



ASTAT

Soft starters for 3ph standard induction motors

High reliability for multiple applications



GE imagination at work



Small soft starters with integral bypass

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 bypass
- Compact, small case
- DIN rail mounting. Optional from 31A
- Start and soft stop features

Approvals/Marking



The cULus 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 (set by potentiometer)
Ramp down	0.5 - 10 s (set by potentiometer)
Initial voltage	0 - 80% Un (set by potentiometer)
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



Small soft starters with integral bypass

Input voltage VAC	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
Accessory	DIN rail mounting kit for types 31A, 44A and 58A						QAOPTDIN	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

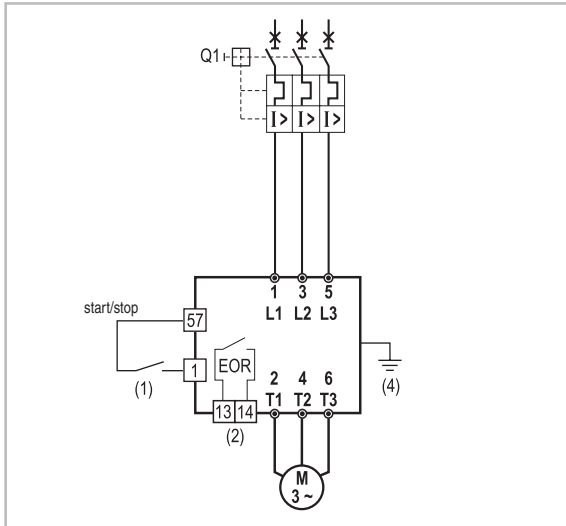
Time between rampings Start/Stop

	Starting current (A)	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
	60 (*)	32	62	155	-
QA_2P022S	22	7	15	35	70
	44	16	33	77	155
	66	26	51	125	250
	77 (*)	32	62	155	-
QA_2P031S	31	4	8	20	40
	62	8	15	38	76
	93	12	24	62	124
	110 (*)	15	31	80	-
QA_2P044S	44	4	8	20	40
	88	8	15	38	76
	132	12	24	62	124
	155 (*)	15	31	80	-
QA_2P058S	58	4	8	20	40
	116	8	15	38	76
	174	12	24	62	124
	200 (*)	15	31	80	-

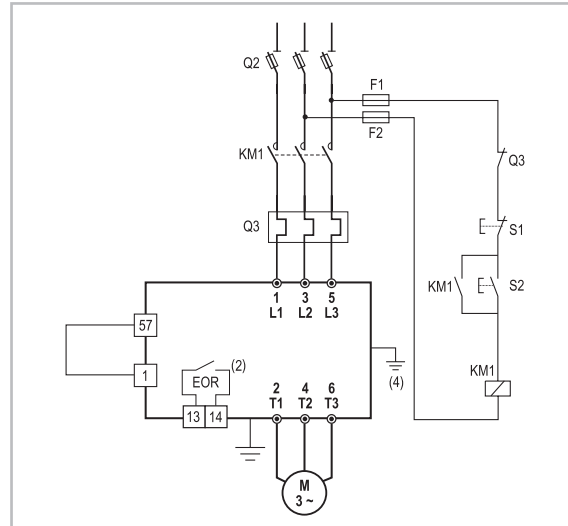
(*) Maximum starting current at all

Diagrams

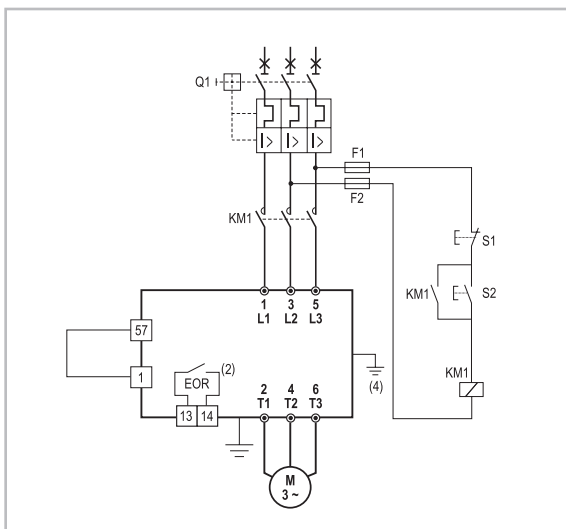
Control by permanent command (soft start and stop)



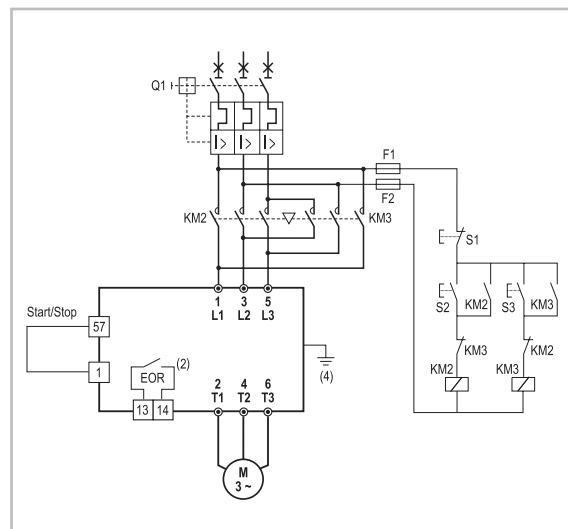
Control by push-buttons, line contactor and thermal overload relay (soft start)



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



Forward/reverse control by push-buttons⁽³⁾



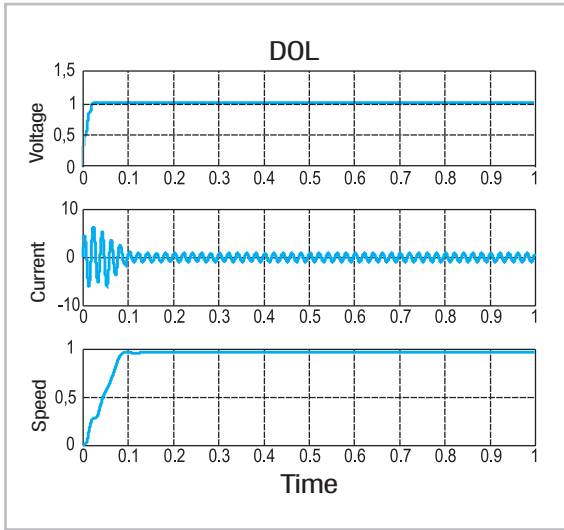
Motor power 380/415V kW Hp	ASTAT S	Q1	Q2 Am fuses	KM1 Contactor	Q3 Thermal overload relay	F1-F2	S1-S2-S3
4 5.5	QA12P008	GPS1B*AK	10	EC25A	268103	-	P9
7.5 10	QA12P017	GPS1B*AN	25	EC25A	268105	-	P9
11 15	QA12P022	GPS1B*AP	32	EC25A	268106	-	P9
15 20	QA12P031	GPS1B*AR	40	EC32A	268108	-	P9
22 30	QA12P044	GPS2B*AT	63	CL06A	113722	-	P9
30 40	QA12P058	GPS2B*AU	80	CL07A	113723	-	P9

Coordination type 2, with thermal overload relays, class 10.
For other thermal class, please consult our Controls & Power Electronics catalogue.

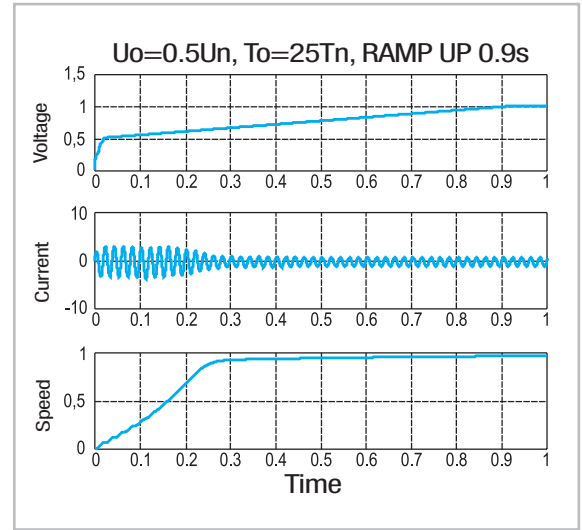
- (1) Use dry contact only.
- (2) End of Ramp output relay (only types 31A, 44A and 58A).
- (3) Forward/Reverse operation must be done when motor is not rotating.
- (4) Ground terminal only for types 31A, 44A and 58A.

Performances

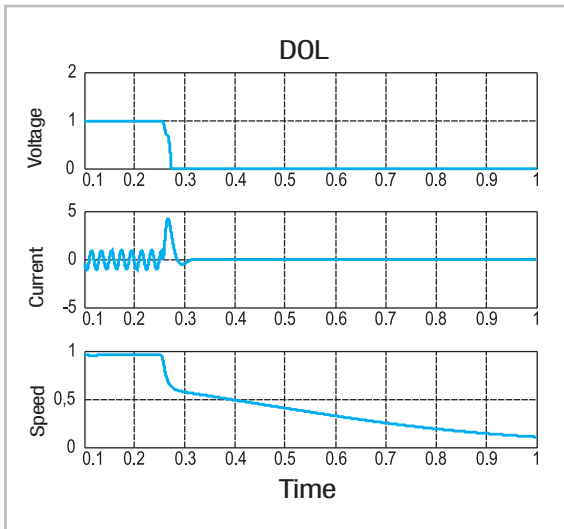
Direct-on-line start



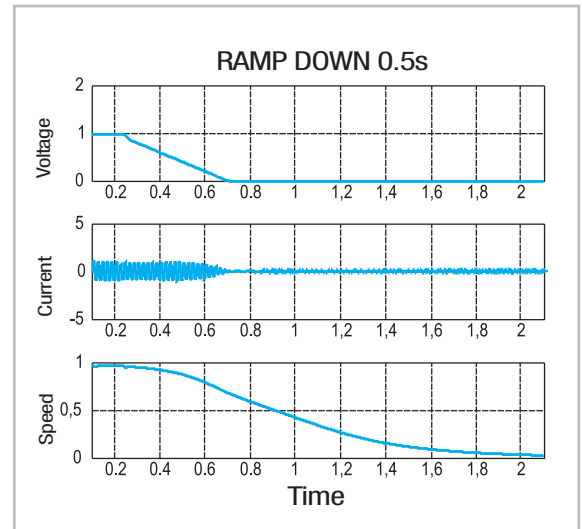
ASTAT S soft start



Direct-on-line stop

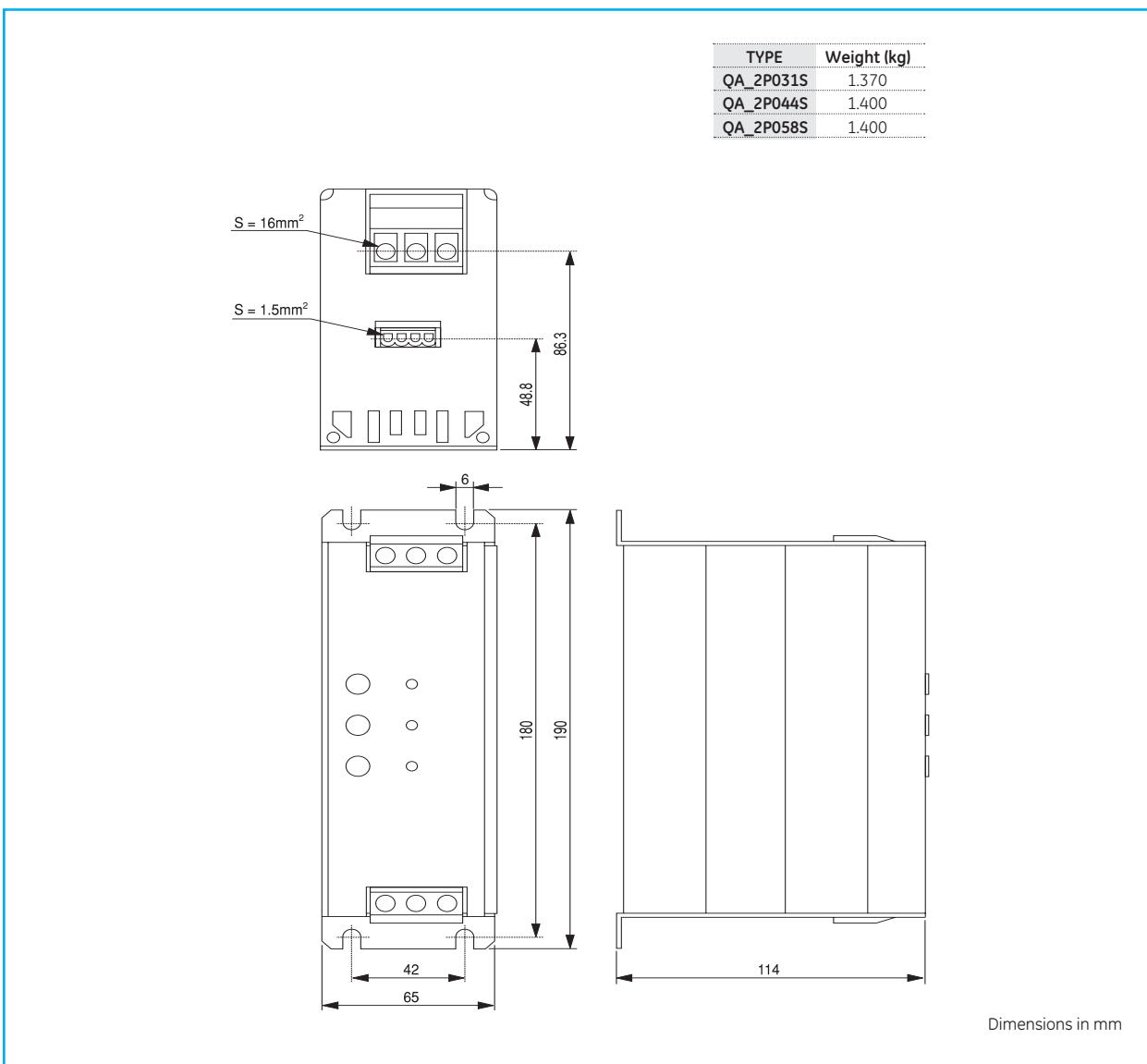
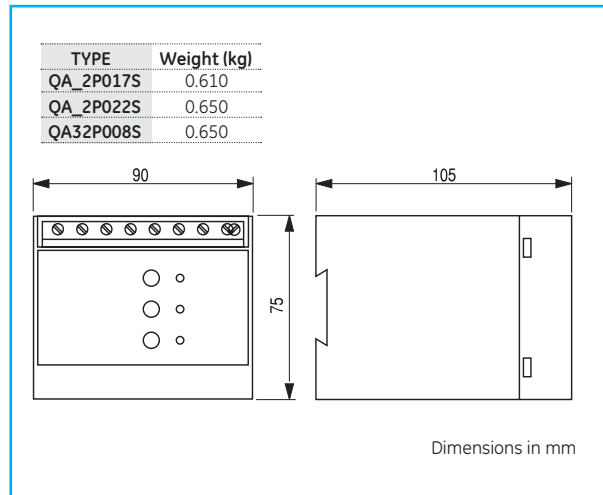
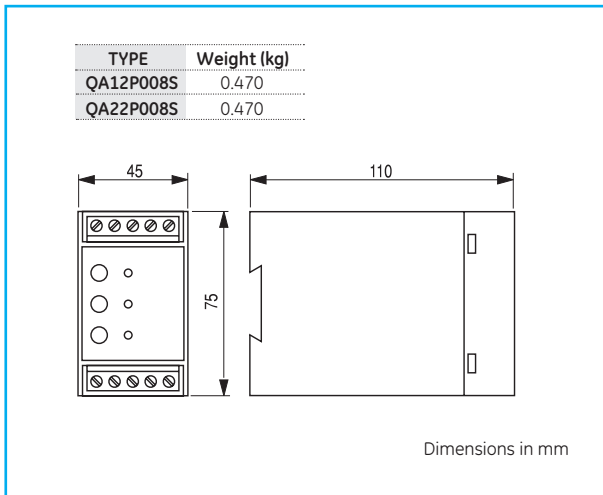


ASTAT S soft stop



Dimensional drawings

Small soft starter with integral bypass



Notes

A large grid of small dots for taking notes.



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 bypass
- 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



Recommended motor and type unit ratings

	Light Duty		Normal Duty (IEC Class 10)				Heavy Duty				
	Max rating current (A)	Rated current (A)	230V kW	400V-415V kW	480V-500V kW	690V kW	Rated current (A)	230V kW	400V-415V kW	480V-500V kW	690V kW
Mains voltage 230-500Vac	8	8	1.5	3	4	-	8	1.5	3	4	-
Control voltage 230Vac	17	17	4	7.5	7.5	-	12	3	5.5	5.5	-
	34	31	7.5	15	18.5	-	31	7.5	15	18.5	-
	54	44	11	22	30	-	44	11	22	30	-
	65	58	15	30	37	-	55	15	30	37	-
	72	72	22	37	45	-	66	18.5	37	45	-
	104	85	22	45	55	-	80	22	45	55	-
Digital inputs voltage 90-230Vac	130	105	30	55	55	-	99	30	55	55	-
	156	145	45	75	90	-	130	37	55	90	-
	170	170	55	90	110	-	134	37	75	90	-
	248	210	55	110	132	-	203	55	110	132	-
	361	310	90	160	200	-	310	75	160	200	-
	390	390	110	200	250	-	344	110	160	250	-
	480	460	132	250	315	-	432	132	250	315	-
	480	460	132	250	315	-	432	132	250	315	-
	610	580	160	315	400	-	488	160	250	355	-
	610	580	160	315	400	-	552	160	315	400	-
	820	650	200	355	400	-	552	160	315	400	-
	820	820	250	400	560	-	690	200	400	500	-
	1180	950	315	560	630	-	950	315	560	630	-
	1375	1100	355	630	800	-	1076	355	630	800	-
	1750	1400	400	800	1000	-	1400	400	800	1000	-
Mains voltage 690Vac	8	8	-	-	-	5.5	8	-	-	-	5.5
Control voltage 230Vac	17	17	-	-	-	15	12	-	-	-	7.5
	34	31	-	-	-	22	31	-	-	-	22
	54	44	-	-	-	37	44	-	-	-	37
	65	58	-	-	-	55	55	-	-	-	45
	72	72	-	-	-	55	66	-	-	-	55
	104	85	-	-	-	75	80	-	-	-	75
Digital inputs voltage 90-230Vac	130	105	-	-	-	90	99	-	-	-	90
	156	145	-	-	-	132	130	-	-	-	90
	170	170	-	-	-	160	134	-	-	-	132
	248	210	-	-	-	200	203	-	-	-	200
	361	310	-	-	-	250	310	-	-	-	250
	390	390	-	-	-	355	344	-	-	-	315
	480	460	-	-	-	400	432	-	-	-	400
	610	580	-	-	-	560	488	-	-	-	400
	820	650	-	-	-	630	552	-	-	-	560
	1180	950	-	-	-	900	950	-	-	-	900
	1375	1100	-	-	-	1000	1076	-	-	-	1000
	1750	1400	-	-	-	-	1400	-	-	-	-

Remarks page 8

- 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)
- Other control and digital inputs voltages are available. Please contact GE
- **Profibus or DeviceNet options cannot be ordered separately.** For those communication networks, please order the ASTAT XT with the required option built-in

remarks page 9

- Motor HP ratings given in NEMA table are for 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)
- Remote mounting kit for keypad that includes cable (3m), remote keypad box, dummy cover, frame and brackets:
 - Frame A QTAKPADKIT1 169072
 - Frame B and others QTAKPADKIT2 169073

For the international version:

- Frame A QTAKPADKIT1SG 129052
- Frame B and others QTAKPADKIT2SG 129053



QT10008U21MS
ASTAT XT 8A-72A



QT10105U21MS
ASTAT XT 105A-170A



QT10460N21MS
ASTAT XT 460A-650A

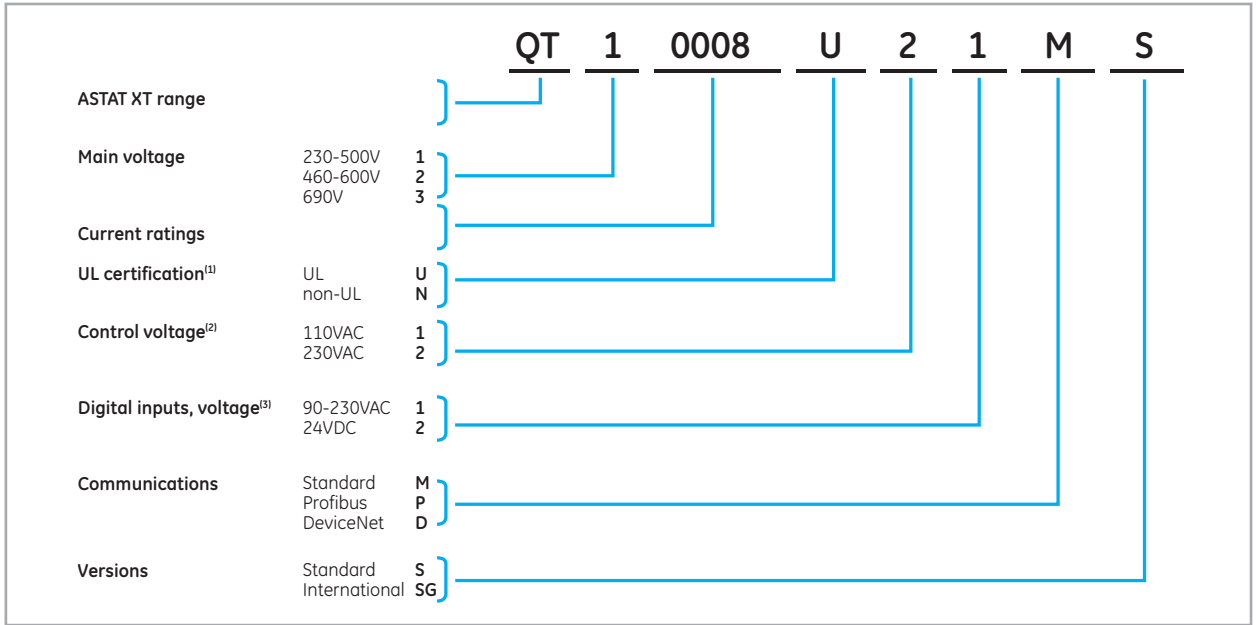
Built-in communication network				International version			
Modbus		Profibus DP		DeviceNet		DeviceNet	
Cat. No.	Ref. No.	QT__N21PS	QT__U21PS	QT__N21DS	QT__U21DS	QT__N21PSG	QT__U21DSG
		Ref. No.	Ref. No.	Ref. No.	Ref. No.	Ref. No.	Ref. No.
QT10008U21MS	169075	169214	169314	QT10008U21MSG	129213	120954	817850
QT10017U21MS	169076	169215	169315	QT10017U21MSG	129214	120957	817851
QT10031U21MS	169077	169216	169316	QT10031U21MSG	129215	120958	817852
QT10044U21MS	169078	169217	169317	QT10044U21MSG	129216	120959	817853
QT10058U21MS	169079	169218	169318	QT10058U21MSG	129217	120960	817854
QT10072U21MS	169080	169219	169319	QT10072U21MSG	129218	120961	817855
QT10085U21MS	169081	169220	169320	QT10085U21MSG	129219	120962	817856
QT10105U21MS	169082	169221	169321	QT10105U21MSG	129220	120963	817857
QT10145U21MS	169083	169222	169322	QT10145U21MSG	129221	120964	817858
QT10170U21MS	169084	169223	169323	QT10170U21MSG	129222	120965	817859
QT10210U21MS	169085	169224	169324	QT10210U21MSG	129223	120966	817860
QT10310U21MS	169086	169225	169325	QT10310U21MSG	129224	120967	817861
QT10390U21MS	169087	169226	169326	QT10390U21MSG	129225	120968	817862
QT10460U21MS	169094	169233	169333	QT10460U21MSG	129229	120972	817863
QT10460U21MS	169088	169227	169327	QT10460U21MSG	129226	120969	817864
QT10580N21MS	169095	169234	169334	QT10580N21MSG	129230	120973	817865
QT10580U21MS	169089	169228	169328	QT10580U21MSG	129227	120970	817866
QT10650N21MS	169096	169235	169335	QT10650N21MSG	129231	120974	817867
QT10820U21MS	169090	169229	169329	QT10820U21MSG	129228	120971	817868
QT10950N21MS	169097	169236	169336	QT10950N21MSG	129232	120975	817869
QT11100N21MS	169098	169237	169337	QT11100N21MSG	129233	120976	817870
QT11400N21MS	169099	169238	169338	QT11400N21MSG	129234	120977	817871
QT30008N21MS	169119	169490	169573	QT30008N21MSG	129257	129511	817872
QT30017N21MS	169120	169491	169574	QT30017N21MSG	129258	129512	817873
QT30031N21MS	169121	169492	169575	QT30031N21MSG	129259	129513	817874
QT30044N21MS	169122	169493	169576	QT30044N21MSG	129260	129539	817875
QT30058N21MS	169123	169494	169577	QT30058N21MSG	129261	129540	817876
QT30072N21MS	169124	169495	169578	QT30072N21MSG	129262	129541	817877
QT30085N21MS	169125	169496	169579	QT30085N21MSG	129263	129542	817878
QT30105N21MS	169126	169497	169580	QT30105N21MSG	129264	129543	817879
QT30145N21MS	169127	169498	169581	QT30145N21MSG	129265	129544	817880
QT30170N21MS	169128	169499	169582	QT30170N21MSG	129266	129545	817881
QT30210N21MS	169129	169500	169583	QT30210N21MSG	129267	129546	817882
QT30310N21MS	169130	169501	169584	QT30310N21MSG	129268	129547	817883
QT30390N21MS	169131	169502	169585	QT30390N21MSG	129269	129548	817884
QT30460N21MS	169132	169503	169586	QT30460N21MSG	129270	129549	817885
QT30580N21MS	169133	169504	169587	QT30580N21MSG	129271	129550	817886
QT30650N21MS	169134	169505	169588	QT30650N21MSG	129272	129551	817887
QT30950N21MS	169135	169506	169589	QT30950N21MSG	129273	129552	817888
QT31100N21MS	169136	169507	169590	QT31100N21MSG	129274	129553	817889
QT31400N21MS	169137	169508	169591	QT31400N21MSG	129275	129554	817890

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	-	17	5	10	-	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	17	-	10	15	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



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%

OPTIONS:

- Remote mounting kit for keypad that includes cable (3m), remote keypad box, dummy cover, frame and brackets:
- Frame A QTAKPADKIT1 169072
- Frame B and others QTAKPADKIT2 169073

For the international version:

- Frame A QTAKPADKIT1SG 129052
- Frame B and others QTAKPADKIT2SG 129053



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	3ph 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
Digital inputs voltage		90-230Vac, +10 -15%, 50/60Hz 24Vdc, +10%, -15% (optional)

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 90 sec, by using extended settings
Deceleration ramp time	1-30 sec. Can be extended up to 90 sec, 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 and maintenance and statistics

Environmental conditions

Operating temperature	-10°C up to 60°C, with current derating by 2.5% per °C, from 50°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, 20-1000Mhz, IEC 801-3 Fast transients 2KV, IEC 801-4
Safety	EN 600947-1 Related to safety requirements. UL508C



Functions

Available standard functions

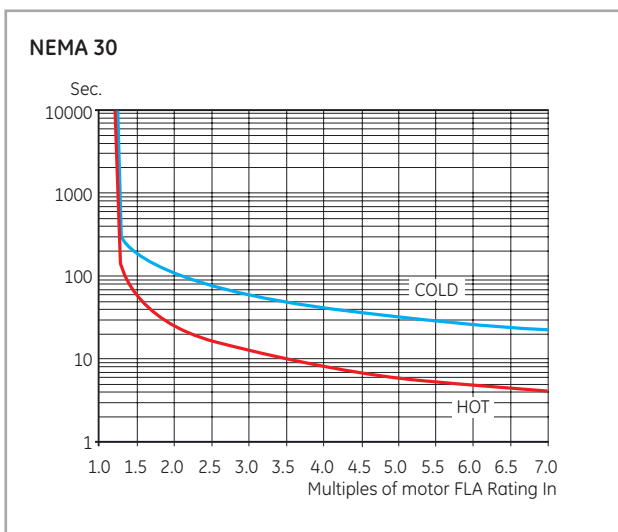
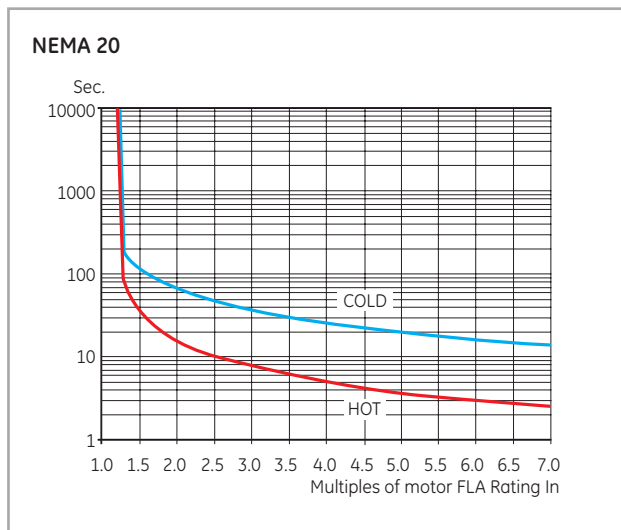
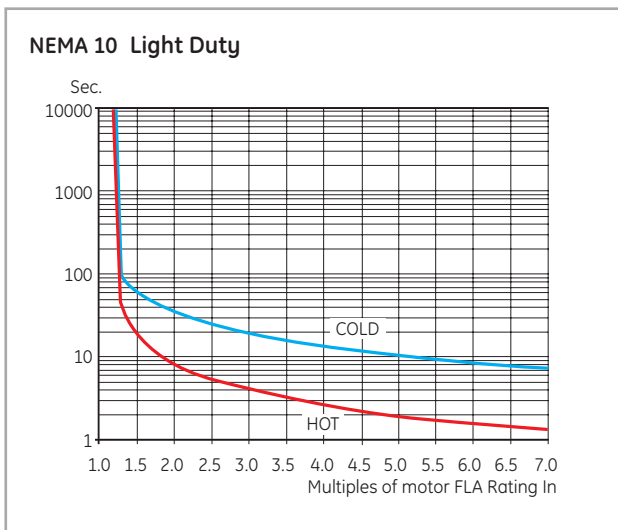
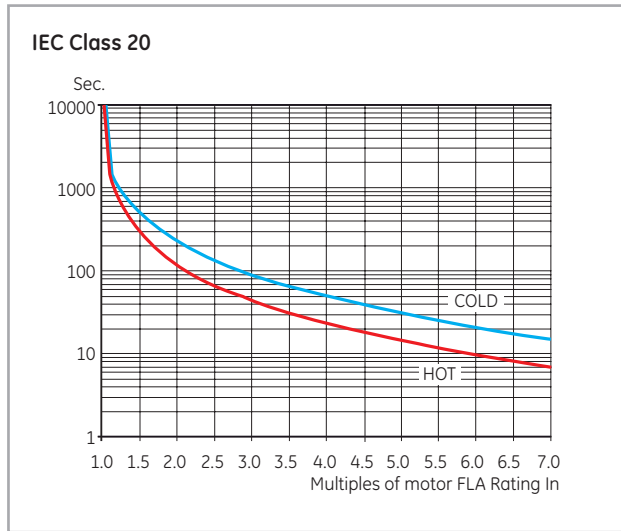
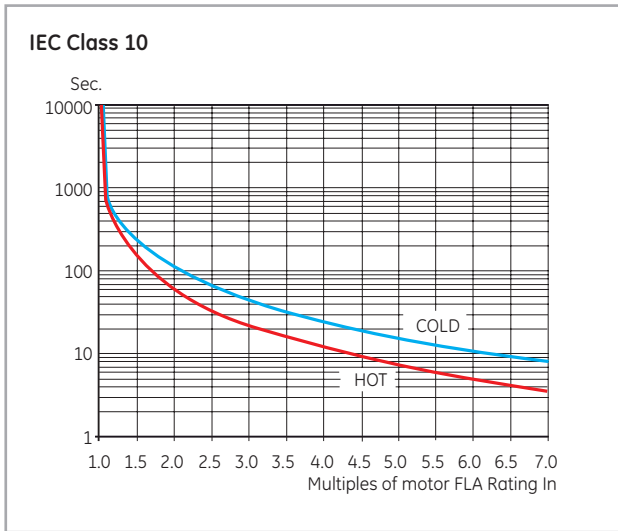
Soft start and soft stop	ASTAT XT is provided with a soft start and soft stop features, including five independent acceleration and deceleration curve models. The factory default curve is used for general purpose, other three are used for pump control and the last one for torque control.
Pump control	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 an 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 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 NO 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.



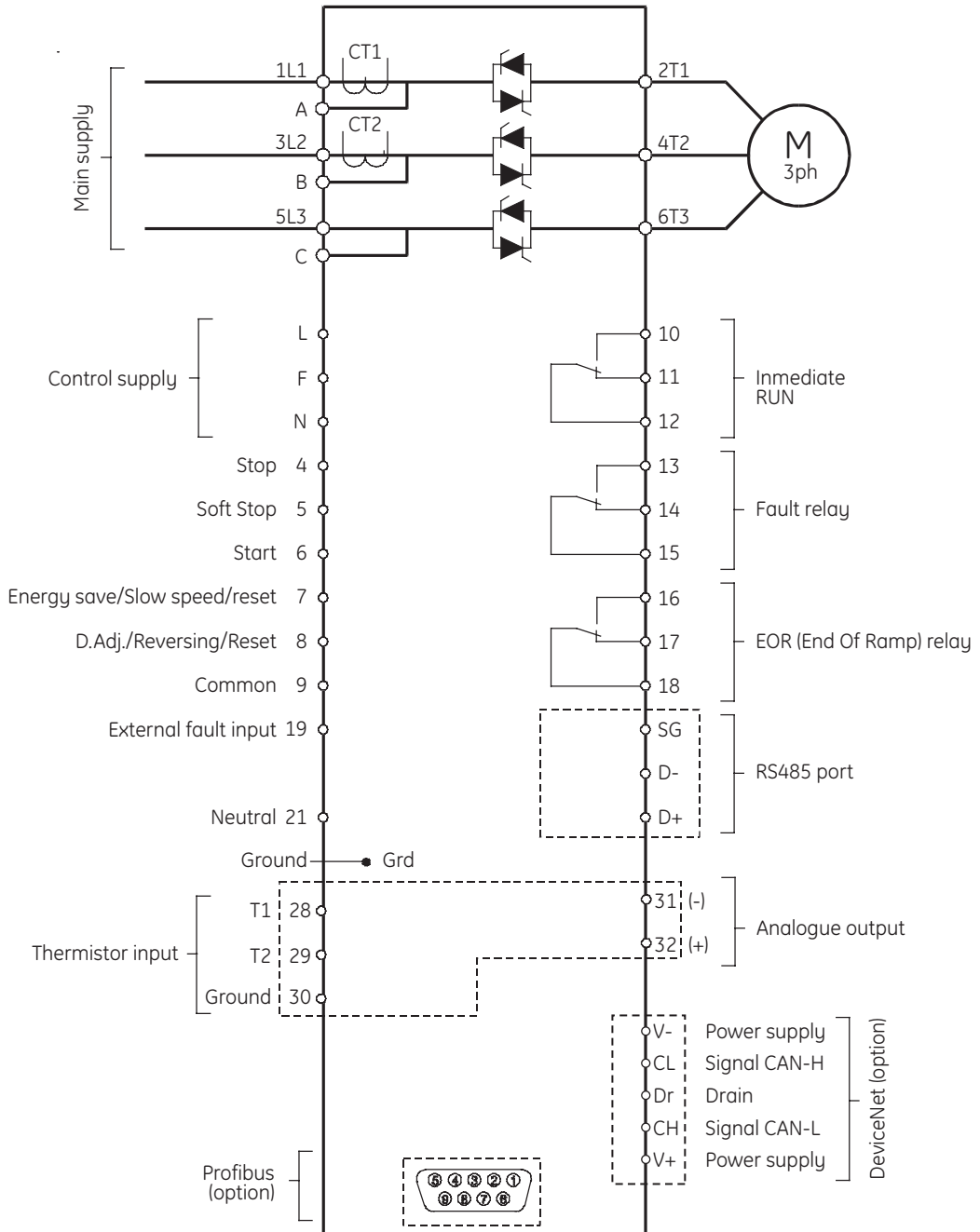
Maximum number starting /hour

Starting current I/In ⁽¹⁾	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



Note: Profibus or DeviceNet options cannot be ordered separately.
For those communication networks, please order the ASTAT XT with the required option built-in (see pages 8 and 9).



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	Bypass	Bypass terminals for external bypass contactor
G	Ground	ASTAT XT, ground connection

Control power supply

L, N	Control supply	110VAC or 220VAC, according ASTAT XT control voltage rating
F	Fan control	Cooling fan external control, together with jumper J1 Control voltage and fan consumption VA: 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
		Operating voltage of digital inputs from 4 to 9 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 and 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
		Relay outputs ratings Max rating: 8A, 250VAC, 2000VA max

Analogue output

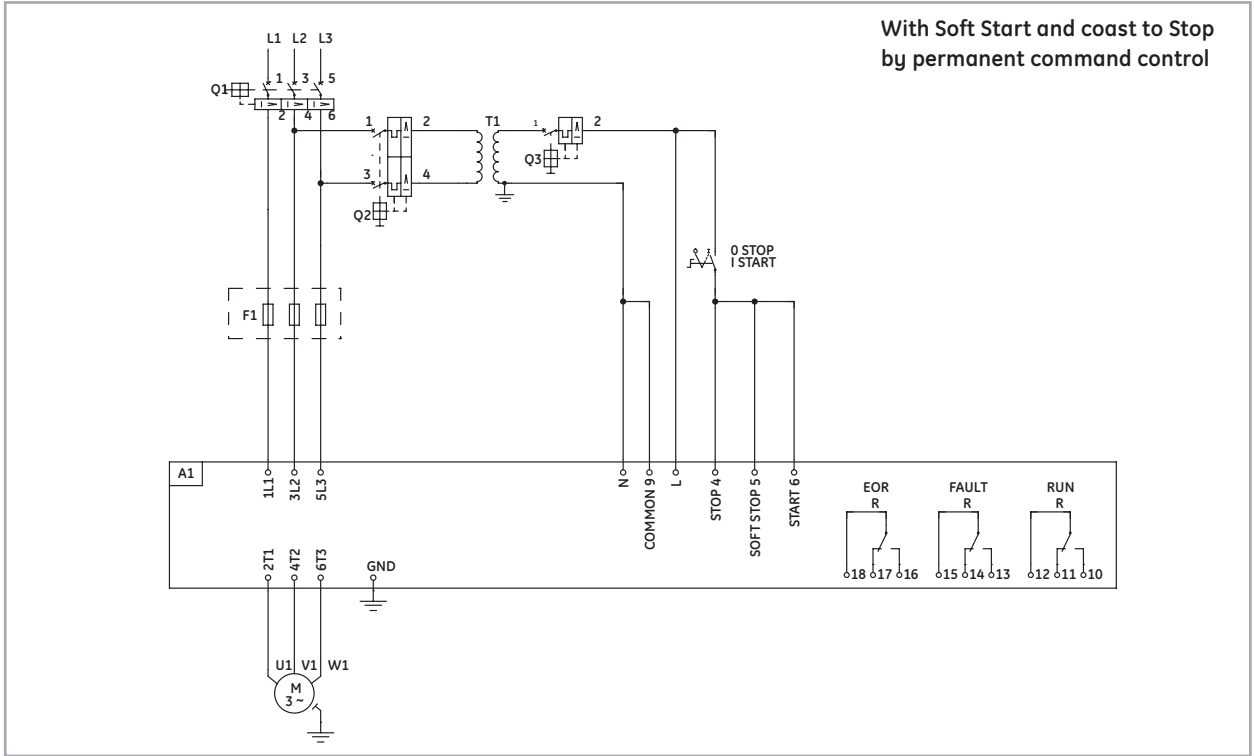
31, 32	Current output	Range 0 to 2xIn. Programmable 0-10VDC, 0-20mA or 4-20mA
30	Ground	Ground terminal for analogue output

Communications

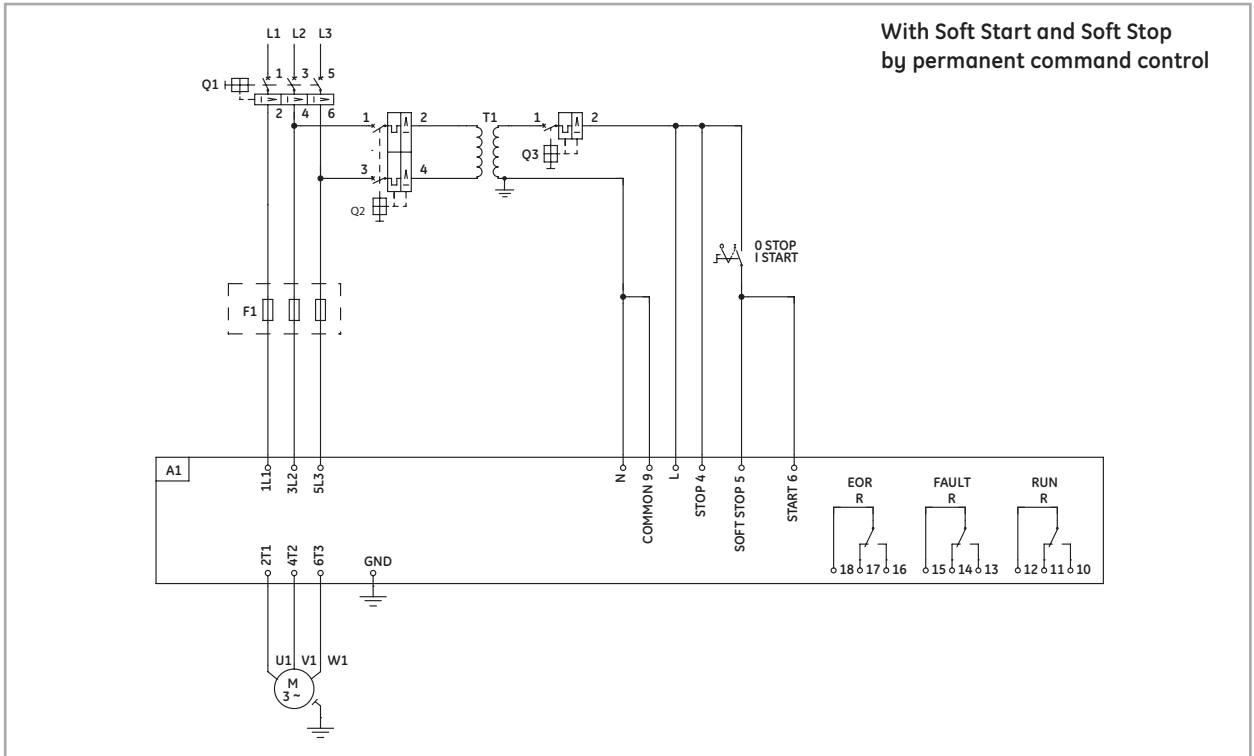
D+, D-, SG	RS485 terminals	RS485 communication port, half duplex for ModBus protocol Baudrate 1200, 2400, 4800, 9600 BPS
D-9 connector	Profibus port	Optional Profibus communications port
V+, CL, Dr, CH, V-	DeviceNet terminals	Optional Devicenet communications port

Application wiring diagrams

Basic diagram without line contactor⁽¹⁾



Basic diagram without line contactor⁽¹⁾



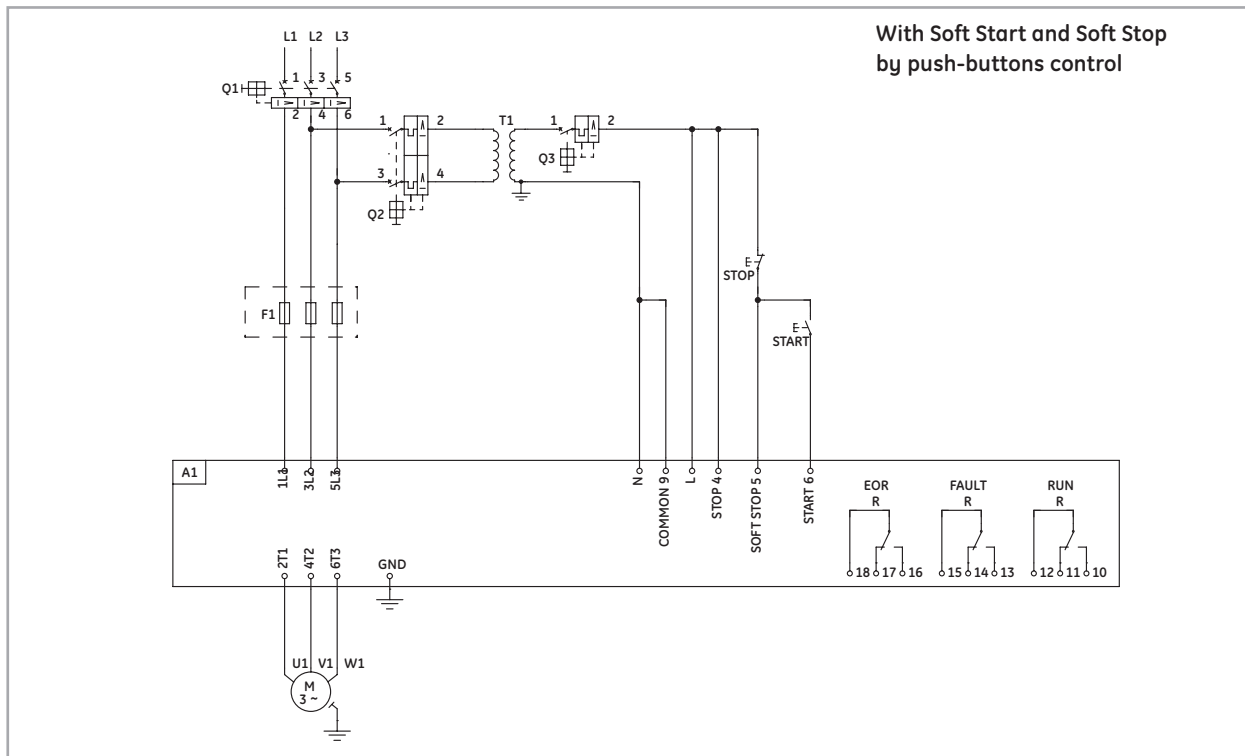
(1) Schemes are given for information purposes. Add additional emergency safety stop, if it is required for your application.

Remarks

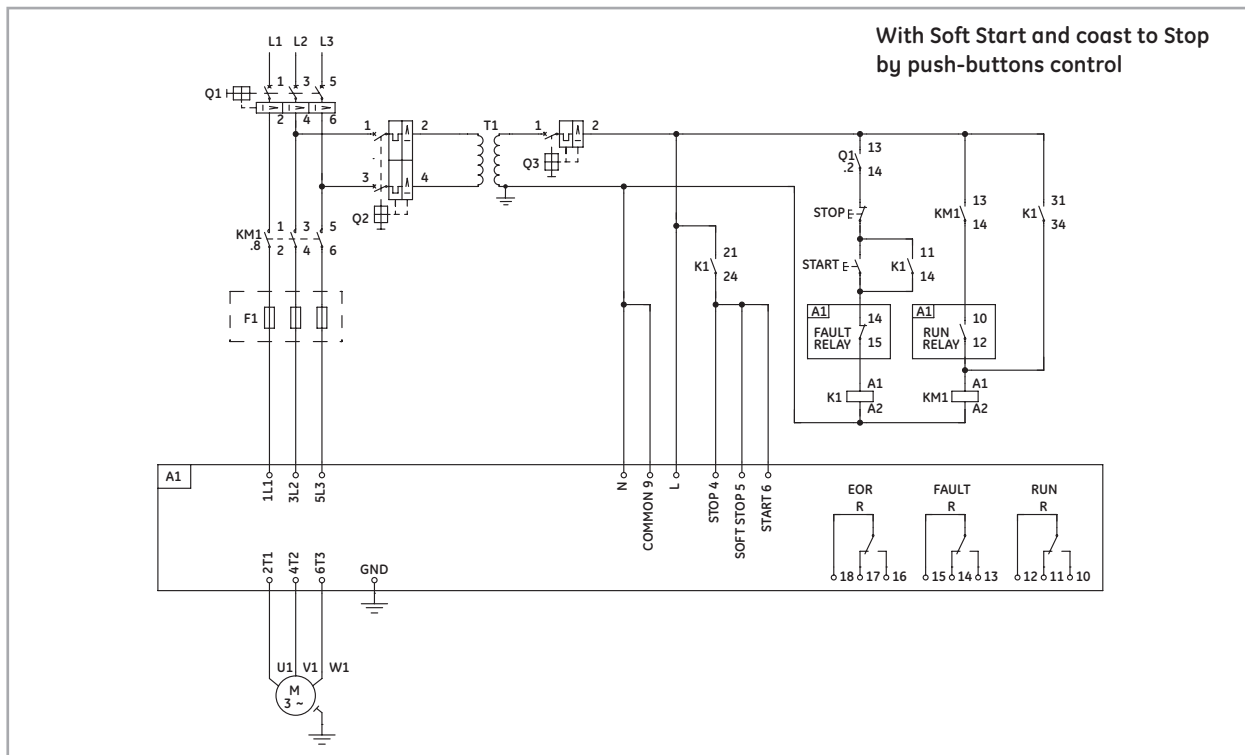
1. Check coordination tables for proper selection of breaker and line contactor.
2. Control voltage and control input voltage are from same source in above example. Please check manuals if you have different sources for control voltage and control input voltage.
3. Semiconductor fuses "F" are only required 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.
5. Line and bypass contactors should be dimensioned according AC1 category.

Application wiring diagrams

Basic diagram without line contactor⁽¹⁾



Basic diagram with line contactor⁽¹⁾



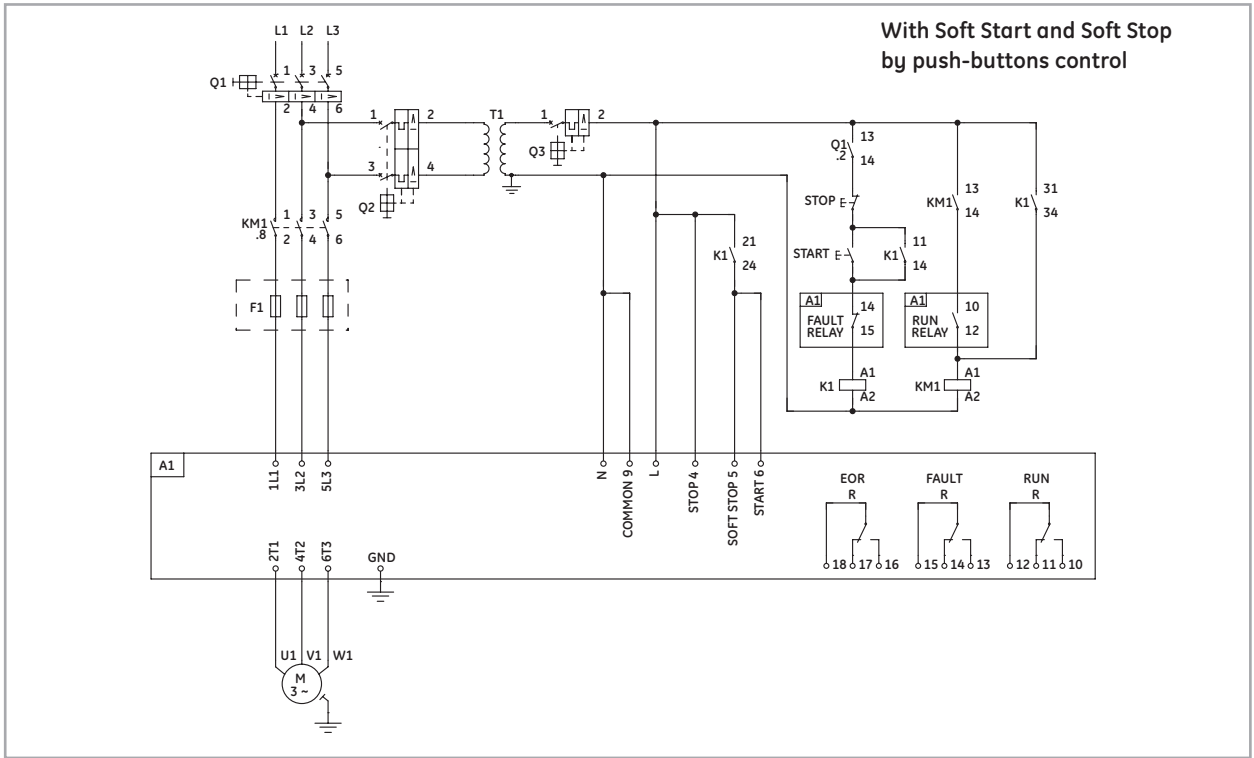
(1) Schemes are given for information purposes. Add additional emergency safety stop, if it is required for your application.

Remarks

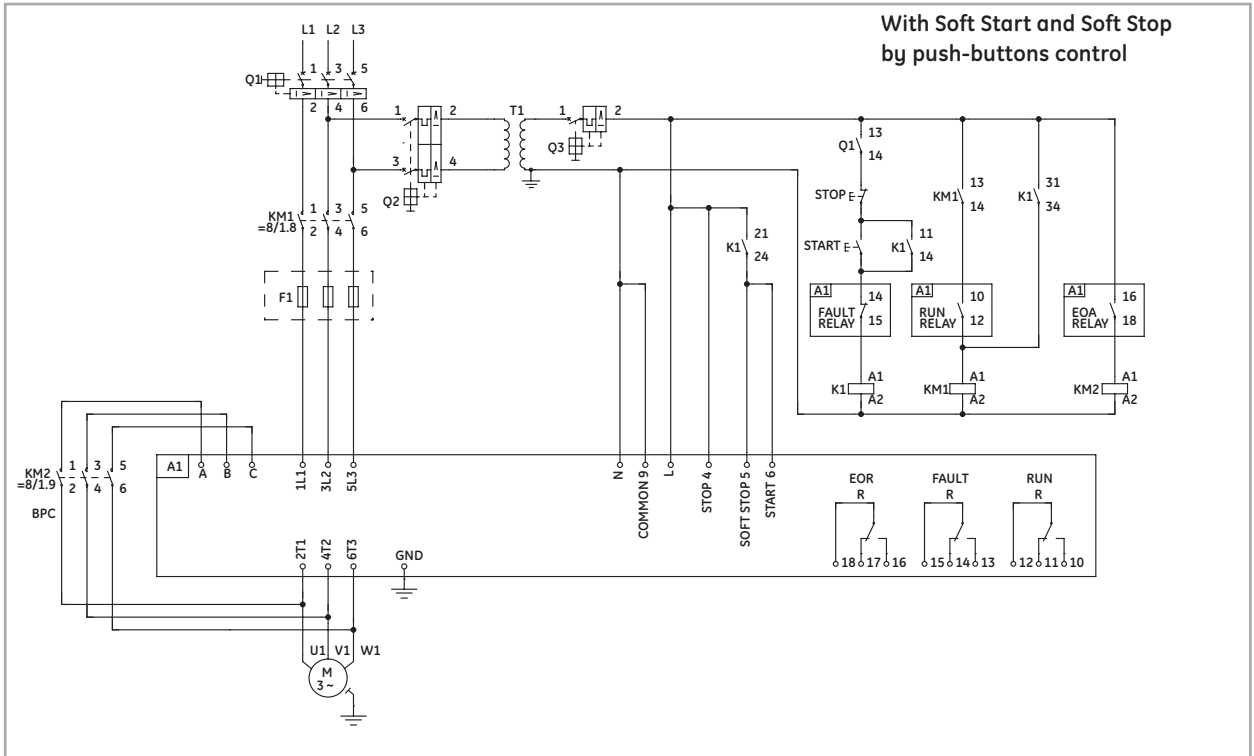
1. Check coordination tables for proper selection of breaker and line contactor.
2. Control voltage and control input voltage are from same source in above example. Please check manuals if you have different sources for control voltage and control input voltage.
3. Semiconductor fuses "F" are only required 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.
5. Line and bypass contactors should be dimensioned according AC1 category.

Application wiring diagrams

Basic diagram with line contactor⁽¹⁾



Basic diagram with line and bypass contactors⁽¹⁾



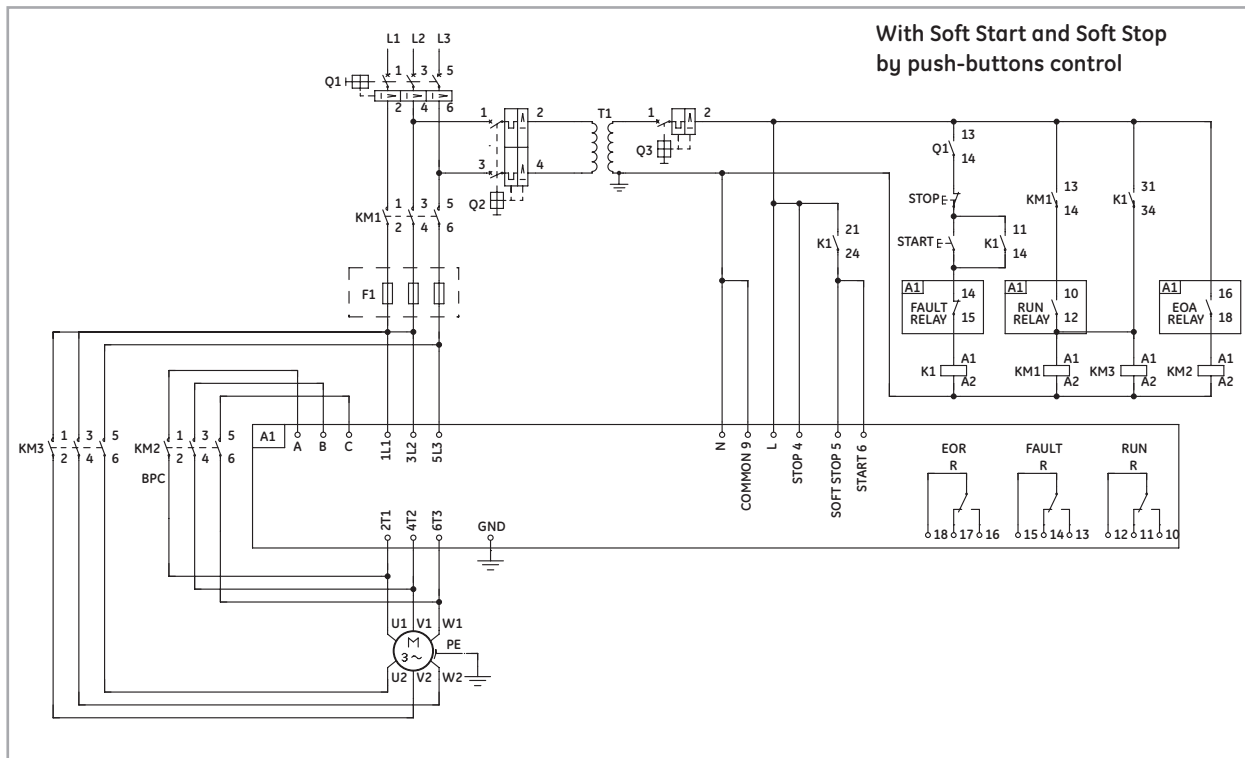
(1) Above schemes are given for information purposes. Add additional emergency safety stop, if it is required for your application.

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. Line and bypass contactors should be dimensioned according AC1 category.

Application wiring diagrams

Basic diagram in "Inside Delta" configuration with line and bypass contactors⁽¹⁾



(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 instruction manual.
5. Line and bypass contactors should be dimensioned according AC1 category.

Coordination Type 1

Type 1 coordination with GE circuit breakers Record Plus

Soft starter Rated current A	Record Plus circuit breakers				Breaking capacity kA
	Overload current A	Frame type	O/L type		
8	16	FD63	LTMD 16		65
17	40	FD63	LTMD 40		65
31	50	FD63	LTMD 50		65
44	63	FD160	LTMD 63		65
58	80	FD160	LTMD 80		65
72	80	FE160	LTMD 80		65
85	125	FE160	SMR1-125		65
105	160	FE160	SMR1-160		65
145	160	FE160	LTMD 160		65
170	250	FE250	LTMD 250		65
210	250	FE250	LTMD 250		65
310	400	FG630	SMR1-400		65
390	400	FG400	SMR1-400		65
460	630	FG630	SMR1-630		65
580	630	FG630	SMR1-630		65
650	800	FK800	SMR1s-800		50
820	1250	FK1250	SMR1s-1250		50
950	1250	FK1250	SMR1s-1250		50
1100	1250	FK1250	SMR1s-1250		50
1400	1600	FK1600	SMR1s-1600		50

Type 1 coordination with Type aM Siba fuses

Soft starter Rated current A	Siba aM fuses						Breaking capacity kA
	Rated current A	Part No.	Size	Un	Type		
8	16	20 477 08.16	0	690	aM		120
17	20	20 477 08.20	0	690	aM		120
31	35	20 477 08.35	0	690	aM		120
44	50	20 477 08.50	0	690	aM		120
58	80	20 209 08.80	0	690	aM		120
72	100	20 209 08.100	0	690	aM		120
85	125	20 209 08.125	0	690	aM		120
105	160	20 210 08.160	0	690	aM		120
145	200	20 211 08.200	1	690	aM		120
170	200	20 211 08.200	1	690	aM		120
210	250	20 211 08.250	1	690	aM		120
310	400	20 212 08.400	2	690	aM		120
390	500	20 213 08.500	3	690	aM		120
460	630	20 213 08.630	3	690	aM		120
580	800	20 225 08.800	4	690	aM		120
650	800	20 225 08.800	4	690	aM		120
820	1000	20 225 08.1000	4	690	aM		120
950	2x630	2x20 213 08.630	2x3	690	aM		120
1100	2x800	2x20 225 08.800	2x4	690	aM		120
1400	2x800	2x20 225 08.800	2x4	690	aM		120



Coordination Type 2

Type 2 coordination with Bussman fuses

Soft starter		Bussman fuses DIN 43620					
Rated current A	A ² sec	Rated current A	Part No.	Size	Un	Type	Breaking capacity kA
8	400	40	170M3808D	1	690	H.S.D.I.	200
17	5000	63	170M3810D	1	690	H.S.D.I.	200
31	10000	125	170M3813D	1	690	H.S.D.I.	200
44	12000	160	170M3814D	1	690	H.S.D.I.	200
58	15000	160	170M3814D	1	690	H.S.D.I.	200
72	18000	200	170M3815D	1	690	H.S.D.I.	200
85	50000	250	170M3816D	1	690	H.S.D.I.	200
105	60000	315	170M3817D	1	690	H.S.D.I.	200
145	10000	315	170M3817D	1	690	H.S.D.I.	200
170	140000	400	170M3819D	1	690	H.S.D.I.	200
210	200000	500	170M4864D	1	690	H.S.D.I.	200
310	600000	500	170M4864D	1	690	H.S.D.I.	200
390	700000	800	170M5814D	2	690	H.S.D.I.	200
460	800000	900	170M6813D	3	690	H.S.D.I.	200
580	1200000	1000	170M6814D	3	690	H.S.D.I.	200
650	2000000	2x800	2x170M5814D	2x2	690	H.S.D.I.	200
820	2000000	2x800	2x170M5814D	2x2	690	H.S.D.I.	200
950	4500000	2x1000	2x170M5816D	2x2	690	H.S.D.I.	200
1100	4500000	2x1100	2x170M6892D	2x2	690	H.S.D.I.	200
1400	6500000	2x1400	2x170M8555D	2x3	690	H.S.D.I.	200

For Type 2 coordination

Use fuses for semiconductor protection to protect the ASTAT XT soft starter from a short circuit. Fuses for semiconductor protection give excellent results because they have low I²t values and high interruption ratings.

Recommended fuse selection procedure

Fuse rated voltage

Choose minimum fuse rated voltage which is above the rated voltage of the mains.

Fuse rated current

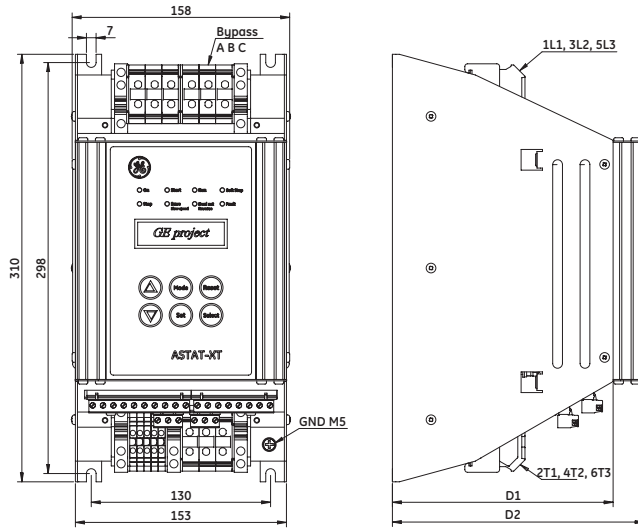
Select a fuse which is able to carry 8 times the rated ASTAT XT soft starter current for 30 seconds (this is double the maximum ASTAT XT soft starter current for the maximum acceleration time).

Fuse I²t

Verify that the I²t value of the fuse is less than or equal to the I²t value of the thyristor in the ASTAT XT soft starter as shown in the table.

Dimensions and weights

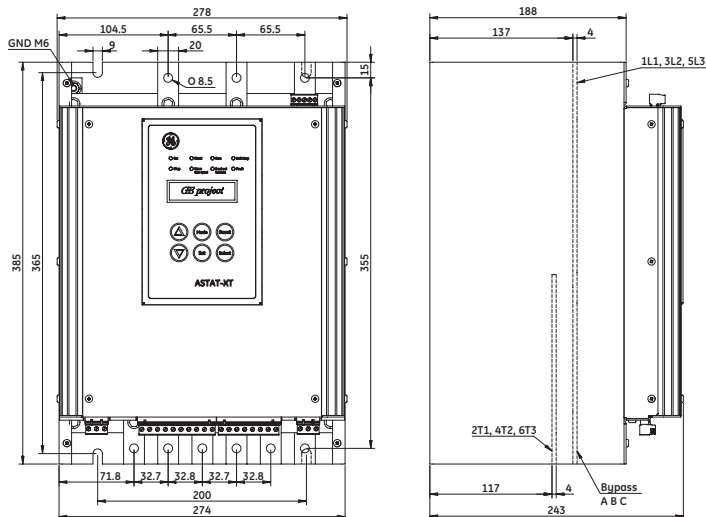
Cat. No.: QTx0008U_, QTx0017U_, QTx0031U_, QTx0044U_, QTx0058U_, QTx0072U_



Cat. No	Dimensions		Power terminal size (mm ²)			Weight (kg)
	D1	D2	Input 1L1, 3L2, 5L3	Bypass A, B, C	Output 2T1, 4T2, 6T3	
QTx0008U	160	182.5	16	16	16	4.2
QTx0017U	160	182.5	16	16	16	4.2
QTx0031U	160	182.5	16	16	16	5.3
QTx0044U	207	229.5	16	16	35	6.7
QTx0058U	207	229.5	16	16	35	6.7
QTx0072U	207	229.5	35	35	35	6.7

IEC and UL certified units

Cat. No.: QTx0085U_, QTx0105U_

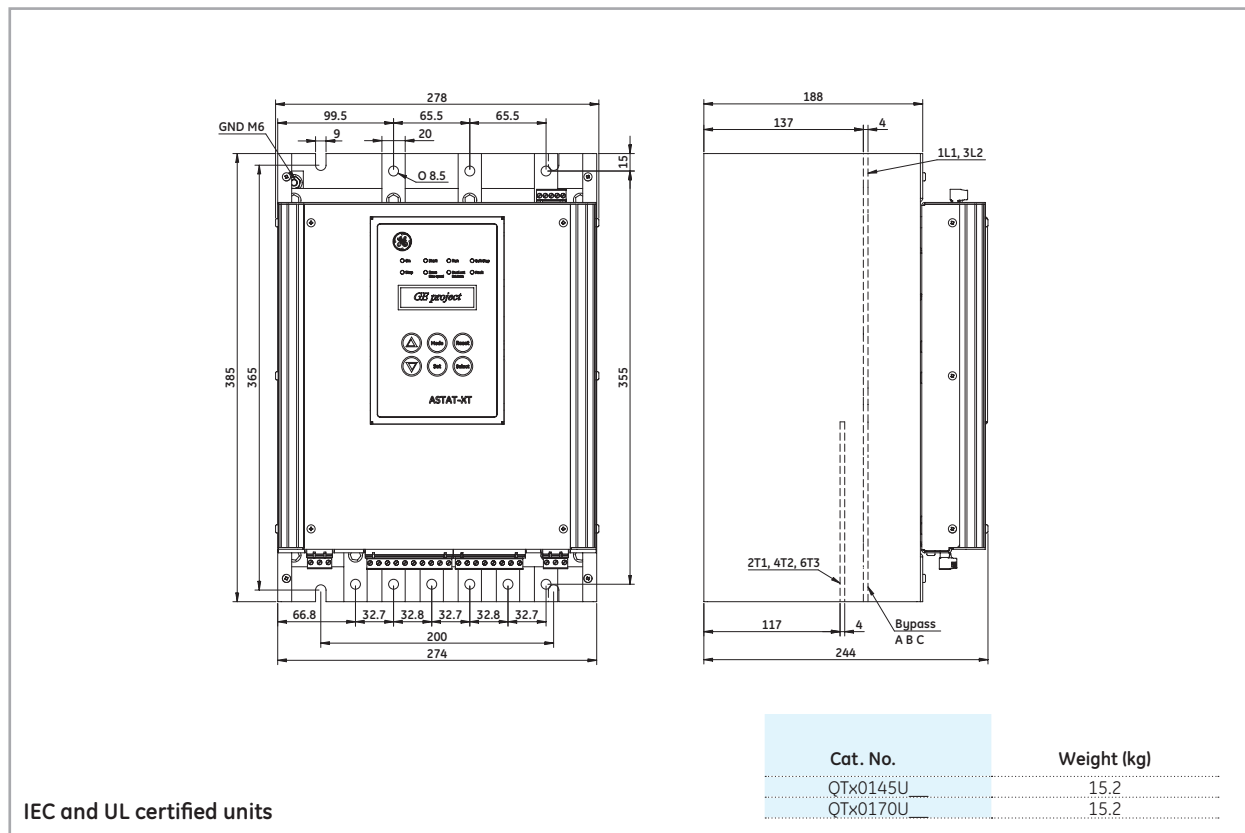


Cat. No.	Weight (kg)
QTx0085U_	15.2
QTx0105U_	15.2

IEC and UL certified units

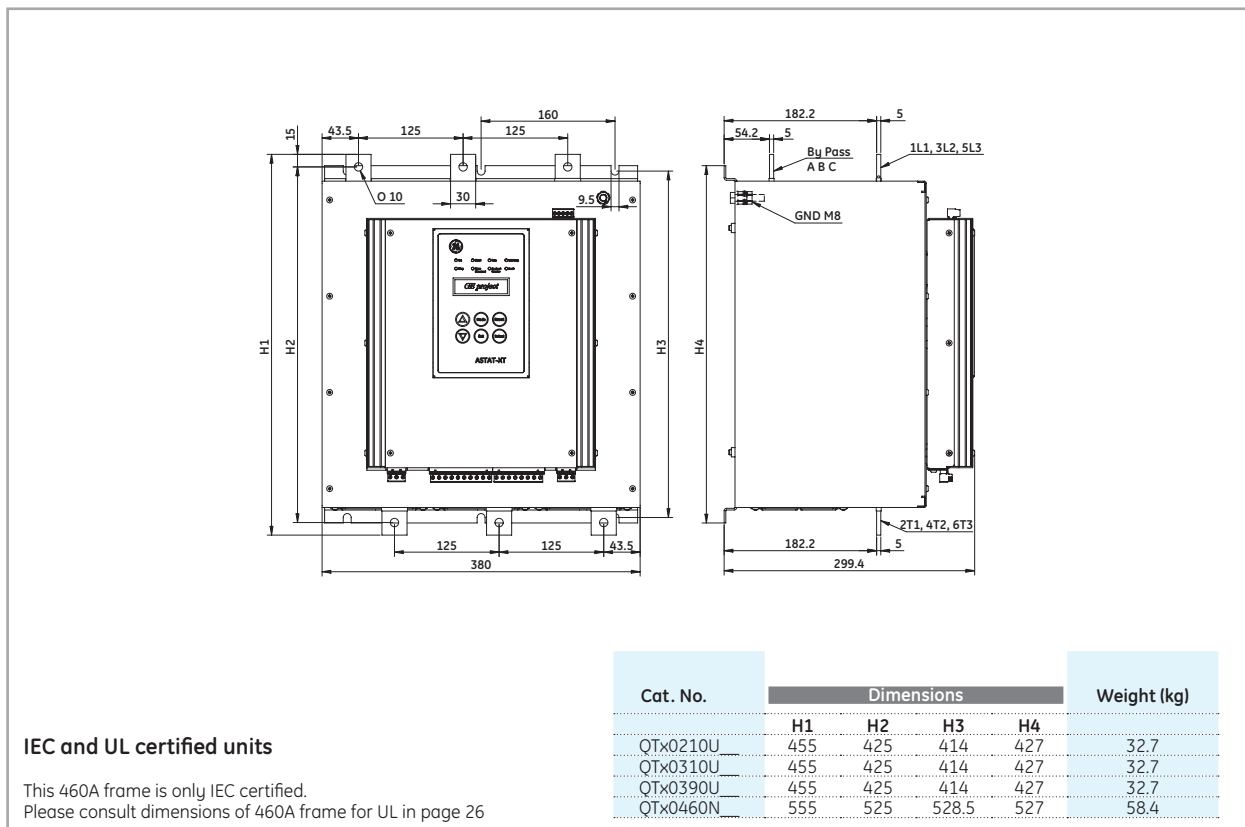
Dimensions and weights

Cat. No.: QTx0145U_, QTx0170U_



IEC and UL certified units

Cat. No.: QTx0210U_, QTx0310U_, QTx0390U_, QTx0460N_

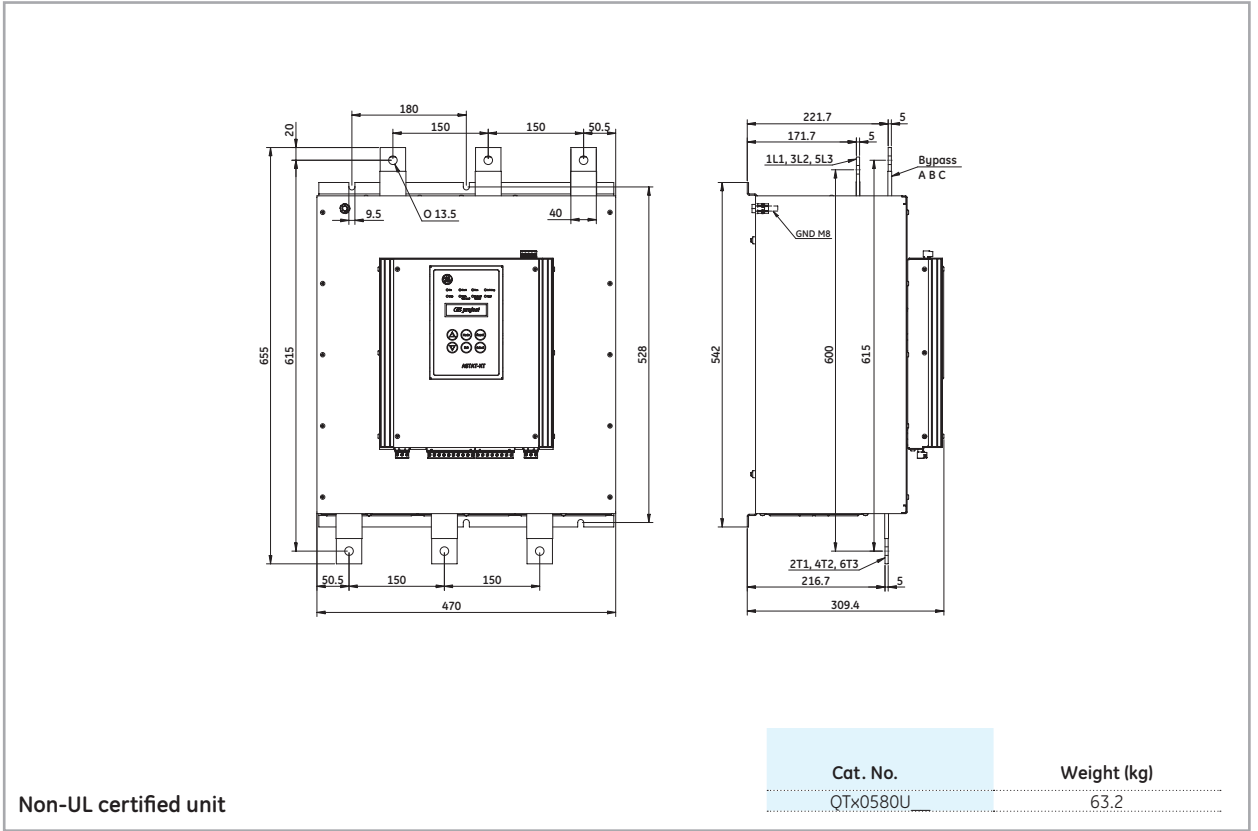


IEC and UL certified units

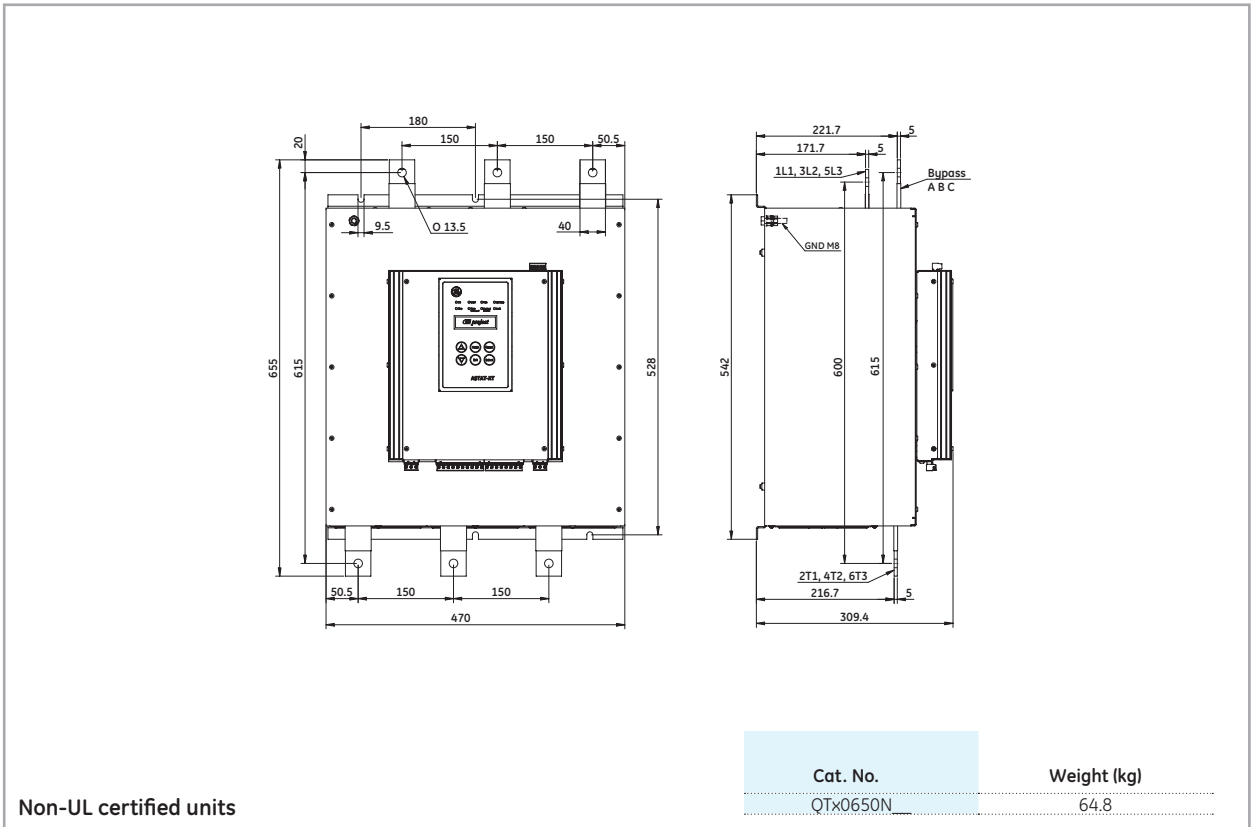
This 460A frame is only IEC certified.
Please consult dimensions of 460A frame for UL in page 26

Dimensions and weights

Cat. No.: QTx0580N_

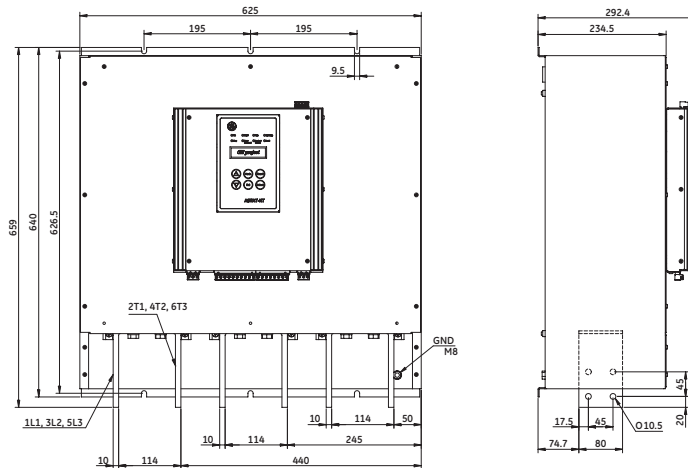


Cat. No.: QTx0650N_



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

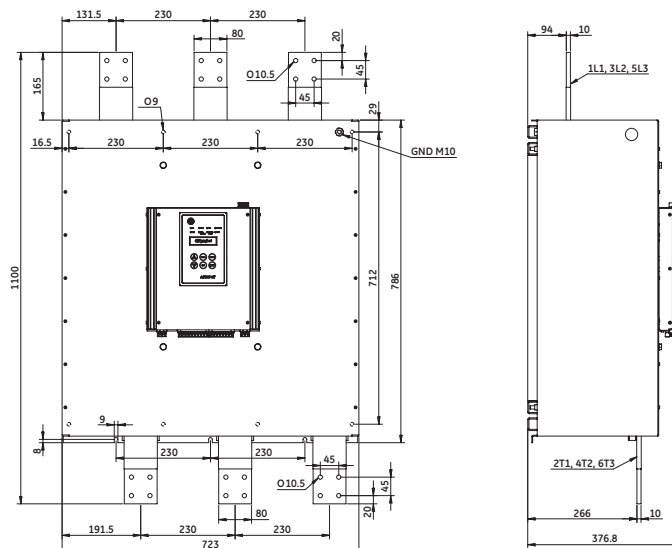
Cat. No.

QTx0950N

Weight (kg)

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. No. QTx1100N_
 W=270mm, H=155mm, D=90mm. (for 1400A unit, Cat. No. QTx1400N_

Non-UL certified unit

Cat. No.

QTx1100N

QTx1400N

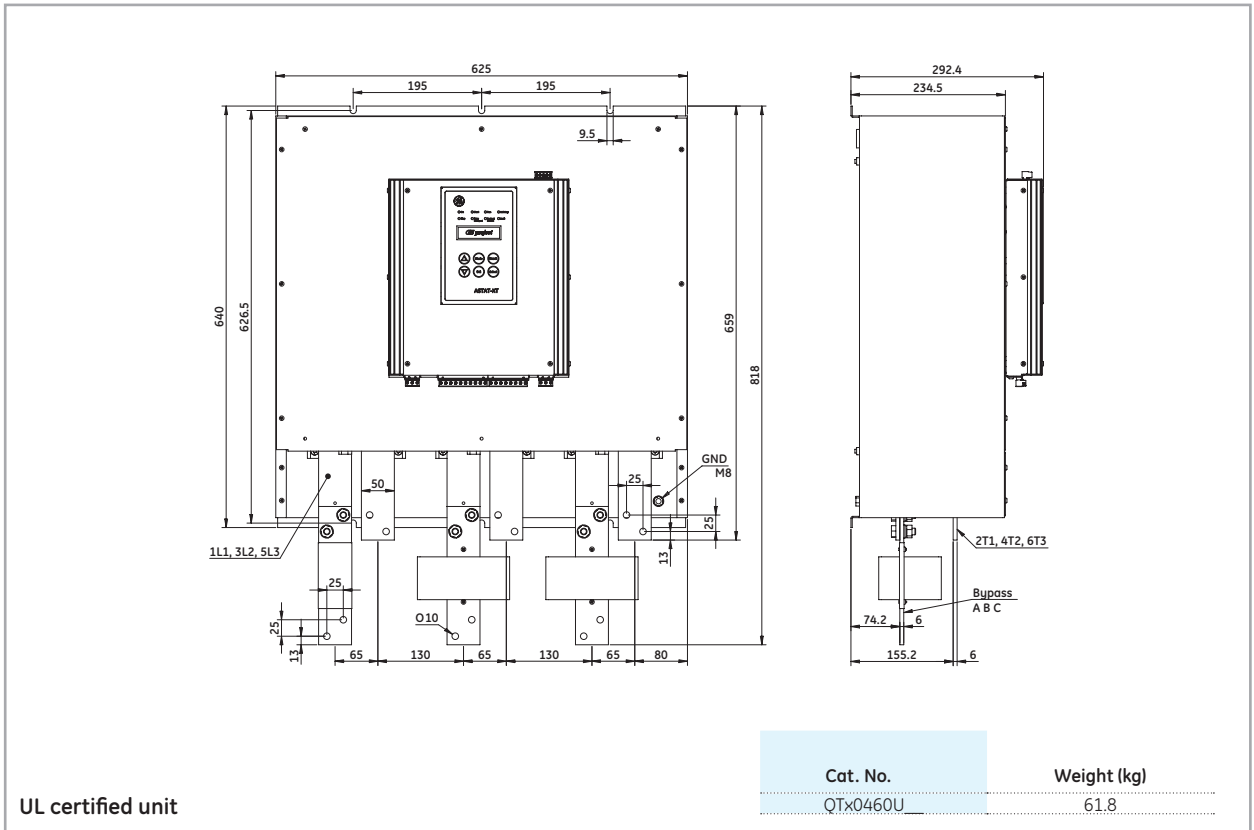
Weight (kg)

169.8

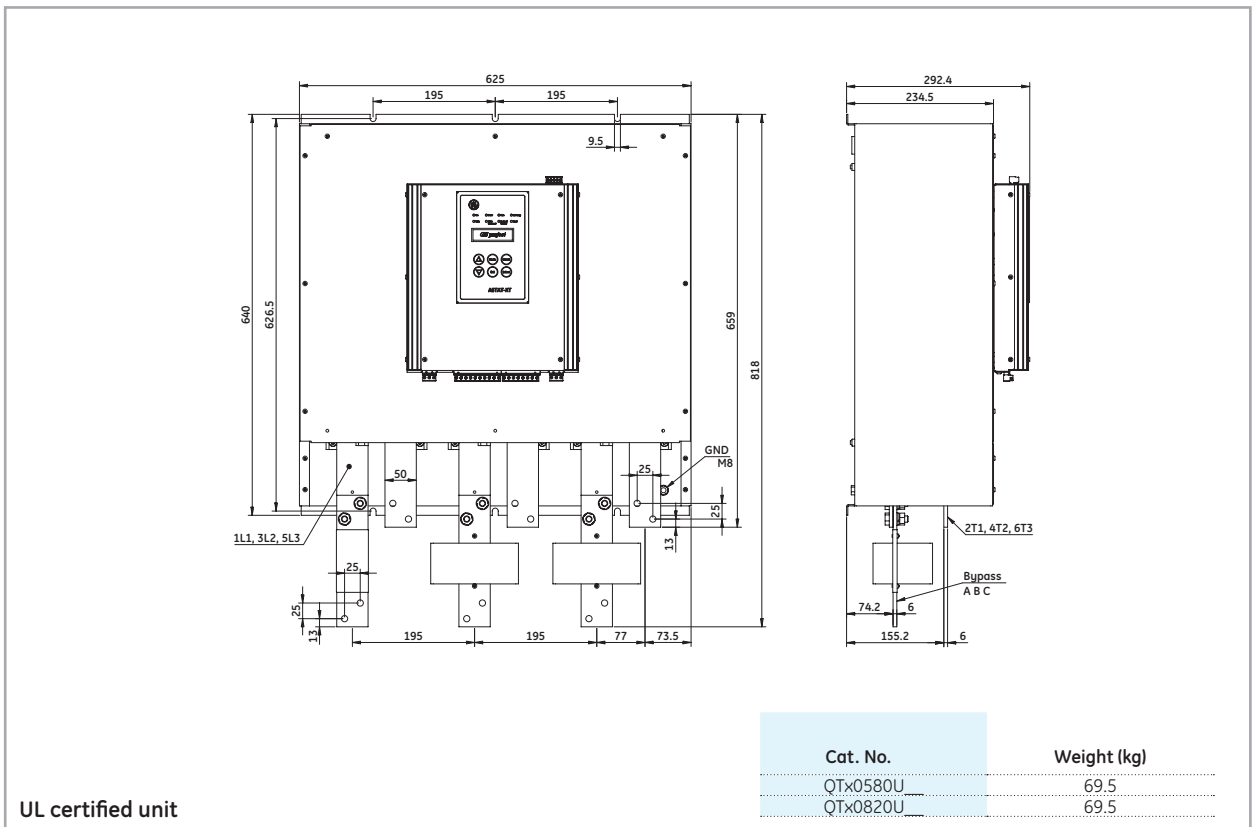
175.5

Dimensions and weights

Cat. No.: QTx0460U_



Cat. No.: QTx0580U_ , QTx0820U_



Notes

A large grid of small blue dots for taking notes, covering most of the page.



GE Industrial Solutions is a first class global supplier of low and medium 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, panelboard builders, contractors, OEMs and utilities worldwide.

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