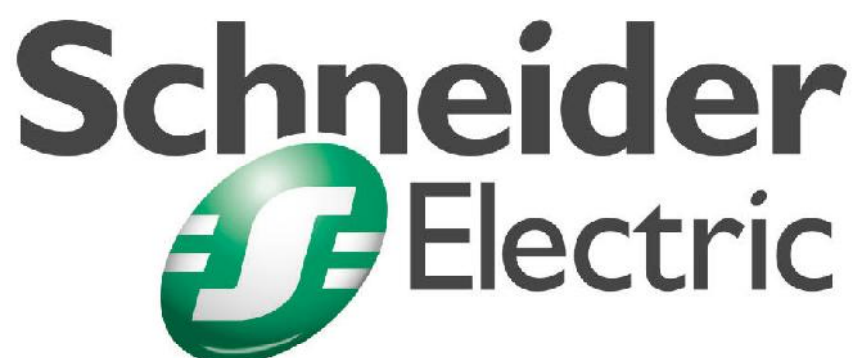


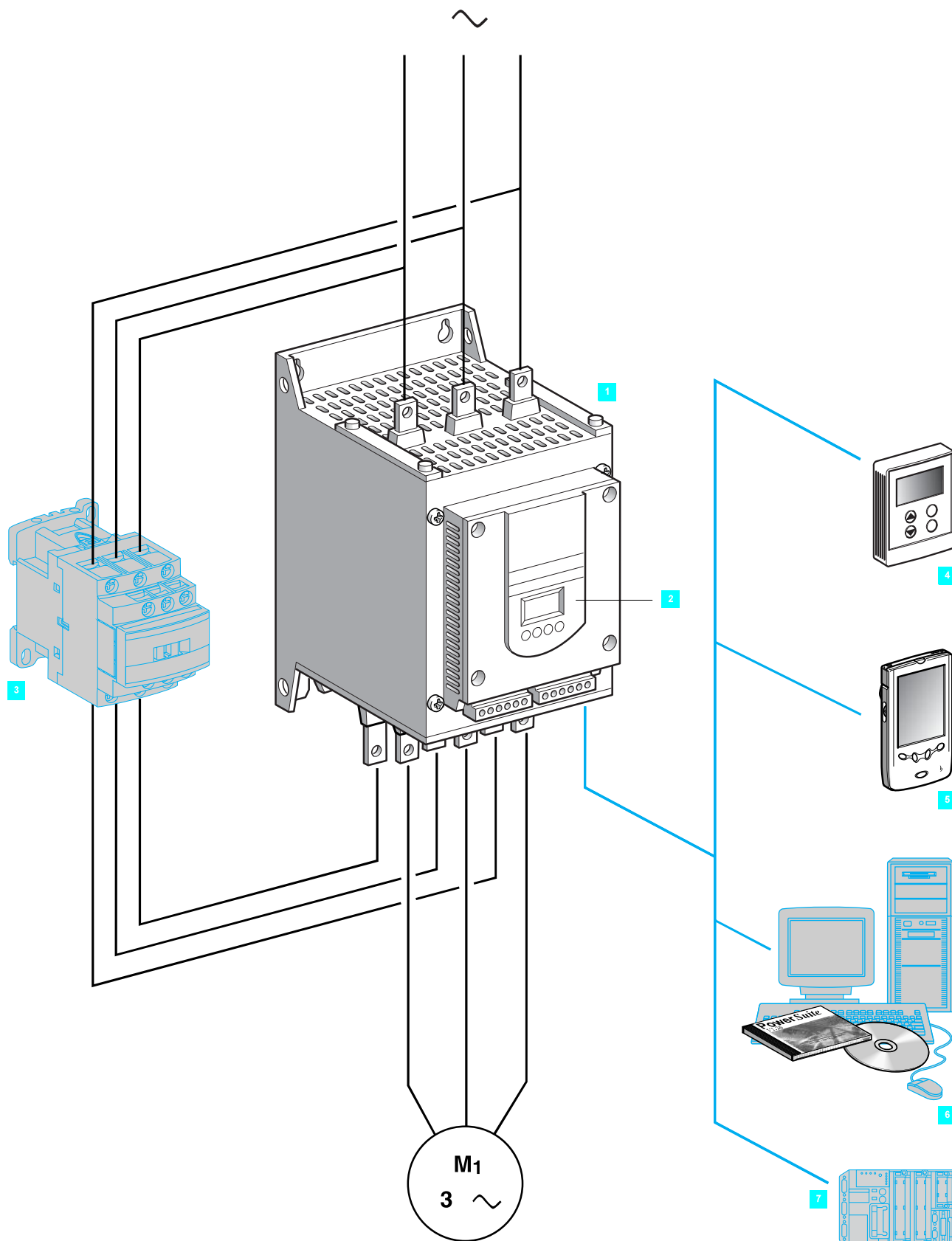
DATA SHEET



ALTISTART 48 SOFT STARTER

Soft starters for asynchronous motors

Altistart 48 soft start - soft stop units



Soft starters for asynchronous motors

Altistart 48 soft start - soft stop units

Applications

The Altistart 48 soft start - soft stop unit is a controller with 6 thyristors which is used for the torque-controlled soft starting and stopping of three-phase squirrel cage asynchronous motors in the power range between 4 and 1200 kW.

It offers soft starting and deceleration functions along with machine and motor protection functions as well as functions for communicating with control systems. These functions are designed for use in state-of-the-art applications in centrifugal machines, pumps, fans, compressors and conveyors, which are primarily to be found in the construction, food and beverages and chemical industries. The high-performance algorithms of the Altistart 48 contribute significantly to its robustness, safety and ease of setup.

The Altistart 48 soft start - soft stop unit is a cost-effective solution which can:

- reduce machine operating costs by reducing mechanical stress and improving machine availability,
- reduce the stress placed on the electrical distribution system by reducing line current peaks and voltage drops during motor starts.

The Altistart soft start - soft stop unit offer comprises 2 ranges:

- three-phase voltages 230 to 415 V, 50/60 Hz,
- three-phase voltages 208 to 690 V, 50/60 Hz.

In each voltage range, the Altistart soft start - soft stop units are dimensioned for standard and severe applications.

Functions

The Altistart 48 soft start - soft stop unit (1) is supplied ready for use in a standard application with motor protection class 10 (see page 44).

It comprises a built-in terminal (2) which can be used to modify programming, adjustment or monitoring functions in order to adapt and customise the application to meet individual customer requirements.

■ Drive performance functions:

- ☐ exclusive Altistart torque control (patented by Schneider Electric),
- ☐ constant control of the torque supplied to the motor during acceleration and deceleration periods (significantly reducing pressure surges),
- ☐ facility for adjusting the ramp and the starting torque,
- ☐ the starter can be bypassed using a contactor (3) at the end of the starting period whilst maintaining electronic protection (by-pass function),
- ☐ wide frequency tolerance for generator set power supplies,
- ☐ the starter can be connected to the motor delta terminals in series with each winding.

■ Machine and motor protection functions:

- ☐ built-in motor thermal protection,
- ☐ processing of information from PTC thermal probes,
- ☐ monitoring of the starting time,
- ☐ motor preheating function,
- ☐ protection against underloads and overcurrents during continuous operation.

■ Functions facilitating the integration of the unit into control systems:

- ☐ 4 logic inputs, 2 logic outputs, 3 relay outputs and 1 analogue output,
- ☐ plug-in I/O connectors,
- ☐ function for configuring a second motor and easy-to-adapt settings,
- ☐ display of electrical values, the state of the load and the operating time,
- ☐ RS 485 serial link for connection to Modbus.

Options

A remote terminal (4) can be mounted on the door of a wall-fixing or floor-standing enclosure.

PowerSuite advanced dialogue solutions:

- PowerSuite Pocket PC with PPC type terminal (5),
- PowerSuite software workshop (6).

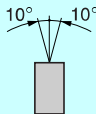
A range of wiring accessories for connecting the starter to PLCs via a Modbus connection (7).

Bus communication and Ethernet, Fipio, DeviceNet and Profibus DP network communication options.

Soft starters for asynchronous motors

Altistart 48 soft start - soft stop units

Environment characteristics

Conforming to standards			The electronic starters have been developed and performance tested in accordance with international standards, in particular with the starter product standard EN/IEC 60947-4-2
CE marking			Products have CE marking in accordance with the harmonised standard EN/IEC 60947-4-2.
Product certifications			UL, CSA, DNV, C-Tick, GOST, CCC, NOM 117, SEPRO, TCF
Degree of protection	ATS 48D17● to 48C11●		IP 20 (IP 00 in the absence of connections)
	ATS 48C14● to 48M12● (1)		IP 00
Vibration resistance			1.5 mm from 2 to 13 Hz, 1 gn from 13 to 200 Hz, conforming to IEC 60068-2-6
Shock resistance			15 gn for 11 ms, conforming to IEC 60068-2-27
Starter noise level (2)	ATS 48D32● to D47●	dBA	52
	ATS 48D62● to C11●	dBA	58
	ATS 48C14● to C17●	dBA	50
	ATS 48C21● to C32●	dBA	54
	ATS 48C41● to C66●	dBA	55
	ATS 48C79● to M12●	dBA	60
Fans	ATS 48D17● and D22●		Natural convection
	ATS 48D32● to M12●		Forced convection. The fans are activated automatically when a temperature threshold is reached. For flow rate: see page 24
Maximum ambient pollution			Level 3, conforming to IEC 60664-1
Relative humidity			95 % without condensation or dripping water, conforming to IEC 60068-2-3
Ambient temperature around the device	Operation	°C	- 10...+ 40 without derating (between + 40 and + 60, derate the nominal current of the Altistart by 2 % for each °C)
	Storage	°C	- 25...+ 70, conforming to IEC 60947-4-2
Maximum operating altitude		m	1000 without derating (above this, derate the nominal current of the Altistart by 2.2 % for each additional 100 m). Limit to 2000 m
Operating position Maximum permanent angle in relation to the normal vertical mounting position			

Electrical characteristics

Operating category			AC-53a, Conforming to IEC 60947-4-2
Three-phase supply voltage	ATS 48●●●Q	V	230 - 15 % ... 415 + 10 %
	ATS 48●●●Y	V	208 - 15 % ... 690 + 10 %
Frequency		Hz	50/60 ± 5 % (automatic) 50 or 60 ± 20 % (must be set)
Nominal starter current	ATS 48●●●Q	A	17...1200
	ATS 48●●●Y	A	17...1200
Motor power	ATS 48●●●Q	kW	4...630
	ATS 48●●●Y	kW/HP	5,5...900 / 5...1200
Voltage indicated on the motor rating plate	ATS 48●●●Q	V	230...415
	ATS 48●●●Y	V	208...690
Starter control circuit supply voltage	ATS 48●●●Q	V	220 - 15 % to 415 + 10 %, 50 / 60 Hz
	ATS 48●●●Y	V	110 - 15 % to 230 + 10 %, 50 / 60 Hz
Maximum control circuit consumption (with fans operating)	ATS 48D17● to C17●	W	30
	ATS 48C21● to C32●	W	50
	ATS 48C41● to M12●	W	80
Relay output (2 configurable outputs)			3 relay outputs (R1, R2, R3), normally open contacts 1 "N/O" Minimum switching capacity: 10 mA for --- 6 V Maximum switching capacity on inductive load: 1.8 A for ~ 230 V and --- 30 V (cos φ= 0.5 and L/R=20ms). Maximum nominal operating voltage ~ 400 V Factory setting: R1 assigned as the "fault relay" (configurable) R2 assigned as the "end of starting relay" to control the starter bypass relay R3 assigned as "motor powered" (configurable)

(1) Protective covers can be fitted to the power terminals of ATS 48C14● to C32● starters (see page 16). ATS 48C41● to 48M12● starters have protection on the front panel and on the sides.

(2) Starters located 1 m away. The noise levels may change depending on the characteristics of the fans.

Soft starters for asynchronous motors

Altistart 48 soft start - soft stop units

Electrical characteristics (continued)

Logic inputs LI (2 configurable inputs)		4 logic inputs, impedance 4.3 kΩ, isolated: Stop, Run, LI3, LI4 + 24 V power supply (maximum 30 V) I max. 8 mA State 0 if U < 5 V and I < 2 mA State 1 if U > 11 V and I > 5 mA
Internal source available		1 x + 24 V output, isolated and protected against short-circuits and overloads Accuracy ± 25%. Max. current 200 mA
Logic outputs LO (configurable)		2 logic outputs LO1 and LO2 with 0 V common, compatible with level 1 PLC, according to standard IEC 65A-68 + 24 V power supply (minimum: + 12 V, maximum: + 30 V) Maximum output current: 200 mA if supplied externally
Analogue output AO (configurable)		Current output 0-20 mA or 4-20 mA Maximum load impedance: 500 Ω Accuracy ± 5% of the maximum value
Input for PTC probe		Total resistance of probe circuit 750 Ω at 25°C, according to IEC 60 738-A
Maximum I/O connection capacity		2.5 mm ² (AWG 12)
Communication		RS 485 multidrop serial link integrated in the starter, for Modbus serial link, with RJ45 type connector Transmission speed 4800, 9600 or 19200 bps Maximum number of Altistart 48 connected: 18 Other uses: - connection to a remote terminal, - connection to a PC, - connection to other buses and networks via communication options.
Protection	Thermal	Built-in, starter and motor (calculated and/or thermal protection with PTC probes)
	Line protection	Phase failure, indicated by output relay
Current settings		The nominal motor current I _n can be adjusted from 0.4 to 1.3 times the starter nominal current. Adjustment of the maximum starting current from 1.5 to 7 times the motor I _n , limited to 5 times the starter nominal current.
Starting mode		By torque control with starter current limited to 5 I _n maximum Factory setting: 4 I _n for standard operation on 15 s torque ramp
Stopping mode	Freewheel stop	"Freewheel" stop (factory setting)
	Controlled stop on torque ramp	Programmed between 0.5 and 60 s (for pump applications)
	Braked stop	Controlled dynamically by the flux

Electromagnetic compatibility EMC ⁽¹⁾

	Standards	Test levels	Examples (sources of interference)
Summary of immunity tests carried out with the Altistart 48	IEC 61000-4-2 level 3 Electrostatic discharge: - by contact, - in the air.	6 kV 8 kV	Contact off an electrically charged individual
	IEC 61000-4-3 level 3 Radiated electromagnetic fields	10 V/m	Equipment transmitting radio frequencies
	IEC 61000-4-4 level 4 Rapid electrical transients: - power supply cables, - control cables.	4 kV 2 kV	Opening/closing of a contactor
	IEC 61000-4-5 level 3 Shock wave: - phase/phase, - phase/earth.	1 kV 2 kV	-
	IEC 61000-4-12 level 3 Damped oscillating waves	1 kV - 1 MHz	Oscillating circuit on the line supply
Radiated and conducted emissions	According to IEC 60947-4-2, class A, on all starters		
	According to IEC 60947-4-2, class B, on starters up to 170 A: ATS 48D17● to 48C17●. Must be bypassed at the end of starting		

(1) The starters conform to product standard IEC 60947-4-2, in particular with regard to EMC. This standard ensures a level of immunity for products and a level of emitted interference. In steady state, the interference emitted is below that required by the standard. During acceleration and deceleration phases, low level loads may be affected by low frequency interference (harmonics). To reduce this interference, connect chokes between the line supply and the Altistart 48 (see page 16).

Nota :

- Power factor correction capacitors can only be used upstream of the Altistart and only powered up at the end of starting.
- The starter must be earthed to conform to the regulations concerning leakage currents (≤ 30 mA). When the use of an upstream "residual current device" for protection is required by the installation standards, an AS-Interface type device must be used. Check its compatibility with the other protective devices. If the installation involves several starters on the same line supply, each starter must be earthed separately.

Soft starters for asynchronous motors

Altistart 48 soft start - soft stop units

Torque characteristics

Curves indicating changes in the torque depending on the starting current of a three-phase asynchronous motor.

Curves 1: direct line starting.

Curves 2: starting in current limiting mode.

Torque curve T_{s1} indicates the total torque range available depending on the limiting current I_{s1} .

Limiting the starting current I_s to a preset value I_{s1} will reduce the starting torque T_{s1} to a value which is almost equal to the square of currents I_{s1}/I_s .

Example:

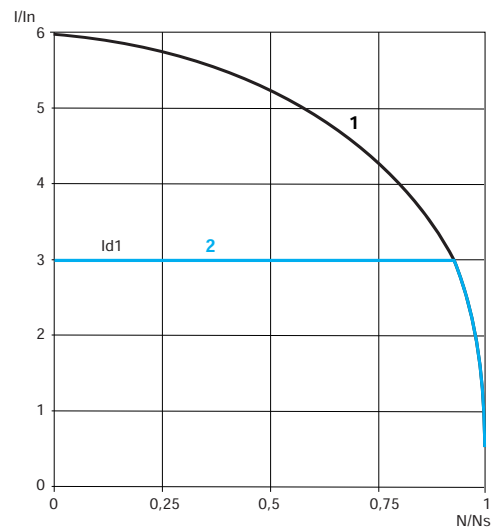
for motor characteristics: $T_s = 3 T_n$ for $I_s = 6 I_n$,

limit the current to $I_{s1} = 3 I_n$ (0.5 I_s)

resulting in a starting torque $T_{s1} = T_s \times (0.5)^2 = 3 T_n \times 0.25 = 0.75 T_n$

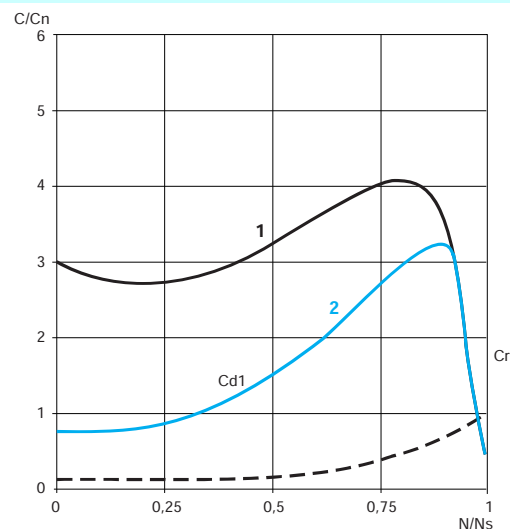
Starting current

- 1 Direct line starting current
- 2 Starting current limited to I_{s1}



Starting torque

- 1 Direct line starting torque
- 2 Starting torque with current limited to I_{s1}



Soft starters for asynchronous motors

Altistart 48 soft start - soft stop units

Conventional starting using current limitation or voltage ramp

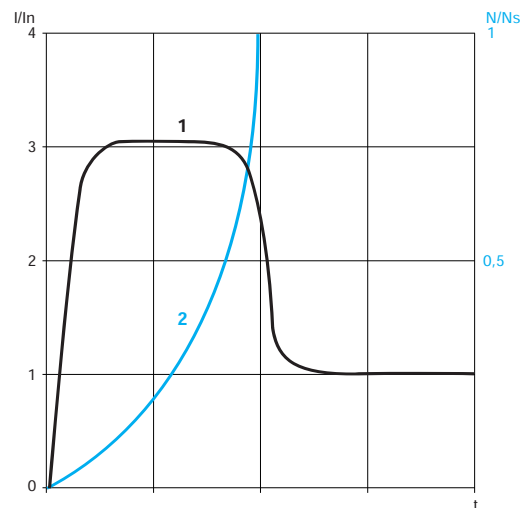
With current limitation I_{s1} , the accelerating torque applied to the motor is equal to the motor torque T_{s1} minus the resistive torque T_r .

The accelerating torque increases in the starting range as the speed changes and is at its highest at the end of acceleration (curve 2).

This characteristic means that the load is taken up very abruptly, which is not recommended for pump type applications.

Example of speed curve for starting with current limitation

- 1 Current applied to the motor (I/I_n)
2 Motor speed N/N_s



Starting with the Altistart 48

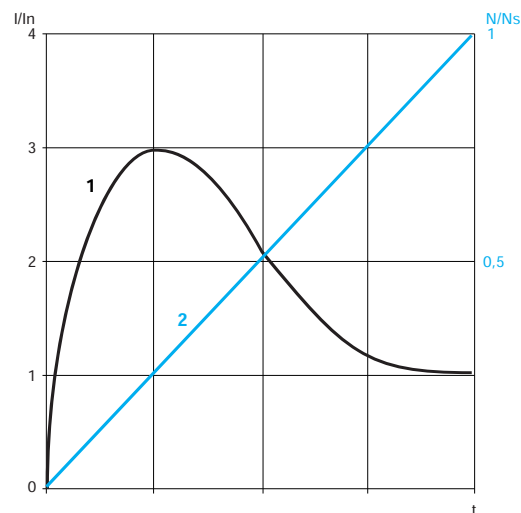
Torque control on the Altistart 48 applies the torque to the motor during the entire starting phase if the current required (curve 1) does not exceed the limiting current. The accelerating torque can be virtually constant over the entire speed range (curve 2).

It is possible to set the Altistart in order to obtain a high torque on starting for a rapid motor speed rise whilst limiting its temperature rise, and a lower accelerating torque at the end of starting for gradual loading.

This control function is ideal for centrifugal pumps or for machines with high resistive torque on starting.

Example of speed curve for starting with torque control

- 1 Current applied to the motor (I/I_n)
2 Motor speed N/N_s



Stopping with the Altistart 48

- Freewheel stop: the motor comes to a freewheel stop.
- Decelerated stop: this type of stop is ideal for pumps and can be used to effectively reduce pressure surges. Torque control on the Altistart 48 reduces the effect of hydraulic transients even if the load increases. This type of control makes adjustment easy.
- Braked stop: this type of stop is suitable for high inertia applications as it reduces the stopping time of the machine.

Soft starters for asynchronous motors

Altistart 48 soft start - soft stop units

Selection criteria for an Altistart 48 soft start - soft stop unit

The Altistart 48 must be selected on the basis of 3 main criteria:

■ Two line power supply voltage ranges are available for selection:

- three-phase a.c. voltage: 230 - 415 V,
- three-phase a.c. voltage: 208 - 690 V.

■ The power and the nominal current indicated on the motor name plate.

■ The type of application and the operating cycle.

To simplify selection, the applications are categorised into 2 types:

- standard applications,
- severe applications.

Standard or severe applications define the limiting values of the current and the cycle for motor duties S1 and S4.

Standard application

In standard applications, the Altistart 48 is designed to provide:

■ Starting at 4 In for 23 seconds or at 3 In for 46 seconds from a cold state (corresponding to motor duty S1).

■ Starting at 3 In for 23 seconds or at 4 In for 12 seconds with a load factor of 50 % and 10 starts per hour or an equivalent thermal cycle (corresponding to motor duty S4).

The motor thermal protection must conform to protection class 10 (see page 43).
Example: centrifugal pump.

Severe application

In severe applications, the Altistart 48 is designed to provide:

■ Starting at 4 In for 48 seconds or at 3 In for 90 seconds from a cold state (corresponding to S1 motor duty).

■ Starting at 4 In for 25 seconds with a load factor of 50 % and 5 starts per hour or an equivalent thermal cycle (corresponding to S4 motor duty).

The motor thermal protection must conform to protection class 20 (see page 43).
Example: grinder.

Motor duties

S1 motor duty corresponds to starting followed by operation at constant load enabling the thermal equilibrium to be reached.

S4 motor duty corresponds to a cycle comprising starting, operation at constant load and an idle period.

This cycle is characterised by a load factor of 50 %.

Selecting the starter

Once the appropriate application has been selected from the following page, select the starter from pages 11 to 14 according to the supply voltage and the motor power.

Caution:

if the Altistart 48 is installed inside an enclosure, observe the mounting and derating recommendations (see page 24).

Soft starters for asynchronous motors

Altistart 48 soft start - soft stop units

Application areas

Depending on the type of machine, the applications are categorized as standard or severe based on the starting characteristics, which are given as examples only, in the table below.

Type of machine	Application	Functions performed by the Altistart 48	Starting current (% In)	Starting time (s)
Centrifugal pump	Standard	Deceleration (reduction in pressure surges) Protection against underloads or inversion of the phase rotation direction	300	5 to 15
Piston pump	Standard	Control of running dry and direction of rotation of the pump	350	5 to 10
Fan	Standard Severe if > 30 s	Detection of overloads caused by clogging or underloads (motor fan transmission broken) Braking torque on stopping	300	10 to 40
Cold compressor	Standard	Protection, even for special motors	300	5 to 10
Screw compressor	Standard	Protection against inversion of direction of phase rotation Contact for automatic draining on stopping	300	3 to 20
Centrifugal compressor	Standard Severe if > 30 s	Protection against inversion of direction of phase rotation Contact for automatic emptying on stopping	350	10 to 40
Piston compressor	Standard	Protection against inversion of direction of phase rotation Contact for automatic emptying on stopping	350	5 to 10
Conveyor, transporter	Standard	Overload control for detecting faults or underload control for detecting breaks	300	3 to 10
Lifting screw	Standard	Overload control for detecting hard spots or underload control for detecting breaks	300	3 to 10
Drag lift	Standard	Overload control for detecting jamming or underload control for detecting breaks	400	2 to 10
Lift	Standard	Overload control for detecting jamming or underload control for detecting breaks Constant starting with variable load	350	5 to 10
Circular saw, band saw	Standard Severe if > 30 s	Braking for fast stop	300	10 to 60
Pulper, butchery knife	Severe	Torque control on starting	400	3 to 10
Agitator	Standard	The current display indicates the density of the product	350	5 to 20
Mixer	Standard	The current display indicates the density of the product	350	5 to 10
Grinder	Severe	Braking to limit vibrations during stopping, overload control to detect jamming	450	5 to 60
Crusher	Severe	Braking to limit vibrations during stopping, overload control to detect jamming	400	10 to 40
Refiner	Standard	Torque control on starting and stopping	300	5 to 30
Press	Severe	Braking to increase the number of cycles	400	20 to 60

Soft starters for asynchronous motors

Altistart 48 soft start - soft stop units

Special uses

Other criteria can influence the selection of the Altistart 48:

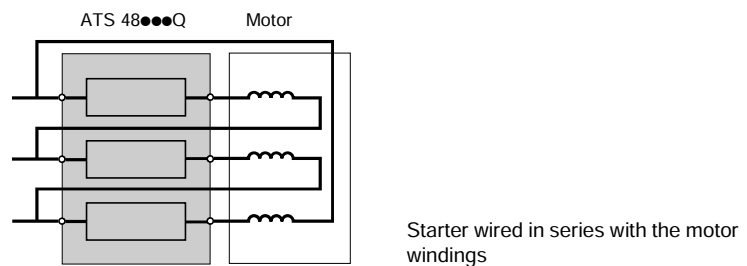
Starter wired to the motor delta terminal

(see the recommended application diagram on page 27)

In addition to the most frequently encountered wiring layouts, where the starter is installed in the line supply of the motor and the motor is connected in star or delta configuration, the Altistart 48 ATS 48●●●Q can be wired to the motor delta terminal in series with each winding (see the application diagram below). The starter current is lower than the line current absorbed by the motor by a ratio of $\sqrt{3}$. This type of installation enables a starter with a lower rating to be used.

Example: for a 400 V/110 kW motor with a line current of 195 A (nominal current for the delta connection), the current in each winding is equal to $195/\sqrt{3}$, i.e. 114 A. Select the starter rating with a maximum permanent nominal current just above this current, i.e. 140A (ATS 48C14Q for a standard application). To avoid making this calculation, simply use the table on page 12.

This type of installation only permits freewheel stopping and is not compatible with the cascade and preheating functions.



Note: the nominal current and limiting current settings as well as the current displayed during operation are on-line values (so do not have to be calculated by the user).

Caution: for this type of installation, observe the wiring scheme and the associated recommendations on page 27.

Starter bypassed by a contactor

(see the recommended application diagram on page 26)

The starter can be bypassed by a contactor at the end of starting (to limit the heat dissipated by the starter). The bypass contactor is controlled by the starter and the current measurements and protective mechanisms remain active when the starter is bypassed.

The starter is selected on the basis of the 3 main criteria and one of the following criteria:

■ If the starter is bypassed at the end of starting, the motor is always started from cold state and the starter can be oversized by one rating.
Example: select an ATS 48D17Q for an 11 kW motor in a standard 400 V application.

■ If the starter must be able to operate without the bypass contactor at the end of starting, it does not have to be derated.
Example: select an ATS 48D17Q for a 7.5 kW motor in a standard 400 V application.

Soft starters for asynchronous motors

Altistart 48 soft start - soft stop units

Special uses (continued)

Motors in parallel

Motors may be connected in parallel provided that the power limit of the starter is not exceeded (the sum of the motor currents must not exceed the nominal current of the starter selected depending on the type of application). Provide thermal protection for each motor.

Brush motor

The Altistart 48 can operate with a bypassed rotor resistance motor or with a resistance lug. The starting torque is modified in accordance with the rotor resistance. If necessary, maintain a low resistance in order to obtain the required torque to overcome the resistive torque on starting.

A bypassed brush motor has a very low starting torque. A high stator current is required to obtain the sufficient starting torque.

Oversize the starter in order that the value of the limiting current is 7 times that of the nominal current.

Note: ensure that the starting torque of the motor, equal to 7 times the nominal current, is greater than the resistive torque.

Note: the Altistart 48 torque control enables excellent soft starting despite the limiting current being 7 times the nominal current required to start the motor.

Dahlander motor and 2-speed motor

The Altistart 48 can operate with a 2-speed motor. A motor demagnetisation period must elapse before changing from low speed to high speed in order to avoid antiphases between the line supply and the motor, which would generate very high currents.

Select the starter using the 3 main criteria.

Very long cable

Very long motor cables cause voltage drops due to the resistance of the cable. If the voltage drop is significant, it could affect the current consumption and the torque available. This must therefore be taken into account when selecting the motor and the starter.

Starters in parallel on the same line supply

If several starters are installed on the same line supply, line chokes should be installed between the transformer and the starter (see page 16).

Recommendations for use

Caution: do not use the Altistart 48 upstream of loads other than motors (for examples transformers and resistors are forbidden).

Do not connect power factor correction capacitors to the terminals of a motor controlled by an Altistart 48.

Soft starters

Altistart 48 soft start - soft stop units

Line voltage 230/415 V

Connection in the motor supply line



ATS 48D17Q



ATS 48C14Q



ATS 48M12Q

For standard applications

Motor		Starter 230/415 V - 50/60 Hz				
Motor power (1)		Nominal current (IcL) (2)	Factory setting current (4)	Power dissipated at nominal load	Reference	Weight
230 V	400 V					
kW	kW	A	A	W		kg
4	7.5	17	14.8	59	ATS 48D17Q	4.900
5.5	11	22	21	74	ATS 48D22Q	4.900
7.5	15	32	28.5	104	ATS 48D32Q	4.900
9	18.5	38	35	116	ATS 48D38Q	4.900
11	22	47	42	142	ATS 48D47Q	4.900
15	30	62	57	201	ATS 48D62Q	8.300
18.5	37	75	69	245	ATS 48D75Q	8.300
22	45	88	81	290	ATS 48D88Q	8.300
30	55	110	100	322	ATS 48C11Q	8.300
37	75	140	131	391	ATS 48C14Q	12.400
45	90	170	162	479	ATS 48C17Q	12.400
55	110	210	195	580	ATS 48C21Q	18.200
75	132	250	233	695	ATS 48C25Q	18.200
90	160	320	285	902	ATS 48C32Q	18.200
110	220	410	388	1339	ATS 48C41Q	51.400
132	250	480	437	1386	ATS 48C48Q	51.400
160	315	590	560	1731	ATS 48C59Q	51.400
–	355	660	605	1958	ATS 48C66Q	51.400
220	400	790	675	2537	ATS 48C79Q	115.000
250	500	1000	855	2865	ATS 48M10Q	115.000
355	630	1200	1045	3497	ATS 48M12Q	115.000

For severe applications

Motor		Starter 230/415 V - 50/60 Hz				
Motor power (1)		Nominal current (3)	Factory setting current (4)	Power dissipated at nominal load	Reference	Weight
230 V	400 V					
kW	kW	A	A	W		kg
3	5.5	12	14.8	46	ATS 48D17Q	4.900
4	7.5	17	21	59	ATS 48D22Q	4.900
5.5	11	22	28.5	74	ATS 48D32Q	4.900
7.5	15	32	35	99	ATS 48D38Q	4.900
9	18.5	38	42	116	ATS 48D47Q	4.900
11	22	47	57	153	ATS 48D62Q	8.300
15	30	62	69	201	ATS 48D75Q	8.300
18.5	37	75	81	245	ATS 48D88Q	8.300
22	45	88	100	252	ATS 48C11Q	8.300
30	55	110	131	306	ATS 48C14Q	12.400
37	75	140	162	391	ATS 48C17Q	12.400
45	90	170	195	468	ATS 48C21Q	18.200
55	110	210	233	580	ATS 48C25Q	18.200
75	132	250	285	695	ATS 48C32Q	18.200
90	160	320	388	1017	ATS 48C41Q	51.400
110	220	410	437	1172	ATS 48C48Q	51.400
132	250	480	560	1386	ATS 48C59Q	51.400
160	315	590	605	1731	ATS 48C66Q	51.400
–	355	660	675	2073	ATS 48C79Q	115.000
220	400	790	855	2225	ATS 48M10Q	115.000
250	500	1000	1045	2865	ATS 48M12Q	115.000

(1) Value indicated on the motor rating plate.

(2) Corresponds to the maximum permanent current in class 10. I_{cL} corresponds to the starter rating.

(3) Corresponds to the maximum permanent current in class 20.

(4) The factory setting current corresponds to the value of the nominal current of a standard 4-pole, 400 V, class 10 motor (standard application). Adjust the settings in accordance with the motor nominal current.

Soft starters

Altistart 48 soft start - soft stop units

Line voltage 230/415 V

Connection to the motor delta terminals

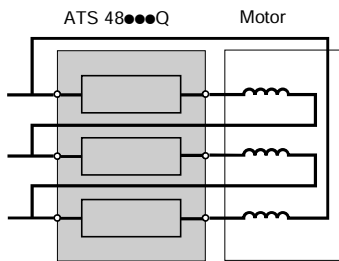


Figure 1
Special use:
starter connected to the motor delta
terminal in series with each winding

For standard applications according to figure 1

Motor		Starter 230/415 V - 50/60 Hz				
Motor power (1)		Nominal current (2)	Factory setting current (4)	Power dissipated at nominal load	Reference	Weight
230 V	400 V					
kW	kW	A	A	W		kg
7.5	15	29	14.8	59	ATS 48D17Q	4.900
9	18.5	38	21	74	ATS 48D22Q	4.900
15	22	55	28.5	104	ATS 48D32Q	4.900
18.5	30	66	35	116	ATS 48D38Q	4.900
22	45	81	42	142	ATS 48D47Q	4.900
30	55	107	57	201	ATS 48D62Q	8.300
37	55	130	69	245	ATS 48D75Q	8.300
45	75	152	81	290	ATS 48D88Q	8.300
55	90	191	100	322	ATS 48C11Q	8.300
75	110	242	131	391	ATS 48C14Q	12.400
90	132	294	162	479	ATS 48C17Q	12.400
110	160	364	195	580	ATS 48C21Q	18.200
132	220	433	233	695	ATS 48C25Q	18.200
160	250	554	285	902	ATS 48C32Q	18.200
220	315	710	388	1339	ATS 48C41Q	51.400
250	355	831	437	1386	ATS 48C48Q	51.400
–	400	1022	560	1731	ATS 48C59Q	51.400
315	500	1143	605	1958	ATS 48C66Q	51.400
355	630	1368	675	2537	ATS 48C79Q	115.000
–	710	1732	855	2865	ATS 48M10Q	115.000
500	–	2078	1045	3497	ATS 48M12Q	115.000

For severe applications according to figure 1

Motor		Starter 230/415 V - 50/60 Hz				
Motor power (1)		Nominal current (3)	Factory setting current (4)	Power dissipated at nominal load	Reference	Weight
230 V	400 V					
kW	kW	A	A	W		kg
5.5	11	22	14.8	46	ATS 48D17Q	4.900
7.5	15	29	21	59	ATS 48D22Q	4.900
9	18.5	38	28.5	74	ATS 48D32Q	4.900
15	22	55	35	99	ATS 48D38Q	4.900
18.5	30	66	42	116	ATS 48D47Q	4.900
22	45	81	57	153	ATS 48D62Q	8.300
30	55	107	69	201	ATS 48D75Q	8.300
37	55	130	81	245	ATS 48D88Q	8.300
45	75	152	100	252	ATS 48C11Q	8.300
55	90	191	131	306	ATS 48C14Q	12.400
75	110	242	162	391	ATS 48C17Q	12.400
90	132	294	195	468	ATS 48C21Q	18.200
110	160	364	233	580	ATS 48C25Q	18.200
132	220	433	285	695	ATS 48C32Q	18.200
160	250	554	388	1017	ATS 48C41Q	51.400
220	315	710	437	1172	ATS 48C48Q	51.400
250	355	831	560	1386	ATS 48C59Q	51.400
–	400	1022	605	1731	ATS 48C66Q	51.400
315	500	1143	675	2073	ATS 48C79Q	115.000
355	630	1368	855	2225	ATS 48M10Q	115.000
–	710	1732	1045	2865	ATS 48M12Q	115.000

(1) Value indicated on the motor rating plate.

(2) Corresponds to the maximum permanent current in class 10.

(3) Corresponds to the maximum permanent current in class 20.

(4) For this type of connection, the factory setting current must be adjusted in accordance with the nominal motor current.

Soft starters

Altistart 48 soft start - soft stop units

Line voltage 208/690 V

Motor power in HP



ATS 48D17Y



ATS 48C14Y



ATS 48M12Y

For standard applications

Motor					Starter 208/690 V - 50/60 Hz				
Motor power (1)					Nominal current (IcL) (2)	Factory setting current (4)	Power dissipated at nominal load	Reference	Weight
208 V	230 V	460 V	575 V						
HP	HP	HP	HP		A	A	W		kg
3	5	10	15		17	14	59	ATS 48D17Y	4.900
5	7.5	15	20		22	21	74	ATS 48D22Y	4.900
7.5	10	20	25		32	27	104	ATS 48D32Y	4.900
10	–	25	30		38	34	116	ATS 48D38Y	4.900
–	15	30	40		47	40	142	ATS 48D47Y	4.900
15	20	40	50		62	52	201	ATS 48D62Y	8.300
20	25	50	60		75	65	245	ATS 48D75Y	8.300
25	30	60	75		88	77	290	ATS 48D88Y	8.300
30	40	75	100		110	96	322	ATS 48C11Y	8.300
40	50	100	125		140	124	391	ATS 48C14Y	12.400
50	60	125	150		170	156	479	ATS 48C17Y	12.400
60	75	150	200		210	180	580	ATS 48C21Y	18.200
75	100	200	250		250	240	695	ATS 48C25Y	18.200
100	125	250	300		320	302	902	ATS 48C32Y	18.200
125	150	300	350		410	361	1339	ATS 48C41Y	51.400
150	–	350	400		480	414	1386	ATS 48C48Y	51.400
–	200	400	500		590	477	1731	ATS 48C59Y	51.400
200	250	500	600		660	590	1958	ATS 48C66Y	51.400
250	300	600	800		790	720	2537	ATS 48C79Y	115.000
350	350	800	1000		1000	954	2865	ATS 48M10Y	115.000
400	450	1000	1200		1200	1170	3497	ATS 48M12Y	115.000

For severe applications

Motor					Starter 208/690 V - 50/60 Hz				
Motor power (1)					Nominal current (3)	Factory setting current (4)	Power dissipated at nominal load	Reference	Weight
208 V	230 V	460 V	575 V						
HP	HP	HP	HP		A	A	W		kg
2	3	7.5	10		12	14	46	ATS 48D17Y	4.900
3	5	10	15		17	21	59	ATS 48D22Y	4.900
5	7.5	15	20		22	27	74	ATS 48D32Y	4.900
7.5	10	20	25		32	34	99	ATS 48D38Y	4.900
10	–	25	30		38	40	116	ATS 48D47Y	4.900
–	15	30	40		47	52	153	ATS 48D62Y	8.300
15	20	40	50		62	65	201	ATS 48D75Y	8.300
20	25	50	60		75	77	245	ATS 48D88Y	8.300
25	30	60	75		88	96	252	ATS 48C11Y	8.300
30	40	75	100		110	124	306	ATS 48C14Y	12.400
40	50	100	125		140	156	391	ATS 48C17Y	12.400
50	60	125	150		170	180	468	ATS 48C21Y	18.200
60	75	150	200		210	240	580	ATS 48C25Y	18.200
75	100	200	250		250	302	695	ATS 48C32Y	18.200
100	125	250	300		320	361	1017	ATS 48C41Y	51.400
125	150	300	350		410	414	1172	ATS 48C48Y	51.400
150	–	350	400		480	477	1386	ATS 48C59Y	51.400
–	200	400	500		590	590	1731	ATS 48C66Y	51.400
200	250	500	600		660	720	2073	ATS 48C79Y	115.000
250	300	600	800		790	954	2225	ATS 48M10Y	115.000
350	350	800	1000		1000	1170	2865	ATS 48M12Y	115.000

(1) Value indicated on the motor rating plate.

(2) Corresponds to the maximum permanent current in class 10. I_{CL} corresponds to the starter rating.

(3) Corresponds to the maximum permanent current in class 20.

(4) The factory setting current corresponds to the value of the nominal current of a standard motor according to NEC, 460 V, class 10 (standard application). Adjust the settings in accordance with the motor nominal current.

Soft starters

Altistart 48 soft start - soft stop units

Line voltage 208/690 V

Motor power in kW

For standard applications

Motor							Starter 208/690 V - 50/60 Hz				
Motor power (1)							Nominal current (IcL) (2)	Factory setting current (4)	Power dissipated at nominal load	Reference	Weight
230 V	400 V	440 V	500 V	525 V	660 V	690 V					
kW	kW	kW	kW	kW	kW	kW	A	A	W		kg
4	7.5	7.5	9	9	11	15	17	14	59	ATS 48D17Y	4.900
5.5	11	11	11	11	15	18.5	22	21	74	ATS 48D22Y	4.900
7.5	15	15	18.5	18.5	22	22	32	27	104	ATS 48D32Y	4.900
9	18.5	18.5	22	22	30	30	38	34	116	ATS 48D38Y	4.900
11	22	22	30	30	37	37	47	40	142	ATS 48D47Y	4.900
15	30	30	37	37	45	45	62	52	201	ATS 48D62Y	8.300
18.5	37	37	45	45	55	55	75	65	245	ATS 48D75Y	8.300
22	45	45	55	55	75	75	88	77	290	ATS 48D88Y	8.300
30	55	55	75	75	90	90	110	96	322	ATS 48C11Y	8.300
37	75	75	90	90	110	110	140	124	391	ATS 48C14Y	12.400
45	90	90	110	110	132	160	170	156	479	ATS 48C17Y	12.400
55	110	110	132	132	160	200	210	180	580	ATS 48C21Y	18.200
75	132	132	160	160	220	250	250	240	695	ATS 48C25Y	18.200
90	160	160	220	220	250	315	320	302	902	ATS 48C32Y	18.200
110	220	220	250	250	355	400	410	361	1339	ATS 48C41Y	51.400
132	250	250	315	315	400	500	480	414	1386	ATS 48C48Y	51.400
160	315	355	400	400	560	560	590	477	1731	ATS 48C59Y	51.400
–	355	400	–	–	630	630	660	590	1958	ATS 48C66Y	51.400
220	400	500	500	500	710	710	790	720	2537	ATS 48C79Y	115.000
250	500	630	630	630	900	900	1000	954	2865	ATS 48M10Y	115.000
355	630	710	800	800	–	–	1200	1170	3497	ATS 48M12Y	115.000

For severe applications

Motor							Starter 208/690 V - 50/60 Hz				
Motor power (1)							Nominal current (3)	Factory setting current (4)	Power dissipated at nominal load	Reference	Weight
230 V	400 V	440 V	500 V	525 V	660 V	690 V					
kW	kW	kW	kW	kW	kW	kW	A	A	W		kg
3	5.5	5.5	7.5	7.5	9	11	12	14	46	ATS 48D17Y	4.900
4	7.5	7.5	9	9	11	15	17	21	59	ATS 48D22Y	4.900
5.5	11	11	11	11	15	18.5	22	27	74	ATS 48D32Y	4.900
7.5	15	15	18.5	18.5	22	22	32	34	99	ATS 48D38Y	4.900
9	18.5	18.5	22	22	30	30	38	40	116	ATS 48D47Y	4.900
11	22	22	30	30	37	37	47	52	153	ATS 48D62Y	8.300
15	30	30	37	37	45	45	62	65	201	ATS 48D75Y	8.300
18.5	37	37	45	45	55	55	75	77	245	ATS 48D88Y	8.300
22	45	45	55	55	75	75	88	96	252	ATS 48C11Y	8.300
30	55	55	75	75	90	90	110	124	306	ATS 48C14Y	12.400
37	75	75	90	90	110	110	140	156	391	ATS 48C17Y	12.400
45	90	90	110	110	132	160	170	180	468	ATS 48C21Y	18.200
55	110	110	132	132	160	200	210	240	580	ATS 48C25Y	18.200
75	132	132	160	160	220	250	250	302	695	ATS 48C32Y	18.200
90	160	160	220	220	250	315	320	361	1017	ATS 48C41Y	51.400
110	220	220	250	250	355	400	410	414	1172	ATS 48C48Y	51.400
132	250	250	315	315	400	500	480	477	1386	ATS 48C59Y	51.400
160	315	355	400	400	560	560	590	590	1731	ATS 48C66Y	51.400
–	355	400	–	–	630	630	660	720	2073	ATS 48C79Y	115.000
220	400	500	500	500	710	710	790	954	2225	ATS 48M10Y	115.000
250	500	630	630	630	900	900	1000	1170	2865	ATS 48M12Y	115.000

(1) Value indicated on the motor rating plate.

(2) Corresponds to the maximum permanent current in class 10. IcL corresponds to the starter rating.

(3) Corresponds to the maximum permanent current in class 20.

(4) The factory setting current corresponds to the value of the nominal current of a standard motor according to NEC, 460 V, class 10 (standard application). Adjust the settings in accordance with the motor nominal current.