Guide d'exploitation
User's manual
Bedienungsanleitung
Guía de explotación

Altistart 46 Telemecanique

Démarreurs-ralentisseurs progressifs,
Soft start- soft stop units,
Sanftanlasser,
Arrancadores, ralentizadores progresivos.

GROUPE SCHNEIDER

Merlin Gerin · Modicon · Square D · Telemecanique

Preliminary checks

Check that the starter reference code printed on the label is the same as that on the delivery note corresponding to the purchase order.
Remove the Altistart 46 from its packaging, and check that it has not been damaged during transport.

ATTENTION

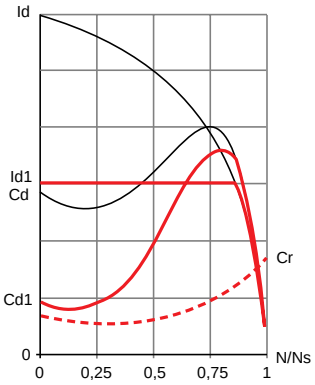
The starter includes safety devices which, in the event of a fault, can cause the stopping of the starter, and hence the motor. The motor itself can also be subject to stoppage by mechanical jamming. Finally, voltage fluctuations or power supply failures can also cause the motor to stop.

The clearance of the fault causing the stoppage can initiate a restart involving a hazard for certain types of machines or installations, especially those which must conform to specific safety regulations. It is therefore important that in such cases the user should take appropriate steps to prevent such restarting. For example by the use of an underspeed detector, causing the disconnection of the starter power supply in the event of a non-programmed motor stoppage.

As a general rule the starter must always be switched off before performing any operation on either the electrical or the mechanical parts of the installation or the machine.
The company reserves the right to change the charcteristics of its products and services at any time to incorporate the latest technological developments. The information contained in this document is therefore subject to change without notice and cannot be construed as containing any form of contractual obligation.

Contents

Available torque



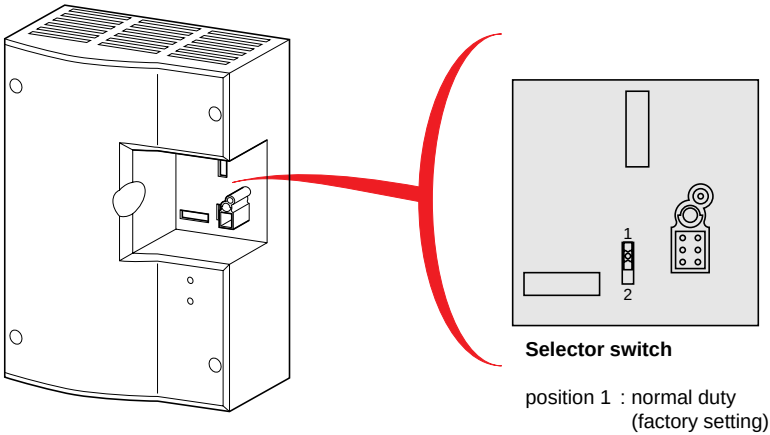
Curves Td and Id represent starting an asynchronous motor on a mains supply.

Curve Td1 indicates the envelope of available torque which is a function of the limit current Id1. A gradual start is obtained by controlling the accelerating torque within this envelope.

Selecting a starter

The Altistart 46 must be selected according to the nominal power of the motor and its use in S1 or S4 duty.

A switch located beneath the control block flap is used to select normal duty or heavy duty, according to motor usage.



Selector switch

position 1 : normal duty
(factory setting)
position 2 : heavy duty

S1 motor duty corresponds to operation at constant load enabling thermal equilibrium to be obtained. In this case, the selector switch must be in position 1 and the motor thermal protection is class 10.

S4 motor duty corresponds to a cycle comprising a start, followed by operation at constant load and a rest and de-energized period. This cycle is characterized by a cyclic duration factor. The Altistart 46 is sized to have a 50 % cyclic duration factor.

With no derating, the selection of an ATS-46D17N for a 7.5 kW - 400 V motor, in normal duty, allows 10 starts per hour at 3 In for 23 seconds maximum or equivalent. In this case, the motor thermal protection is class 10.

With derating, the selection of an ATS-46D17N for a 5.5 kW - 400 V motor, in heavy duty, allows 5 starts per hour at 3.5 In for 46 seconds maximum or equivalent. In this case, the motor thermal protection is class 20.

Note : it is possible to over-rate the starter, select an ATS-46D17N for a 11 kW - 400 V motor in S4 motor duty.
To do this, select normal duty and short-circuit the Altistart at the end of starting. This allows 10 starts per hour at 3 In for 23 seconds maximum or equivalent and the motor thermal protection is class 10.

Caution : do not use the Altistart 46 upstream of a motor supply transformer. Do not connect power factor compensation capacitors to the terminals of a motor controlled by an Altistart 46.

Starter-motor combination

If the nominal current on the motor identification plate is not between 0.95 In and 1.05 In (In being the factory set starter current), the motor thermal protection is not at is optimum. Use option VW3-G46101 to adapt the thermal protection.

Starter-motor combination

Normal duty application (power indicated on the motor identification plate in kW)

Motor				Starter			
Motor power				Current factory setting (In)	Rating (IcL)	Starter Reference (1)	Weight
230 V	400 V	440 V	500 V				
kW	**kW**	**kW**	**kW**	**A**	**A**		kg
4	7.5	7.5	9	15.2	17	**ATS-46D17N**	4.100
5.5	11	11	11	21	22	**ATS-46D22N**	4.100
7.5	15	15	18.5	28	32	**ATS-46D32N**	4.400
9	18.5	18.5	22	34	38	**ATS-46D38N**	4.400
11	22	22	30	42	47	**ATS-46D47N**	6.900
15	30	30	37	54	62	**ATS-46D62N**	6.900
18.5	37	37	45	68	75	**ATS-46D75N**	10.700
22	45	45	55	80	88	**ATS-46D88N**	10.700
30	55	55	75	98	110	**ATS-46C11N**	11.900
37	75	75	90	128	140	**ATS-46C14N**	16.000
45	90	90	110	160	170	**ATS-46C17N**	44.000
55	110	110	132	190	210	**ATS-46C21N**	44.000
75	132	132	160	236	250	**ATS-46C25N**	44.000
90	160	160	220	290	320	**ATS-46C32N**	45.000
110	220	220	250	367	410	**ATS-46C41N**	56.000
132	250	250	315	430	480	**ATS-46C48N**	62.000
160	315	355	400	547	590	**ATS-46C59N**	62.000
–	355	400	–	610	660	**ATS-46C66N**	62.000
220	400	500	500	725	790	**ATS-46C79N**	112.000
250	500	630	630	880	1000	**ATS-46M10N**	124.000
355	630	710	800	1130	1200	**ATS-46M12N**	124.000

(1) Product with no MMI module.

Starter-motor combination

Normal duty application (power indicated on the motor identification plate in HP)

Motor			Starter			
Motor power			Current factory setting (In)	Rating (IcL)	Starter Reference (1)	Weight
208 V	230 V	460 V				
HP	**HP**	**HP**	**A**	**A**		kg
3	5	10	15.2	17	**ATS-46D17N**	4.100
5	7.5	15	21	22	**ATS-46D22N**	4.100
7.5	10	20	28	32	**ATS-46D32N**	4.400
10	–	25	34	38	**ATS-46D38N**	4.400
–	15	30	42	47	**ATS-46D47N**	6.900
15	20	40	54	62	**ATS-46D62N**	6.900
20	25	50	68	75	**ATS-46D75N**	10.700
25	30	60	80	88	**ATS-46D88N**	10.700
30	40	75	98	110	**ATS-46C11N**	11.900
40	50	100	128	140	**ATS-46C14N**	16.000
50	60	125	160	170	**ATS-46C17N**	44.000
60	75	150	190	210	**ATS-46C21N**	44.000
75	100	200	236	250	**ATS-46C25N**	44.000
100	125	250	290	320	**ATS-46C32N**	45.000
125	150	300	367	410	**ATS-46C41N**	56.000
150	–	350	430	480	**ATS-46C48N**	62.000
–	200	400	547	590	**ATS-46C59N**	62.000
200	250	500	610	660	**ATS-46C66N**	62.000
250	300	600	725	790	**ATS-46C79N**	112.000
350	400	800	880	1000	**ATS-46M10N**	124.000
400	450	900	1130	1200	**ATS-46M12N**	124.000

(1) Product with no MMI module.

Starter-motor combination

Heavy duty application (power indicated on the motor identification plate in kW)

Motor				Starter			
Motor power				Current factory setting (In)	Rating (IcL)	Starter Reference (1)	Weight
230 V	400 V	440 V	500 V				
kW	**kW**	**kW**	**kW**	**A**	**A**		kg
3	5.5	5.5	7.5	11	12	**ATS-46D17N**	4.100
4	7.5	7.5	9	15.2	17	**ATS-46D22N**	4.100
5.5	11	11	11	21	22	**ATS-46D32N**	4.400
7.5	15	15	18.5	28	32	**ATS-46D38N**	4.400
9	18.5	18.5	22	34	38	**ATS-46D47N**	6.900
11	22	22	30	42	47	**ATS-46D62N**	6.900
15	30	30	37	54	62	**ATS-46D75N**	10.700
18.5	37	37	45	68	75	**ATS-46D88N**	10.700
22	45	45	55	80	88	**ATS-46C11N**	11.900
30	55	55	75	98	110	**ATS-46C14N**	16.000
37	75	75	90	128	140	**ATS-46C17N**	44.000
45	90	90	110	160	170	**ATS-46C21N**	44.000
55	110	110	132	190	210	**ATS-46C25N**	44.000
75	132	132	160	236	250	**ATS-46C32N**	45.000
90	160	160	220	290	320	**ATS-46C41N**	56.000
110	220	220	250	367	410	**ATS-46C48N**	62.000
132	250	250	315	430	480	**ATS-46C59N**	62.000
160	315	355	400	547	590	**ATS-46C66N**	62.000
–	355	400	–	610	660	**ATS-46C79N**	112.000
220	400	500	500	725	790	**ATS-46M10N**	124.000
250	500	630	630	880	1000	**ATS-46M12N**	124.000

(1) Product with no MMI module.

Starter-motor combination

Heavy duty application (power indicated on the motor identification plate in HP)

Motor			Starter			
Motor power 208 V	230 V	460 V	Current factory setting (In)	Rating (IcL)	Starter Reference (1)	Weight
HP	**HP**	**HP**	**A**	**A**		kg
2	3	7.5	11	12	**ATS-46D17N**	4.100
3	5	10	15.2	17	**ATS-46D22N**	4.100
5	7.5	15	21	22	**ATS-46D32N**	4.400
7.5	10	20	28	32	**ATS-46D38N**	4.400
10	–	25	34	38	**ATS-46D47N**	6.900
–	15	30	42	47	**ATS-46D62N**	6.900
15	20	40	54	62	**ATS-46D75N**	10.700
20	25	50	68	75	**ATS-46D88N**	10.700
25	30	60	80	88	**ATS-46C11N**	11.900
30	40	75	98	110	**ATS-46C14N**	16.000
40	50	100	128	140	**ATS-46C17N**	44.000
50	60	125	160	170	**ATS-46C21N**	44.000
60	75	150	190	210	**ATS-46C25N**	44.000
75	100	200	236	250	**ATS-46C32N**	45.000
100	125	250	290	320	**ATS-46C41N**	56.000
125	150	300	367	410	**ATS-46C48N**	62.000
150	–	350	430	480	**ATS-46C59N**	62.000
–	200	400	547	590	**ATS-46C66N**	62.000
200	250	500	610	660	**ATS-46C79N**	112.000
250	300	600	725	790	**ATS-46M10N**	124.000
350	400	800	880	1000	**ATS-46M12N**	124.000

(1) Product with no MMI module.

Environment

Degree of protection	IP 20 : ATS-46D17N to 46C14N starters IP 00 : ATS-46C17N to 46M12N starters
Shock resistance	Conforming to IEC 68-2-27 : 15 g, 11 ms : ATS-46D17N to 46D38N starters
Vibration resistance	Conforming to IEC 68-2-6, NFC 20706 and BV1
Resistance to electro-static discharges	Conforming to IEC 1000-4-2 – level 3
Immunity to radio-electric interference	Conforming to IEC 1000-4-3 – level 3
Immunity to rapid electrical transients	Conforming to IEC 1000-4-4 – level 4
EMC Conducted and radiated emissions	Standard IEC 947-4-2, class A : for all products. Standard IEC 947-4-2, class B : on all products up to 140 A (sizes 1 and 2). Neccesary to bypass the Altistart at the end of starting or add a line choke as listed in the catalogue.
Ambient air temperature	Operation : 0 to + 40 °C without derating (between + 40 °C and + 60 °C, derate the Altistart current by 1.2 % for each °C) Storage : - 25 °C to + 70 °C
Maximum relative humidity	93 % without condensation or dripping water
Maximum ambient pollution	Degree 3 conforming to IEC 664
Maximum operating altitude	1000 m without derating (above this, derate the Altistart current by 0.5 % for each additional 100 m)
Operating position	Maximum vertical inclination ± 15° with respect to the normal mounting position

Electrical characteristics

Three-phase supply voltage	208 V - 10 % … 240 V + 10 % 380 V - 15 % … 415 V + 10 % 440 V - 15 % … 500 V + 10 %
Frequency	50 or 60 Hz self-adaptation
Nominal current	17 to 1200 A in 21 ratings
Motor power	2.2 to 800 kW and 5 to 1220 HP
Motor voltage	208-220-230-240 V, or 400 V, or 440-460-500 V

Characteristics

Method of starting			
- Via torque control - Current limit	Following an acceleration ramp, 10 s in normal duty (factory setting) or 15 s in heavy duty. In the event of a high torque, the starter current is limited to 3 In in normal duty, to 3.5 In in heavy duty and can be as high as 5 In when a VW3-G46101 option is used.		
Method of stopping			
- Freewheel stop	“Freewheel" stop (factory setting)		
LED display	Off	On steady	Flashing (with VW3-G46101 option)
- Locking (red)	–	Fault	Automatic fault reset
- On (green)	–	Switched on	–
Protection	Integrated thermal protection, motor and starter		
- Mains supply protection	Phase failure and imbalance, signalling via output relay		
- Thermocontacts	On fan-cooled units (75 to 1200 A ratings), fixed on the thyristor heatsink : thermocontact (50 °C) for controlling ventilation and thermocontact for protecting the starter (90 °C or 105 °C)		
- Short circuit	Protection against short circuits less than13 times IcL		

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Thermal protection

A monitoring network controlled by the microprocessor continuously calculates the motor and starter temperature rise, based on the starter nominal current and the current which is actually drawn.

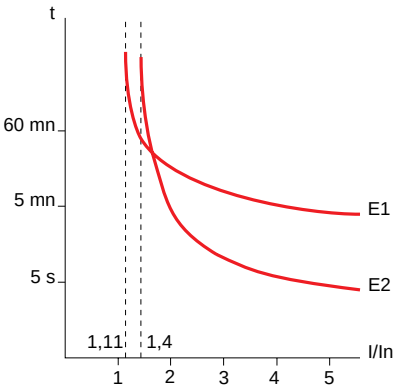
Temperature rises can be caused by a low or high overload, lasting for a long or short period. Rises in temperature are managed very precisely with digital modelling using two thermal images :

- the first (E1) represents the overshoot of the temperature rise corresponding to “iron",

- the second (E2) represents the overshoot of the temperature rise corresponding to “copper".

The tripping curves opposite and on the next page have been determined as a function of multiples of starter nominal current In.

Standard IEC947-4-2 defines the protection classes giving the motor starting capacities from hot and from cold with no thermal fault. The various protection classes are given for a COLD state (corresponding to a stabilized motor thermal state, with the motor off) and for a HOT state (corresponding to a stabilized motor thermal state, at nominal power).



The starter is factory set to class 10, normal duty (class 20 for heavy duty). It is possible to modify these protection classes by using option VW3-G46101.

For each thermal image, two cascaded alarm levels detect the size of the temperature rises :

- an overload alarm which warns when the motor exceeds its nominal temperature rise threshold, set at 1.05 In for E1 and 1.3 In for E2,

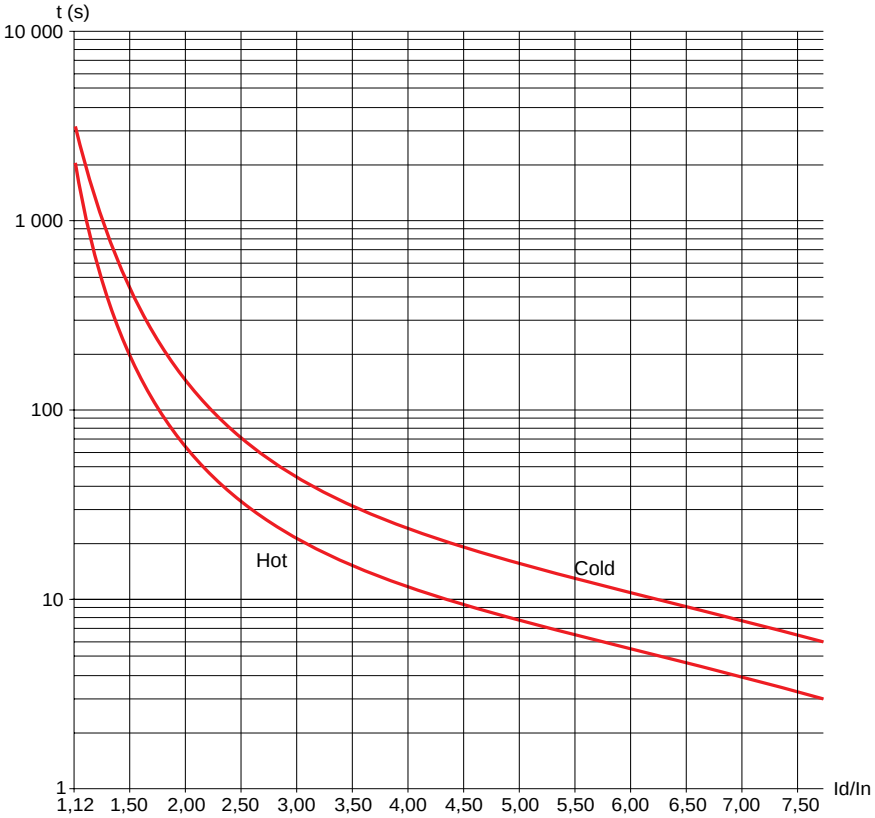
- a thermal fault which stops the motor if a critical temperature rise threshold is exceeded. This threshold is set at 1.1 In for E1 and 1.4 In for E2.

The thermal fault is indicated by relay R1.

After a stop, the Altistart thermal control prevents the motor restarting if its temperature is still too high.

If a special motor is used (flameproof, submerged, etc), external thermal protection must be provided using thermistor probes or a thermal relay.

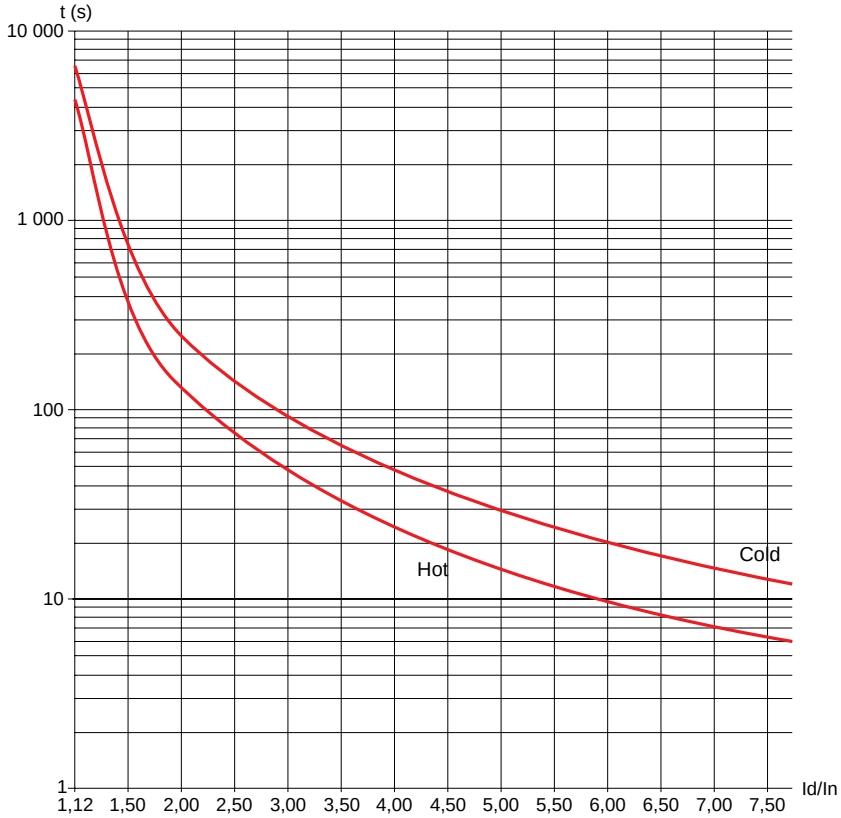
Tripping curves for normal duty : class 10



Tripping time at :

Class 10	3 In	5 In	7.2 In
Cold	45 s	15 s	7.4 s
Hot	23 s	7.5 s	3.5 s

Tripping curves for heavy duty : class 20

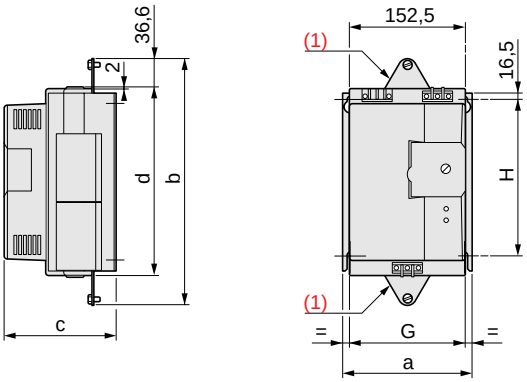


Tripping time at :

Class 20	3.5 In	5 In	7.2 In
Cold	63 s	29 s	15 s
Hot	32 s	15 s	7 s

Dimensions

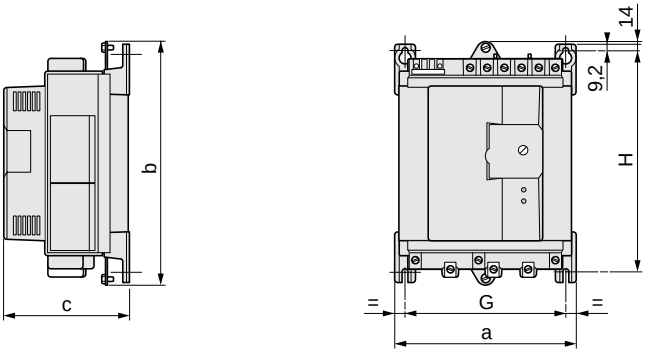
Size 1 : ATS-46D17N to 46D38N



(1) Removable earth boss, supplied with product but not fitted.

	a mm	b mm	c mm	d mm	G mm	H mm	Weight kg
ATS-46D17N	170	326	151	252	150	210	4.100
ATS-46D22N	170	326	151	252	150	210	4.100
ATS-46D32N	170	376	151	302	150	260	4.400
ATS-46D38N	170	376	151	302	150	260	4.400

Size 2 : ATS-46D47N to 46C14N



	a mm	b mm	c mm	G mm	H mm	Weight kg
ATS-46D47N	240	330	167	212	300	6.900
ATS-46D62N	240	330	167	212	300	6.900
ATS-46D75N	240	340	244	212	300	10.700
ATS-46D88N	240	340	244	212	300	10.700
ATS-46C11N	240	390	244	212	350	11.900
ATS-46C14N	240	440	244	212	400	16.000

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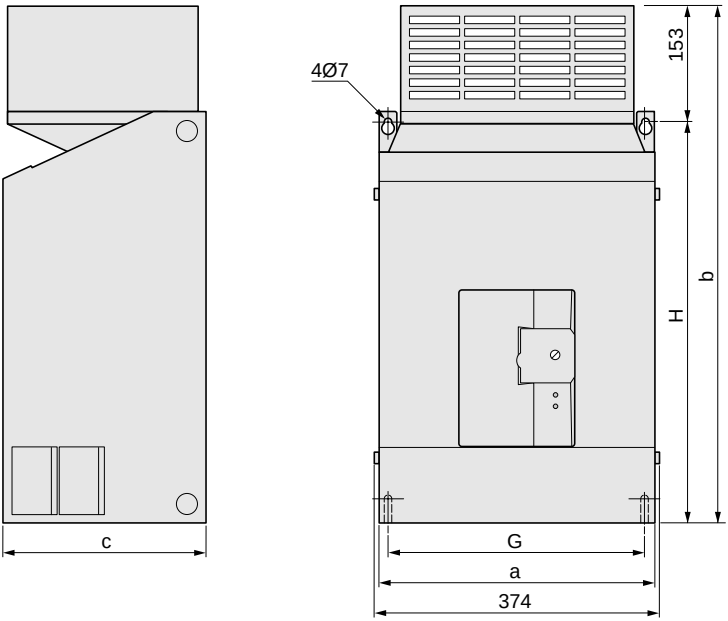
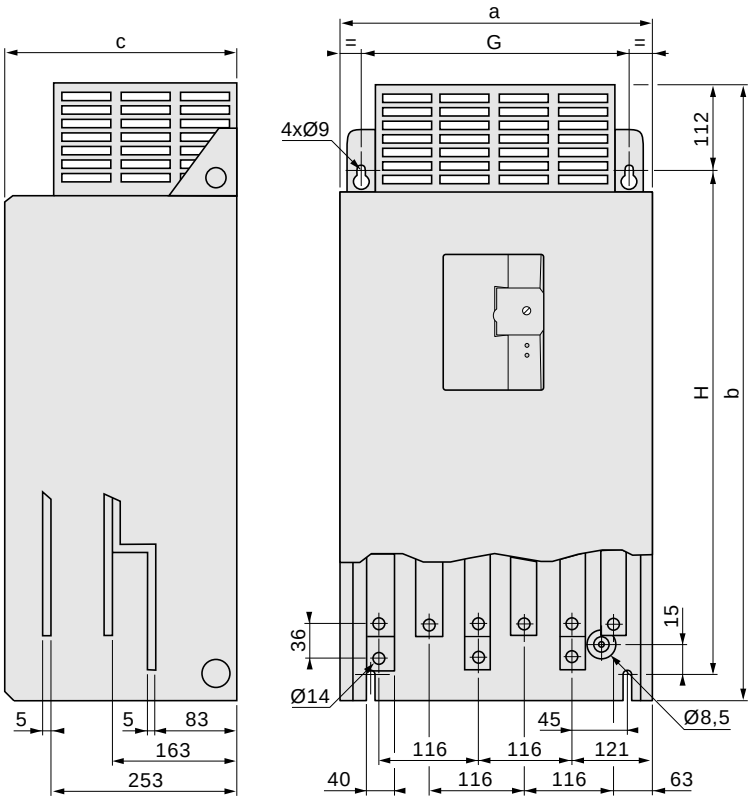
Size 3 : ATS-46C17N to 46C32N



	a mm	b mm	c mm	G mm	H mm	Weight kg
ATS-46C17N	364	685	269	339	500	44.000
ATS-46C21N	364	685	269	339	500	44.000
ATS-46C25N	364	685	269	339	500	44.000
ATS-46C32N	364	685	269	339	500	45.000

Dimensions

Size 4 : ATS-46C41N to 46C66N



	a mm	b mm	c mm	G mm	H mm	Weight kg
ATS-46C41N	401	950	353	335	800	56.000
ATS-46C48N	401	950	353	335	800	62.000
ATS-46C59N	401	950	353	335	800	62.000
ATS-46C66N	401	950	353	335	800	62.000

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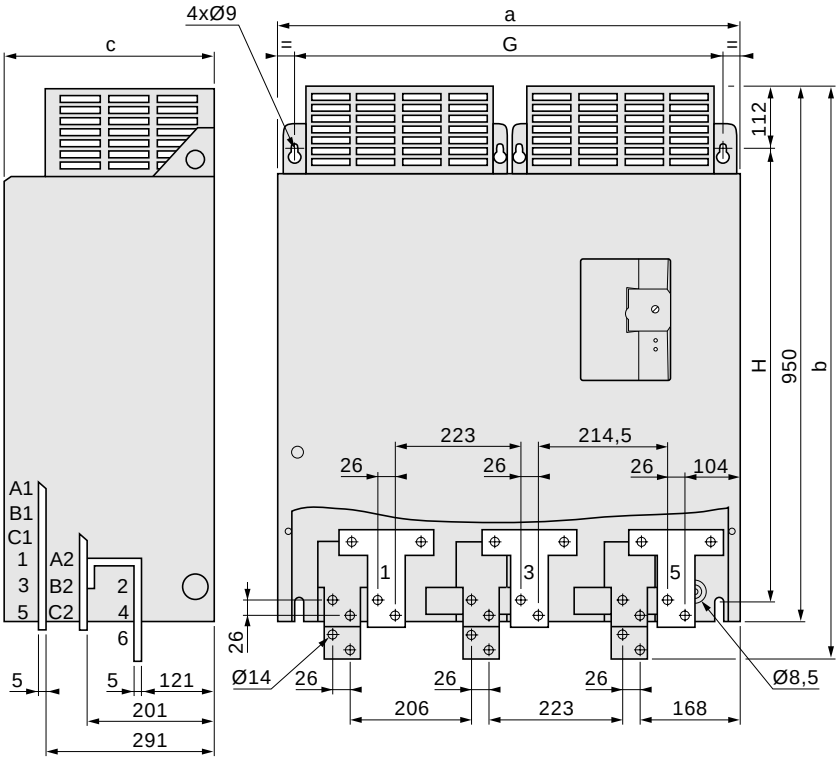
Size 5 : ATS-46C79N to 46M12N



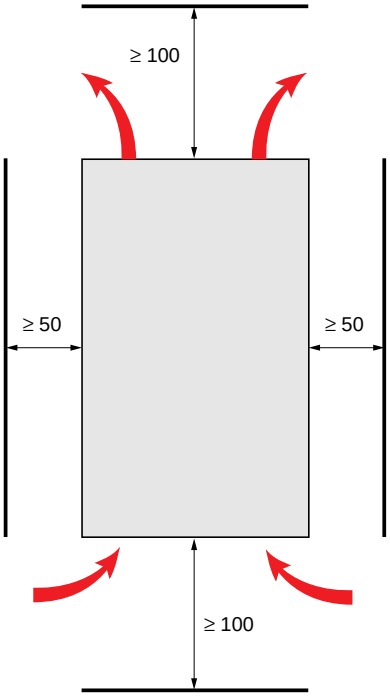
	a mm	b mm	c mm	G mm	H mm	Weight kg
ATS-46C79N	766	1012	353	700	800	112.000
ATS-46M10N	766	1012	353	700	800	124.000
ATS-46M12N	766	1012	353	700	800	124.000

Mounting recommendations (sizes 1 to 5)

Install the unit vertically.

Do not place it close to heating elements.

Leave sufficient clearance to allow circulation of air necessary for cooling. Ventilation is from the bottom to the top of the unit.



Ventilating fan flow rates : ATS-46D75N to 46C14N : 100 dm^3/s
ATS-46C17N to 46M12N : 385 dm^3/s

Power rating of control supply transformers (with internal ventilating fan) :

ATS-46D17N to 46D62N : 20 VA
ATS-46D75N to 46C14N : 70 VA
ATS-46C17N to 46C32N : 250 VA
ATS-46C41N to 46M12N : 250 VA

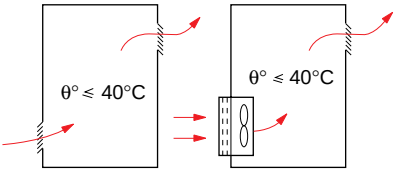
Metal enclosure, degree of protection IP23

Observe the mounting recommendations on page 19.

To ensure adequate air circulation in the starter :

- provide ventilation louvres,

- check that the ventilation is adequate. If not, fit a forced ventilation unit with a filter.



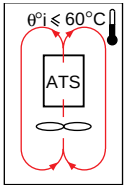
Power dissipated by the starters, non-shunted, at their rated current

Starter reference	Power in W	Starter reference	Power in W
ATS-46D17N	72	ATS-46C21N	670
ATS-46D22N	91	ATS-46C25N	817
ATS-46D32N	104	ATS-46C32N	973
ATS-46D38N	121	ATS-46C41N	1404
ATS-46D47N	161	ATS-46C48N	1452
ATS-46D62N	206	ATS-46C59N	1800
ATS-46D75N	265	ATS-46C66N	2022
ATS-46D88N	310	ATS-46C79N	2680
ATS-46C11N	342	ATS-46M10N	3040
ATS-46C14N	426	ATS-46M12N	3640
ATS-46C17N	566		

Dust and damp proof metal enclosure (degree of protection IP54)

For non-ventilated units (ATS-46D17N to 46D38N), in order to avoid hot spots in the starter, provide a ventilation fan to circulate the air inside the enclosure :

- flow rate 100 dm^3/s,
- mount ≤ 50 mm below the starter.



This arrangement makes it possible to use the starter in an enclosure whose maximum internal temperature can be 60 °C.

Caution : in this case, derate the Altistart current by 1.2 % for each °C above 40 °C.

Do not use insulated enclosures, as they have a poor level of thermal conductivity.

Calculating the size of the enclosure

Maximum thermal resistance Rth (°C/W) :

$$Rth = \frac{60 - \theta°e}{P}$$

θ°e = maximum external temperature in °C,
P = total power dissipated in the enclosure in W.

Power dissipated by the starter : see page 20.
Add the power dissipated by the other component parts of the device.

Useful heat exchange surface of the enclosure S (m^2) :
(sides + upper surface + front panel, when wall-mounted)

$$S = \frac{K}{Rth}$$

K = thermal resistance per m^2 of enclosure.

For an ACM type metal enclosure : K = 0.12 with ventilation fan,
K = 0.15 without fan.

Note

When starts are infrequent, it is advisable to short-circuit the Altistart at the end of starting in order to reduce the thermal dissipation.

Possibility of condensation

In this case, if the device is left switched off for long periods, a heating system must be provided (0.2 to 0.5 W per 10 cm^2 of enclosure) which switches on automatically as soon as the unit stops. This device keeps the inside of the enclosure at a temperature slightly above the external temperature, and avoids any risk of condensation or dripping water while the device is switched off.
Alternative solution : keep the device powered up while it is stopped (the heat of the device itself when it is powered up is generally sufficient to provide this difference in temperature).

Terminals	Functions	Maximum connection capacity *Terminal tightening torque*				
		Size 1	Size 2	Size 3	Size 4	Size 5
⏚	Earth terminal connected to Altistart earth	10 mm² *1.7 N.m*	16 mm² *3 N.m*	120 mm² *27 N.m*	240 mm² *27 N.m*	2 x 240 mm² *27 N.m*
		8 AWG *15 lb.in*	4 AWG *25.6 lb.in*	Bus Bar *238 lb.in*	Bus Bar *238 lb.in*	Bus Bar *238 lb.in*
1/L1 A1 3/L2 B1 5/L3 C1	Power supply	10 mm² *1.7 N.m*	50 mm² *10 N.m*	240 mm² *34 N.m*	2 x 240 mm² *57 N.m*	4 x 240 mm² *57 N.m*
		8 AWG *15 lb.in*	2/0 AWG *88 lb.in*	Bus Bar *300 lb.in*	Bus Bar *500 lb.in*	Bus Bar *500 lb.in*
2/T1 A2 4/T2 B2 6/T3 C2	Connection to the motor	10 mm² *1.7 N.m*	50 mm² *10 N.m*	240 mm² *34 N.m*	2 x 240 mm² *57 N.m*	4 x 240 mm² *57 N.m*
		8 AWG *15 lb.in*	2/0 AWG *88 lb.in*	Bus Bar *300 lb.in*	Bus Bar *500 lb.in*	Bus Bar *500 lb.in*
⏚	Earth terminal connected Altistart earth	10 mm² *1.7 N.m*	16 mm² *3 N.m*	120 mm² *27 N.m*	240 mm² *27 N.m*	2 x 240 mm² *27 N.m*
		8 AWG *15 lb.in*	4 AWG *25.6 lb.in*	Bus Bar *238 lb.in*	Bus Bar *238 lb.in*	Bus Bar *238 lb.in*
C 230 400 460/500	Control power supply	2.5 mm² *1.2 N.m*	2.5 mm² *1.2 N.m*	2.5 mm² *0.6 N.m*	2.5 mm² *0.6 N.m*	2.5 mm² *0.6 N.m*
		12 AWG *10.5 lb.in*	12 AWG *10.5 lb.in*	12 AWG *5.2 lb.in*	12 AWG *5.2 lb.in*	12 AWG *5.2 lb.in*

For all the starters, the control card is supplied via terminals C-230, 400, 460/500. It is therefore advisable to check the connection according to the supply voltage.

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Control terminal blocks

Terminal blocks J1 and J2 have plug-in connectors with a coding chip.

Maximum connection capacity : 2.5 mm^2 (12 AWG)
Maximum tightening torque : 0.4 N.m (3.5 lb.in)

To access terminal blocks J1 and J2 on starters ATS-46C17N to 46M12N, the protective cover must be removed.

Factory configuration of the starter

J2-Terms.	**Function**	**Characteristics**
STOP RUN LI	Stop starter Run starter Freewheel stop (assignable input)	3 logic inputs with 1.5 kΩ impedance Umax = 30 V, Imax = 16.5 mA state 1 : U > 11 V - I > 6 mA state 0 : U < 5 V - I < 2 mA
PL	Supply to logic inputs	+ 24 V ± 20% isolated and not protected against short-circuits and overloads; maximum : 60 mA
LO+	Supply to logic outputs	Connect to PL or to an external supply
LO1 LO2	Motor thermal alarm Current threshold alarm	Logic outputs compatible with PLC inputs (open collector) Umax = 40 V, Umin = 10 V ; maximum current : 200 mA with external supply
AO1	Motor current	0-20 mA, linearity 1 %, precision 1 % maximum impedance 800 Ω
COM	Logic input, logic output and analog output common	0 V isolated
J1-Terms.		
R1B R1D R1A R1C	N/C contact of relay R1 N/O contact of relay R1 Activated on power up Deactivated at a fault	Minimum switching capacity 100 mA-24 V maximum operating voltage ∿ 400 V Nominal operating current : 0.5 A at AC-14 and AC-15 (∿ 240 V) and DC-13 (⎓ 48 V)
R2A R2C	N/O contact of relay R2 Control of starter shunt contactor	

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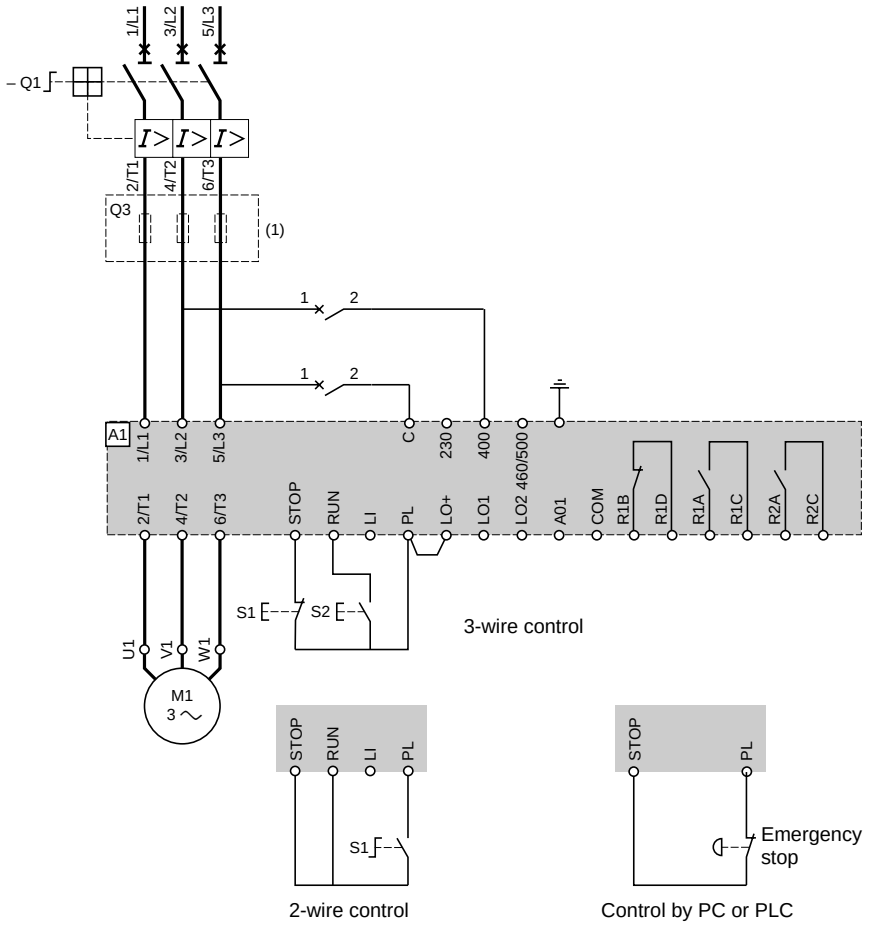
ATS-46 : 1 running direction, free or controlled stop, coordination type 1



(1) Installation of fuses for type 2 coordination

Use the fault relay contact for signalling, or provide the magnetic circuit-breaker of an undervoltage trip.

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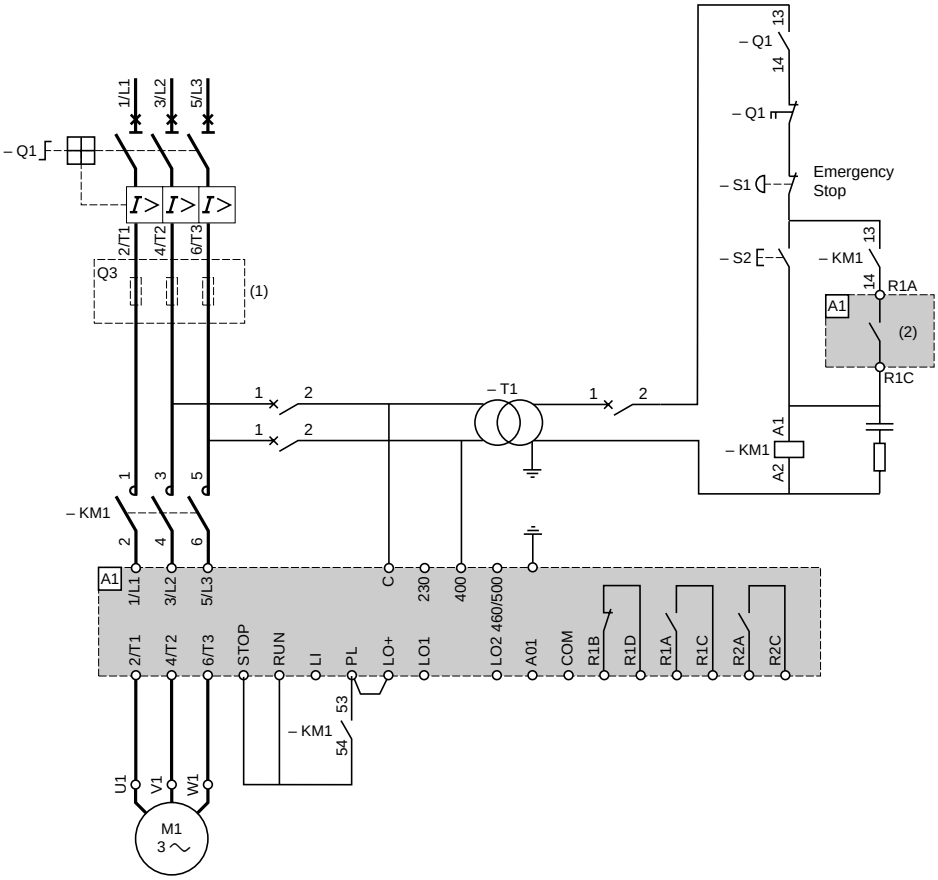
Application diagram (400 V supply)

ATS-46 : non-reversing with line contactor, freewheel stop, type 1 coordination



(1) Installation of fuses for type 2 coordination

(2) Assignment of relay R1 : Isolating relay (RII)

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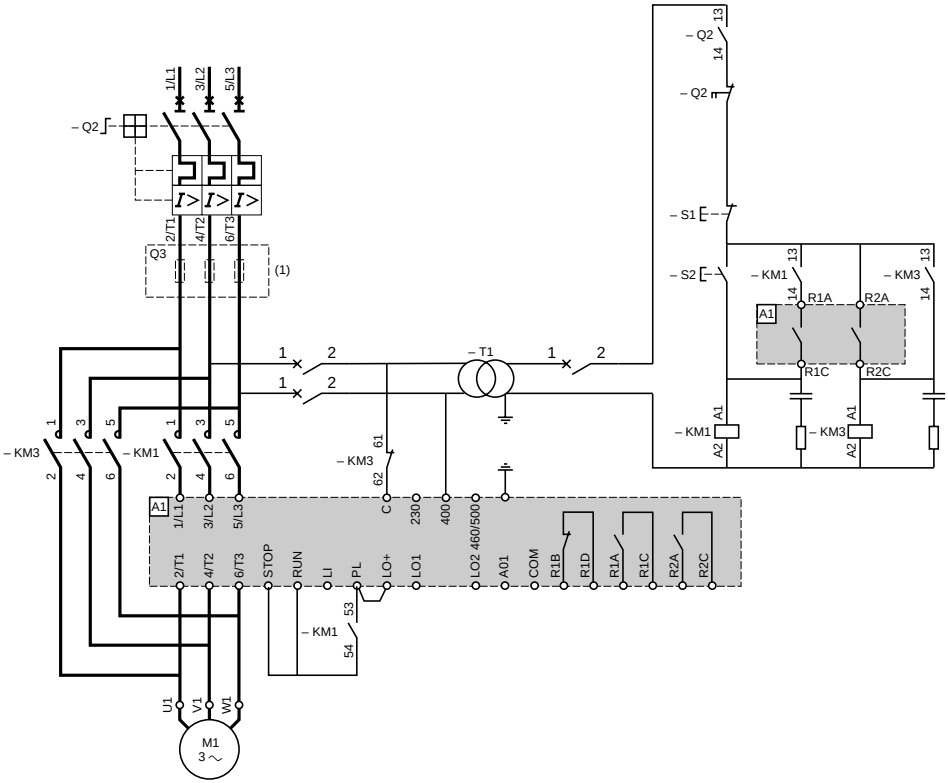
ATS-46D17N to 46D38N : non-reversing, short-circuit at end of start, freewheel stop, type 1 coordination

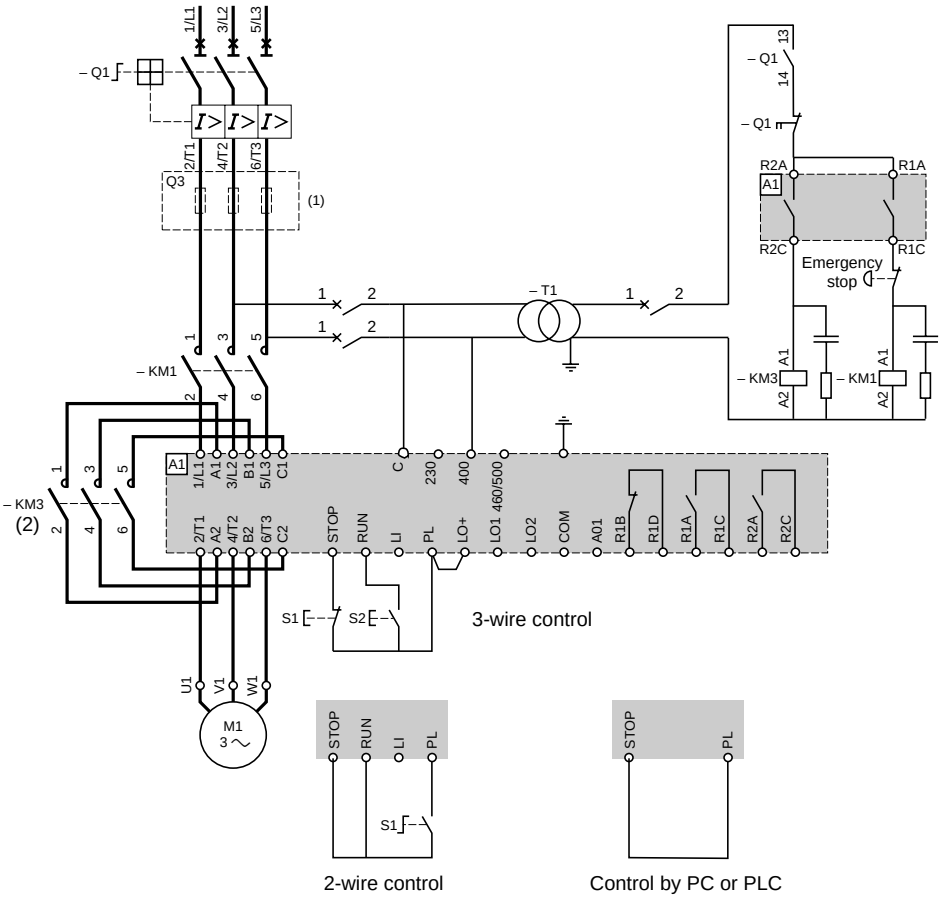


(1) Installation of fuses for type 2 coordination

The Altistart is switched off at the end of starting by contactor KM3.

Application diagram (400 V supply)

ATS-46D47N to 46M12N : non-reversing with isolating contactor, short-circuiting, free or controlled stop, type 1 coordination



(1) Installation of fuses for type 2 coordination
(2) Not compulsory

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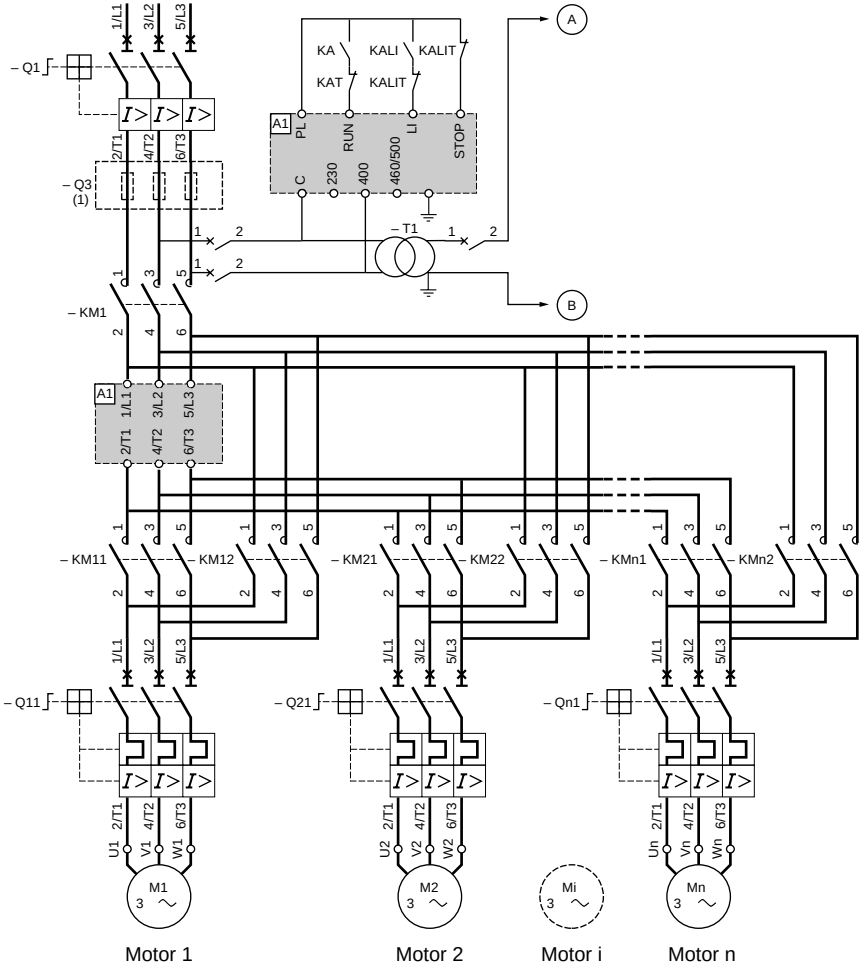
ATS-46 : 1 operating direction using a line contactor, starting and stopping several motors in cascade with one Altistart.



(1) Installation of fuses for type 2 coordination

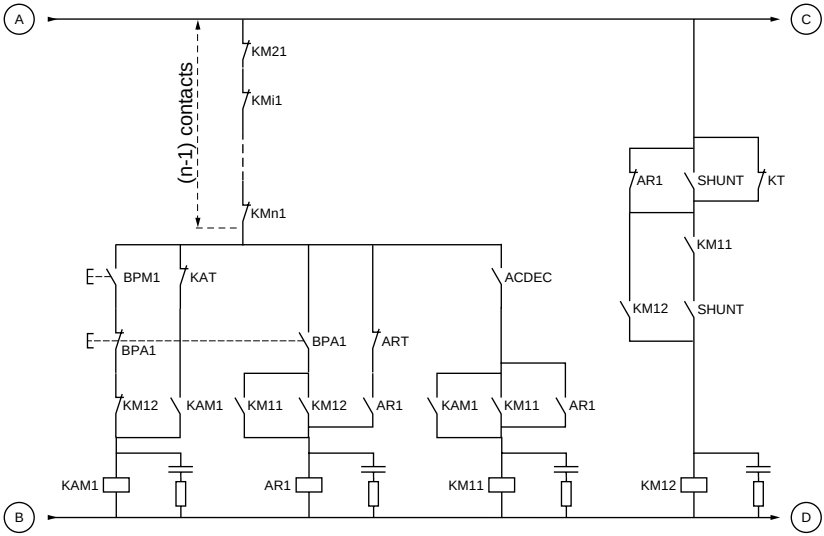
Use the fault relay contact for signalling , or use an undervoltage release in the magnetic breaker.

Important :

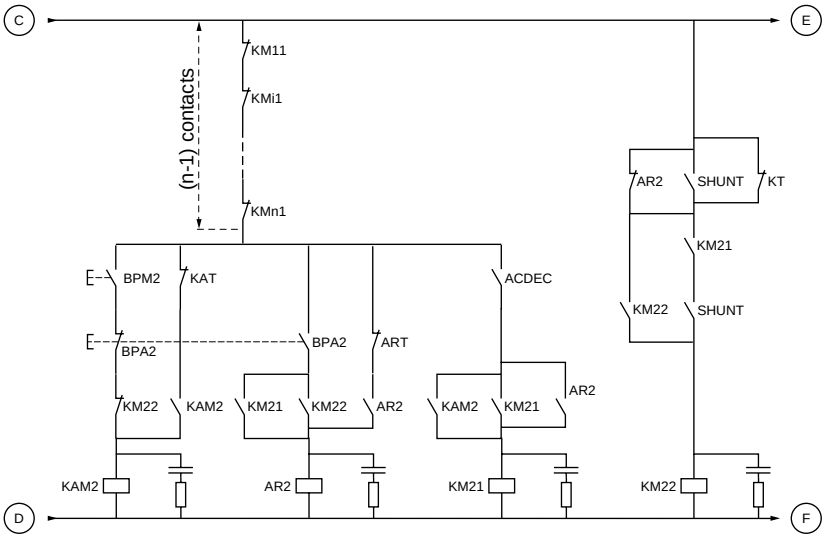
- It is necessary to configure the ATS46 in cascade.
- In case of a fault it is not possible to decelerate or brake any motors in service.

ATS-46 : 1 operating direction using a line contactor, starting and stopping several motors in cascade with one Altistart.

Motor control 1



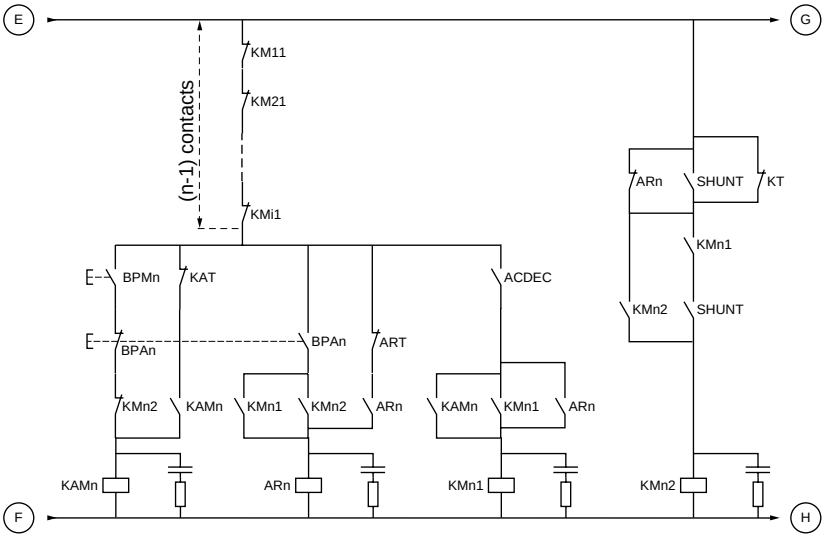
Motor control 2



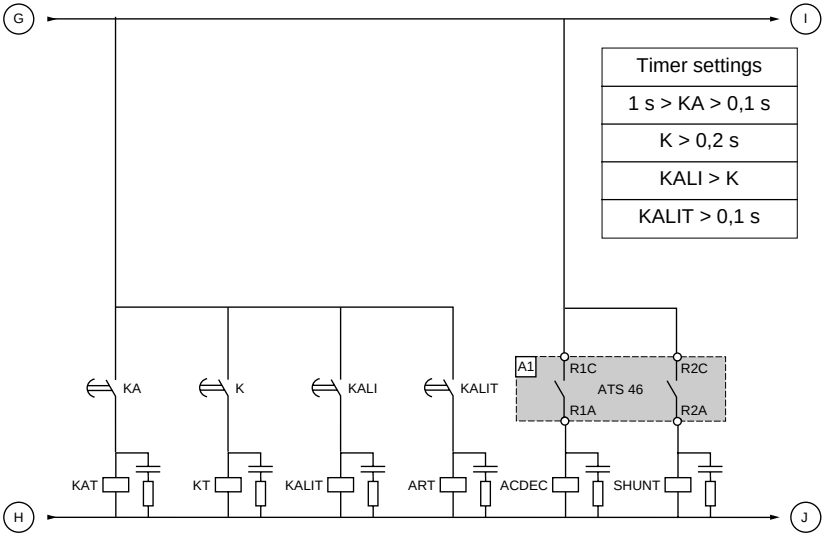
BPM1 : Pushbutton "Start" motor 1
BPM2 : Pushbutton "Start" motor 2
BPA1 : Pushbutton "Stop" motor 1
BPA2 : Pushbutton "Stop" motor 2

ATS-46 : 1 operating direction using a line contactor, starting and stopping several motors in cascade with one Altistart.

Motor control n



Cascade control

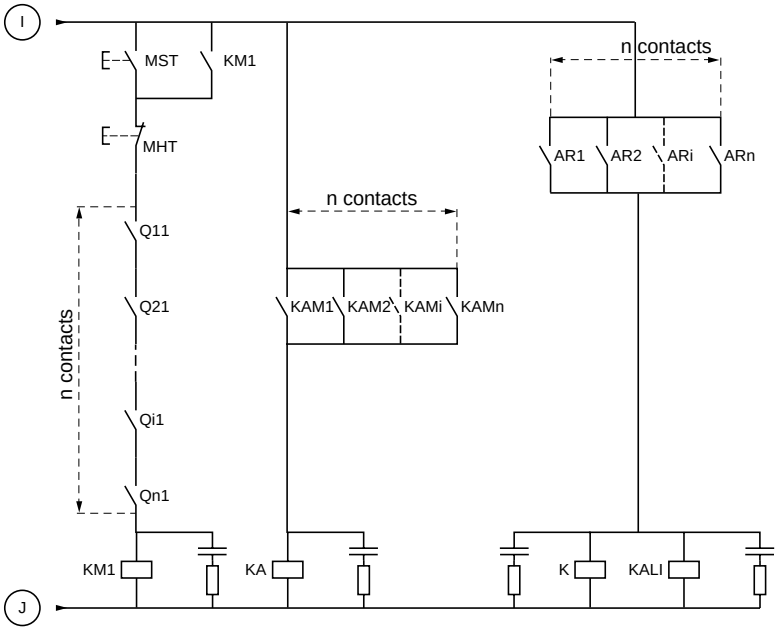


BPMn : Pushbutton "Start" motor n
BPAn : Pushbutton "Stop" motor n

Application diagram (400 V supply)

ATS-46 : 1 operating direction using a line contactor, starting and stopping several motors in cascade with one Altistart.

Cascade control



MST : Pushbutton "Start" general
MHT : Pushbutton "Stop" general

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Conforming to IEC 947-4-2, type 2 coordination
Three-phase supply voltage : 400 V

Label	M1	A1	KM1, KM2, KM3	Q1	Q2
Description	Motor 400 V power	Starter	Contactor (1)	Magnetic circuit-breaker	Thermal-magnetic circuit-breaker
Reference					
	7.5kW	ATS-46D17N	LC1-D2510●●	GV2-L20	GV2-P21
	11 kW	ATS-46D22N	LC1-D2510●●	GV2-L22	GV2-P22
	15 kW	ATS-46D32N	LC1-D3210●●	NS80H+MA	GV7-RS40
	18.5 kW	ATS-46D38N	LC1-D5011●●	NS80H+MA	GV7-RS50
	22 kW	ATS-46D47N	LC1-D5011●●	NS80H+MA	–
	30 kW	ATS-46D62N	LC1-D6511●●	NS80H+MA	–
	37 kW	ATS-46D75N	LC1-D8011●●	NS80H+MA	–
	45 kW	ATS-46D88N	LC1-F115●●	NS100H+MA	–
	55 kW	ATS-46C11N	LC1-F115●●	NS160H+MA	–
	75 kW	ATS-46C14N	LC1-F150●●	NS250H+MA	–
	90 kW	ATS-46C17N	LC1-F185●●	NS250H+MA	–
	110 kW	ATS-46C21N	LC1-F225●●	NS250H+MA	–
	132 kW	ATS-46C25N	LC1-F265●●	NS400H+MA	–
	160 kW	ATS-46C32N	LC1-F330●●	NS400H+MA	–
	220 kW	ATS-46C41N	LC1-F400●●	NS630H+MA	–
	250 kW	ATS-46C48N	LC1-F500●●	NS630H+MA	–
	315 kW	ATS-46C59N	LC1-F630●●	–	–
	355 kW	ATS-46C66N	LC1-F630●●	–	–
	400 kW	ATS-46C79N	LC1-F780●●	–	–
	500 kW	ATS-46M10N	LC1-BM33●22	–	–
	630 kW	ATS-46M12N	LC1-BP33●22	–	–

(1) Complete the reference according to the mains supply frequency and the control voltage.
Control devices S1 and S2 are **XB2-B** or **XB2-M** units.

Conforming to IEC 947-4-2, type 2 coordination
Three-phase supply voltage : 400 V

Label	**Q3**		
Description	Quick-blowing fuse		
	Reference	Size	Rating
	DF3-EF04001	14 x 51	40 A
	DF3-FF10001	22 x 58	50 A
	DF3-FF10001	22 x 58	100 A
	DF3-FF10001	22 x 58	100 A
	DF3-NF40002	(1)	400 A
	DF3-NF40002	(1)	400 A
	DF3-NF40002	(1)	400 A
	DF3-NF40002	(1)	400 A
	DF3-NF50002	(1)	500 A
	DF3-QF63002	(1)	630 A
	DF3-QF63002	(1)	630 A
	DF3-QF63002	(1)	630 A
	DF3-QF63002	(1)	630 A
	DF3-QF80002	(1)	800 A
	DF3-QF90002	(1)	900 A
	DF3-QF90002	(1)	900 A
	DF3-QFM1202	(1)	1 250 A
	DF3-QFM1202	(1)	1 250 A
	DF3-QQFM1802	(1)	1 800 A
	DF3-QQFM2202	(1)	2 200 A
	DF3-QQFM2202	(1)	2 200 A

(1) Provide the necessary accessories for fixing and connecting these fuses, as well as the microswitches and visual adaptors.

Conforming to IEC 947-4-2, type 1 coordination
Three-phase supply voltage : 400 V

Label	M1	A1	KM1, KM2, KM3	Q1	Q2
Description	Motor 400 V power	Starter	Contactor (1)	Magnetic circuit-breaker	Thermal-magnetic circuit-breaker
Reference	7.5kW	ATS-46D17N	LC1-D1810●●	GV2-L20	GV2-M20
	11 kW	ATS-46D22N	LC1-D2510●●	GV2-L22	GV2-M22
	15 kW	ATS-46D32N	LC1-D3210●●	GK3-EF40	GV3-M63
	18.5 kW	ATS-46D38N	LC1-D3810●●	GK3-EF40	GV3-M63
	22 kW	ATS-46D47N	LC1-D5011●●	GK3-EF65	–
	30 kW	ATS-46D62N	LC1-D6511●●	GK3-EK65	–
	37 kW	ATS-46D75N	LC1-D8011●●	GK3-EF80	–
	45 kW	ATS-46D88N	LC1-D9511●●	NS100N+MA	–
	55 kW	ATS-46C11N	LC1-F115●●	NS160N+MA	–
	75 kW	ATS-46C14N	LC1-F150●●	NS160N+MA	–
	90 kW	ATS-46C17N	LC1-F185●●	NS250N+MA	–
	110 kW	ATS-46C21N	LC1-F225●●	NS250N+MA	–
	132 kW	ATS-46C25N	LC1-F265●●	NS400N+MA	–
	160 kW	ATS-46C32N	LC1-F330●●	NS400N+MA	–
	220 kW	ATS-46C41N	LC1-F400●●	NS630N+MA	–
	250 kW	ATS-46C48N	LC1-F500●●	NS630N+MA	–
	315 kW	ATS-46C59N	LC1-F500●●	–	–
	355 kW	ATS-46C66N	LC1-F500●●	–	–
	400 kW	ATS-46C79N	LC1-F630●●	–	–
	500 kW	ATS-46M10N	LC1-F630●●	–	–
	630 kW	ATS-46M12N	LC1-F780●●	–	–

(1) Complete the reference according to the mains supply frequency and the control voltage.
Control devices S1 and S2 are **XB2-B** or **XB2-M** units.

Maintenance

The Altistart does not requires any preventive servicing. However, it is advisable to perform the following at regular intervals :

- check the state and tightness of connections,
- check that the ventilation is efficient and that the temperature around the starter remains at an acceptable level,
- remove dust from the starter if necessary.

Before performing any operation on the starter, **switch it off**.

Line chokes

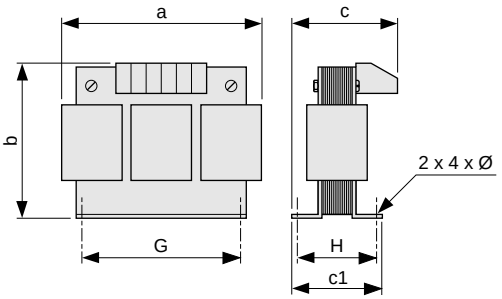
The installation of line chokes is particularly recommended for installations where there are several electronic starters or speed controllers on the same line.

For Altistart	Characteristics	Reference	Weight kg
ATS-46D17N	1.7 mH-15 A	**VZ1-L015UM17T**	2.100
ATS-46D22N	0.8 mH-30 A	**VZ1-L030U800T**	4.100
ATS-46D32N and 46D38N	0.6 mH-40 A	**VZ1-L040U600T**	5.100
ATS-46D47N and 46D62N	0.35 mH-70 A	**VZ1-L070U350T**	8.000
ATS-46D75N and 46C14N	0.17 mH-150 A	**VZ1-L150U170T**	14.900
ATS-46C17N to 46C25N	0.1 mH-250 A	**VZ1-L250U100T**	24.300
ATS-46C32N	0.075 mH-325 A	**VZ1-L325U075T**	28.900
ATS-46C41N to 46C48N	0.045 mH-530 A	**VZ1-L530U045T**	37.000
ATS-46C59N to 46M10N	0.024 mH-1025 A	**VZ1-LM10U024T**	66.000
ATS-46M12N	0.016 mH-1435 A	**VZ1-LM14U016T**	80.000

Installation - Dimensions

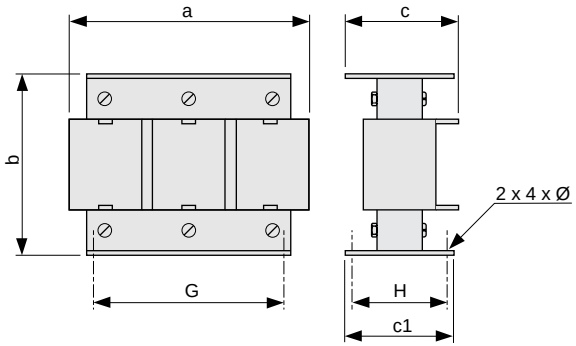
Install the three-phase choke between the line contactor and the starter.

VZ1-L015UM17T to L070U350T



Choke	a	b	c	c1	G	H	Ø
VZ1-L015UM17T	120	150	80	75	60/80.5	52	6
VZ1-L030U800T	150	180	120	100	75/106.5	76	7
VZ1-L040U600T	180	215	130	100	85/122	76	7
VZ1-L070U350T	180	215	150	130	85/122	97	7

VZ1-L150U170T to LM14U016T



Choke	a	b	c	c1	G	H	Ø
VZ1-L150U170T	270	240	170	140	105/181	96	11.5
VZ1-L250U100T	270	240	220	160	105/181	125	11.5
VZ1-L325U075T	270	240	240	175	105/181	138	11.5
VZ1-L530U045T	380	410	225	140	310	95	9
VZ1-LM10U024T	400	410	310	170	310	125	9
VZ1-LM14U016T	420	490	340	170	310	125	9

Spare parts

Description	For starters	Reference	Weight kg
Encapsulated components with 2 thyristors	ATS-46D17N	**VZ3-TM2026M16**	0.125
	ATS-46D22N and 46D32N	**VZ3-TM2055M16**	0.125
	ATS-46D38N	**VZ3-TM2090M16**	0.125
	ATS-46D47N to 46D88N	**VZ3-TM2130M16**	0.400
	ATS-46C11N	**VZ3-TM2160M1601**	0.400
	ATS-46C14N to 46C25N	**VZ3-TM2250M16**	1.100
Encaps. component with 1 thyristor	ATS-46C32N	**VZ3-TM1400M16**	0.700
Plug-in unit with 2 thyristors (with no firing circuit protection card)	ATS-46C41N and 46C79N	**VZ3-TP2900M16**	6.200
	ATS-46C48N to 46C66N, 46M10N and 46M12N	**VZ3-TP2M12M16**	6.200
	For ATS-46C79N to 46M12N, replace both parallel-connected assemblees at the same time		
Control module	ATS-46 all ratings	**VX4-G461**	0.780
Current measurement card	ATS-46D17N	**VX4-G46101**	0.130
	ATS-46D22N	**VX4-G46102**	0.130
	ATS-46D32N	**VX4-G46103**	0.130
	ATS-46D38N	**VX4-G46104**	0.130
	ATS-46D47N	**VX4-G46105**	0.050
	ATS-46D62N	**VX4-G46106**	0.050
	ATS-46D75N	**VX4-G46107**	0.050
	ATS-46D88N	**VX4-G46108**	0.050
	ATS-46C11N	**VX4-G46109**	0.050
	ATS-46C14N	**VX4-G46110**	0.050
	ATS-46C17N	**VX4-G46111**	0.050
	ATS-46C21N	**VX4-G46112**	0.050
	ATS-46C25N	**VX4-G46113**	0.050
	ATS-46C32N	**VX4-G46114**	0.050
	ATS-46C41N	**VX4-G46115**	0.250
	ATS-46C48N	**VX4-G46116**	0.250
	ATS-46C59N	**VX4-G46117**	0.250
	ATS-46C66N	**VX4-G46118**	0.250
	ATS-46C79N	**VX4-G46119**	0.250
	ATS-46M10N	**VX4-G46120**	0.250
	ATS-46M12N	**VX4-G46121**	0.250
Filter card	ATS-46D17N to 46D38N	**VX4-G46161**	0.500
	ATS-46C17N to 46M12N	**VX4-G46162**	0.500
	ATS-46D47N to 46C14N	**VX4-G46163**	0.500
"Firing circuit protection" card for unit with 2 thyristors	ATS-46C41N to 46M12N	**SF1-LG220**	0.090

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Spare parts

Description	For starters	Reference	Weight kg
Ventilation fans	ATS-46D75N to C14N	**SZ1-XH07**	0.850
	ATS-46C17N to M12N	**VZ3-V001**	4.200
Protective grille	ATS-46D75N to C14N	**VY1-G23101**	0.550
Thermocontacts			
Safety (90 °C)	ATS-46D75N to C32N	**SY3-AT0007**	0.100
Safety (105 °C)	ATS-46C41N to M12N	**SY3-AT0011**	0.100
Fan (50 °C)	ATS-46D75N to M12N	**VZ1-GF01**	0.100
Control transformers	ATS-46D17N to 46D38N	**VY1-G461401**	0.400
	ATS-46D47N to 46C14N	**VY1-G461402**	1.300
	ATS-46C17N to 46C32N	**VY1-G461403**	2.700
	ATS-46C41N to 46M12N	**VY1-G461404**	2.700
Current transformer	ATS-46C17N to 46C32N	**VY1-G461301**	0.400
	ATS-46C41N to 46M12N	**VY1-G461302**	0.400
Control module terminal blocks	ATS-46D17N to 46M12N	**VZ3-N007**	0.100
PC connection kit	ATS-46D17N to 46M12N	**VY1-G461510**	0.300