-	-	-	-	90	129	-	-	-	-	CL09	CL07	RT2J	160	250
-	-	75	138	-	-	-	-	-	-	-	-	CL09	CL07	RT2L	160	250
-	-	-	-	-	-	-	-	110	118	-	-	CL10	CL07	RT2J	160	250
45	150	-	-	-	-	-	-	-	-	-	-	CL10	CL07	RT2L	160	250
-	-	-	-	-	-	110	156	-	-	-	-	CL10	CL08	RT2L	200	250
-	-	90	170	90	165	-	-	-	-	-	-	CL10	CL08	RT2M	200	250
-	-	-	-	-	-	-	-	132	141	-	-	CK75C	CL08	RT3C	160	200
55	182	-	-	-	-	132	188	-	-	-	-	CK75C	CL08	RT3D	200	250
-	-	-	-	110	200	-	-	-	-	-	-	CK75C	CL08	RT3D	250	315
-	-	-	-	-	-	-	-	150	166	-	-	CK75C	CL09	RT3D	200	250
-	-	-	-	-	-	-	-	160	170	-	-	CK75C	CL10	RT3D	200	250
-	-	110	211	-	-	150	218	-	-	-	-	CK75C	CL10	RT3E	250	315
-	-	-	-	132	240	160	228	-	-	-	-	CK75C	CL10	RT3E	250	315
75	239	-	-	-	-	-	-	-	-	-	-	CK75C	CL10	RT3E	250	315
-	-	-	-	-	-	-	-	-	-	90	64	CK75C	CK75C	RT4LJ	80	125
-	-	-	-	-	-	-	-	-	-	110	78	CK75C	CK75C	RT4LJ	108	160
-	-	132	245	-	-	-	-	-	-	-	-	CK75C	CL10	RT3F	315	355
-	-	-	-	-	-	-	-	185	193	-	-	CK75C	CK75C	RT3E	250	315
-	-	150	288	150	269	185	261	-	-	-	-	CK08C	CK75C	RT3F	315	355
-	-	-	-	160	285	-	-	-	-	-	-	CK08C	CK75C	RT3F	315	355
-	-	-	-	-	-	-	-	200	207	-	-	CK08C	CK75C	RT3E	250	315
-	-	-	-	-	-	-	-	220	230	-	-	CK08C	CK75C	RT3E	250	315
90	309	-	-	-	-	-	-	-	-	-	-	CK08C	CK75C	RT3F	315	355

For electrical endurance see page C.34-44, but first divide the rated power and current values shown in the table by 1.73. The thermal overload relay should be set at 0.58 In of the motor.

Star-delta starters

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Star-delta starters

Selection table (continued)

	Motor										Contactors		Thermal relay	Fuse			
	230/200V		400/380V		440/415V		500V		690/660V		1000V			Line and Delta	Star	aM	gG-gL
	kW	A	kW	A	kW	A	kW	A	kW	A	kW	A					
	-	-	-	-	-	-	-	-	-	132	94	CK08C	CK75C	RT4LK	125	160	
	-	-	-	-	-	-	-	-	-	150	105	CK08C	CK75C	RT3B	125	160	
	-	-	-	-	-	-	-	-	-	160	113	CK08C	CK75C	RT3B	125	160	
	-	-	-	-	-	-	-	-	-	185	130	CK85B	CK75C	RT4LL	160	200	
	-	-	160	309	-	-	200	281	250	262	-	-	CK85B	CK75C	RT4N	355	400
	-	-	-	-	-	-	220	310	-	-	-	-	CK85B	CK75C	RT4N	355	400
	-	-	-	-	185	325	-	-	-	-	-	-	CK85B	CK75C	RT4P	400	425
110	356	185	355	200	350	-	-	-	-	-	-	-	CK85B	CK75C	RT4P	400	425
-	-	-	-	-	-	-	-	-	280	262	-	-	CK09B	CK75C	RT4N	315	355
132	425	200	370	220	385	250	348	-	-	-	-	-	CK09B	CK75C	RT4P	500	500
-	-	220	408	-	-	280	385	-	-	-	-	-	CK09B	CK08C	RT4P	500	500
-	-	-	-	-	-	-	-	-	-	200	141	CK09B	CK08C	RT4LL	200	250	
-	-	-	-	-	-	-	-	-	-	220	155	CK09B	CK08C	RT4LM	200	250	
-	-	-	-	-	-	-	-	-	-	250	175	CK09B	CK08C	RT4LM	200	250	
-	-	-	-	-	-	-	-	300	307	-	-	CK09B	CK08C	RT4N	355	400	
-	-	-	-	-	-	-	-	315	322	-	-	CK09B	CK08C	RT4N	355	400	
-	-	-	-	-	-	-	-	335	349	-	-	CK09B	CK08C	RT4P	500	500	
-	-	-	-	-	-	-	-	-	-	280	197	CK95B	CK09B	RT4LM	250	315	
-	-	-	-	250	437	-	-	-	-	-	-	CK95B	CK08C	RT4P	500	500	
-	-	-	-	-	-	-	-	355	366	-	-	CK95B	CK85B	RT4P	425	500	
-	-	-	-	-	-	300	409	375	390	-	-	CK95B	CK85B	RT4P	500	500	
-	-	-	-	-	-	315	426	-	-	-	-	CK95B	CK85B	RT4P	500	500	
150	500	250	475	280	480	-	-	-	-	-	-	CK95B	CK85B	RT4R	630	630	
-	-	-	-	-	-	-	-	-	-	300	211	CK95B	CK85B	RT4LM	250	315	
-	-	-	-	-	-	-	-	-	-	315	221	CK95B	CK85B	RT4LM	250	315	
-	-	-	-	-	-	-	-	400	412	-	-	CK95B	CK85B	RT4R	500	500	
-	-	-	-	-	-	-	-	425	442	-	-	CK95B	CK85B	RT4R	500	500	
-	-	-	-	300	508	335	456	450	462	-	-	CK10C	CK85B	RT5C	630	630	
160	520	-	-	-	-	355	485	-	-	-	-	CK10C	CK85B	RT4C	630	630	
-	-	-	-	-	-	375	513	-	-	-	-	CK10C	CK85B	RT5C	630	630	
-	-	280	530	315	530	-	-	-	-	-	-	CK10C	CK85B	RT5C	630	630	
-	-	300	563	355	561	-	-	-	-	-	-	CK10C	CK85B	RT5C	630	630	
-	-	315	580	-	-	-	-	-	-	-	-	CK10C	CK85B	RT5C	630	630	
185	609	-	-	355	600	-	-	-	-	-	-	CK10C	CK85B	RT5C	800	800	
-	-	-	-	-	-	-	-	-	-	335	234	CK10C	CK09B	RT5A	315	355	
-	-	-	-	-	-	-	-	-	-	355	245	CK10C	CK09B	RT5A	315	355	
-	-	-	-	-	-	-	-	-	-	375	256	CK10C	CK09B	RT5A	315	355	
-	-	-	-	-	-	-	-	-	-	400	273	CK10C	CK09B	RT5A	355	400	
-	-	-	-	-	-	-	-	-	-	425	290	CK10C	CK09B	RT5A	355	400	
-	-	-	-	-	-	-	-	-	-	450	307	CK10C	CK09B	RT5A	355	400	
-	-	-	-	-	-	-	-	475	488	-	-	CK10C	CK09B	RT5C	630	630	
-	-	-	-	-	-	-	-	500	514	-	-	CK10C	CK09B	RT5C	630	630	
-	-	-	-	-	-	400	543	530	545	-	-	CK10C	CK09B	RT5C	630	630	
-	-	-	-	375	587	425	580	560	575	-	-	CK10C	CK09B	RT5C	630	630	
200	630	335	630	375	630	450	613	-	-	-	-	CK10C	CK09B	RT5D	800	800	
-	-	355	650	-	-	-	-	-	-	-	-	CK10C	CK09B	RT5D	800	800	
-	-	-	-	-	-	-	-	600	616	-	-	CK10C	CK95B	RT5D	800	800	
-	-	-	-	400	622	475	647	630	646	-	-	CK10C	CK95B	RT5D	800	800	
-	-	-	-	-	-	-	-	-	-	475	324	CK10C	CK95B	RT5B	355	400	
-	-	-	-	-	-	-	-	-	-	500	341	CK10C	CK95B	RT5B	400	425	
-	-	-	-	-	-	-	-	-	-	600	407	CK10C	CK95B	RT5B	500	500	
-	-	-	-	400	673	425	659	-	-	-	-	CK10C	CK10C	RT5D	800	800	
-	-	375	680	-	-	500	680	670	688	-	-	CK11C	CK10C	RT5D	800	800	
220	710	400	720	425	714	530	725	710	729	-	-	CK11C	CK10C	RT5D	800	800	
-	-	-	-	450	756	560	762	750	770	-	-	CK11C	CK10C	RT5E	1000	1000	
-	-	425	763	475	798	-	-	-	-	-	-	CK11C	CK10C	RT5E	1000	1000	
-	-	-	-	-	-	600	817	-	-	-	-	CK11C	CK10C	RT5E	1000	1000	

For electrical endurance see page C.34-44, but first divide the rated power and current values shown in the table by 1.73. The thermal overload relay should be set at 0.58 In of the motor.

Motorstarters

A

B

C

D

E

F

G

H

I

X



**Selection table (continued)**

Motor										Contactors		Thermal	Fuse			
230/200V		400/380V		440/415V		500V		690/660V		1000V		Line and Delta	Star	relay	aM	gG-gL
kW	A	kW	A	kW	A	kW	A	kW	A	kW	A				A	A
250	823	-	-	-	-	-	-	-	-	-	-	CK11C	CK10C	RT5E	1000	1000
-	-	-	-	-	-	-	-	-	-	630	428	CK11C	CK10C	RT5B	500	630
-	-	-	-	-	-	-	-	-	-	670	455	CK11C	CK10C	RT5C	500	630
-	-	450	800	-	-	-	-	-	-	-	-	CK11C	CK10C	RT5E	1000	1000
-	-	475	846	500	840	-	-	-	-	-	-	CK11C	CK10C	RT5E	1000	1000
-	-	-	-	-	-	-	-	800	821	-	-	CK11C	CK10C	RT5E	1000	1000
-	-	500	892	530	890	630	857	850	873	-	-	CK11C	CK10C	RT5E	1000	1000
280	910	530	943	560	941	670	912	-	-	-	-	CK11C	CK10C	RT5E	2x630	2x630
300	975	-	-	-	-	710	965	-	-	-	-	CK12C	CK10C	RT5E	2x630	2x630
315	1023	560	996	600	1010	750	1020	-	-	-	-	CK12C	CK10C	RT5E	2x630	2x630
335	1083	-	-	630	1058	-	-	-	-	-	-	CK12C	CK10C	RT5E	2x630	2x630
-	-	-	-	-	-	-	-	-	-	750	510	CK12C	CK11C	RT5C	630	630
-	-	-	-	-	-	-	-	900	924	-	-	CK13B	CK11C	RT6A	2x630	2x630
-	-	-	-	-	-	800	1088	950	975	-	-	CK13B	CK11C	RT6A	2x630	2x630
-	-	600	1074	-	-	-	-	-	-	-	-	CK12B	CK11C	RT5E	2x630	2x630
355	1142	-	-	710	1097	-	-	-	-	-	-	CK12B	CK11C	RT5E	2x630	2x630
-	-	-	-	-	-	-	-	-	-	800	543	CK13B	CK11C	RT5C	630	800
-	-	630	1128	670	1125	-	-	-	-	-	-	CK12B	CK11C	RT5E	2x630	2x630
375	1206	670	1200	710	1190	850	1156	-	-	-	-	CK13B	CK11C	RT6A	2x800	2x800
400	1286	710	1270	750	1255	-	-	-	-	-	-	CK13B	CK11C	RT6A	2x800	2x800
425	1364	-	-	-	-	-	-	-	-	-	-	CK13B	CK12C	RT6A	2x800	2x800
-	-	750	1342	-	-	-	-	-	-	-	-	CK13B	CK12C	RT6A	2x800	2x800

For electrical endurance see page C.34-44, but first divide the rated power and current values shown in the table by 1.73. The thermal overload relay should be set at 0.58 In of the motor.

Star-delta starters

A

B

C

D

E

F

G

H

I

X





## Autotransformer starters

### For AC squirrel cage motors

This type of starting is used for machines where the resisting torque during starting is less than the motor torque (see torque speed curves):

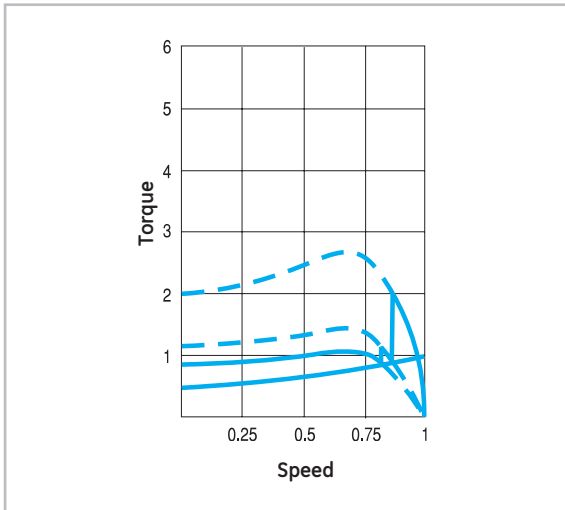
- Reduce current during starting to the required value (this will depend on the autotransformer voltage ratio selected).
- Reduce motor torque to smooth out mechanical stress on the machine and on the load (see torque speed curves). Reduction of the motor will depend on the autotransformer voltage ratio.

The two requirements for star-delta starting do not apply here. That is to say both end of the three windings do not have to be accessible and the line voltage does not have to be the same as the delta connection voltage.

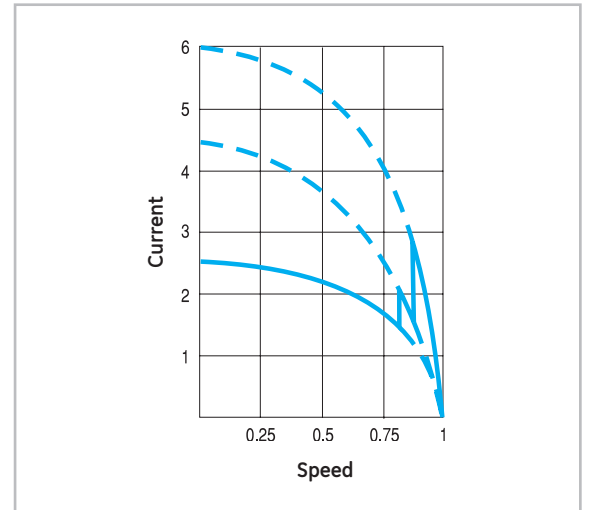
This system also has the following advantages over star-delta starting:

- required current and starting torque can be selected.
- starting can be effected at various points.
- motor voltage continuity during network switching.

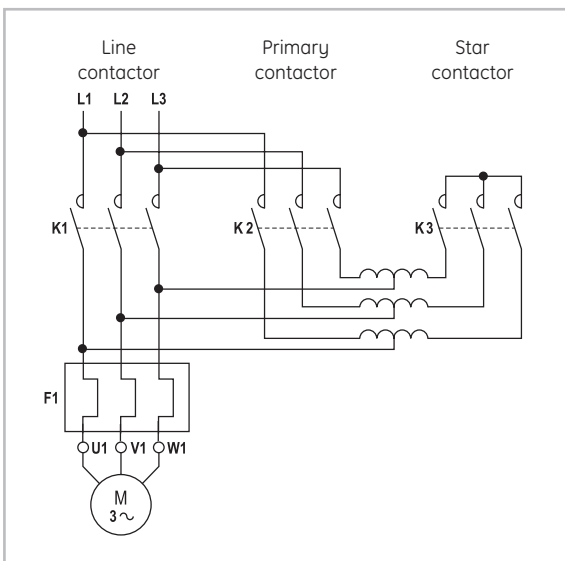
### Torque-speed curve



### Current-speed curve



### Diagram



Selection table

Motor												Contactors		Thermal	Fuse	
230/200V		400/380V		440/415V		500V		690/660V		1000V		Line	Pr. trafo + Star	relay	aM	gG-gL
kW	A	kW	A	kW	A	kW	A	kW	A	kW	A				A	A
2.2	9	4	9	4	8	5.5	9	-	-	-	-	CL00	CL00	RT1N	16	25
-	-	-	-	-	-	-	-	7.5	9	-	-	CL01	CL00	RT1N	16	25
3	12	5.5	12	5.5	11	7.5	12	-	-	-	-	CL01	CL00	RT1P	16	35
3.7	14	-	-	7.5	14	-	-	-	-	-	-	CL02	CL00	RT1P	20	40
-	-	7.5	16	-	-	10	15.5	-	-	-	-	CL02	CL00	RT1S	20	40
-	-	-	-	-	-	-	-	11	13	-	-	CL25	CL01	RT1P	20	40
-	-	-	-	-	-	11	17	-	-	-	-	CL25	CL01	RT1S	20	40
5.5	21	11	22.5	11	21	13	20	-	-	-	-	CL25	CL01	RT1T	32	50
-	-	-	-	-	-	-	-	15	18	-	-	CL03	CL01	RT1T	32	50
-	-	-	-	-	-	15	23	-	-	-	-	CL04	CL01	RT1U	32	50
7.5	27	15	30	15	28	-	-	-	-	-	-	CL04	CL02	RT1V	40	63
-	-	-	-	-	-	-	-	18.5	23	-	-	CL45	CL02	RT1U	32	50
-	-	-	-	-	-	18.5	22.5	22	25	-	-	CL45	CL02	RT1U	40	63
-	-	-	-	18.5	35	22	33	-	-	-	-	CL45	CL02	RT1W	50	80
11	40	18.5	37	22	40	-	-	-	-	-	-	CL06	CL03	RT2E	50	80
-	-	-	-	-	-	-	-	30	35	-	-	CL06	CL03	RT2E	50	80
-	-	22	44	-	-	-	-	-	-	-	-	CL06	CL03	RT2G	63	80
15	50	-	-	-	-	-	-	-	-	-	-	CL06	CL03	RT2G	63	80
-	-	-	-	-	-	30	45	-	-	-	-	CL07	CL03	RT2G	63	80
-	-	-	-	-	-	-	-	37	41	-	-	CL07	CL04	RT2E	63	80
-	-	30	60	30	55	37	55	-	-	-	-	CL07	CL04	RT2H	80	125
18.5	65	-	-	37	66	-	-	-	-	-	-	CL07	CL04	RT2J	80	125
-	-	-	-	-	-	-	-	45	49	-	-	CL08	CL04	RT2G	80	125
-	-	-	-	-	-	-	-	55	60	-	-	CL08	CL04	RT2H	80	125
-	-	-	-	-	-	45	65	-	-	-	-	CL08	CL06	RT2J	80	125
22	75	37	72	-	-	-	-	-	-	-	-	CL08	CL06	RT2J	80	125
-	-	-	-	45	80	55	80	-	-	-	-	CL08	CL06	RT2L	100	160
25	84	45	85	50	88	-	-	-	-	-	-	CL09	CL06	RT2L	100	160
-	-	-	-	-	-	-	-	75	80	-	-	CL09	CL06	RT2L	125	160
30	105	55	105	55	100	75	105	-	-	-	-	CL10	CL06	RT2M	160	200
-	-	-	-	-	-	-	-	90	97	-	-	CL10	CL07	RT2M	125	200
37	126	75	138	75	135	90	129	-	-	-	-	CK75C	CL07	RT3E	200	224
-	-	-	-	-	-	-	-	110	118	-	-	CK08C	CL08	RT3E	160	200
-	-	-	-	-	-	-	-	132	141	-	-	CK08C	CL08	RT3F	200	250
45	150	90	170	90	165	110	156	-	-	-	-	CK08C	CL08	RT3F	200	250
55	182	-	-	-	-	-	-	-	-	-	-	CK08C	CL08	RT3F	200	250
-	-	-	-	-	-	-	-	-	90	64	-	CK08C	CL08	RT3B	100	160
-	-	-	-	-	-	-	-	150	166	-	-	CK85B	CL09A	RT4N	250	315
-	-	110	211	110	200	132	188	-	-	-	-	CK85B	CL09A	RT4P	250	315
-	-	-	-	-	-	-	-	-	110	78	-	CK85B	CK75C	RT4N	100	160
-	-	-	-	-	-	-	-	160	170	-	-	CK09B	CK75C	RT4N	200	250
-	-	-	-	-	-	150	218	185	193	-	-	CK09B	CK75C	RT4P	250	315
75	239	132	245	132	240	160	228	200	207	-	-	CK09B	CK75C	RT4R	315	355
-	-	-	-	-	-	-	-	-	-	150	105	CK09B	CK75C	RT4M	160	200
-	-	-	-	-	-	-	-	-	-	160	113	CK95B	CK08C	RT4M	160	200
-	-	-	-	-	-	-	-	-	-	220	155	CK10C	CK08C	RT5A	200	250
-	-	-	-	-	-	-	-	-	-	250	175	CK10C	CK85B	RT5A	250	315
-	-	-	-	-	-	-	-	220	230	-	-	CK95B	CK08C	RT4P	315	355
90	309	160	309	-	-	220	310	-	-	-	-	CK10C	CK08C	RT5C	400	425
-	-	-	-	185	325	-	-	300	307	-	-	CK10C	CK08C	RT5C	425	500
110	356	220	408	220	385	280	285	335	344	-	-	CK10C	CK85B	RT5D	425	500
132	425	-	-	250	437	-	-	-	-	-	-	CK11C	CK85B	RT5D	630	630
-	-	-	-	-	-	-	-	-	-	280	197	CK10C	CK09B	RT5B	250	315
-	-	-	-	-	-	-	-	-	-	335	234	CK11C	CK09B	RT5B	315	355
-	-	-	-	-	-	-	-	-	-	355	245	CK11C	CK09B	RT5B	315	355
-	-	-	-	-	-	300	409	400	412	-	-	CK11C	CK09B	RT5D	500	500
-	-	-	-	-	-	315	426	-	-	-	-	CK11C	CK09B	RT5D	630	630
150	500	250	475	280	480	335	456	-	-	-	-	CK11C	CK09B	RT5E	630	630
-	-	-	-	-	-	-	-	-	-	375	256	CK12B	CK95B	RT5B	315	355
-	-	-	-	300	508	375	513	450	462	-	-	CK12B	CK95B	RT5E	630	630
160	520	315	580	335	565	-	-	-	-	-	-	CK12B	CK95B	RT5E	630	630
-	-	-	-	-	-	-	-	-	-	450	307	CK12B	CK10C	RT5C	400	425
-	-	-	-	-	-	-	-	475	488	-	-	CK12B	CK10C	RT5D	630	630
200	630	335	630	375	630	450	613	-	-	-	-	CK12B	CK10C	RT5E	800	800
-	-	-	-	-	-	-	-	-	-	500	341	CK13B	CK10C	RT5C	500	630
-	-	-	-	-	-	-	-	500	514	-	-	CK13B	CK10C	RT6A	800	800
220	710	425	762	450	756	500	800	-	-	-	-	CK13B	CK10C	RT6A	1000	1000
250	823	450	800	-	-	-	-	-	-	-	-	CK13B	CK10C	RT6A	1000	1000

A

B

C

D

E

F

G

H

I

X



## Contactors for rotor starters

### For AC slip-ring motors

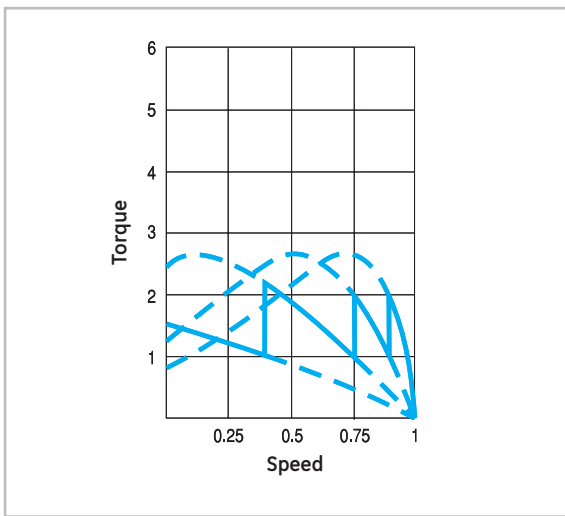
This type of starter is used in machines with resisting torque of any value where it is required to:

- Start with reduced peak currents without consequent motor torque reduction, as is the case with high resisting torques and when starting with reduced peak currents is required.
- Control speed for different load or resisting torque values, with reduced peak currents: lifting and transport gear, flow volume control, etc.

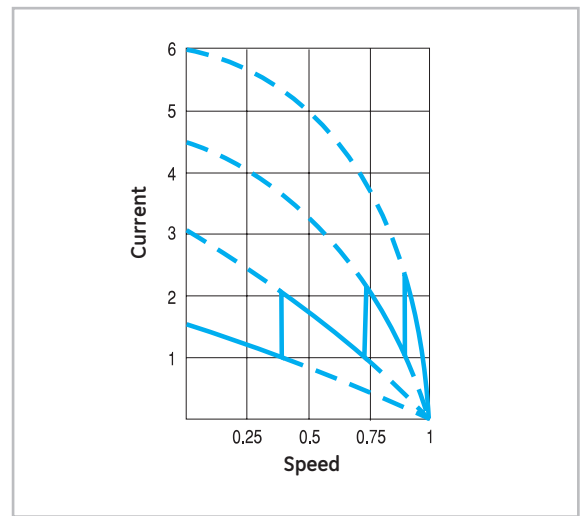
Whatever the application, a distinction should be made between the two electrical circuits which are used in this type of starters:

- Stator circuit, present in two categories and having a different breaking current in each:  
Category AC'2: switching-off motors during running,  $I_c = I_e$   
Category AC 2: switching-off motors during starting,  $I_c = 2.5 I_e$
- Rotor circuit, with similar characteristics to those in category AC1.

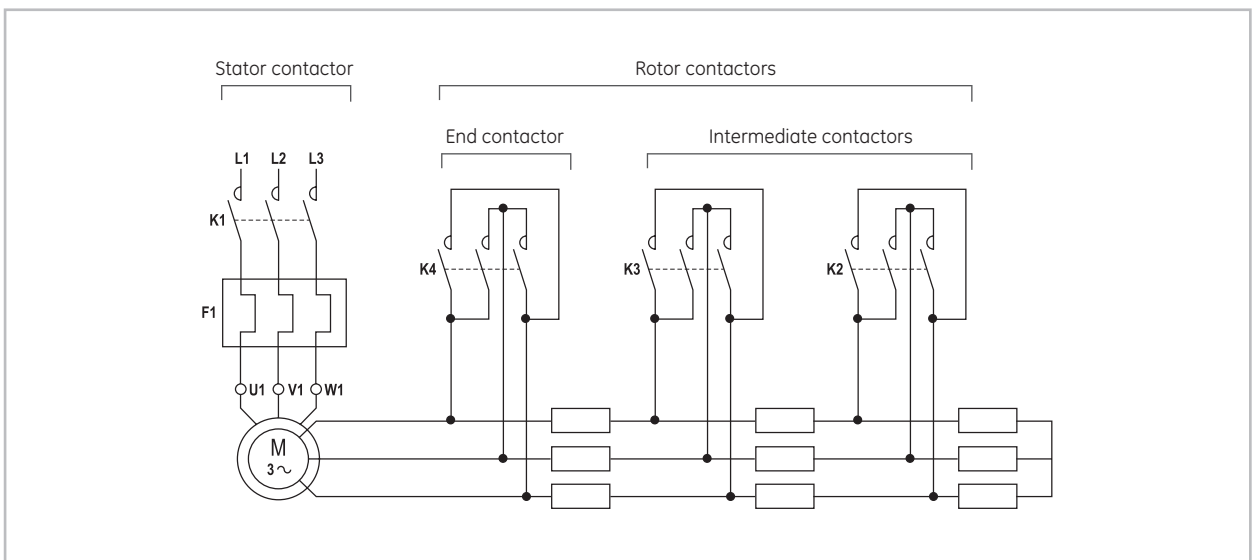
### Torque-speed curve



### Current-speed curve



### Diagram



**Stator circuit**

Motor power						Con-tactor	Thermal relay	Fuse	
230V	400V	440V	500V	690V	1000V			aM	gG-gL
220V	380V	415V		660V					
kW	kW	kW	kW	kW	kW	A	A		
-	-	11	13	-	-	CL25	RT1T	32	50
5.5	11	-	-	-	-	CL25	RT1U	32	50
-	-	-	-	15	-	CL03	RT1T	25	40
-	-	-	-	17	-	CL04	RT1T	32	50
-	-	-	15	-	-	CL04	RT1U	32	50
7.5	15	15	17	-	-	CL04	RT1V	40	63
-	-	-	-	18.5	-	CL45	RT1U	32	50
-	-	18.5	22	33	-	CL45	RT1W	50	80
11	18.5	22	-	-	-	CL06	RT2E	50	80
-	22	25	25	33	-	CL06	RT2G	63	80
15	-	-	-	-	-	CL06	RT2G	63	80
-	-	-	30	40	-	CL07	RT2G	63	80
-	30	30	37	-	-	CL07	RT2H	80	125
18.5	-	37	-	-	-	CL07	RT2J	80	125
-	-	-	-	45	-	CL08	RT2G	63	80
-	-	-	-	55	-	CL09	RT2H	80	125
-	-	-	45	-	-	CL08	RT2J	80	125
22	37	45	-	-	-	CL08	RT2J	100	160
-	-	-	55	75	-	CL10	RT2J	100	160
25	45	50	63	-	-	CL10	RT2L	125	160
-	-	-	-	90	-	CK75C	RT3D	125	160
30	55	55	75	-	-	CK75C	RT3D	160	200
37	75	75	90	-	-	CK75C	RT3E	200	250
-	-	-	-	-	90	CK08C	RT3B	100	125
-	-	-	-	110	-	CK08C	RT3E	160	200
-	-	-	-	132	-	CK08C	RT3F	200	250
45	90	90	110	-	-	CK08C	RT3F	200	250
55	-	100	-	-	-	CK08C	RT4N	250	315
-	-	110	132	-	-	CK85B	RT4P	250	315
-	-	-	-	-	150	CK09B	RT4M	125	160
-	-	-	-	160	-	CK09B	RT4N	200	250
-	-	-	-	200	-	CK09B	RT4P	250	315
75	132	132	160	-	-	CK09B	RT4P	315	355
-	-	-	-	-	185	CK95B	RT4N	160	200
-	-	-	-	-	250	CK10C	RT4N	200	250
-	-	-	-	220	-	CK10C	RT4P	315	355
90	160	160	220	300	-	CK10C	RT5C	355	400
-	-	185	-	315	-	CK10C	RT5C	400	425
110	200	220	250	335	-	CK10C	RT5C	500	630
-	-	-	-	-	280	CK10C	RT5B	250	315
-	-	-	-	-	335	CK11C	RT5B	315	355
-	-	-	-	-	355	CK11C	RT5B	315	355
-	220	-	300	400	-	CK11C	RT5D	500	600
132	-	250	315	-	-	CK11C	RT5D	630	630
150	250	250	335	-	-	CK11C	RT5E	630	630
-	-	-	-	-	375	CK12B	RT5B	355	400
-	-	-	-	-	450	CK12B	RT5C	400	425
-	-	300	375	475	-	CK12B	RT5E	630	800
220	335	375	-	-	-	CK12B	RT5E	800	800
-	-	-	-	-	500	CK13B	RT5C	400	500
-	-	-	-	500	-	CK13B	RT6A	630	800
220	425	-	450	-	-	CK13B	RT6A	1000	1000
250	450	450	500	-	-	CK13B	RT6A	1000	1000

**Rotor circuit**

Rotor		Contactor	
Current (1)	Max. voltage	Intermediate	End
A	V		
28	1000	CL00	CL00
37	1000	CL00	CL01
42	1000	CL00	CL01
48	1000	CL01	CL02
55	1000	CL02	CL25
60	1000	CL02	CL03
75	1000	CL25	CL04
90	1000	CL25	CL45
98	1000	CL03	CL45
112	1000	CL04	CL06
120	1000	CL45	CL06
135	1000	CL45	CL06
147	1000	CL06	CL06
165	1000	CL06	CL07
180	1000	CL06	CL07
187	1000	CL07	CL08
202	1000	CL07	CL09
240	1000	CL08	CL10
247	1000	CL08	CK75C
280	1000	CL09	CK75C
315	1000	CL09	CK08C
360	1000	CL10	CK85C
390	1500	CK75C	CK09B
472	1500	CK08C	CK95B
525	1500	CK85B	CK95B
585	1500	CK09B	CK10C
660	1500	CK95B	CK10C
825	1500	CK10C	CK11C
945	1500	CK10C	CK12B
1087	1500	CK11C	CK12B
1188	1500	CK11C	CK12B
1485	1500	CK12B	CK13B
1956	1500	CK13B	-

(1) The currents shown relate to the delta connection of the contactors poles. If the poles are star-connected, divide the values given in the column by 1.5.

**Electrical endurance**

- Stator circuit (see graph AC-2)
- Rotor circuit (see graph AC-1)

Contactor for rotor starters

A

B

C

D

E

F

G

H

I

X



## Contactors for rotor speed drives

Motorstarters

A

B

C

D

E

F

G

H

I

X

### Stator circuit

	Motor power (1)							Contactor
	230V 220V	400V 380V	415V	440V	500V	690V	1000V	
	kW	kW	kW	kW	kW	kW	kW	
Jogging 10% AC-2	2.4	4.5	5	5.5	5.5	6.3	-	CL00
	3.7	6.5	7.5	7.5	8	9	-	CL01
	5	8	10	10	10	11	-	CL02
	7	13	15	15	15	15	-	CL25
	9	16.5	19	19	19	19	-	CL04
	10.5	19.5	24	24	24	27	-	CL45
	13.5	23	27	27	27	30	-	CL06
	18.5	28	32	32	32	35	-	CL07
	21	34	40	40	40	45	-	CL08
	22.5	39	47	47	47	50	-	CL09
27.5	49	55	55	55	60	-	CL10	
38	65	70	70	75	75	-	CK75C	
40	75	85	85	85	95	80	CK08C	
50	85	90	90	100	100	95	CK85B	
55	96	110	110	110	120	110	CK09B	
70	110	115	115	125	125	120	CK95B	
85	147	175	175	175	195	165	CK10C	
105	181	220	220	220	233	220	CK11C	
124	215	235	235	257	270	250	CK12B	
140	250	260	260	300	280	276	CK13B	
Jogging 20% AC-2	2.1	3.7	4.4	4.4	4.4	5	-	CL00
	2.6	4.5	6.1	6.1	6.1	7	-	CL01
	3.6	6.5	8.2	8.2	8.2	9	-	CL02
	6.3	11	12.7	12.7	12.7	11	-	CL25
	8	13.8	15.9	15.9	15.9	17	-	CL04
	9.2	16	18.5	18.5	18.5	20	-	CL45
	10.5	18.5	22	22	22	25	-	CL06
	13	23	27	27	27	31	-	CL07
	17.3	30	34.6	34.6	34.6	43	-	CL08
	19.6	34	39	39	39	47	-	CL09
	22	38	46	46	46	55	-	CL10
	32	60	65	65	65	70	65	CK75C
	36	75	75	75	75	90	75	CK08C
	42	78	85	85	85	100	85	CK85B
	47.8	82.5	90	96	96	115	100	CK09B
	60	96	110	110	110	135	125	CK95B
	77	132	140	150	150	190	160	CK10C
	89	153	178	178	185	220	185	CK11C
110	190	218	218	220	258	220	CK12B	
132	228	230	230	258	240	230	CK13B	

### Rotor circuit

	Rotor current (2)	Rotor voltage without counter-current	Rotor voltage with counter-current	Contactor
	22	690	500	CL00
	30	690	500	CL01
	39	690	500	CL02
	60	690	500	CL25
	72	690	500	CL04
	87	750	600	CL45
	105	750	600	CL06
	127	750	600	CL07
	147	750	600	CL08
	177	750	600	CL09
	195	750	600	CL10
	220	1000	750	CK75C
	240	1000	750	CK08C
	280	1000	750	CK85B
	315	1000	750	CK09B
	360	1000	750	CK95B
	405	1000	750	CK10C
	525	1000	750	CK11C
	780	1000	750	CK12B
	885	1000	750	CK13B
	18	690	500	CL00
	25	690	500	CL01
	37	690	500	CL02
	48	690	500	CL25
	60	690	500	CL04
	72	750	600	CL45
	85	750	600	CL06
	106	750	600	CL07
	123	750	600	CL08
	147	750	600	CL09
	165	750	600	CL10
	190	1000	750	CK75C
	210	1000	750	CK08C
	240	1000	750	CK85B
	273	1000	750	CK09B
	305	1000	750	CK95B
	348	1000	750	CK10C
	453	1000	750	CK11C
	570	1000	750	CK12B
	750	1000	750	CK13B

Electrical endurance 10<sup>6</sup> x 1.3 operations

continued on D.61

- (1) Power values shown are not standard as they refer to intermittent service.  
 (2) The current shown relates to the delta connection of the contactor poles.  
 If the poles are star-connected, divide the values given in the column by 1.5.



Jogging  
35% AC-2

**Stator circuit (continued)**

Motor power (1)							Contactor
230V 220V kW	400V 380V kW	415V kW	440V kW	500V kW	690V kW	1000V kW	
1.4	2.8	3.4	3.4	3.4	4	-	CL00
2.2	3.8	4.5	4.5	4.5	5.5	-	CL01
3	5.5	7.5	7.5	7.5	7.5	-	CL02
4.9	9	10	10	10	11	-	CL25
6.7	12.8	14.8	14.8	14.8	13	-	CL04
7	13	15	15	15	17	-	CL45
9	15	18	18	18	20	-	CL06
10.5	18.5	22	22	22	25	-	CL07
13.5	24	28	28	28	33	-	CL08
18.5	29	33	33	33	40	-	CL09
19.6	34	39	39	39	45	-	CL10
25	45	47	47	47	55	60	CK75C
30	55	63	63	63	77	63	CK08C
35	78	80	80	80	90	75	CK85B
40	75	85	85	85	100	80	CK09B
46	83	100	100	100	135	117	CK95B
63	110	132	132	132	150	132	CK10C
79	136	157	157	160	190	160	CK11C
91	157	165	176	188	220	185	CK12B
115	200	200	200	220	205	202	CK13B

Electrical endurance 10<sup>6</sup> x 1.3 operations

- (1) Power values shown are not standard as they refer to intermittent service.
- (2) The current shown relates to the delta connection of the contactor poles.  
If the poles are star-connected, divide the values given in the column by 1.5.

**Rotor circuit (continued)**

Rotor current (2)	Rotor voltage without counter-current	Rotor voltage with counter-current	Contactor
14	660	500	CL00
20	660	500	CL01
26	660	500	CL02
42	660	500	CL25
50	660	500	CL04
57	750	600	CL45
70	750	600	CL06
85	750	600	CL07
100	750	600	CL08
120	750	600	CL09
138	750	600	CL10
155	1000	750	CK75C
172	1000	750	CK08C
200	1000	750	CK85B
225	1000	750	CK09B
250	1000	750	CK95B
285	1000	750	CK10C
385	1000	750	CK11C
495	1000	750	CK12B
637	1000	750	CK13B

A

B

C

D

E

F

G

H

I

X



## Contactors for connection of power transformers

In this application it is essential to ascertain the no-load inrush current of the transformer  $I_{\mu}$ , (magnetisation current) which in the majority of cases determines the size of the contactor.

Two cases are illustrated in the table:

- No-loop inrush current up to 20 times the rated transformer current
- No-loop inrush current up to 40 times the rated transformer current.

The contactor should not cut out the short-circuit current; if the protective devices used are fuses, this condition will be intrinsically complied with.

In the case however of devices with tripping contacts the general line circuit breaker will be driven rather than the contactor coil.

### Selection table

$\frac{I_{\mu}}{I_e} = 20$		$\frac{I_{\mu}}{I_e} = 40$		Contactor
230V 240V kVA	380V 400V kVA	230V 240V kVA	380V 400V kVA	
2	3.5	1	1.75	CL00A
2.75	5	1.37	2.5	CL01A
4	7	2	3.5	CL02A
5.75	10	2.85	5	CL25A
5.75	10	2.85	5	CL03A
7.25	12.5	3.65	6.25	CL04A
9	15.5	4.50	7.75	CL45A
10	17	5	8.5	CL05A
12	21	6	10.5	CL06A
15	25	7.5	12.5	CL07A
20	35	10	16	CL08A
25	40	12.5	20	CL09A
30	50	15	25	CL10A
35	55	17	27	CK75C
40	60	20	30	CK08C
45	75	22	35	CK85B
50	85	25	42.5	CK09B
80	150	40	75	CK10C
100	170	50	85	CK11C
127	215	64	107	CK12B
160	280	80	140	CK13B

## Contactors for capacitors (category AC6b)

The most usual application of capacitors is for centralised automatic power factor ( $\cos \varphi$ ) correction. A characteristic of capacitors is the high overcurrent which appears as they are connected.

Such overcurrents are due to:

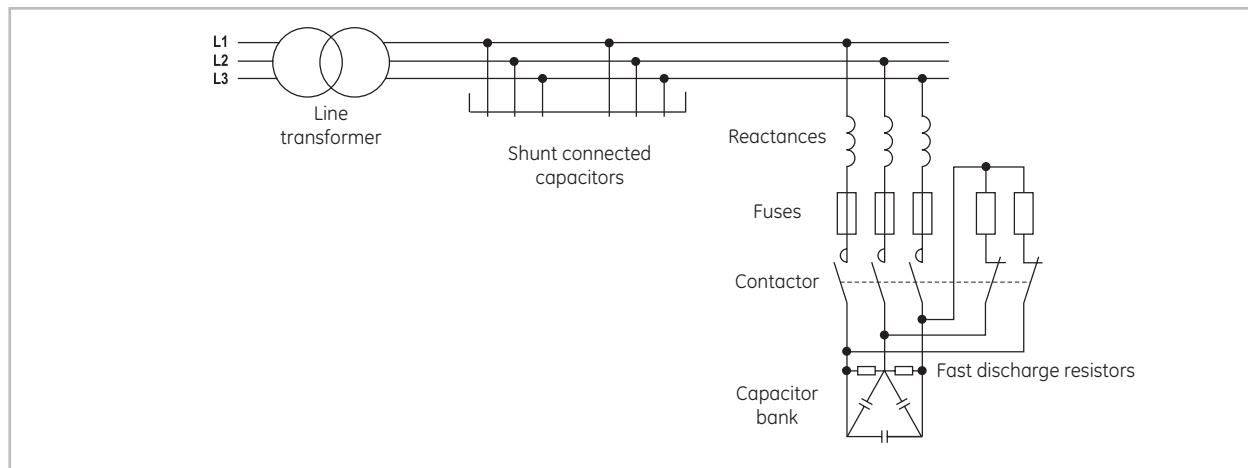
- Harmonic currents produced by saturated transformers, rectifiers, etc.
- Transient currents, the frequency and amplitude of which depend on the network inductance and the capacitor size.
- Additional transient currents arising where a capacitor is connected when others have already been connected, and caused by discharging of the latter.

GE Power Controls contactors are fitted with specially treated hardened alloy contacts which are highly resistant to welding and are therefore capable of withstanding high current peaks on connection.

The operation conditions taken as a basis for usage are:

- Near presence of other previously connected capacitors with a total power of up to eight times that of the capacitor to be connected.
- Shock coils reactances with a minimum inductance of  $4\mu\text{H}$ . These can be obtained by making 4 or 6 turns of 15cm windings on the conductor of each phase.
- Fast discharge resistor for reconnection within 60 seconds.

### Diagram



### Selection table

Contactor		$\theta \leq 55^\circ\text{C}$					$\theta \leq 70^\circ\text{C}$					Fuse gl - gG A	I max. (peak) A
Type	Ith	220V 230V 240V kvar	400V kvar	415V kvar	500V kvar	690V 660V kvar	220V 230V 240V kvar	400V kvar	415V kvar	500V kvar	690V 660V kvar		
CL00A	25	3	5	5.5	6.5	5.7	2.4	4	4.5	5.2	4.5	10	1000
CL01A	25	4.5	9.5	10.5	12.5	11	3.6	6	6.5	10	7	16	1000
CL02A	32	6.5	11	12	14.5	12.5	5.2	8.5	9	11.5	10	25	1000
CL25A	45	7.5	12.5	14	16	15	6.5	10	11	13	12	25	1000
CL03A	45	9	15	16.5	20	17.5	7.2	12	13	16	14	35	2500
CL04A	60	12.5	21	23	27.5	24	10	17	18	22	19.5	40	2500
CL45A	60	16.5	25	27	32	30	13	20	22	25	22	50	2500
CL06A	90	22	40	43	52	50	17	30	33	41	35	80	3500
CL07A	110	25	45	48	58	65	19	35	37	46	40	125	3500
CL08A	110	30	50	54	65	70	22	40	43	52	50	125	3500
CL09A	140	40	65	70	85	95	35	58	62	75	85	160	3500
CL10A	140	45	70	80	90	105	40	60	64	65	75	160	3500
CK75C	250	60	110	118	145	150	48	88	94	116	120	250	5000
CK08C	250	70	125	135	162	170	56	100	107	130	136	250	5000
CK85B	315	80	150	160	195	200	64	120	130	156	160	315	5000
CK09B	315	95	165	177	215	230	85	148	160	192	205	315	5000
CK95B	450	105	190	205	250	288	95	175	188	230	265	450	5500
CK10C	600	135	260	280	340	370	120	235	252	375	330	630	10000
CK11C	700	190	325	350	425	450	152	260	280	340	360	800	10000
CK12B	1000	250	400	430	520	600	200	320	344	416	480	1000	12000
CK13B	1250	315	525	565	685	650	252	420	452	548	520	1250	15000

Electrical endurance: 100.000 operations





## Contactors for control lighting circuits

The characteristics of the most usual lighting systems are as follows:

### Incandescent lamps

The connection current in very high -of the order of 15 times- rated current. Although this is a very short duration, it is only taken into account in order for the contactor connection current not to be exceeded. The power factor is always maintained at 1.

### Fluorescent lamps

The connection current is slightly higher than rated current. The power factor is about 0.5. To improve up to 0.9, compensating capacitors can be used. In such cases, the connection power of the capacitor must be taken into account, the effect of which is appreciably greater on the smaller contactors.

### High pressure mercury vapour lamps

The connection current varies, depending on type, between

1.6 and 2 times the rated current and will hold for between 3 and 5 minutes.

The power factor is of the order of 0.6 and this can be improved up to approximately unit value by means of compensating capacitors. In such cases, the connection power of the capacitor must be taken into account, the effect of which is appreciably greater on the smaller contactors.

### High pressure sodium vapour lamps

The connection current values varies, depending on type, between 1.3 and 1.6 times the rated current and will hold between 3 and 5 minutes.

The power factor is of the order of 0.45 and this can be improved up to apporximately unit value by means of compensating capacitors. In such cases, the connection power of the capacitor must be taken into account, the effect of which is appreciably greater on the smaller contactors.

### Selection table

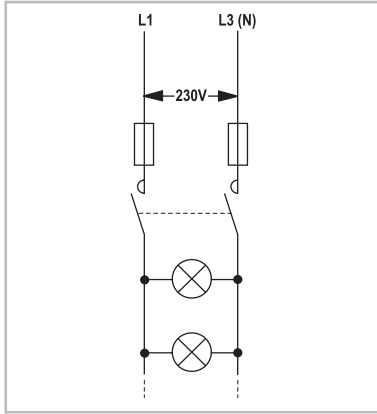
Types	W	A	µF	Maximum number of lamps per phase at 230V									
				MCR	MCO	MC1	MC2	RL	CL00	CL01	CL02	CL25	
Incandescent	60	0.27		27	37	59	59	59	62	62	70	77	
	100	0.45		16	22	35	35	35	40	40	50	60	
	200	0.91		8	11	17	17	17	20	20	25	30	
	300	1.36		5	7	11	11	11	13	13	17	20	
	500	2.27		3	4	7	7	7	8	8	10	12	
	1000	4.5		1	2	3	3	3	4	4	5	6	
2000	9.1		0	1	1	1	1	1	1	2	3		
Fluorescent Single arrangement Without compensation	15	0.23		51	61	79	79	79	88	98	126	155	
	20	0.37		32	38	49	49	49	57	61	78	110	
	40	0.44		28	33	41	41	41	48	51	66	93	
	65	0.7		18	21	26	26	26	30	32	41	58	
100	1.5		8	10	12	12	12	14	16	19	27		
Fluorescent Single arrangement With compensation	15	0.23	3.5	26	32	49	49	49	61	77	94	111	
	20	0.25	4.5	20	25	38	38	38	48	61	74	87	
	40	0.3	4.5	20	25	38	38	38	48	61	74	87	
	65	0.45	7	13	14	25	25	25	31	39	47	56	
100	0.7	18	5	6	9	9	9	11	14	17	21		
High pressure mercury vapour Without compensation	250	2.13		5	5	5	6	6	6	8	10	12	
	400	3.25		3	3	4	4	4	4	5	6	8	
	700	5.4		2	2	2	2	2	2	3	4	5	
1000	7.5		1	1	2	2	2	2	2	3	3		
High pressure mercury vapour With compensation	250	1.3	20	9	9	9	9	11	11	14	18	22	
	400	2.1	25	7	7	7	7	7	7	9	11	14	
	700	3.6	40	5	5	5	5	4	4	5	6	8	
	1000	5.3	60	3	3	3	3	3	3	3	4	5	
High pressure sodium vapour Without compensation	250	3		3	3	4	4	4	4	5	7	9	
	400	4.4		2	2	3	3	3	3	4	5	6	
	1000	10.3		1	1	1	1	1	1	2	2	2	
High pressure sodium vapour With compensation	250	1.45	40	5	5	5	5	10	10	12	16	20	
	400	2.5	45	4	4	4	4	6	6	7	9	11	
	1000	5.5	100	2	2	2	2	3	3	3	4	5	
	2500	2.17	-	3	3	4	4	4	4	5	7	9	
Metal iodide Without compensation	400	3.48	-	2	2	2	3	3	3	3	4	6	
	700	6.09	-	1	1	1	1	1	1	2	2	3	
	1000	8.7	-	1	1	1	1	1	1	1	2	2	
	2000	17.39	-	0	0	0	1	1	1	1	1	1	
	250	1.4	32	0	6	6	7	7	7	9	11	16	
	400	2.0	45	0	4	5	5	5	5	6	8	11	
Metal iodide With compensation	700	3.6	65	0	2	3	3	3	3	3	4	6	
	1000	5.3	85	0	2	2	2	2	2	2	3	4	
	2000	10.6	100	0	0	0	0	0	1	1	2	2	



## Diagrams

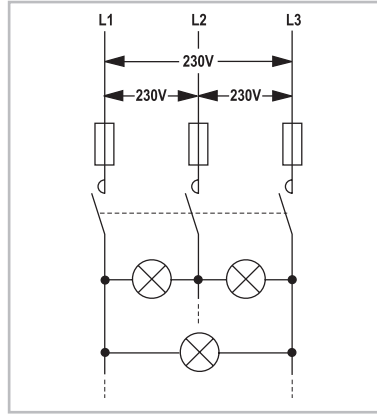
### Single-phase circuit

The total number of lamps will be as shown in the table.



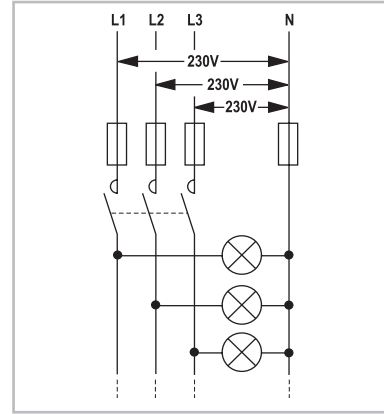
### 3-phase circuit, lamps delta-connected

The total number of lamps will be as shown in the table, multiplied by 1.73 and distributed in three equal quantities.



### 3-phase circuit, lamps star-connected

The total number of lamps will be as shown in the table, multiplied by 3 and distributed in three equal quantities.



Maximum number of lamps per phase at 230V

CL03	CL04	CL45	CL06	CL07	CL08	CL09	CL10	CK75C	CK08C	CK09	CK95	CK10	CK11	CK12	CK13
77	85	122	156	191	222	264	284	333	410	555	820	1320	1550	1860	1860
60	66	73	95	116	133	160	170	200	246	333	490	790	930	1120	1120
30	33	36	47	58	66	79	84	99	122	165	240	390	460	550	550
20	22	24	31	38	44	53	56	66	81	110	165	260	300	370	370
12	12	14	19	23	26	31	33	39	48	66	95	155	185	220	220
6	6	7	9	11	13	16	17	20	24	33	50	80	90	110	110
3	3	3	4	5	7	8	8	10	12	16	25	40	45	55	55
177	224	237	355	390	434	496	553	790	988	1245	1770	2340	2740	3910	4890
125	139	147	221	243	270	309	344	490	614	774	1090	1460	1700	2430	3040
105	118	124	186	204	227	260	289	413	516	650	920	1220	1430	2045	2550
66	74	78	116	127	142	163	181	259	324	409	570	770	900	1280	1600
30	34	36	54	59	66	76	85	121	151	190	270	360	420	600	750
119	134	149	191	232	273	312	347	496	621	786	900	1240	1450	1740	1740
92	103	115	148	180	212	243	270	385	482	610	700	960	1120	1350	1350
92	103	115	148	180	212	243	270	385	482	610	700	960	1120	1350	1350
59	66	74	95	115	136	155	173	248	310	393	440	610	720	860	860
23	23	29	37	45	53	60	67	96	120	152	170	240	280	330	330
14	15	18	27	30	33	36	42	60	75	95	136	181	211	302	377
9	10	12	18	20	22	24	28	40	49	62	89	119	138	198	247
5	6	7	11	12	13	14	17	24	30	38	54	71	83	119	149
4	4	5	8	9	9	10	12	17	21	27	39	51	60	86	107
31	27	33	49	55	60	66	77	109	156	156	171	311	311	374	467
25	17	20	31	34	37	41	48	87	125	125	137	249	249	299	374
16	10	12	18	20	22	24	28	54	78	78	86	156	156	187	234
10	7	8	12	13	15	16	19	36	52	52	57	104	104	125	156
10	11	13	19	21	24	26	30	43	54	68	96	129	150	214	268
7	7	9	13	15	16	18	20	29	37	46	66	88	102	146	183
3	3	4	6	6	7	7	9	12	16	20	28	37	44	62	78
16	25	30	44	49	54	59	69	57	81	81	90	163	163	195	244
14	14	17	26	29	31	34	40	51	72	72	80	145	145	174	217
7	6	8	12	13	14	16	18	23	33	33	36	65	65	78	98
12	12	12	19	21	23	25	29	41	52	65	93	124	145	207	259
8	8	8	12	13	14	16	18	26	32	41	58	78	91	129	162
4	4	4	7	7	8	9	10	15	18	23	33	44	52	74	92
3	3	3	5	5	6	6	7	10	13	16	23	31	36	52	65
2	2	2	2	3	3	3	4	5	6	8	12	16	18	26	32
21	21	21	32	36	39	43	50	68	97	97	107	195	195	234	292
15	15	15	23	25	28	30	35	48	69	69	76	138	138	166	208
8	8	8	13	14	15	17	19	34	48	48	53	96	96	115	144
6	6	6	8	9	10	11	13	26	37	37	40	73	73	88	110
3	3	3	4	5	5	6	7	22	31	31	34	62	62	75	93





## Small soft starter with integral by-pass

ASTAT S is compact, easy to operate soft starter, designed for use with standard 3-phase squirrel cage motors. It provides an advanced method of reducing current during motor starting and stopping. ASTAT S will start supplying a reduced voltage to the motor, increasing up to the rated voltage, so avoiding, high currents and generating soft starting and stopping.

The motor has to be able to start in a reduced voltage.

- Solid soft starter for standard 3ph AC motors up to 30kW at 400V AC
- Voltage ratings up to 600V
- Two phase control with integral by-pass
- Compact, small case
- DIN rail mounting. Optional from 31A
- Start and soft stop features

### Marking



The cUL is achieved for all range of ASTAT S, except for 58A models, items QA02P058S, QA12P058S, QA22P058S, QA32P058S.

### Technical data

#### Ratings

Voltage ratings	3ph AC systems 220/230V (+10%, -15%) for units QA02P___S 380/415V (+10%, -15%) for units QA12P___S 480/500V (+10%, -15%) for units QA22P___S 575/600V (+10%, -15%) for units QA32P___S
Frequency range	50/60Hz (±5%)
Load	3ph, AC standard motors

#### Control specifications

Ramp up	0,5 - 10 s
Ramp down	0,5 - 10 s
Initial voltage	0 - 80% Un
Starting torque	0 - 64% Tn

#### I/O control

Inputs	one input for Start/Stop
Outputs	one output for «End of Ramp» signal for ratings 31, 44, 58A

#### Ambient conditions

Operating temperature	0 to 40°C. Up to 60°C derating by 1,2% per °C
Storage temperature	-20 to 70°C
Relative humidity	up to 80%, without condensation
Max. altitude	up to 1000m. Above this derate by 5% each 100m
Protection degree	IP20

- Order codes ● page D.67
- Diagrams ● page D.68
- Performances ● page D.69
- Dimensions ● page D.70



Small soft starter with integral by-pass



Input voltage V/CA	Current rating (2) A	Maximum current A	Maximum motor power (1)				Cat. No.	Ref. no.	Pack
			220/230V kW / Hp	380/415V kW / Hp	480/500V kW / Hp	575/600V kW / Hp			
220	8	28	1.5 / 2	-	-	-	QA02P008S	120881	1
	17	60	4 / 5.5	-	-	-	QA02P017S	120882	1
	22	77	5.5 / 7.5	-	-	-	QA02P022S	120883	1
	31	110	7.5 / 10	-	-	-	QA02P031S	120884	1
	44	150	11 / 15	-	-	-	QA02P044S	120885	1
	58	200	15 / 20	-	-	-	QA02P058S	120886	1
400	8	28	-	4 / 5.5	-	-	QA12P008S	120892	1
	17	60	-	7.5 / 10	-	-	QA12P017S	120893	1
	22	77	-	11 / 15	-	-	QA12P022S	120894	1
	31	110	-	15 / 20	-	-	QA12P031S	120895	1
	44	150	-	22 / 30	-	-	QA12P044S	120896	1
	58	200	-	30 / 40	-	-	QA12P058S	120897	1
500	8	28	-	-	5.5 / 7.5	-	QA22P008S	120898	1
	17	60	-	-	11 / 15	-	QA22P017S	120899	1
	22	77	-	-	15 / 20	-	QA22P022S	120900	1
	31	110	-	-	22 / 30	-	QA22P031S	120901	1
	44	150	-	-	30 / 40	-	QA22P044S	120902	1
	58	200	-	-	45 / 60	-	QA22P058S	120903	1
600	8	28	-	-	-	7.5 / 10	QA32P008S	120904	1
	17	60	-	-	-	15 / 20	QA32P017S	120905	1
	22	77	-	-	-	22 / 30	QA32P022S	120906	1
	31	110	-	-	-	30 / 40	QA32P031S	120907	1
	44	150	-	-	-	37 / 50	QA32P044S	120908	1
	58	200	-	-	-	55 / 75	QA32P058S	120909	1
<b>Accessory</b>	DIN rail mounting kit for types 31A, 44A and 58A						QAOPDIN	120910	1

(1) Ratings for standard 4-poles AC motors  
 (2) See Operations/hour in table below  
 Cycles/hour includes both soft start and soft stop

Times between rampings Start/Stop

	Starting current	Ramp 1 sec.	Ramp 2 sec.	Ramp 5 sec.	Ramp 10 sec.
QA_2P008S	8	7	15	35	70
	16	16	33	77	155
	24	26	51	125	250
	28 (*)	32	62	155	-
QA_2P017S	17	7	15	35	70
	34	16	33	77	155
	51	26	51	125	250
QA_2P022S	60 (*)	32	62	155	-
	22	7	15	35	70
	44	16	33	77	155
QA_2P031S	66	26	51	125	250
	77 (*)	32	62	155	-
	31	4	8	20	40
QA_2P044S	62	8	15	38	76
	93	12	24	62	124
	110 (*)	15	31	80	-
	44	4	8	20	40
QA_2P058S	88	8	15	38	76
	132	12	24	62	124
	155 (*)	15	31	80	-
	58	4	8	20	40
QA_2P058S	116	8	15	38	76
	174	12	24	62	124
	200 (*)	15	31	80	-

(\*) Maximum starting current at all

Small soft starters

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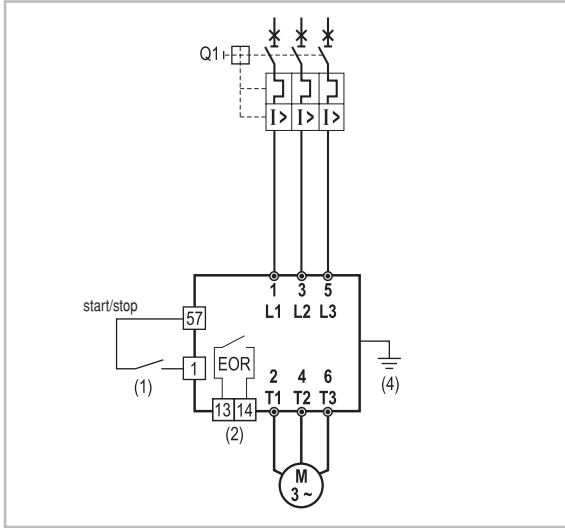
I

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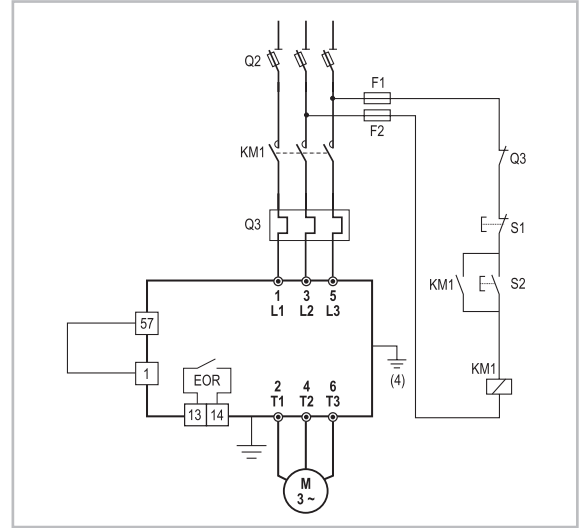


## Diagrams

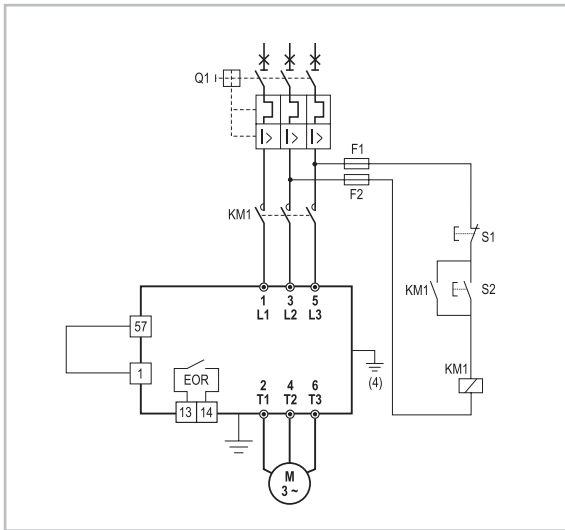
Control by permanent command (soft start and stop)



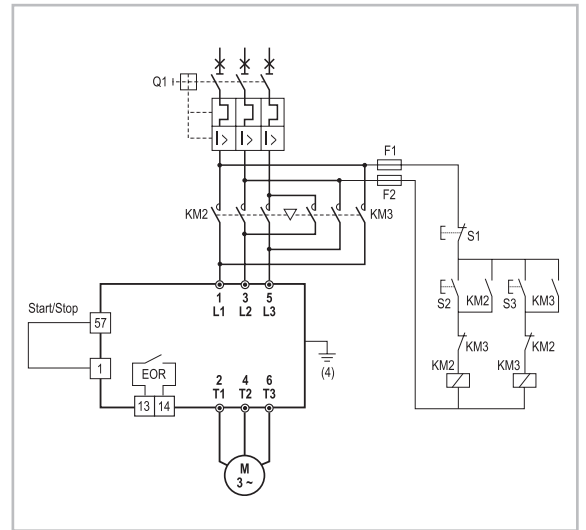
Control by push-buttons, line contactor and thermal overload relay (soft start)



Control by push-buttons and line contactor (soft start)



Forward/reverse control by push-buttons (3)



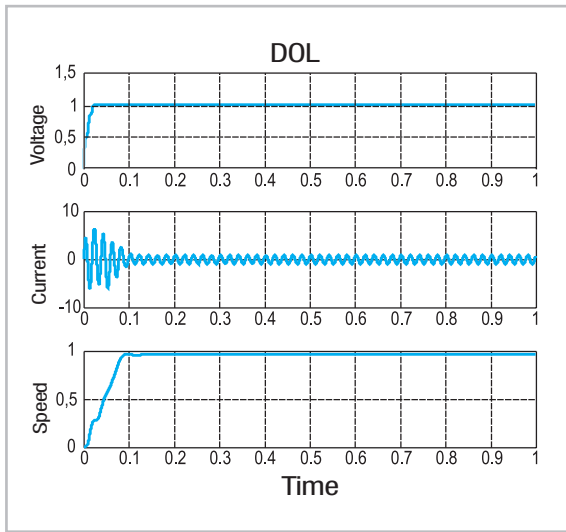
Motor power 380/415V kW Hp		ASTAT S	Q1	Q2 Am fuses	KM1 Contactor	Q3 Thermal overload relay	F1-F2	S1-S2-S3
4	5.5	QA12P008	GPS1B*AK	10	CL25A	RT A 1N	-	P9-P3
7.5	10	QA12P017	GPS1B*AN	25	CL25A	RT A 1S	-	P9-P3
11	15	QA12P022	GPS1B*AP	32	CL25A	RT A 1T	-	P9-P3
15	20	QA12P031	GPS1B*AR	40	CL04A	RT A 1V	-	P9-P3
22	30	QA12P044	GPS2B*AT	63	CL06A	RT A 2F	-	P9-P3
30	40	QA12P058	GPS2B*AU	80	CL07A	RT A 2H	-	P9-P3

Coordination type 1

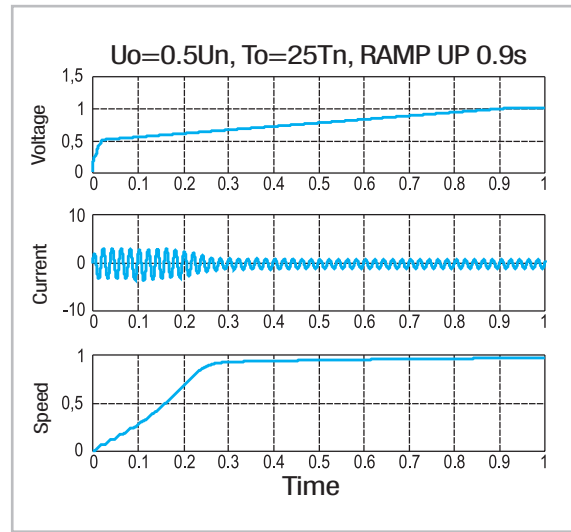
- (1) Use dry contact only.
- (2) End of Ramp output relay (only types 31A, 44A and 58A).
- (3) Forward/Reverse operation must be done when motor is not rotating.
- (4) Ground terminal only for types 31A, 44A and 58A.

Performances

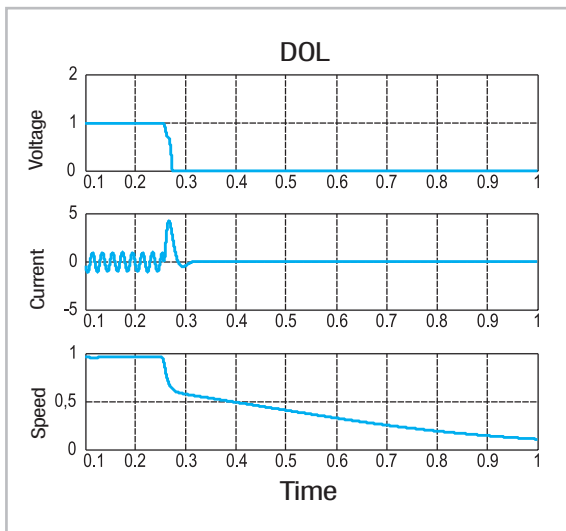
Direct-on-line start



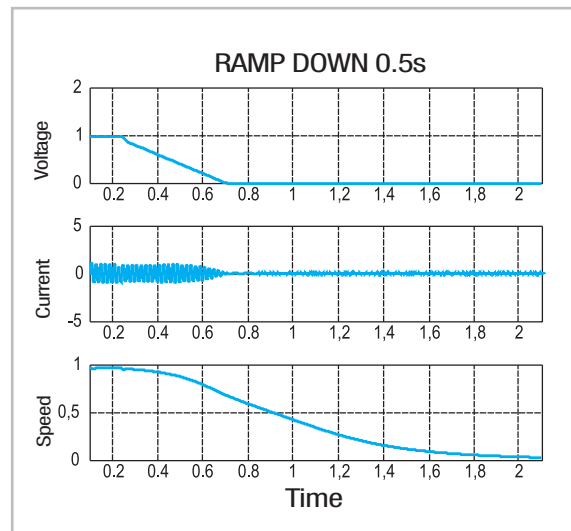
ASTAT S soft start



Direct-on-line stop

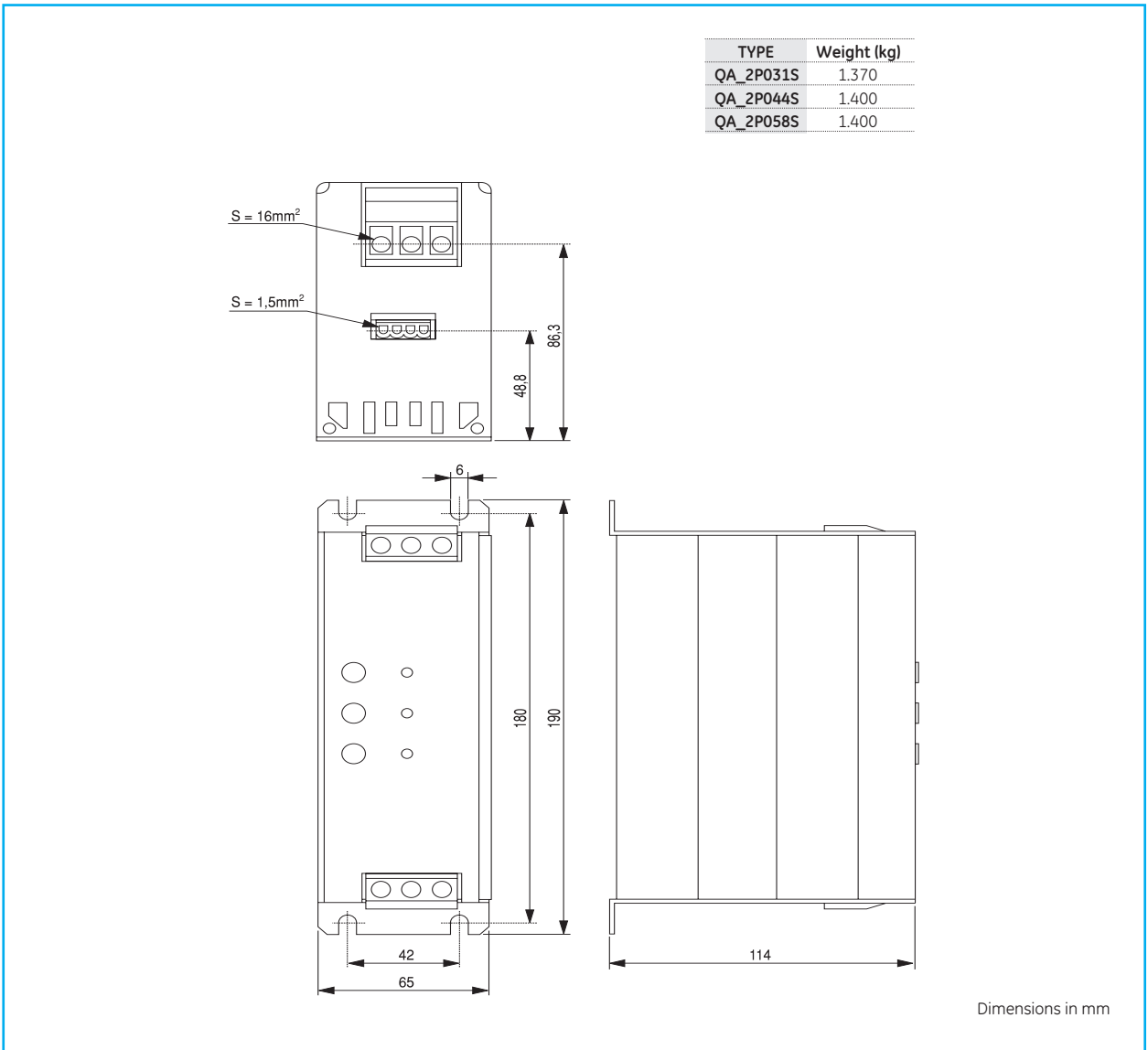
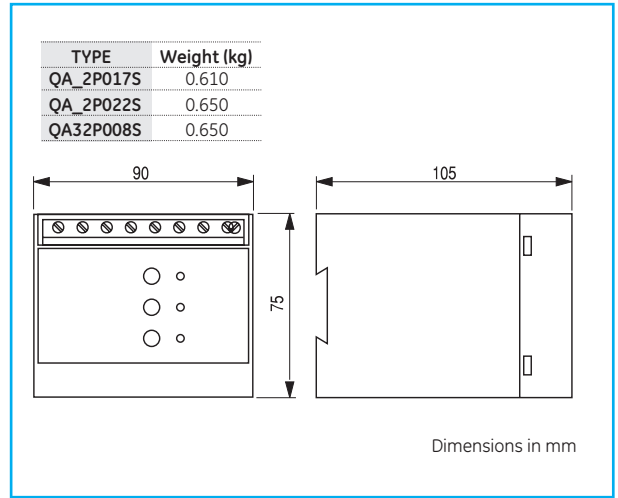
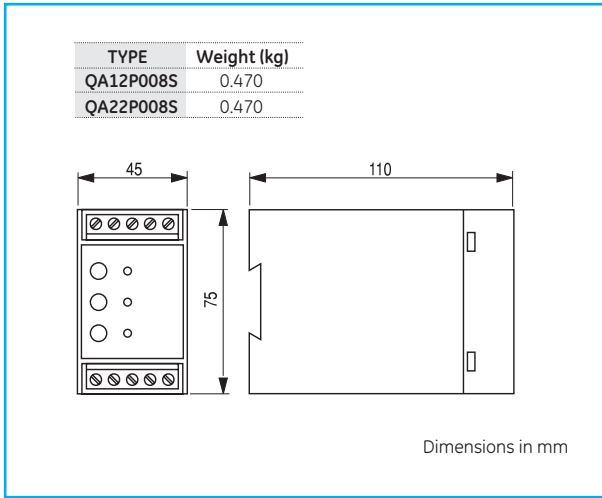


ASTAT S soft stop



## Dimensional drawings

### Small soft starter with integral by-pass





## ASTAT XT

### Digital soft starters for 3ph standard induction motors

GE's new ASTAT XT solid state soft starter features microprocessor control digital technology. Setup and adjustment is performed through a six-button keypad and parameters or messages are displayed out through a friendly LCD multilanguage interface with two rows, sixteen alphanumeric characters each. The design includes isolated I/O and high level of protection in their circuits to minimize the disturbance effects while working in the hardest industrial environment.

ASTAT XT Soft Starter offers reliable performance and smooth acceleration for a variety of standard AC motors up to 1400A and up to 690V, reducing mechanical shock to the driving system, resulting in extended component and motor life.

ASTAT XT offers many traditional features such a motor overload function, adjustable ramps, current limit, kick start, but also other high end features like Inside-Delta operation, Torque Control, Pump control and a reliable motor and unit set of protections.

### Key Features

- Ratings up to 1400Amps and up to 690VAC
- Friendly multilanguage interface with two rows, sixteen characters each
- Built-in with three extra power terminals for external bypass
- In-Line or Inside-Delta operation modes
- Torque control and pump control advanced features
- Motor protection according IEC 10, 20 and NEMA 10, 20, 30, even if ASTAT XT is in By-pass
- Built in communications RS485 port, and ModBus protocol as standard
- ProfibusDP and DeviceNet optional interfaces for communications

### Approvals / Marking



For units up to 820A. "U" type



### Control panel





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### IEC ratings. Recommended motor and type unit ratings

	Mains voltage	Max Current Rating	NORMAL DUTY (IEC Class 10)				HEAVY DUTY (IEC Class 20)				Cat. No.	Ref. No.	
			Rated Current	400V-230V	480V-415V	500V-690V	Rated Current	400V-230V	480V-415V	500V-690V			
			A	kW	kW	kW	A	kW	kW	kW			
230-500VAC	8	8	1.5	3	4	-	8	1.5	3	4	-	QT10008U21MS	169075
	17	17	4	7.5	7.5	-	12	3	5.5	5.5	-	QT10017U21MS	169076
	34	31	7.5	15	18.5	-	31	7.5	15	18.5	-	QT10031U21MS	169077
	54	44	11	22	30	-	44	11	22	30	-	QT10044U21MS	169078
	65	58	15	30	37	-	55	15	30	37	-	QT10058U21MS	169079
	72	72	22	37	45	-	66	18.5	37	45	-	QT10072U21MS	169080
	104	85	22	45	55	-	80	22	45	55	-	QT10085U21MS	169081
	130	105	30	55	55	-	99	30	55	55	-	QT10105U21MS	169082
	156	145	45	75	90	-	130	37	55	90	-	QT10145U21MS	169083
	170	170	55	90	110	-	134	37	75	90	-	QT10170U21MS	169084
	248	210	55	110	132	-	203	55	110	132	-	QT10210N21MS	169091
	361	310	90	160	200	-	310	75	160	200	-	QT10310N21MS	169092
	390	390	110	200	250	-	344	110	160	250	-	QT10390N21MS	169093
	480	460	132	250	315	-	432	132	250	315	-	QT10460N21MS	169094
	480	460	132	250	315	-	432	132	250	315	-	QT10460U21MS	169088
	610	580	160	315	400	-	488	160	250	355	-	QT10580N21MS	169095
	610	580	160	315	400	-	552	160	315	400	-	QT10580U21MS	169089
820	650	200	355	400	-	552	160	315	400	-	QT10650N21MS	169096	
820	820	250	400	560	-	690	200	400	500	-	QT10820U21MS	169090	
1180	950	315	560	630	-	950	315	560	630	-	QT10950N21MS	169097	
1375	1100	355	630	800	-	1076	355	630	800	-	QT11100N21MS	169098	
1750	1400	400	800	1000	-	1400	400	800	1000	-	QT11400N21MS	169099	
690VAC	8	8	-	-	-	5.5	8	-	-	-	5.5	QT30008N21MS	169119
	17	17	-	-	-	15	12	-	-	-	7.5	QT30017N21MS	169120
	34	31	-	-	-	22	31	-	-	-	22	QT30031N21MS	169121
	54	44	-	-	-	37	44	-	-	-	37	QT30044N21MS	169122
	65	58	-	-	-	55	55	-	-	-	45	QT30058N21MS	169123
	72	72	-	-	-	55	66	-	-	-	55	QT30072N21MS	169124
	104	85	-	-	-	75	80	-	-	-	75	QT30085N21MS	169125
	130	105	-	-	-	90	99	-	-	-	90	QT30105N21MS	169126
	156	145	-	-	-	132	130	-	-	-	90	QT30145N21MS	169127
	170	170	-	-	-	160	134	-	-	-	132	QT30170N21MS	169128
	248	210	-	-	-	200	203	-	-	-	200	QT30210N21MS	169129
	361	310	-	-	-	250	310	-	-	-	250	QT30310N21MS	169130
	390	390	-	-	-	355	344	-	-	-	315	QT30390N21MS	169131
	480	460	-	-	-	400	432	-	-	-	400	QT30460N21MS	169132
	610	580	-	-	-	560	488	-	-	-	400	QT30580N21MS	169133
	820	650	-	-	-	630	552	-	-	-	560	QT30650N21MS	169134
	1180	950	-	-	-	900	950	-	-	-	900	QT30950N21MS	169135
1375	1100	-	-	-	1000	1076	-	-	-	1000	QT31100N21MS	169136	
1750	1400	-	-	-	-	1400	-	-	-	-	QT31400N21MS	169137	

#### Remark

Motor kW ratings given in above table are for IEC, standard AC four poles motors. Always check that motor rated current is less than the specified rated current of the starter, for the specific application (Normal Duty or Heavy Duty)



QT10008U21MS  
ASTAT XT 8A-72A



QT10105U21MS  
ASTAT XT 105A-170A



QT10210N21MS  
ASTAT XT 210A-390A



QT10460N21MS  
ASTAT XT 460A-650A

**NEMA ratings. Recommended unit type and motor ratings**

	LIGHT DUTY Nema 10				NORMAL DUTY Nema 20				HEAVY DUTY Nema 30				Cat. No.	Ref. No.
	Current Rating	230V	460V	575V	Current Rating	230V	460V	575V	Current Rating	230V	460V	575V		
	A	HP	HP	HP	A	HP	HP	HP	A	HP	HP	HP		
Mains voltage 230-500VAC	8	2	5	-	8	2	5	-	8	2	5	-	QT10008U21MS	169075
	17	5	10	-	17	5	10	-	12	3	7.5	-	QT10017U21MS	169076
	34	10	25	-	31	10	20	-	31	10	20	-	QT10031U21MS	169077
	54	20	40	-	44	15	30	-	44	15	30	-	QT10044U21MS	169078
	65	20	50	-	58	20	40	-	55	20	40	-	QT10058U21MS	169079
	72	25	50	-	72	25	50	-	66	20	50	-	QT10072U21MS	169080
	104	40	75	-	85	30	60	-	80	30	60	-	QT10085U21MS	169081
	130	50	100	-	105	40	75	-	99	40	75	-	QT10105U21MS	169082
	156	60	125	-	145	50	100	-	130	50	100	-	QT10145U21MS	169083
	170	60	125	-	170	60	125	-	134	50	100	-	QT10170U21MS	169084
	262	100	200	-	210	75	150	-	203	75	150	-	QT10210U21MS	169085
	387	150	300	-	310	100	250	-	310	100	250	-	QT10310U21MS	169086
	414	150	350	-	390	150	300	-	361	150	300	-	QT10390U21MS	169087
	480	200	400	-	460	150	350	-	432	150	350	-	QT10460U21MS	169088
	610	250	500	-	580	200	400	-	552	200	400	-	QT10580U21MS	169089
	820	-	-	-	820	250	500	-	690	250	500	-	QT10820U21MS	169090
Mains voltage 460-600VAC	8	-	5	5	8	-	5	5	8	-	5	5	QT20008U21MS	169100
	17	-	10	15	17	-	10	15	12	-	7.5	10	QT20017U21MS	169101
	34	-	25	30	31	-	20	25	31	-	20	25	QT20031U21MS	169102
	54	-	40	50	44	-	30	40	44	-	30	40	QT20044U21MS	169103
	65	-	50	60	58	-	40	50	55	-	40	50	QT20058U21MS	169104
	72	-	50	60	72	-	50	60	66	-	50	60	QT20072U21MS	169105
	104	-	75	100	85	-	60	75	80	-	60	75	QT20085U21MS	169106
	130	-	100	125	105	-	75	100	99	-	75	100	QT20105U21MS	169107
	156	-	125	150	145	-	100	150	130	-	100	125	QT20145U21MS	169108
	170	-	125	150	170	-	125	150	134	-	100	125	QT20170U21MS	169109
	262	-	200	250	210	-	150	200	203	-	150	200	QT20210U21MS	169110
	387	-	300	400	310	-	250	300	310	-	250	300	QT20310U21MS	169111
	414	-	350	400	390	-	300	400	361	-	300	300	QT20390U21MS	169112
	480	-	400	500	460	-	350	400	432	-	350	400	QT20460U21MS	169113
	610	-	500	-	580	-	400	400	552	-	400	500	QT20580U21MS	169114
	820	-	-	-	820	-	500	500	690	-	500	-	QT20820U21MS	169115

**Remark**

Motor HP ratings given in above table are for NEMA, standard AC four poles motors. Always check that motor rated current is less than the specified rated current of the starter, for the specific application (Light duty, Normal duty or Heavy duty)

Order codes

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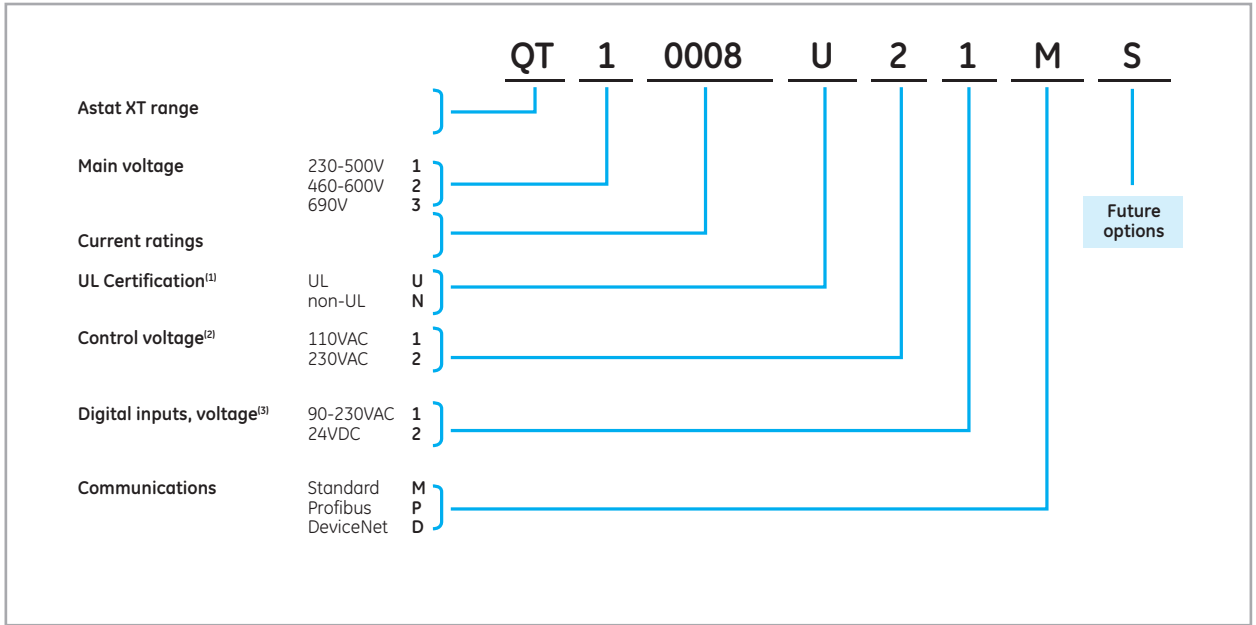
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## Unit configuration



- (1) - ASTAT XT up to 600V, and up to 170A (Cat Numbers up to QT10170\_ or up to QT20170) are always cUL certified. Option "N" not available  
 - Units QT2, from QT20008\_, up to QT20820\_ are always cUL certified. Option "N" not available.  
 - Units QT1, or QT2 from QTx0950\_ up to QTx1400 are not UL certified. Option "U" not available.  
 - Units QT3\_, rated to 690V, are not UL certified. Option "U" not available
- (2) ASTAT XT standard Control Voltage configuration is option 2, Voltage 230VAC, +10%, -15%
- (3) ASTAT XT standard configuration for Inputs is option 1, Voltage 90-230VAC, +10%, -15%

## Technical Data

### Ratings

Main voltage	3Ph AC supply	230 to 500VAC +10%, -15% for QT1xxx units 460 to 600VAC +10%, -15% for QT2xxx units 690VAC +10%, -15% for QT3xxx units
Starter current rating	for 3Ph AC motors	From 8A up to 1400A.
Motor current rating	3 phases Induction motors	Motor rated current from 50% to 100% of starter current
Control voltage	1ph AC supply	230VAC, +10, -15%, 50/60Hz, or 110VAC, +10, -15%, 50/60Hz (optional)
Frequency range	50/60Hz systems	Wide from 45Hz to 65Hz. Auto-tracking frequency range

### Control specifications

Control system	Digital control with microcontroller. Starting ramp, with progressive increase in voltage and current limitation	
Operation mode	In-Line (three wires) or Inside-Delta (six wires) of the motor	
Run operation	Soft Start and Soft stop by multiple choices, including torque control both at start or Stop phases	
Operator interface	By LCD display, keypad and Indication LEDs Display: LCD with two rows, 16 characters each Type: Multilanguage, dip-switch selectable for English, Italian, Spanish and German Keys: Six keys, Mode, reset, Set, Select and Up / Down LEDs: ON, Start, Run, Soft Stop, Stop, Save / Slow Speed, Dual Set / Reverse and Fault	
Initial voltage	10-50% Un. Up to 80% with expanded settings function	
Starting current	100-400% In. Can be extended up to 500%, by using extended settings	
Acceleration ramp time	1-30 sec. Can be extended up to 90sec, by using extended settings	
Deceleration ramp time	1-30 sec. Can be extended up to 90sec, by using extended settings	
Current limitation	100-400% of motor rated current. Can be extended up to 500% by using extended settings	
Bypass	By external contactor while motor is full protected by ASTAT XT.	
Monitoring	Motor Current, Line Voltage, motor thermistor resistance, Test & Maintenance and Statistics	

### Environmental conditions

Operating temperature	-10 up to 50°C, with current derating by 2.5% per °C, from 40°C	
Storage temperature	-20°C up to 70°C	
Maximum altitude	Up to 1000 mts. Ask your dealer for installation at higher altitude	
Humidity	95% at 50°C or 98% at 45°C	
Protection degree	IP20 for units up to 72A, IP00 for units from 85A up to 1400A	
Pollution degree	Class 3	

### Standards

Global standards	CE for the full range. UL, cUL for specified units up to 820A	
EMC emissions	EN 61000-6-4 CISPR 11 Class A	
Immunity	EN 61000-6-2 ESD 8KV air, IEC 801-2; Electric RF field 10 V/m, 20-100Mhz, IEC 801-3 Fast transients 2KV, IEC 801-4	
Safety	EN 600947-1 Related to safety requirements. UL508C	



## Functions

### Available standard functions

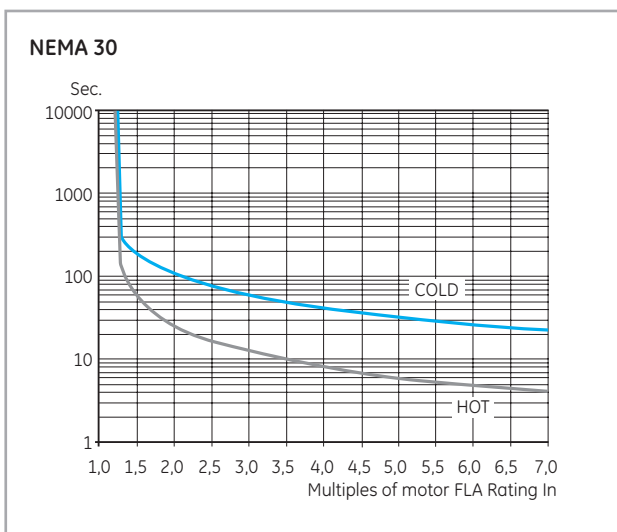
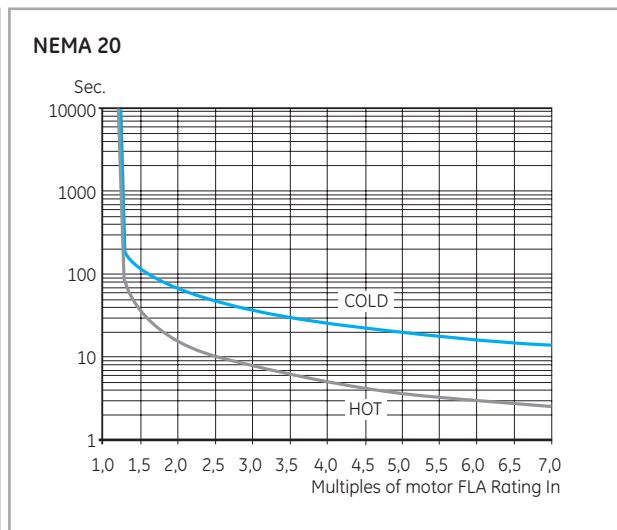
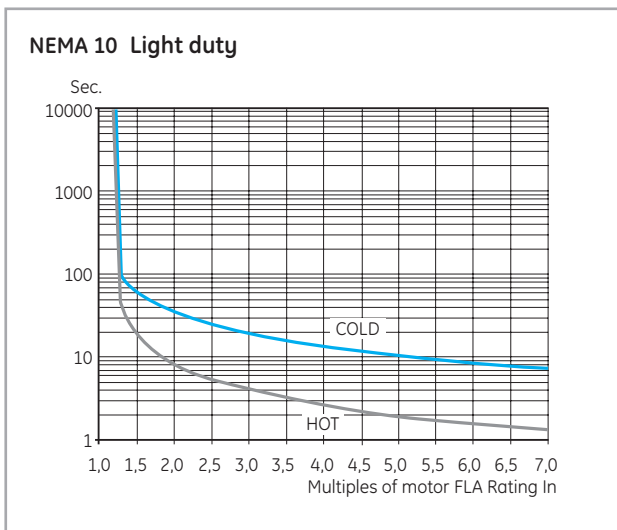
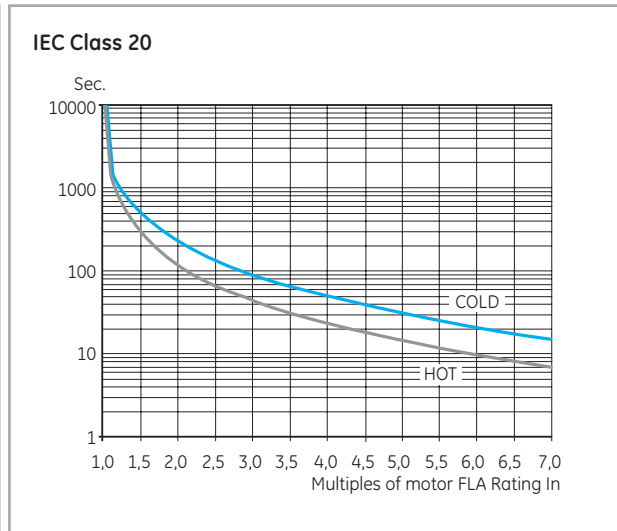
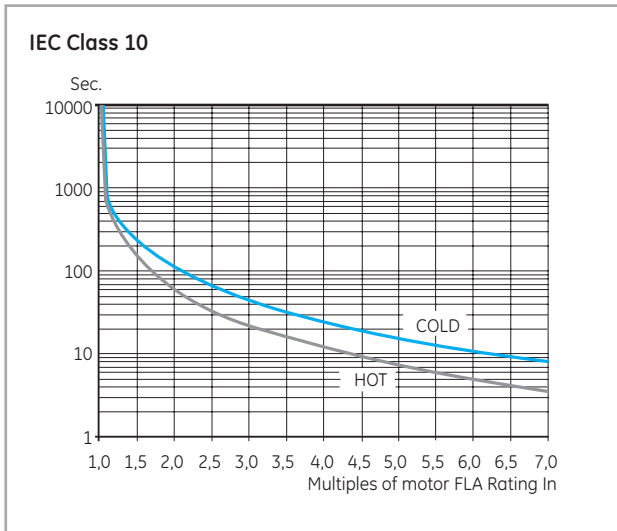
Soft start and soft stop	ASTAT XT is provided with a soft start and soft stop features, including five independent acceleration and deceleration curve models. The factory default curve is used for general purpose, other three are used for pump control and the last one for torque control.
Pump control	Specific function for pump control, that avoids overpressure in the system at the end of acceleration phase and suppresses the hammering at stopping phase.
Torque control	Provides a smooth time controlled torque ramp acceleration and deceleration, with linear deceleration of the torque resulting in a close to linear speed deceleration, thus eliminating stall conditions
In line / Inside delta	ASTAT XT allows either traditional Line operation or Inside Delta operation. When the ASTAT XT is installed to operate Inside Delta, the individual phases of the starter are connected in series with the individual motor windings (six wiring connections like the Start-Delta starters), thus reducing the current x1.73, and allowing the use of a much smaller starter (x1.5 less than motor rated current).
Bypass	ASTAT XT allows bypass operation using an external contactor, controlled ON/OFF by starter function EOR (End Of Ramp). The starter is provided with three dedicated power terminals to facilitate wirings to the bypass contactor. ASTAT XT protections to motor are enabled, even in bypass.
Kick start	This function allows to start high friction loads that require high starting torque for a short period of time. When this function is enabled, a pulse of 80% Un during an adjustable time from 0 to 1sec is given to the motor. After this pulse the output voltage is ramping down to Starting Voltage setting, before ramping up again to full voltage.
End of ramp	Detects end of acceleration and outputs a signal by a dry relay contact. This signal can be delayed by an adjustable timer from 0-120 sec.
Lock-Out	Allows to control the number of startings into a period of time, then protecting both motor and ASTAT.
Dual settings	By this function, ASTAT XT is able to control a secondary motor Dual setting of Starting Voltage, Starting Current, Current Limit, Ramp Up, Ramp Down and Motor current parameters can be selected by using one of the programmable ASTAT XT's inputs
Energy saving	Activated when the motor has a light load for extended periods of time, then reducing the output voltage level and decreasing the reactive current and motor copper/iron losses. This function can be enabled or disabled by dedicated parameters in ASTAT XT.
Slow speed	Function that allows the motor to run at 1/6 constant rated speed, for a short period of time of maximum 30sec. This function supports forward and reverse operation.
Auto reset	This function allows the ASTAT XT automatic recover after a fault caused by Undervoltage, Undercurrent or Phase lost. Auto-Reset can be programmed up to maximum 10 attempts.
Cooling fan control	Allows three methods of control for the ASTAT's built-in cooling fans. - Continuous Operation - Controlled by an external Input - Automatically OFF controlled, after five minutes ASTAT XT is stopped
Generator supply	This is a specific function useful when the Starter is powered from a diesel generator rather than from commercial power supply. The function is enabled by an internal Dip Switch, and helps to minimize the negative effects caused by the generator's voltage fluctuations during starting.
Keypad lock	This function is enabled by means of starter's internal dipswitch, then locking the keypad. This is useful to prevent undesired parameter modifications.
Built-in communications	ASTAT XT includes a ModBus RTU communications protocol. Communications are carried out through a half duplex RS485 port, with maximum baudrate of 9600, supporting up to 247 stations.
Statistic data	ASTAT XT records useful data for maintenance and start up - Last 10 trip events - Statistical data like number of starts, number of trip events and elapsed RUN time. - Last trip data information of Motor current, Starting current and acceleration time.

### Motor and starter protection

Overload	Trips the ASTAT-XT when current exceeds the Overload Trip level according IEC Class 10, 20 or NEMA 10, 20, 30
Motor thermistor	Trips when motor thermistor resistance decreases below trip level set ASTAT XT allows both PTC or NTC sensors, with adjustable trip level
Too many starts	Trips if the number of starts, during Duty Cycle Time exceeds the preset number
Long start time	Trips if output voltage does not reach rated voltage at the preset Max. Start time
O/C JAM fault	Trips under the following conditions: - Instantaneously when current exceeds 8.5 x ASTAT-XT Current - During starting when current exceeds 8.5 x Motor Current - During running when current exceeds 200-850% of Motor Current O/C JAM has a programmable tripping delay of 0-5 seconds
Undercurrent	Trips when line current drops below the preset level for the preset time.
Undervoltage	Trips when line voltage drops below the preset level for the preset time.
Overvoltage	Trips when line voltage increases above a preset level for a preset time
Phase loss	Trips if 1 or 2 phases are lost
Frequency loss	Trips if frequency is not in the range of 40-66.6Hz
Phase sequence	Trips if line phase sequence is wrong
Slow speed time	Trips when operating at slow speed for extended periods
Wrong connection	Trips the ASTAT-XT when one or more motor phases is not properly connected to ASTAT-XT's load terminals or if there is an internal disconnection in the motor winding
Shorted SCR	Trips and prevents starting if any SCR is short-circuited or when motor windings are shorted
Over temperature	Heat-sink over-temperature. Trips the ASTAT-XT when the heat-sink temperature rises above 85°C
External fault	Trips the ASTAT-XT when a N.O. contact between terminals 19-21 closes for over two seconds
Wrong parameters	Parameters not transferred from RAM to EEPROM or vice versa
OC or wrong CON	Trips when the ASTAT-XT is connected Inside Delta and Wrong connection or overcurrent is detected

## Overload protections - Thermal characteristics

The ASTAT XT allows motor protection according IEC Class 10 or Class 20 and NEMA 10, 20 or 30, user free selectable by ASTAT internal dedicated parameter.

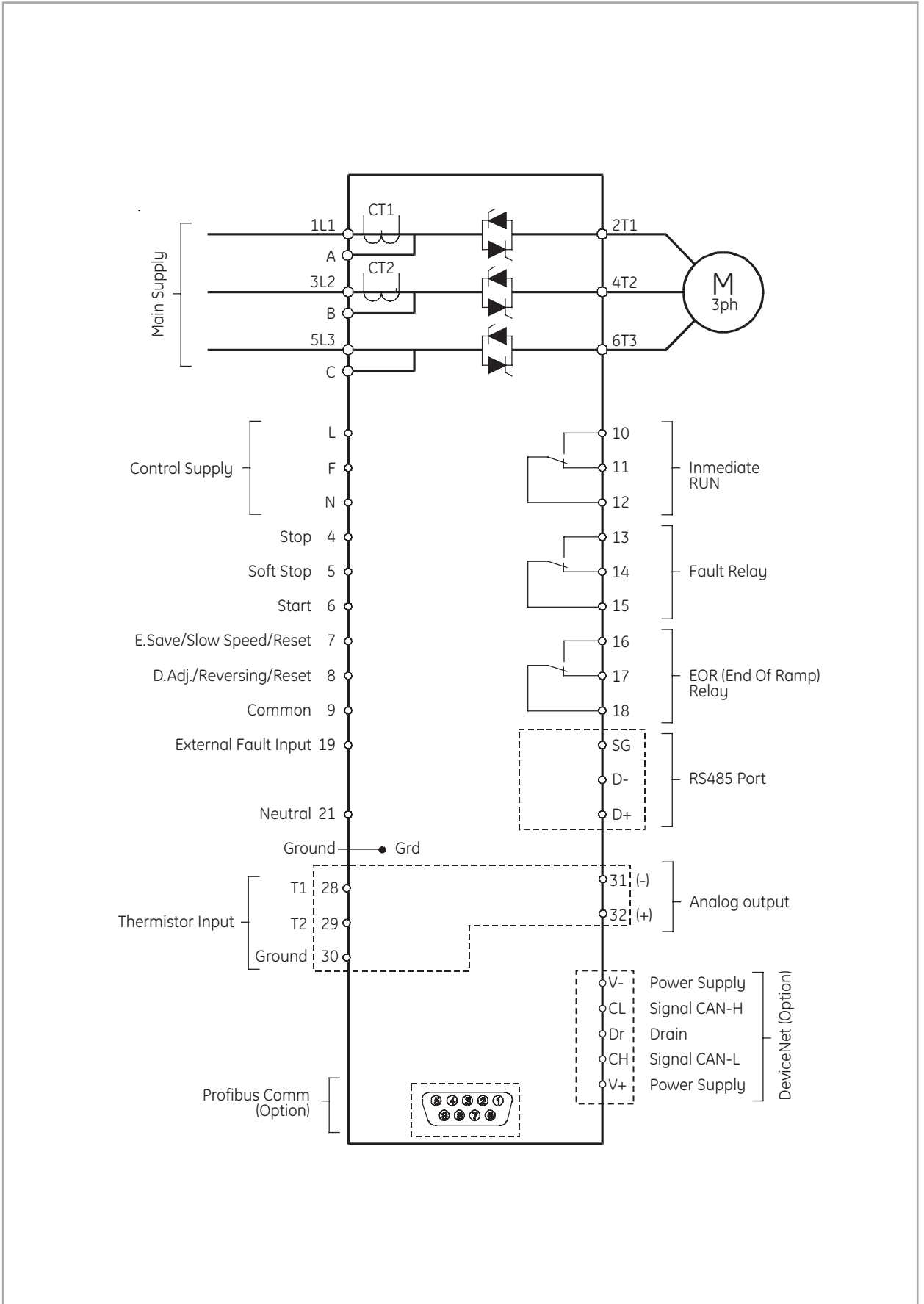


### Maximum number starting /hour

Starting current I/In <sup>(1)</sup>	Ramp time		
	10s	20s	30s
2	24	12	8
3	16	8	5
4	12	6	4

(1) In= rated current of ASTAT XT in the specified class IEC/Nema

I/O Wiring, Basic scheme



## I/O terminal board specifications

### Power I/O terminals

Terminals	Function	Description
1L1, 3L2, 5L3	Mains Input	3ph Input voltage according Astat XT Main Voltage Option rating (Option 1, QT1_) 230-500VAC, +10%/-15% 50/60Hz (Option 2, QT2_) 460-600VAC, +10%/-15% 50/60Hz (Option 3, QT3_) 690VAC, +10%/-15% 50/60Hz
2T1, 4T2, 6T3	Output to motor	Power Output terminals to 3ph AC motor
A, B, C	By-pass	Bypass terminals for external by-pass contactor
G	Ground	ASTAT XT, ground connection

### Control power supply

L, N	Control Supply	a110VAC or 220VAC, according ASTAT XT Control Voltage rating
F	Fan control	Cooling fan external control, together with jumper J1 <b>Control Voltage &amp; Fan consumption VA:</b> QTx0008 to QTx0031: No fan. Total consumption: 150VA QTx0044 to QTx0072: Fan 35 VA. Total consumption 185VA QTx0085 to QTx0170: Fan 60 VA. Total consumption 210VA QTx0210 to QTx0390: Fans 105VA. Total consumption 255VA QTx0390 to QTx 1400A : Fans 150VA.Total consumption 300VA

### Digital inputs

4	Stop	Dedicated input to Stop
5	Soft Stop	Dedicated input to Soft Stop
6	Start	Dedicated input to Start
7	Programmable Inputs	Programmable to functions Energy Saving, Slow Speed and Reset
8	Programmable Inputs	Programmable to functions Dual Set, Reverse and Reset
9	Common	Common terminal for digital inputs from 4, 5, 6, 7 and 8
		<b>Operating Voltage of digital inputs from 4 to 9</b> Digital Input hardware is operated according either of below ordered voltage ratings (Option 1, standard) From 90 to 230VAC +10%, 50/60Hz (Option 2, Optional) 24VDC +10%/ -15%

### Other inputs

19, 21	External fault	Requires a free voltage relay contact, to detect external fault
21	Neutral	This terminal may be connected to Mains Neutral when available
28, 29	Motor thermistor	PTC or NTC programmable input for motor thermistor protection The input can be enabled or disabled, and programmed at desired trip level resistance

### Digital outputs

10, 11, 12	RUN	Run Relay with NO & NC dry contact. Programmable ON delay
13, 14, 15	FAULT	Fault to ON or Fault to OFF programmable function
16, 17, 18	EOR	End Of Ramp relay. Programmable ON delay
		<b>Relay Outputs Ratings</b> Max rating: 8A, 250VAC, 2000VA max

### Analogue output

31, 32	Current output	Range 0 to 2xIn. Programmable 0-10VDC, 0-20mA or 4-20mA.
30	Ground	Ground terminal for Analog Output

### Communications

D+, D-, SG	RS485 terminals	RS485 Communication port, half duplex for ModBus protocol Baudrate 1200, 2400, 4800, 9600 BPS
D-9 connector	Profibus port	Optional Profibus Communications port
V+, CL, Dr, CH, V-	DeviceNet terminals	Optional Devicenet Communications port

A

B

C

D

E

F

G

H

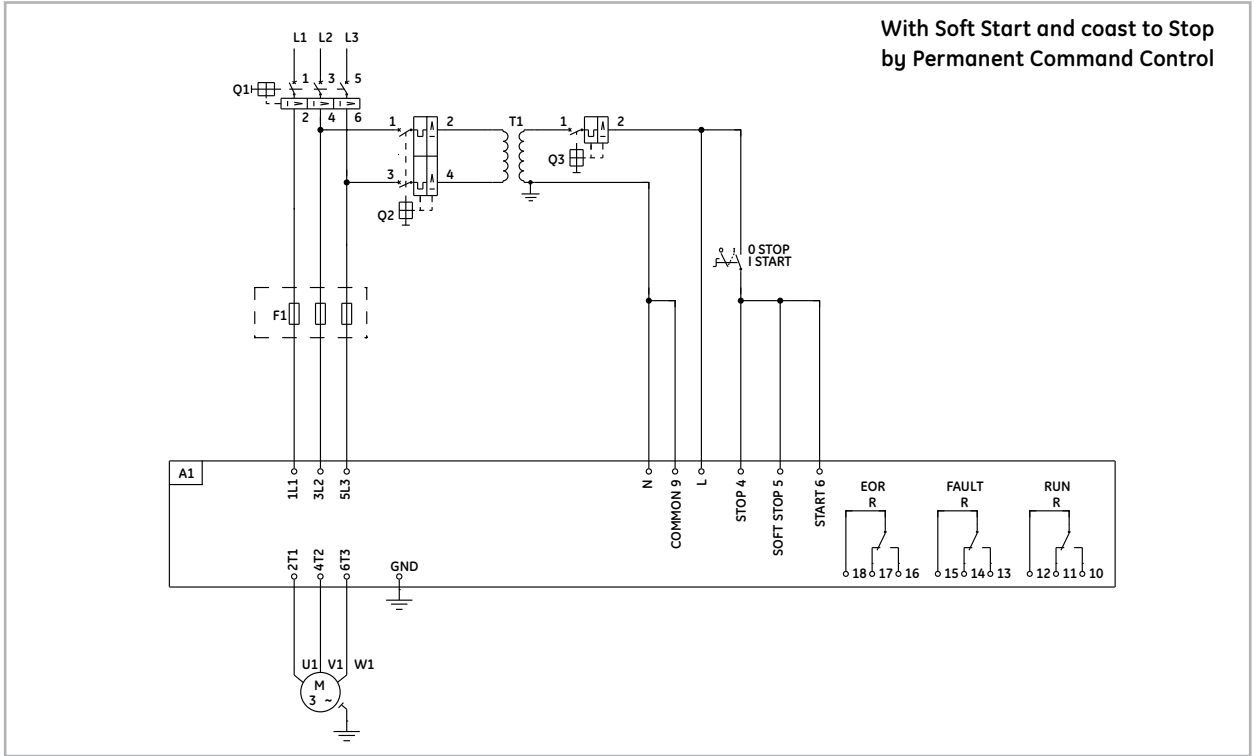
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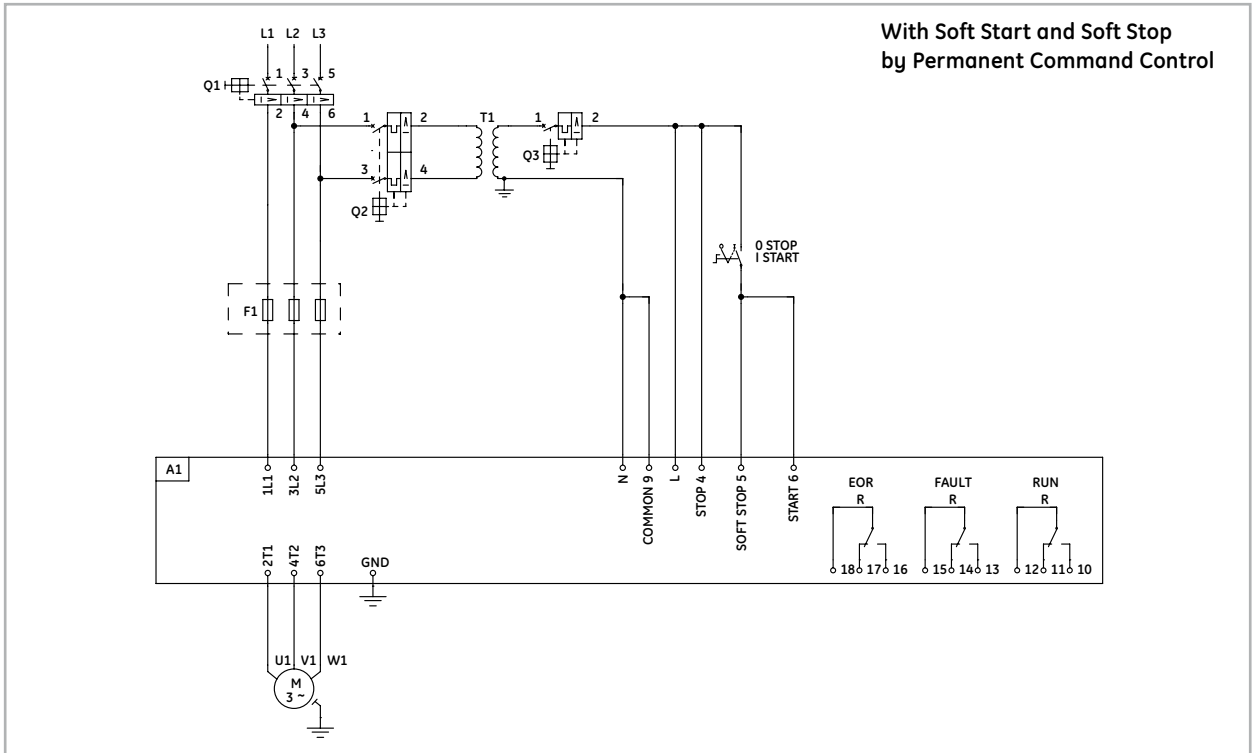


Application wiring diagrams

Basic diagram without line contactor<sup>(1)</sup>



Basic diagram without line contactor<sup>(1)</sup>



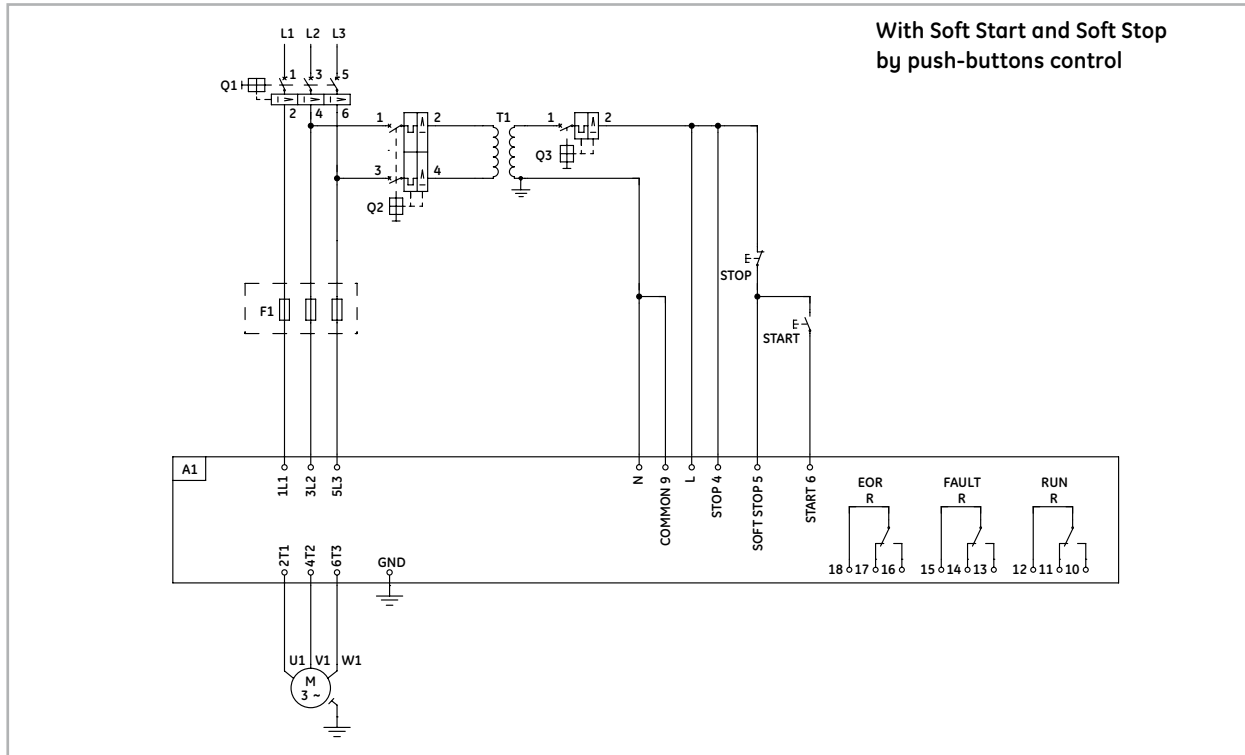
(1) Schemes are given for information purposes. Add additional emergency safety stop, if it is required for your application.

Remarks

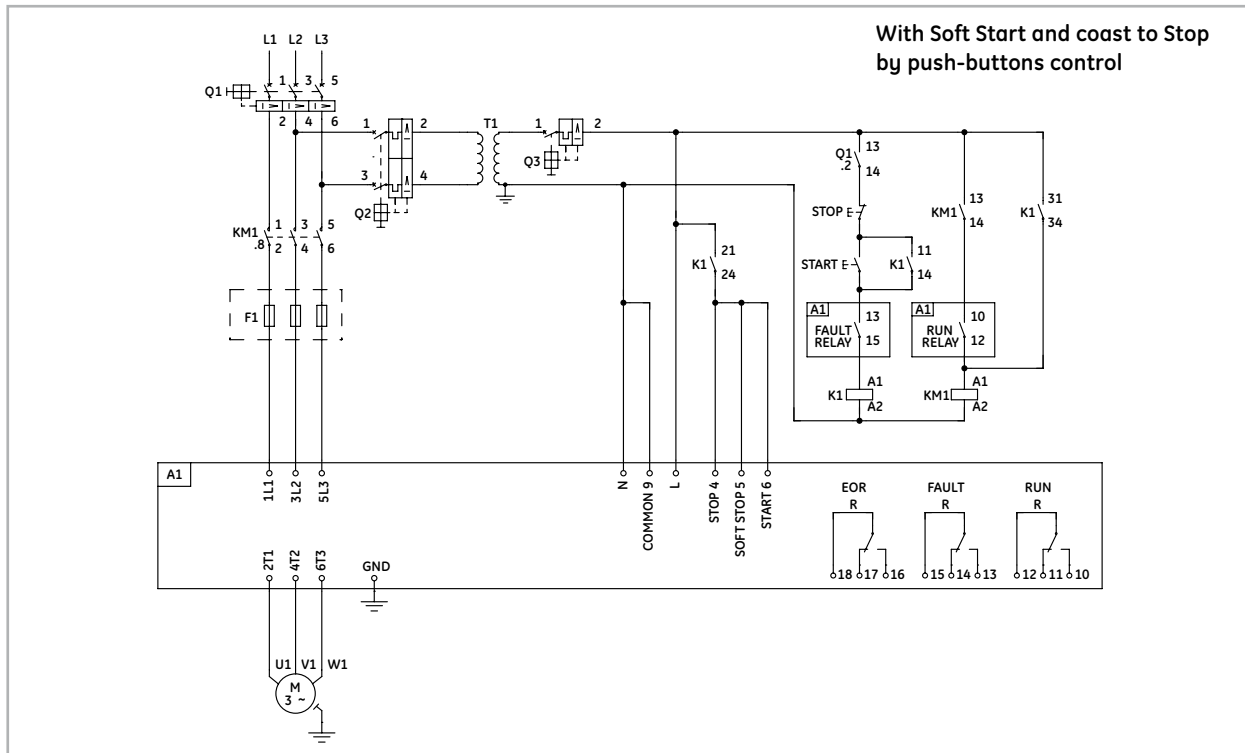
1. Check coordination tables for proper selection of Breaker and Line contactor.
2. Control Voltage and Control Input voltage are from same source in above example. Please check manuals if you have different sources for Control Voltage and Control input Voltage.
3. Semiconductor Fuses "F" are only required for Type 2 coordination. Please check coordination tables
4. In spite of ASTAT XT can operate without line contactor, the use of a line contactor will increase the operation safety. Anyway provide a way to switch off the Breaker in case of an emergency.

## Application wiring diagrams

### Basic diagram without line contactor<sup>(1)</sup>



### Basic diagram with line contactor<sup>(1)</sup>



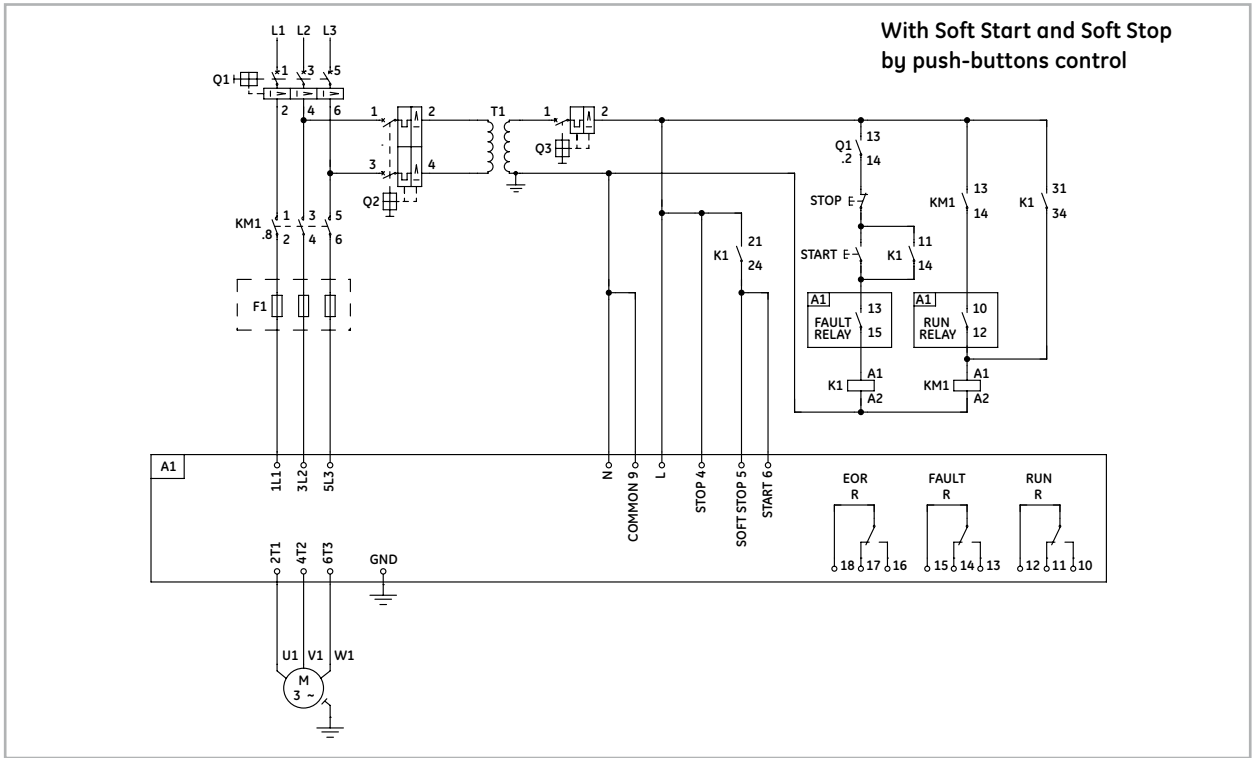
(1) Schemes are given for information purposes. Add additional emergency safety stop, if it is required for your application.

#### Remarks

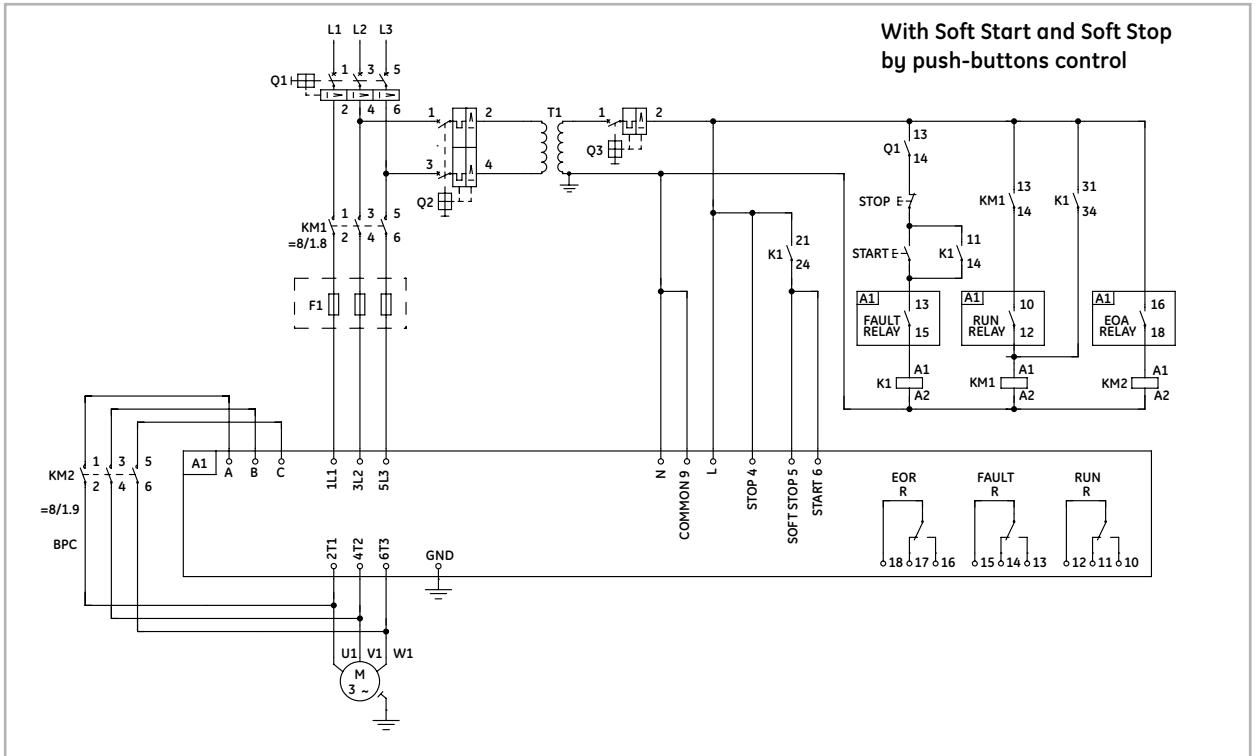
1. Check coordination tables for proper selection of Breaker and Line contactor.
2. Control Voltage and Control Input voltage are from same source in above example. Please check manuals if you have different sources for Control Voltage and Control input Voltage.
3. Semiconductor Fuses "F" are only required for Type 2 coordination. Please check coordination tables
4. In spite of ASTAT XT can operate without line contactor, the use of a line contactor will increase the operation safety. Anyway provide a way to switch off the Breaker in case of an emergency.

Application wiring diagrams

Basic diagram with line contactor<sup>(1)</sup>



Basic diagram with line and bypass contactors<sup>(1)</sup>



(1) Above schemes are given for information purposes. Add additional emergency safety stop, if it is required for your application.

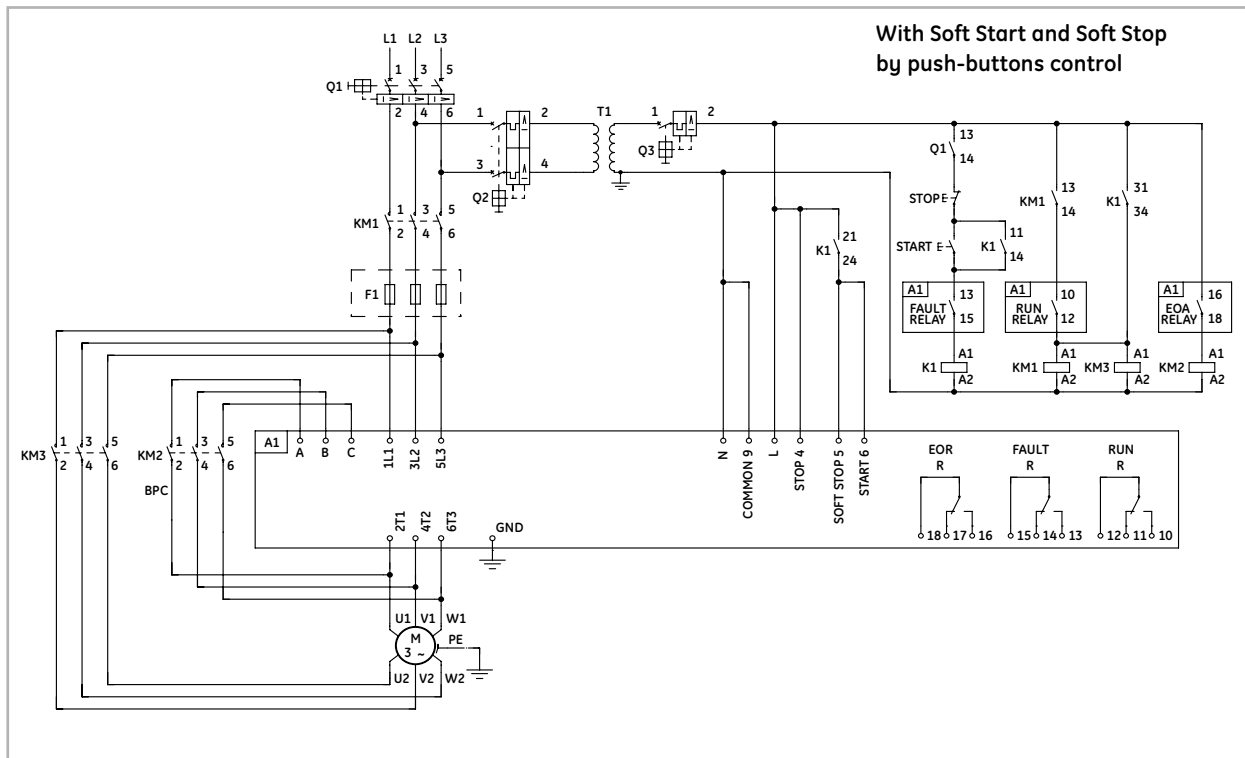
Remarks

1. Check coordination tables for proper selection of Breaker and Line contactor.
2. Control Voltage and Control Input voltage are from same source in above example. Please check manuals if you have different sources for Control Voltage and Control input Voltage.
3. Semiconductor Fuses "F" are only required for Type 2 coordination. Please check coordination tables



## Application wiring diagrams

### Basic diagram in "Inside Delta" configuration with line and bypass contactors<sup>(1)</sup>



(1) Above schemes are given for information purposes. Add additional emergency safety stop, if it is required for your application.

#### Remarks

1. Check coordination tables for proper selection of Breaker and Line contactor.
2. Control Voltage and Control Input voltage are from same source in above example. Please check manuals if you have different sources for Control Voltage and Control input Voltage.
3. Semiconductor Fuses "F" are only required for Type 2 coordination. Please check coordination tables
4. Wrong connection of the motor, or the ASTAT-XT when it is Inside-delta connected may seriously damage the motor or the ASTAT-XT. Please check additional details given in the ASTAT XT's instruction manual.

## Coordination Type 1

A

B

C

D

E

F

G

H

I

X

### Combination with aM fuses - 415V

Main Voltage Up to 415VAC	Rating (A)	ASTAT-XT type		aM fuses		Contactor Type	Short-circuit current
			Cat. No.		Rating (A)	CL/CK series	Iq (kA)
	8	-	QT10008	-	16	CL00	80
	17	-	QT10017	-	20	CL02	80
	31	-	QT10031	-	35	CL04	80
	44	-	QT10044	-	50	CL06	80
	58	-	QT10058	-	80	CL07	80
	72	-	QT10072	-	100	CL08	80
	85	-	QT10085	-	125	CL09	80
	105	-	QT10105	-	160	CL10	80
	145	-	QT10145	-	200	CK75C	80
	170	-	QT10170	-	200	CK08C	80
	210	-	QT10210	-	250	CK09B	80
	310	-	QT10310	-	400	CK95B	80
	390	-	QT10390	-	500	CK10C	80
	460	-	QT10460	-	630	CK11C	80
	580	-	QT10580	-	800	CK12B	80
	650	-	QT10650	-	1000	CK13B	80
	950	-	QT10950	-	2x630	-	80
	1100	-	QT11100	-	2x800	-	80
	1400	-	QT11400	-	2x800	-	80

### Combination with Record Plus MCCB'S - 415V

Main Voltage Up to 415VAC	Rating (A)	ASTAT-XT type		Circuit Breaker		Contactor Type	Short-circuit current
			Cat. No.	Record Plus	Rating (A)	CL/CK series	Iq (kA)
	8	-	QT10008	FD63	16	CL45	65
	17	-	QT10017	FD63	40	CL06	65
	31	-	QT10031	FD63	50	CL06	65
	44	-	QT10044	FD160	63	CL06	65
	58	-	QT10058	FD160	80	CL07	65
	72	-	QT10072	FD160	80	CL08	65
	85	-	QT10085	FE160	125	CL10	65
	105	-	QT10105	FE160	160	CL10	65
	145	-	QT10145	FE160	160	CK85B	65
	170	-	QT10170	FE250	160	CK08	65
	210	-	QT10210	FE250	160	CK85	65
	310	-	QT10310	FG400	400	CK10C	65
	390	-	QT10390	FG400	400	CK12B	65
	460	-	QT10460	FG630	630	CK12B	65
	580	-	QT10580	FG630	630	CK13B	65
	650	-	QT10650	FK1250	1000	CK13B	50
	950	-	QT10950	FK1250	1000	-	50
	1100	-	QT11100	FK1250	1250	-	50
	1400	-	QT11400	FK1600	1600	-	50

### Combination with aM fuses - 500V

Main Voltage 500 VAC	Rating (A)	ASTAT-XT type		aM fuses		Contactor Type	Short-circuit current
			Cat. No.		Rating (A)	CL/CK series	Iq (kA)
	8	QT10008	QT20008	-	16	CL00	80
	17	QT10017	QT20017	-	20	CL02	80
	31	QT10031	QT20031	-	35	CL04	80
	44	QT10044	QT20044	-	50	CL06	80
	58	QT10058	QT20058	-	80	CL07	80
	72	QT10072	QT20072	-	100	CL08	80
	85	QT10085	QT20085	-	125	CL09	80
	105	QT10105	QT20105	-	160	CL10	80
	145	QT10145	QT20145	-	200	CK75C	80
	170	QT10170	QT20170	-	200	CK08C	80
	210	QT10210	QT20210	-	250	CK09B	80
	310	QT10310	QT20310	-	400	CK95B	80
	390	QT10390	QT20390	-	500	CK10C	80
	460	QT10460	QT20460	-	630	CK11C	80
	580	QT10580	QT20580	-	800	CK12B	80
	650/820	QT10650	QT20820	-	1000	CK13B	80
	950	QT10950	QT20950	-	2x630	-	80
	1100	QT11100	QT21100	-	2x800	-	80
	1400	QT11400	QT21400	-	2x800	-	80



Coordination Type 2

Combination with semiconductor fuses - 415V

Main Voltage Up to 415VAC	Rating (A)	ASTAT-XT type		Semiconductor fuses <sup>(1)</sup>	Contactor Type	Short-circuit current
		Cat. No.	Bussmann type	CL/CK series	Iq (kA)	
	8	-	QT10008	170M3808D	CL25	80
	17	-	QT10017	170M3810D	CL25	80
	31	-	QT10031	170M3813D	CL04	80
	44	-	QT10044	170M3814D	CL45	80
	58	-	QT10058	170M3814D	CL07	80
	72	-	QT10072	170M3815D	CL08	80
	85	-	QT10085	170M3816D	CL09	80
	105	-	QT10105	170M3817D	CL10	80
	145	-	QT10145	170M3817D	CK75C	80
	170	-	QT10170	170M3819D	CK08C	80
	210	-	QT10210	170M4864D	CK09B	80
	310	-	QT10310	170M4864D	CK95B	80
	390	-	QT10390	170M5814D	CK10C	80
	460	-	QT10460	170M5820D	CK11C	80
	580	-	QT10580	170M5816D	CK12B	50
	650	-	QT10650	2x170M5814D	CK13B	80
	950	-	QT10950	2x170M5816D	-	80
	1100	-	QT11100	2x170M6892D	-	80
	1400	-	QT11400	2x170M8555D	-	80

Combination with semiconductor fuses - 500V

Main Voltage 500 VAC	Rating (A)	ASTAT-XT type		Semiconductor fuses <sup>(1)</sup>	Contactor Type	Short-circuit current
		Cat. No.	Bussmann type	CL/CK series	Iq (kA)	
	8	QT10008	QT20008	170M3808D	CL25	80
	17	QT10017	QT20017	170M3810D	CL25	80
	31	QT10031	QT20031	170M3813D	CL04	80
	44	QT10044	QT20044	170M3814D	CL06	80
	58	QT10058	QT20058	170M3814D	CL07	80
	72	QT10072	QT20072	170M3815D	CL08	80
	85	QT10085	QT20085	170M3816D	CL09	80
	105	QT10105	QT20105	170M3817D	CL10	80
	145	QT10145	QT20145	170M3817D	CK75C	80
	170	QT10170	QT20170	170M3819D	CK08C	80
	210	QT10210	QT20210	170M4864D	CK09B	80
	310	QT10310	QT20310	170M4864D	CK10C	80
	390	QT10390	QT20390	170M5814D	CK10C	80
	460	QT10460	QT20460	170M5820D	CK11C	80
	580	QT10580	QT20580	170M5816D	CK12B	50
	650/820	QT10650	QT20820	2x170M5814D	CK13B	80
	950	QT10950	QT20950	2x170M5816D	-	80
	1100	QT11100	QT21100	2x170M6892D	-	80
	1400	QT11400	QT21400	2x170M8555D	-	80

Combination with semiconductor fuses - 690V

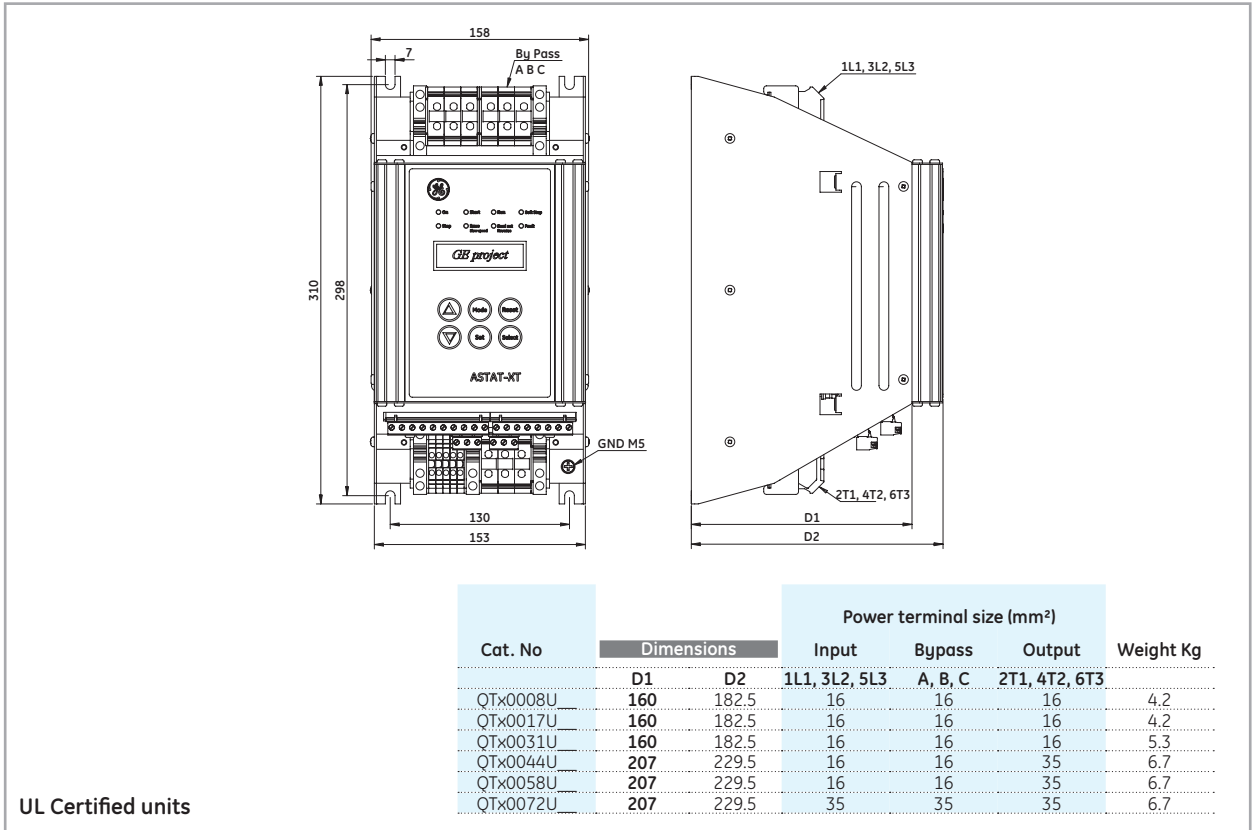
Main Voltage 690 VAC	Rating (A)	ASTAT-XT type		Semiconductor fuses <sup>(1)</sup>	Contactor Type	Short-circuit current
		Cat. No.	Bussmann type	CL/CK series	Iq (kA)	
	8	-	QT30008	170M3808D	CL25	50
	17	-	QT30017	170M3810D	CL25	50
	31	-	QT30031	170M3813D	CL06	50
	44	-	QT30044	170M3814D	CL06	50
	58	-	QT30058	170M3814D	CL07	50
	72	-	QT30072	170M3815D	CL08	50
	85	-	QT30085	170M3816D	CK75C	50
	105	-	QT30105	170M3817D	CK75C	50
	145	-	QT30145	170M3817D	CK08B	50
	170	-	QT30170	170M3819D	CK08B	50
	210	-	QT30210	170M4864D	CK08B	50
	310	-	QT30310	170M4864D	CK10C	50
	390	-	QT30390	170M5814D	CK10C	50
	460	-	QT30460	170M5820D	CK12B	50
	580	-	QT30580	170M5816D	CK12B	30
	650	-	QT30650	2x170M5814D	-	50
	950	-	QT30950	2x170M5816D	-	50
	1100	-	QT31100	2x170M6892D	-	50
	1400	-	QT31400	2x170M8555D	-	50

(1) Semiconductor Fuses must be always used for Type 2 coordination

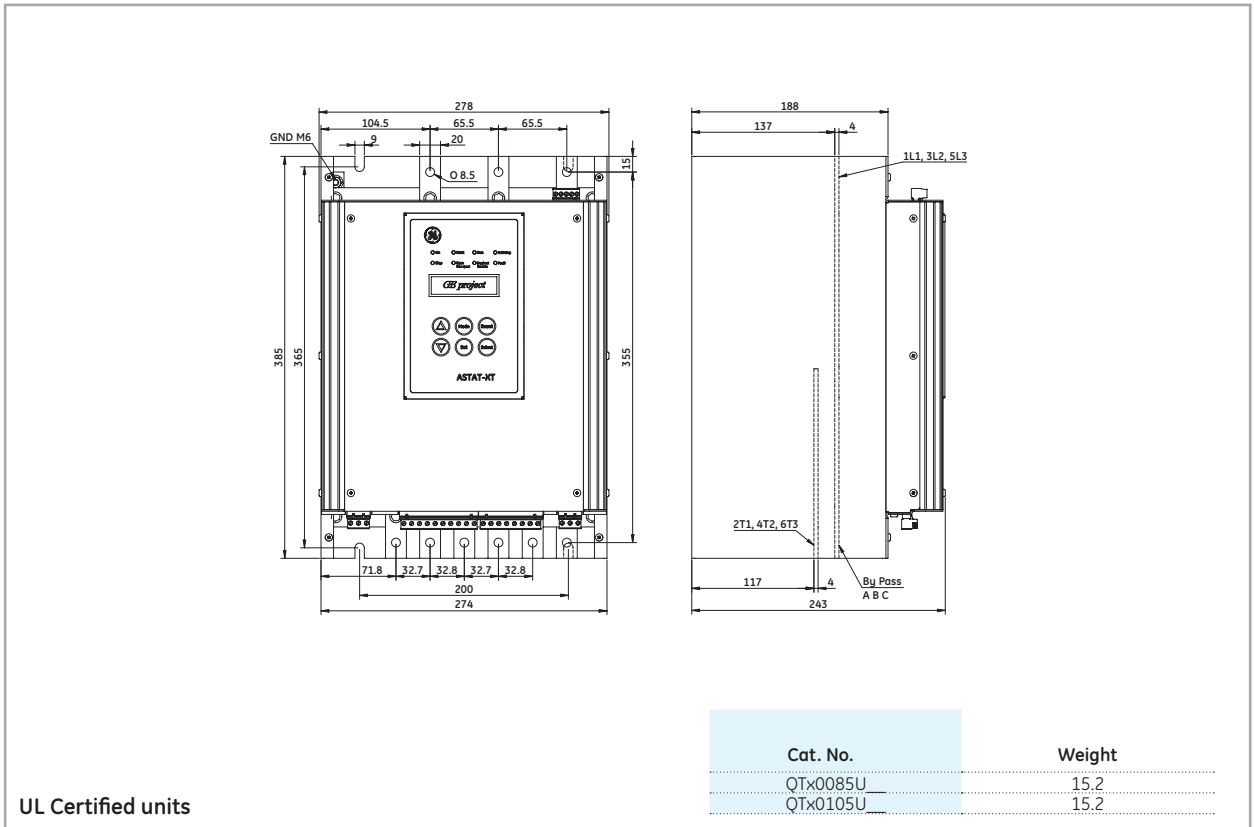


## Dimensions and weights

Cat. No.: QTx0008U\_, QTx0017U\_, QTx0031U\_, QTx0044U\_, QTx0058U\_, QTx0072U\_

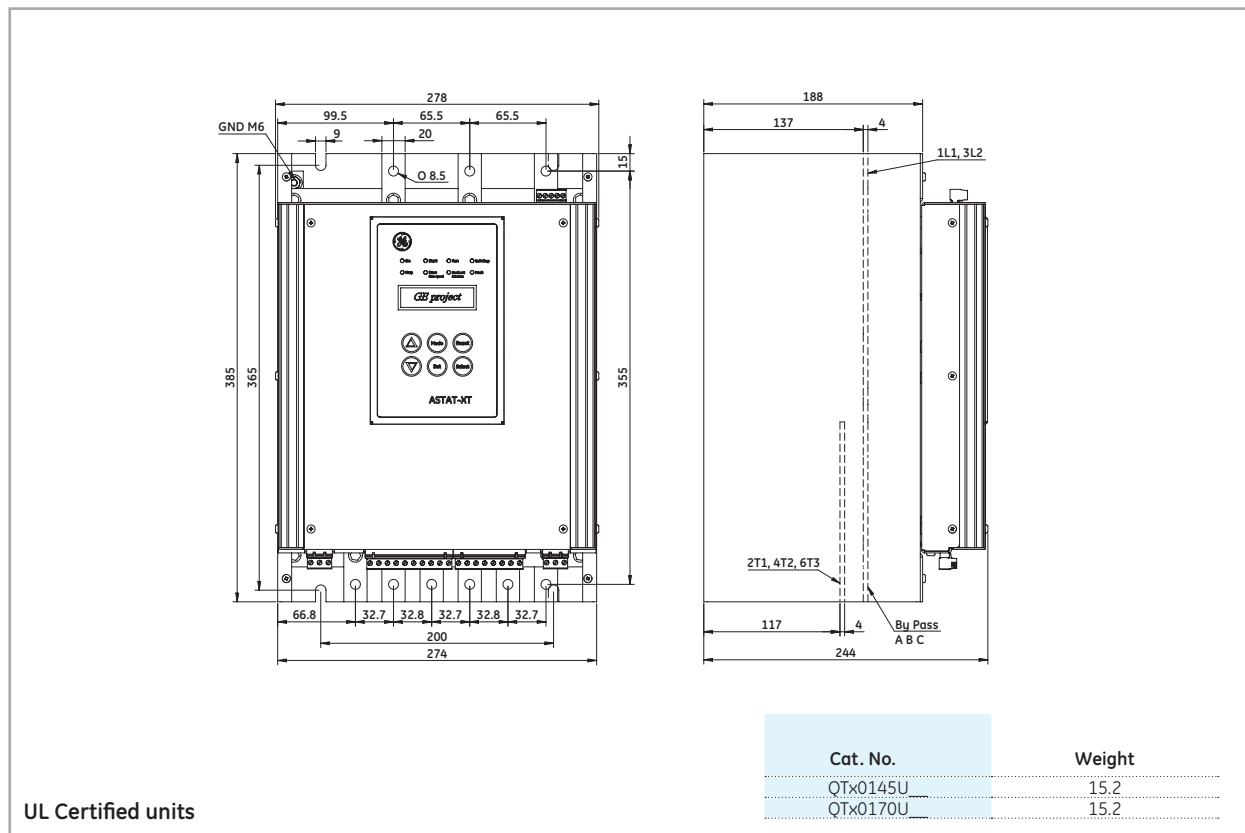


Cat. No.: QTx0085U\_, QTx0105U\_

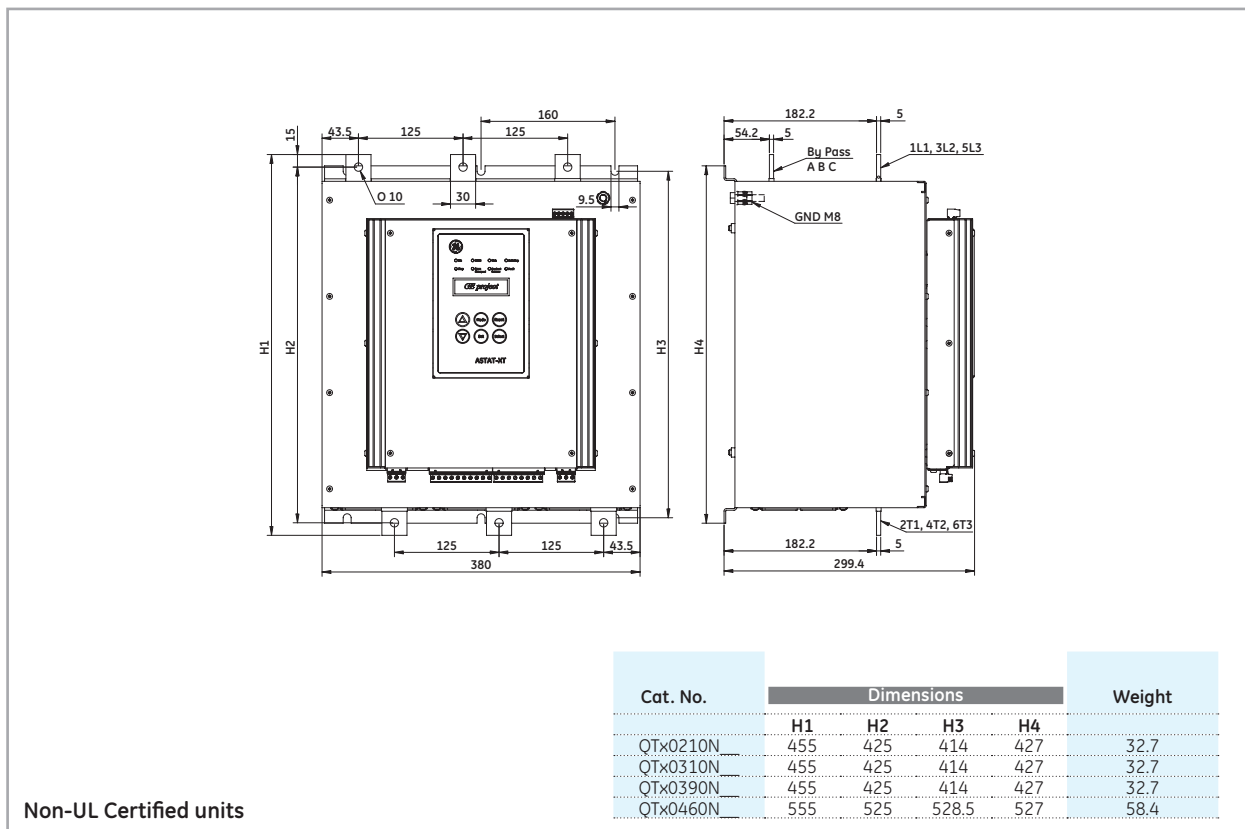


Dimensions and weights

Cat. No.: QTx0145U\_ , QTx0170U\_



Cat. No.: QTx0210N\_ , QTx0315N\_ , QTx0390N\_ , QTx0460N\_



Dimensions

A

B

C

D

E

F

G

H

I

X





Dimensions and weights

Cat. No.: QTx0580N\_

Digital Soft Starters

A

B

C

D

E

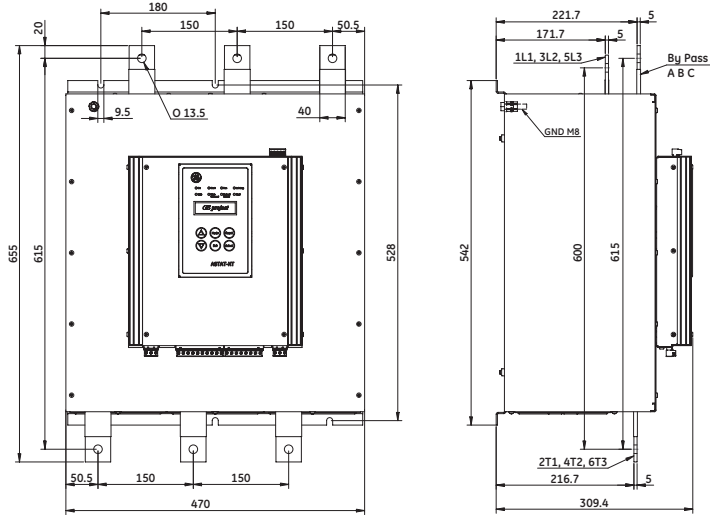
F

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X



Non-UL Certified unit

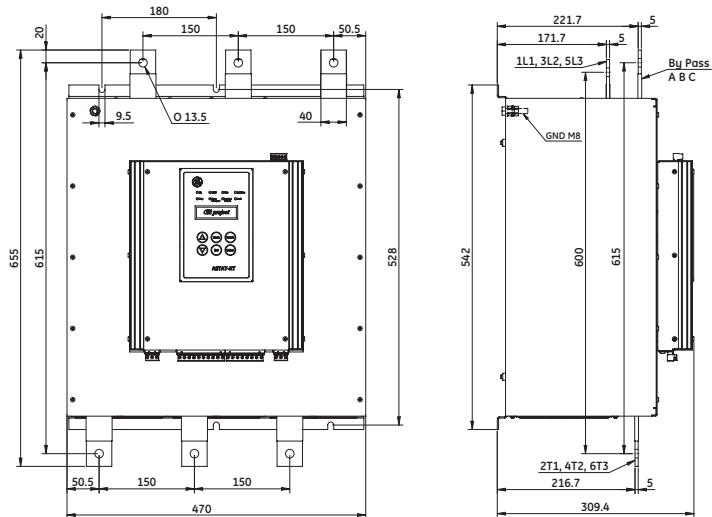
Cat. No.

QTx0580U

Weight

63.2

Cat. No.: QTx0650N\_



Non-UL Certified units

Cat. No.

QTx0650N

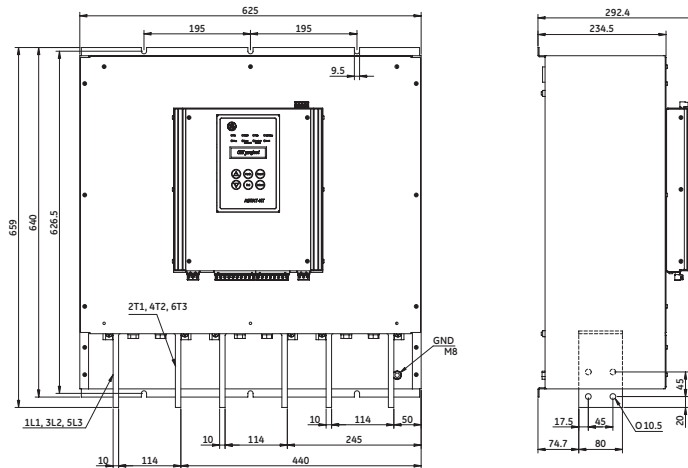
Weight

64.8



## Dimensions and weights

Cat. No.: QTx0950N\_



**Remarks**

1. This unit must be operated with a bypass contactor
2. Add space for current transformers (supplied separately from the main unit) and bus bars for preparation for bypass

Approximate current transformers dimensions: W=240mm, H=130mm, D=90mm

Non-UL Certified unit

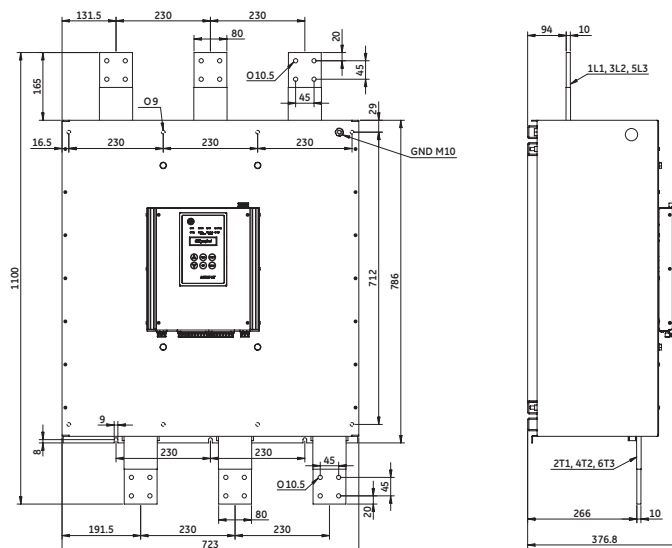
Cat. No.

QTx0950N

Weight

86.7

Cat. No.: QTx1100N\_ , QTx1400N



**Remarks**

1. Units must be operated with a bypass contactor
2. Add space for current transformers (Supplied separately from main unit) and bus bars for preparation for bypass

Approximate current transformers dimensions:

W=240mm, H=130mm, D=90mm. (for 1100A unit, Cat Numbers QTx1100N\_

W=270mm, H=155mm, D=90mm. (for 1400A unit, Cat Numbers QTx1400N\_

Non-UL Certified unit

Cat. No.

QTx1100N

Weight

169.8

QTx1400N

175.5

Dimensions

A

B

C

D

E

F

G

H

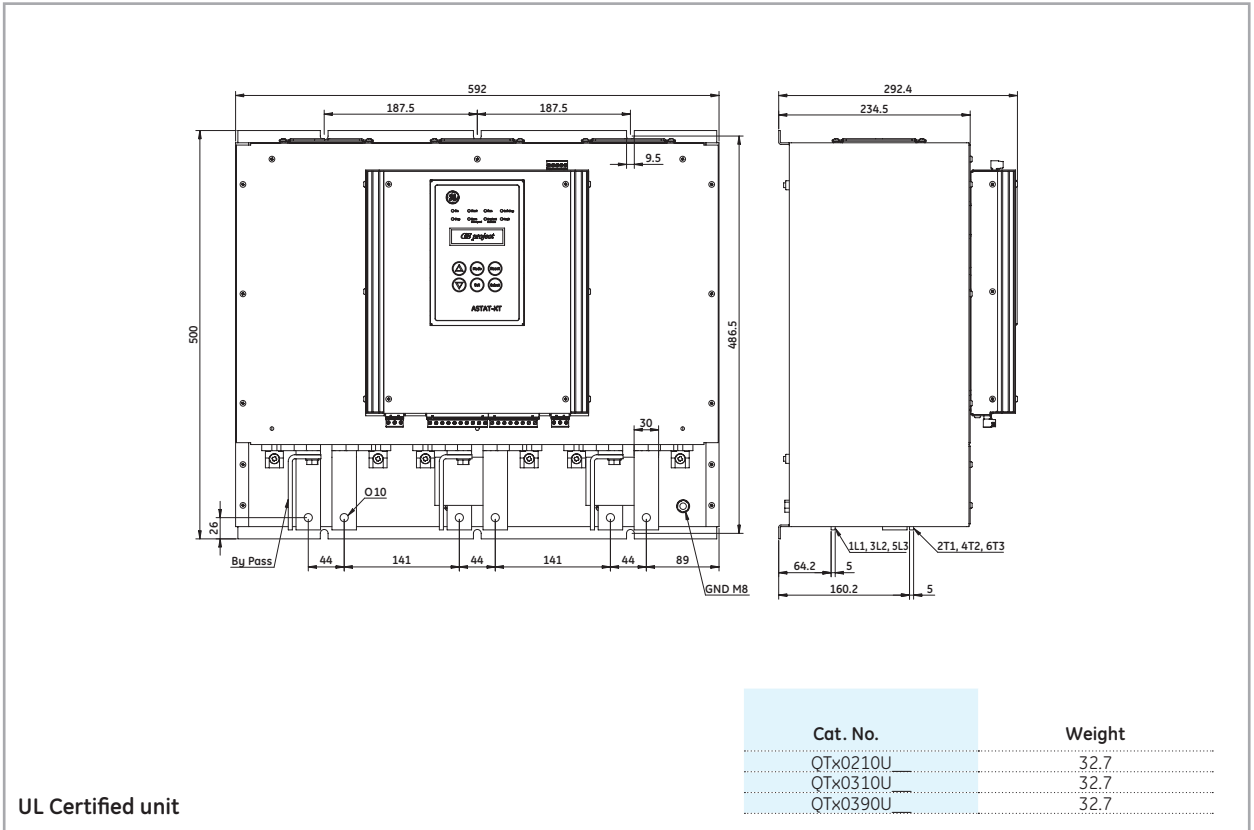
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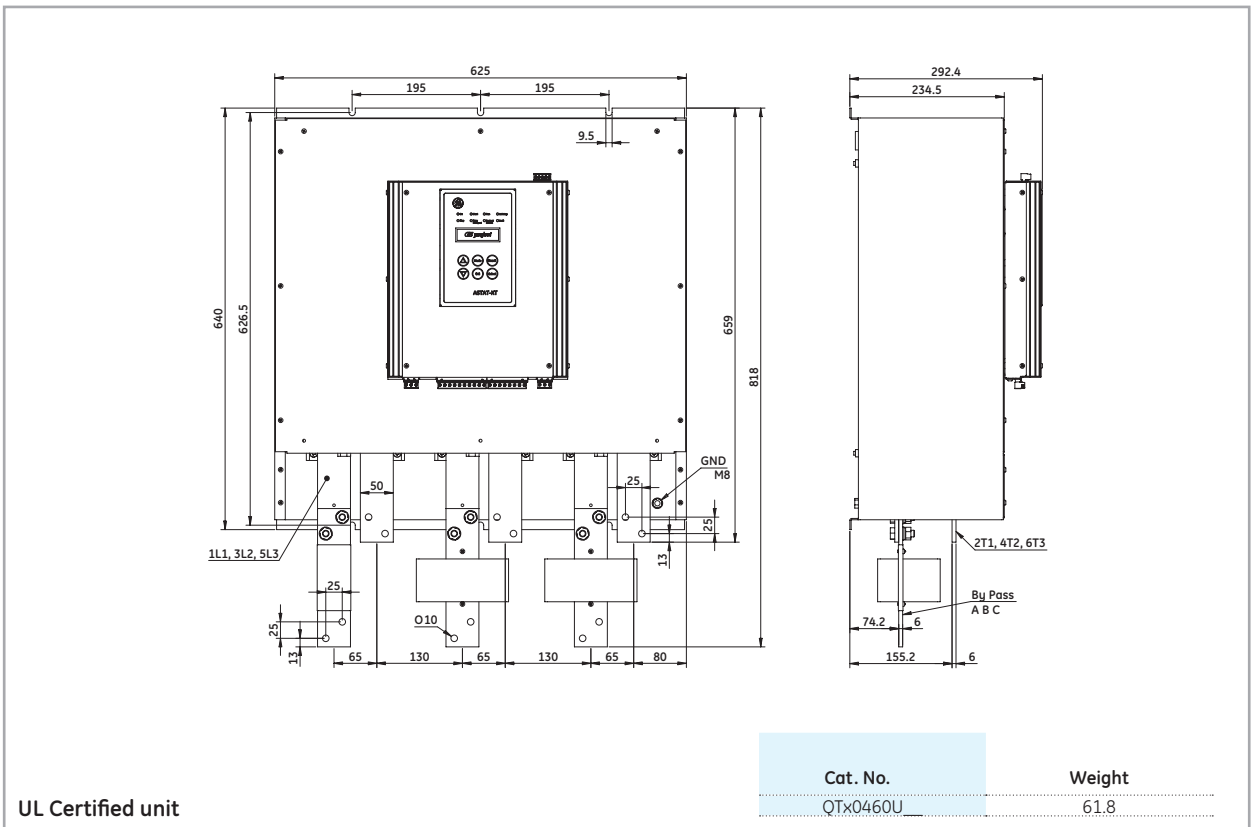


## Dimensions and weights

Cat. No.: QTx0210U\_, QTx0315U\_, QTx0390U\_



Cat. No.: QTx0460U\_





# GE Consumer & Industrial Power Protection

Power Protection (formerly GE Power Controls), a division of GE Consumer & Industrial, is a first class European supplier of low-voltage products including wiring devices, residential and industrial electrical distribution components, automation products, enclosures and switchboards. Demand for the company's products comes from, wholesalers, installers, panel-board builders, contractors, OEMs and utilities worldwide.



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GE imagination at work