

Soft starters **Altistart 01** The *starting* solution...

Catalogue
February

04



For single-phase and 3-phase asynchronous motors
from 0.37 to 75 kW / 3 to 85 A.

- 1** – Altistart 01

- 2** – Altistart U01

- 3** – Services

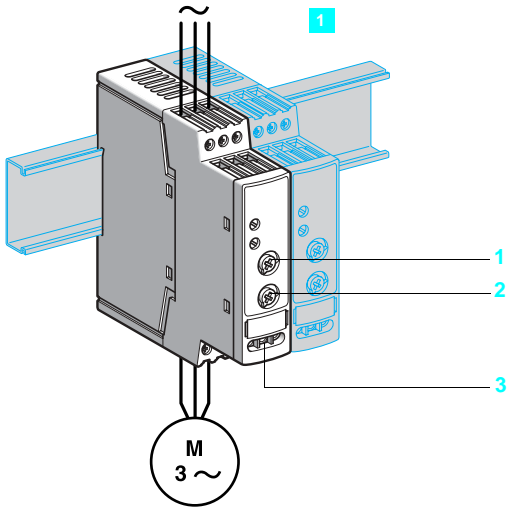
1 - Altistart 01 soft starters for asynchronous motors

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Soft starters for asynchronous motors

Altistart 01

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Presentation

The Altistart 01 soft starter operates either as a torque limiter on starting or as a soft start/soft stop unit for asynchronous motors.

Using the Altistart 01 starter enhances the starting performance of asynchronous motors by allowing the motor to start gradually and smoothly in a controlled manner. Using it can also prevent mechanical shocks, which lead to wear and tear, maintenance work and production downtime. The Altistart 01 limits the starting torque and current peaks on starting on machines which do not require a high starting torque.

These starters are designed for the following simple applications:

- conveyors
- conveyor belts
- pumps
- fans
- compressors
- automatic doors
- small cranes
- belt-drive machines, etc.

The Altistart 01 is compact, easy to install, can be mounted horizontally next to another unit, complies with standards IEC/EN 60947-4-2, UL and CSA certifications, and has CE marking.

The Altistart 01 soft starter offer comprises 3 product ranges:

■ 1 ATS 01N1●●● soft starters

- Control one phase of the motor power supply (single phase or 3-phase) to limit the starting torque.
- Motor power ratings range from 0.37 kW to 5.5 kW.
- Motor supply voltages range from 110 V to 480 V, 50/60 Hz. An external power supply is required for controlling the starter.

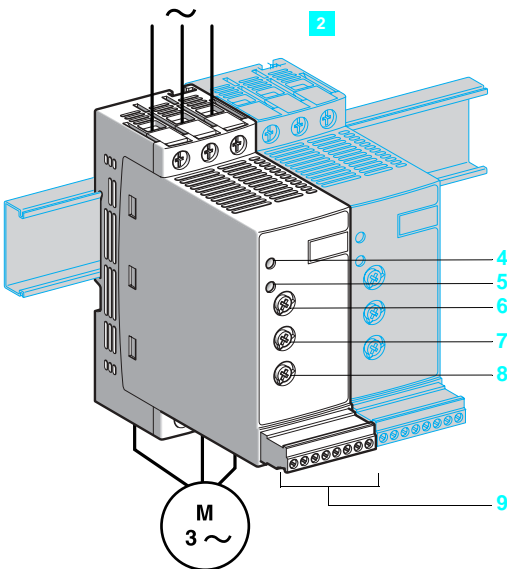
■ 2 ATS 01N2●●● soft start/soft stop units

- Control two phases of the motor power supply to limit the starting current and for deceleration.
- Motor power ratings range from 0.75 kW to 75 kW.
- The motor supply voltages are as follows: 230 V, 400 V, 480 V and 690 V, 50/60 Hz. The use of a line contactor is not necessary on machines where electrical isolation is not required.

■ ATSU 01N2●●● soft start/soft stop units

See pages 2/2 to 2/11.

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Description

■ Altistart 01 soft starters (ATS 01N1●●●) are equipped with:

- a potentiometer 1 for controlling the starting time
- a potentiometer 2 for adjusting the start voltage threshold according to the motor load
- 2 inputs 3:
 - 1 \approx 24 V input or 1 \sim 110...240 V input for powering the control part that controls the motor

■ Altistart 01 soft start/soft stop units (ATS 01N2●●●) are equipped with:

- a potentiometer 6 for controlling the starting time
- a potentiometer 8 for controlling the deceleration time
- a potentiometer 7 for adjusting the start voltage threshold according to the motor load
- 1 green indicator LED 4: device switched on
- 1 yellow indicator LED 5: motor powered at nominal voltage
- a connector 9:
 - 2 logic inputs for Run/Stop commands
 - 1 logic input for the BOOST function
 - 1 logic output to indicate the end of starting
 - 1 relay output to indicate the starter has a power supply fault or the motor has reached a standstill at the end of the deceleration stage.

Soft starters for asynchronous motors

Altistart 01 Functions

Description (continued)

Equivalence table for contact reference

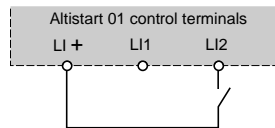
Functions	ATS 01N2●●LU/QN/RT	ATS 01N2●●LY	ATS 01N2●●Q
Relay outputs	R1A	04	04
	R1C	05	05
0 V external power supply	C0M	–	–
Stop command	LI1	02	02
Run command	LI2	03	03
Control power supply	LI + (+ 24 V positive logic)	01 (0 V negative logic)	01 (0 V negative logic)
BOOST	BOOST	–	–
End of starting	LO1	–	–
115 V external power supply	–	06	–
	–	07	–

Functions

■ 2-wire control:

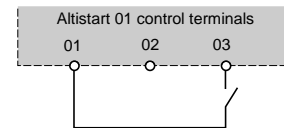
The run and stop commands are controlled by a single logic input. State 1 of logic input LI2 controls the run process and state 0 controls the stop process.

ATS 01N2●●LU/QN/RT



Wiring diagram for 2-wire control

ATS 01N2●●LY/Q



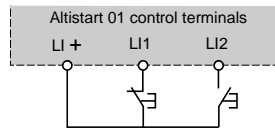
Wiring diagram for 2-wire control

■ 3-wire control:

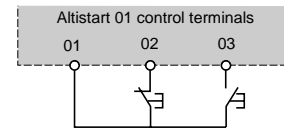
The run and stop commands are controlled by 2 different logic inputs.

Stopping is achieved when logic input LI1 opens (state 0).

The pulse on input LI2 is stored until input LI1 opens.



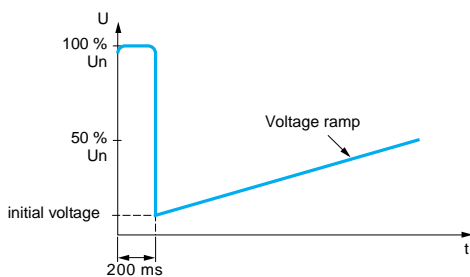
Wiring diagram for 3-wire control



Wiring diagram for 3-wire control

■ Starting time

Controlling the starting time means that the time of the voltage ramp applied to the motor can be adjusted and a gradual starting time achieved, which is dependent on the motor load.



Application of a voltage BOOST equal to 100% of the nominal motor voltage

■ Voltage BOOST function via logic input:

Activating the BOOST logic input enables the function for supplying a starting overtorque capable of overcoming any mechanical friction.

When the input is at state 1, the function is active (input connected to the + 24 V) and the starter supplies a fixed voltage to the motor for a limited time before starting.

■ End of starting

□ Application function via logic output LO1

Soft start/soft stop units ATS 01N206●● to ATS 01N232●● are equipped with an open collector logic output LO, which indicates the end of starting when the motor has reached nominal speed.

□ Application function via an option

For ATS01N2●●LY/Q soft start/soft stop units end of starting information can be obtained by adding the option LAD 8N11 with N/O+N/C contacts.

The option can be easily connected to the bypass contactor of the electronic(s) unit without dismantling the product.

■ Fault relay

Soft start/soft stop units ATS 01N206●● to ATS 01N232●● have a relay which opens when a fault is detected.

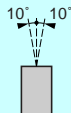
Relay contact R1A-R1C (04-05 for ATS 01N2●●LY/Q) closes with the LI2 command (02-03 for ATS 01N2●●LY/Q) and opens when the motor voltage is around 0 with a decelerated stop or stop immediately on a fault.

This information can be used for controlling the line contactor and achieving deceleration (by maintaining the line contactor until the motor has stopped).

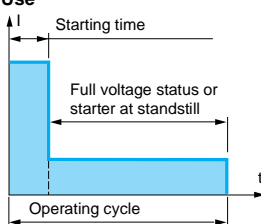
Soft starters for asynchronous motors

Altistart 01

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Environment		
Type of starter		ATS 01N1●●FT, ATS 01N2●●LU, ATS 01N2●●QN, ATS 01N2●●RT
		ATS 01N2●●LY and ATS 01N2●●Q
Conformity to standards		Altistart 01 electronic starters have been developed to conform to the strictest international standards and the recommendations relating to electrical industrial control devices (IEC, EN), in particular standard IEC/EN 60947-4-2
Electromagnetic compatibility EMC		
Conducted and radiated emissions		CISPR 11 level B, IEC 60947-4-2, level B
Harmonics		IEC 1000-3-2, IEC 1000-3-4
EMC immunity		EN 50082-2, EN 50082-1
Electrostatic discharge		IEC 61000-4-2 level 3
Immunity to radiated radio-electrical interference		IEC 61000-4-3 level 3
Immunity to electrical transients		IEC 61000-4-4 level 4
Voltage/current impulse		IEC 61000-4-5 level 3
Immunity to conducted interference caused by radio-electrical fields		IEC 61000-4-6 level 3
Micro-cuts and voltage fluctuation		IEC 61000-4-11
Damped oscillating waves		IEC 61000-4-12 level 3
CE marking		The starters bear CE marking in accordance with the European low voltage directives IEC/EN 60947-4-2
Product certification		UL, CSA and C-Tick B44.1-96/ASME A17.5 for starter wired to the motor delta terminal
Degree of protection		IP 20
		IP 20 on front panel
Degree of pollution		2 conforming to IEC/EN 60947-4-2
		3 conforming to IEC 60664-1 and UL 508
Vibration resistance		1.5 mm peak to peak from 3 to 13 Hz, 1 gn from 13 to 150 Hz conforming to IEC/EN 60068-2-6
		2 gn
Shock resistance		15 gn for 11 ms conforming to IEC/EN 60068-2-27
		8 gn for 11 ms conforming to IEC/EN 60068-2-27
Relative humidity		5...95% without condensation or dripping water, conforming to IEC/EN 60068-2-3
Ambient air temperature around the device	Storage	°C - 25...+ 70 conforming to IEC/EN 60947-4-2
	Operation	°C - 10...+ 40 without derating, up to 50°C with current derating of 2% per °C above 40°C
		0...+ 55
Maximum operating altitude		1000 without derating (above this, derate the current by 2.2% per additional 100 m)
		2000 without derating (above this, derate the current by 0.5% per additional 100 m)
Operating position		
Maximum permanent angle in relation to the normal vertical mounting position		

Electrical characteristics							
Type of starter	ATS	01N1●●FT	01N2●●LU	01N2●●QN	01N2●●RT	01N2●●LY	01N2●●Q
Category of use	Conforming to IEC 60947-4-2	Ac-53b					
Rated operating voltage	Three-phase voltage	V	200 - 15% to 480 + 10%	200 - 15% to 240 + 10%	380 - 15% to 415 + 10%	440 - 15% to 480 + 10%	230 - 15% to 690 + 10%
			400 -15...+ 10%				
Frequency		Hz	50 - 5% to 60 + 5%				
Output voltage			Maximum 3-phase voltage equal to line supply voltage.				
Control power supply voltage		V	~ 110...220 ± 10% ≈ 24 ± 10%	Built into the starter			~ 110 ± 10%
							Built into the starter
Rated operating current		A	3...12	6...32			32...85
Adjustable starting time		s	1...5	1...10			1...25
Adjustable deceleration time		s	-	1...10			1...25
Starting torque		%	30...80% of starting torque of motor connected directly on the line supply				
Type of starter	ATS	01N206●● to 01N222●●		01N232●●		01N2●●LY/01N2●●Q	
Use		s	1	5	1	5	1
Starting time							12
Maximum number of cycles per hour			310	20	180	10	360
							30



Soft starters for asynchronous motors

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Electrical characteristics (continued)

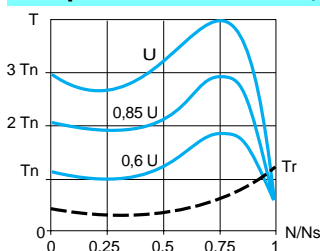
Type of starter	ATS 01N1	03FT	06FT	09FT/12FT			
Control power supply consumption		~ 24 V, 25 mA, ~ 110 V, 30 mA ~ 240 V, 65 mA		~ 24 V, 30 mA, ~ 110 V, 35 mA, ~ 240 V, 80 mA			
Power dissipated	At full load at end of starting	W	4	1			
	In transient state	W	19	31			
Starting current at nominal load (1)	A	15	30	45			
Type of starter	ATS 01N2	06LU/QN/RT	09LU/QN/RT	12LU/QN/RT	22LU/QN/RT	32LU/QN/RT	
Power dissipated	At full load at end of starting	W	4	4	4	4.5	4.5
	In transient state	W	64	94	124	224.5	324.5
Starting current at nominal load (1)	A	30	45	60	110	160	
Type of starter	ATS 01N2	30LY/Q	44LY/Q	72LY/Q	85LY/Q		
Power dissipated	At full load at end of starting	W	22	22	23	23	
	In transient state	W	184	268	436	514	
Starting current at nominal load (1)	A	90	132	216	255		
Type of starter	ATS 01N2	●●LU/QN/RT			●●LY/Q		
Logic input power supply: For LI1, LI2 and BOOST only (electrically isolated between power and control) LI +, COM		24 V power supply Max. current available 10 mA. No short-circuit and overload protection			-		
Logic inputs LI1, LI2, BOOST (01, 02, 03 for ATS 01N2●●LY/Q) Stop, run and boost on start-up functions		Logic inputs with impedance 27 kohms 24 V power supply (U max. 40 V) Max. current consumption 8 mA State 0 if U < 5 V and I < 0.2 mA State 1 if U > 13 V and I > 0.5 mA			Input with internal control relay, internal 24 V power supply Max. current 8 mA State 0 if I < =3 mA State 1 if I > =10 mA		
Logic output LO1 End of starting signal		Open collector logic output External 24 V power supply (min. 6 V, max. 30 V) Max. current 200 mA			-		
Relay outputs R1A R1C (04, 05 for ATS 01N2●●LY/Q)		Normally open (N/O) contact (contact open in fault mode) Minimum switching capacity: 10 mA for ~ 6 V Max. switching capacity on inductive load (cos φ = 0.5 and L/R = 20 ms): 2 A for ~ 250 V or ~ 30 V (AC-15) Max. operating voltage 440 V			Operating category AC-15: Ie 3 A, Ue 250 V, DC-13: Ie 2 A, Ue 24 V, Minimum switching capacity: 10 mA for ~ 17 V Maximum operating voltage 250 V		
LED signalling	green LED	Starter powered up					
	yellow LED	Nominal voltage reached					

(1) Acceleration current complying with the maximum conditions of use (see page 1/4).

Connections (Maximum connection capacity and tightening torque)

Type of starter	ATS	01N103FT, 01N106FT	01N109FT, 01N112FT, 01N206●● to 01N232●●	01N2●●LY and 01N2●●Q	
Power circuit		Cage type connector	Connection via Ø 4mm screw clamp		
Flexible wire without cable end	1 conductor	mm ²	2.5 14 AWG	1.5...10 8 AWG	6...25
	2 conductors	mm ²	1 17 AWG	1.5...6 10 AWG	6...25
Flexible wire with cable end	1 conductor	mm ²	2.5 14 AWG	1...6 10 AWG	4...25
	2 conductors	mm ²	0.75 18 AWG	1...6 10 AWG	4...16
Rigid wire	1 conductor	mm ²	2.5 14 AWG	1...10 8 AWG	6...35
	2 conductors	mm ²	1 17 AWG	1...6 10 AWG	6...25
Tightening torque	N.m	0.8	1.9...2.5	5	
Control circuit		Cage type connector	Screw connector		
Flexible wire without cable end	1 conductor	mm ²	2.5 14 AWG	0.5...2.5 14 AWG	0.75...1.5
	2 conductors	mm ²	1 17 AWG	0.5...1.5 16 AWG	0.75...1.5
Flexible wire with cable end	1 conductor	mm ²	2.5 14 AWG	0.5...1.5 16 AWG	0.75...1.5
	2 conductors	mm ²	0.75 18 AWG	0.5...1.5 16 AWG	0.75...1.5
Rigid wire	1 conductor	mm ²	2.5 14 AWG	0.5...2.5 14 AWG	0.75...1.5
	2 conductors	mm ²	1 17 AWG	0.5...1 17 AWG	0.75...1.5
Earth connection		-	-	Tinned connector. Fixed using 6 Ø screws	
Tightening torque	N.m	0.8	0.5	0.7	

Torque characteristics (typical curves)



The diagram opposite shows the torque/speed characteristic of a cage motor in relation to the supply voltage.

The torque varies in line with the square of the voltage at a fixed frequency.

The gradual increase in the voltage prevents the instantaneous current peak on power-up.

Soft starters for asynchronous motors

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ATS 01N103FT



ATS 01N212QN



ATS 01N230LY

Soft starter for 0.37 to 5.5 kW motor

Motor						Starter		
Motor power (1)						Nominal current	Reference	Weight
Single phase 3-phase								
230 V	210 V	230 V	230 V	400 V	460 V	A		kg
kW	HP	kW	HP	kW	HP			
Single phase 110...230 V or 3-phase 200...480 V supply voltage, 50/60 Hz								
0.37	–	0.37	0.5	1.1	0.5	3	ATS 01N103FT	0.160
	–	0.55	–	–	1.5			
0.75	0.5	0.75	1	2.2	2	6	ATS 01N106FT	0.160
	–	1.1	1.5	–	3			
1.1	1	1.5	2	4	5	9	ATS 01N109FT	0.280
1.5	1.5	2.2	3	5.5	7.5	12	ATS 01N112FT	0.280

Soft start/soft stop unit for 0.75 to 15 kW motor

Motor		Starter		
Motor power (1)		Nominal current	Reference	Weight
kW	HP			
3-phase supply voltage: 200...240 V 50/60 Hz				
0.75/1.1	1/1.5	6	ATS 01N206LU	0.420
1.5	2	9	ATS 01N209LU	0.420
2.2/3	3/–	12	ATS 01N212LU	0.420
4/5.5	5/7.5	22	ATS 01N222LU	0.560
7.5	10	32	ATS 01N232LU	0.560
3-phase supply voltage: 380...415 V 50/60 Hz				
1.5/2.2	–	6	ATS 01N206QN	0.420
3/4	–	9	ATS 01N209QN	0.420
5.5	–	12	ATS 01N212QN	0.420
7.5/11	–	22	ATS 01N222QN	0.560
15	–	32	ATS 01N232QN	0.560
3-phase supply voltage: 440...480 V 50/60 Hz				
–	2/3	6	ATS 01N206RT	0.420
–	5	9	ATS 01N209RT	0.420
–	7.5	12	ATS 01N212RT	0.420
–	10/15	22	ATS 01N222RT	0.560
–	20	32	ATS 01N232RT	0.560

Soft start/soft stop unit for 15 to 75 kW motor

3-phase supply voltage: 230...690 V 50/60 Hz

Motor							Starter		
Motor power (1)							Nominal current	Reference	Weight
230 V	230 V	400 V	400 V	460 V	575 V	690 V			
kW	HP	kW	HP	HP	HP	kW	A		kg
7.5	10	15	15	20	30	30	32	ATS 01N230LY	2.400
11	15	22	25	30	40	37	44	ATS 01N244LY	2.400
18.5	25	37	40	50	60	55	72	ATS 01N272LY	3.800
22	30	45	50	60	75	75	85	ATS 01N285LY	3.800

3-phase supply voltage: 400 V 50/60 Hz

Motor		Starter		
Motor power (1)		Nominal current	Reference	Weight
kW	HP			
22	25	44	ATS 01N244Q	2.400
37	40	72	ATS 01N272Q	3.800
45	50	85	ATS 01N285Q	3.800



Accessories

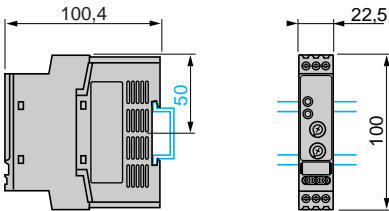
Description	Used for starter	Reference	Weight
Plate for quick mounting on DIN rail	ATS 01N230LY, ATS 01N244●	VY1 H4101	–
Adaptor for mounting on □ DZ5 MB rail	ATS 01N103FT, ATS 01N106FT	RHZ 66	0.005
Auxiliary contact, provides information that the motor is at full voltage	ATS 01N2●●●LY, ATS 01N2●●●Q	LAD 8N11	–

(1) Standard power ratings of motors, HP power ratings indicated according to standard UL 508.


Soft starters for asynchronous motors Altistart 01

ATS 01N103FT, ATS 01N106FT

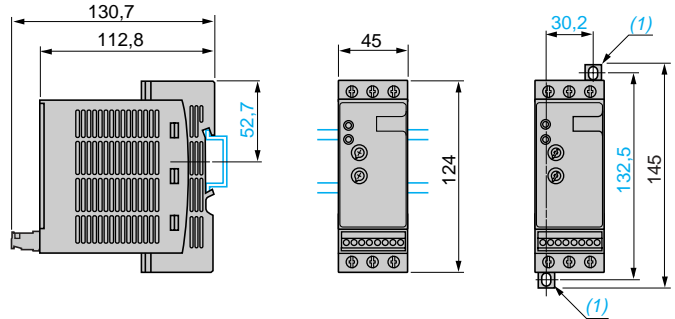
Mounting on  (35 mm) rail or  rail with adaptor RHZ 66




ATS 01N109FT, ATS 01N112FT

Mounting on  (35 mm) rail

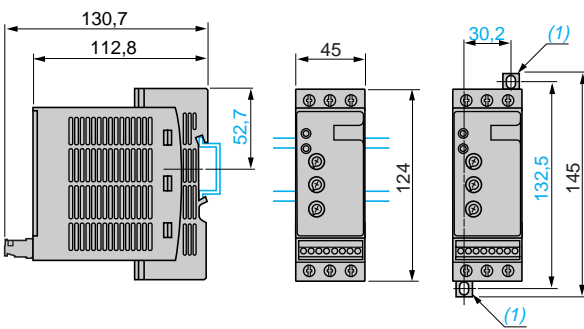
Screw fixing




ATS 01N206 to ATS 01N212

Mounting on  (35 mm) rail

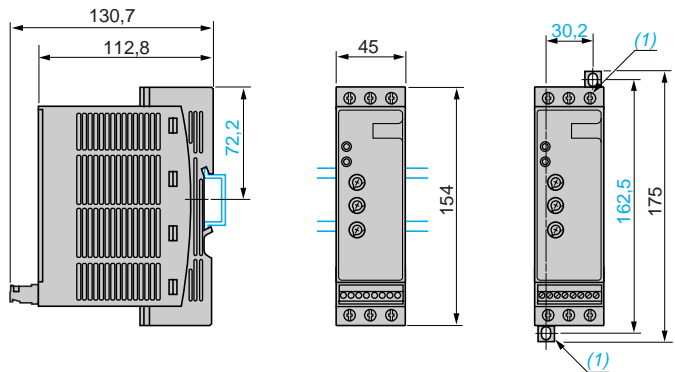
Screw fixing



ATS 01N222 to ATS 01N232

Mounting on  (35 mm) rail


Screw fixing



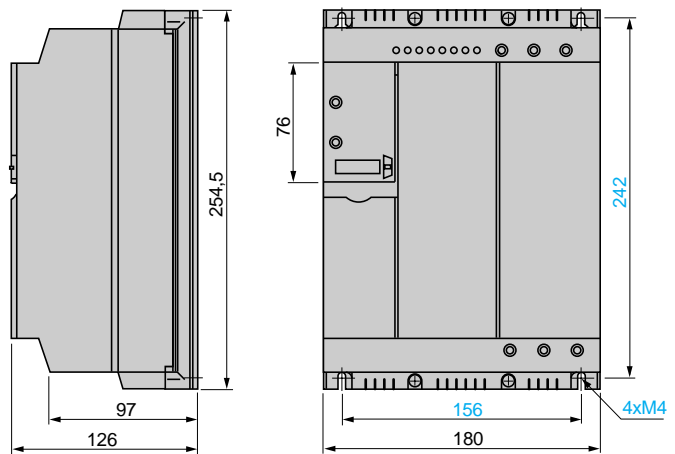
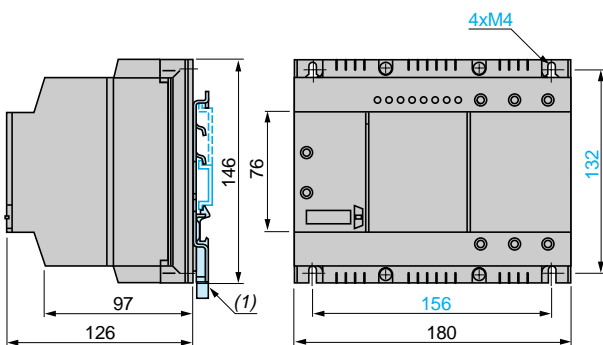
(1) Retractable fixings

(1) Retractable fixings

ATS 01N230LY, ATS 01N244LY, ATS 01N244Q

Quick mounting on  rail (35 or 70 mm) using plate VY1 H4101 (1)

ATS 01N272LY, ATS 01N285LY, ATS 01N272Q, ATS 01N285Q



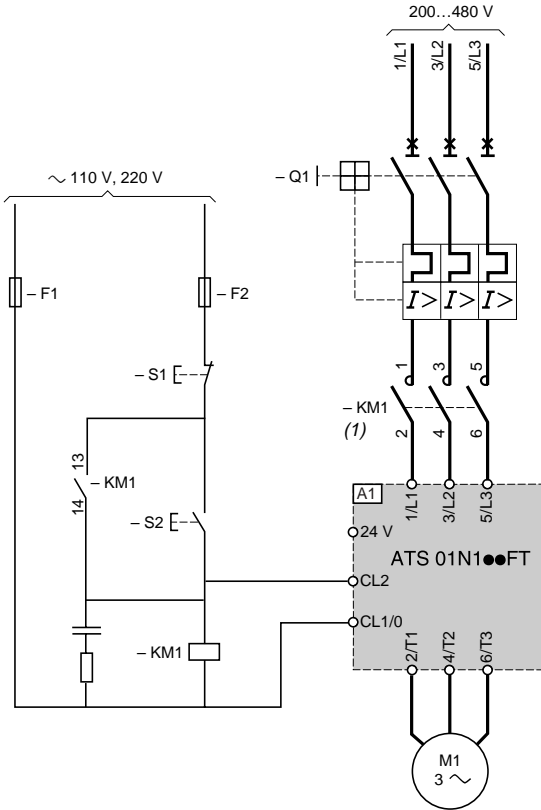
Soft starters for asynchronous motors

Altistart 01

For 0.37 to 5.5 kW motors

ATS 01N1●●FT soft starters

Single-phase or 3-phase power supply



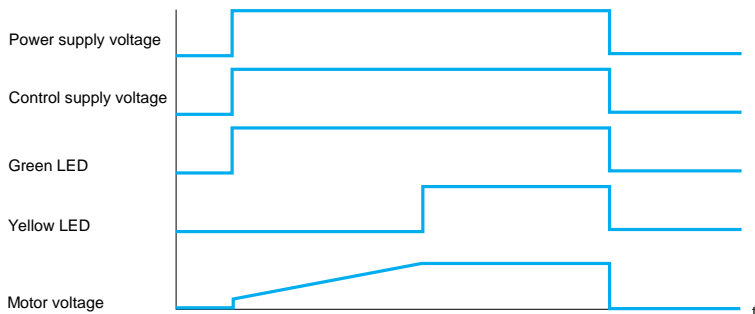
Note : For single-phase motors, use the ATS 01N1●●FT without connecting the 2nd phase 3/L2, 4/T2. Wait 5 seconds after switching the soft starter off before switching it on again.

(1) A line contactor must be used in the sequence.

Compatible components (For full references, see pages 1/16 and 1/17 or refer to our catalogue: "Motor starter solutions - Control and protection components".)

Code	Description
A1	Soft starter
Q1	GV2 ME circuit-breaker
KM1	LC1 ●●● + LA4 DA2U
F1, F2	Control protection fuses
S1, S2	XB4 B or XB5 B pushbuttons

Function chart



Soft starters for asynchronous motors

Altistart 01

For 0.75 to 15 kW motors

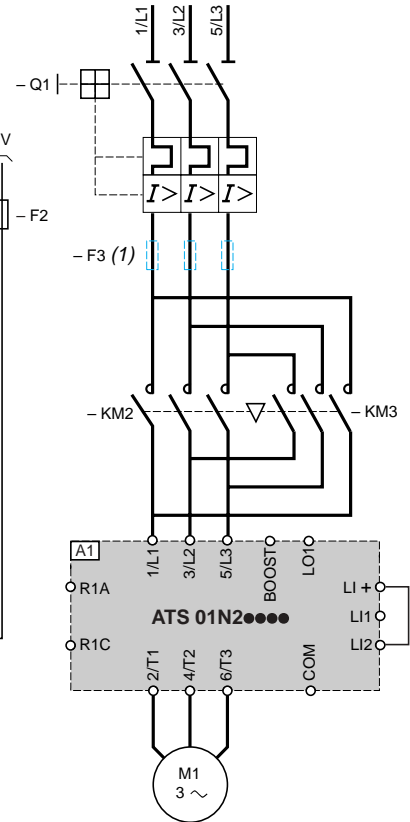
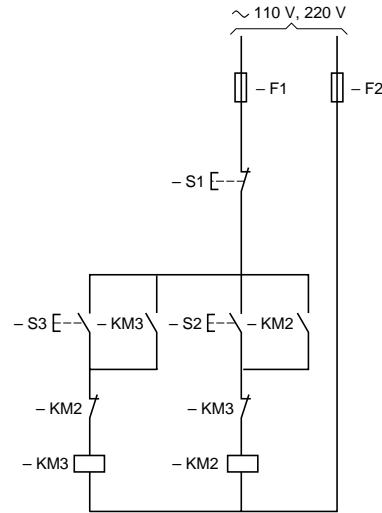
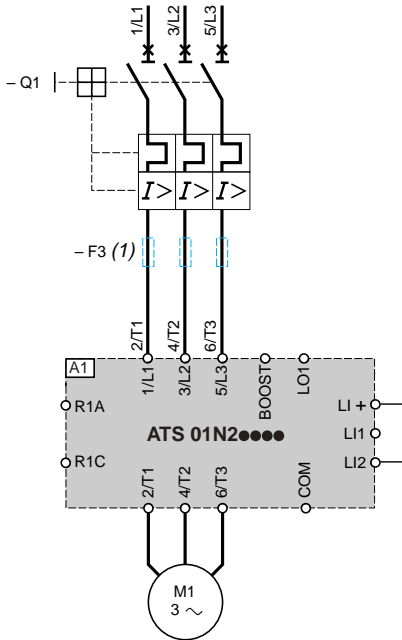
ATS 01N2●●LU/QN/RT soft start/soft stop units

Manual control without deceleration (freewheel), with GV2 and GV3 motor circuit-breaker

ATS 01N206●● to ATS 01N232●●

Automatic control with reversal of operating direction, without deceleration (freewheel)

ATS 01N206●● to ATS 01N232●●



(1) For type 2 coordination.

Compatible components (For full references, see pages 1/16 and 1/17 or refer to our catalogue: "Motor starter solutions - Control and protection components".)

Code	Description
A1	Soft start/soft stop unit
Q1	GV2 ME circuit-breaker
KM1, KM2, KM3	LC1 ●●● + LA4 DA2U
F1, F2	Control protection fuses
F3	3 fast-acting fuses
S1, S2, S3	XB4 B or XB5 B pushbuttons

Soft starters for asynchronous motors

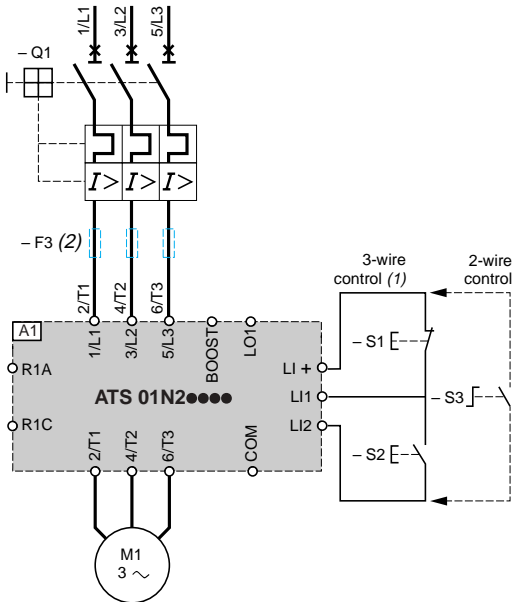
Altistart 01

For 0.75 to 15 kW motors

ATS 01N2●●LU/QN/RT soft start/soft stop units

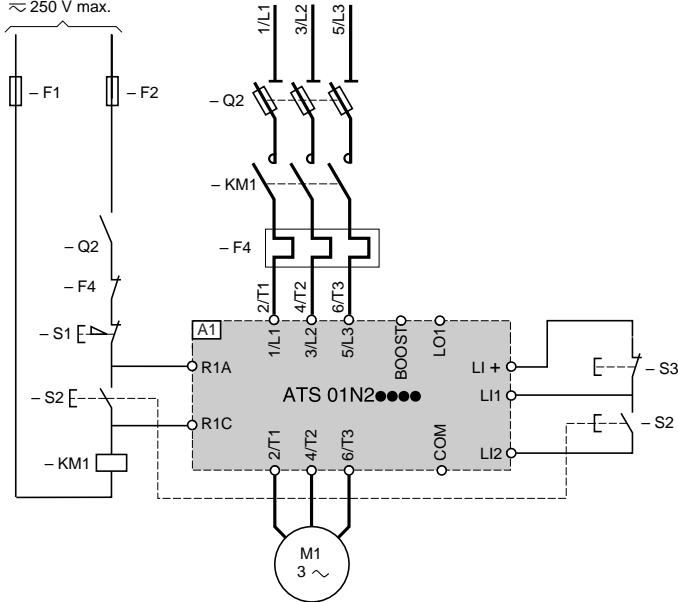
Automatic control with or without deceleration (freewheel), without contactor

ATS 01N206●● to ATS 01N232●●



Automatic control with or without deceleration (freewheel), with contactor

ATS 01N206●● to ATS 01N232●●



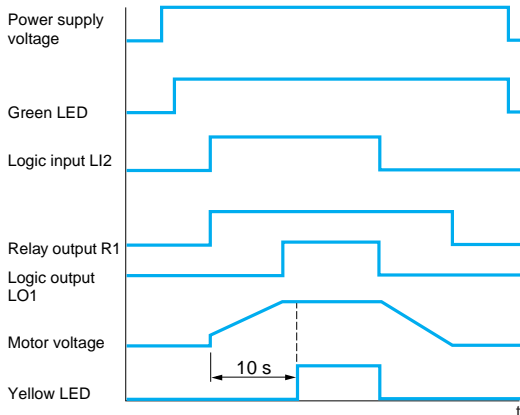
- (1) Use shielded wires above 1 m.
- (2) For type 2 coordination.

Compatible components (For full references, see pages 1/16 and 1/17 or refer to our catalogue: "Motor starter solutions - Control and protection components".)

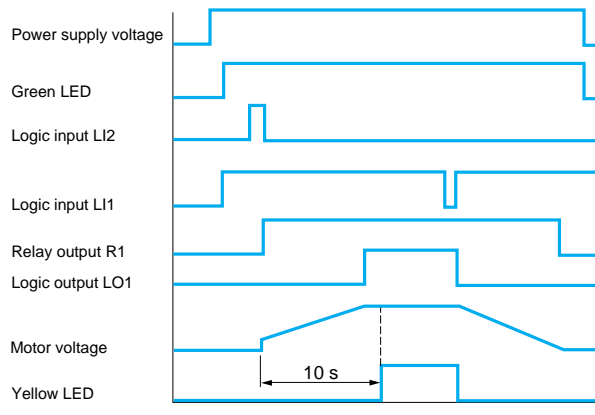
Code	Description
A1	Soft start/soft stop unit
Q1	GV2 ME circuit-breaker
Q2	Fuse switches
F4	Thermal overload relay
KM1	LC1 ●●● + LA4 DA2U
F1, F2	Control protection fuses
F3	3 fast-acting fuses
S1, S2, S3	XB4 B or XB5 B pushbuttons

Function charts

2-wire control with deceleration



3-wire control with deceleration



Soft starters for asynchronous motors

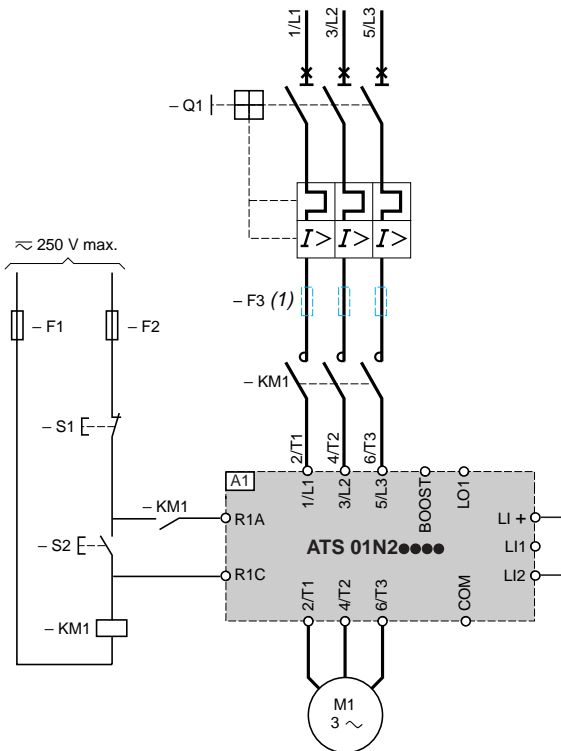
Altistart 01

For 0.75 to 15 kW motors

ATS 01N2●●LU/QN/RT soft start/soft stop units

Automatic control without deceleration (freewheel), with a maintaining function

ATS 01N206●● to ATS 01N232●●



(1) For type 2 coordination.

Compatible components (For full references, see pages 1/16 and 1/17 or refer to our catalogue: "Motor starter solutions - Control and protection components".)

Code	Description
A1	Soft start/soft stop unit
Q1	GV2 ME circuit-breaker
KM1	LC1 ●●● + LA4 DA2U
F1, F2	Control protection fuses
F3	3 fast-acting fuses
S1, S2	XB4 B or XB5 B pushbuttons

Soft starters for asynchronous motors

Altistart 01

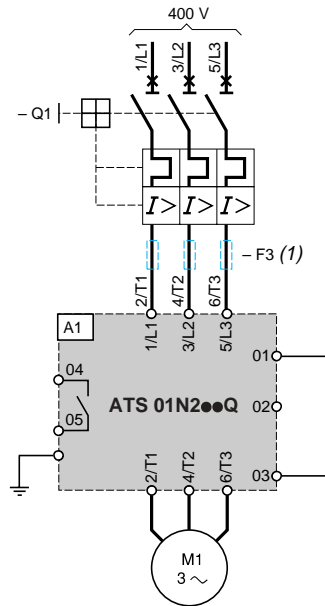
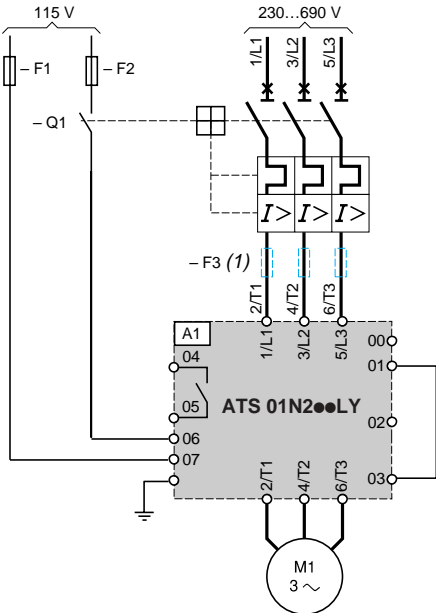
For 15 to 75 kW motors

ATS 01N2●●LY and ATS 01N2●●Q soft start/soft stop units (compatible components, see page 1/13)

Manual control without deceleration (freewheel), with GV3 and GV7 motor circuit-breaker

ATS 01N230LY to ATS 01N285LY

ATS 01N244Q to ATS 01N285Q



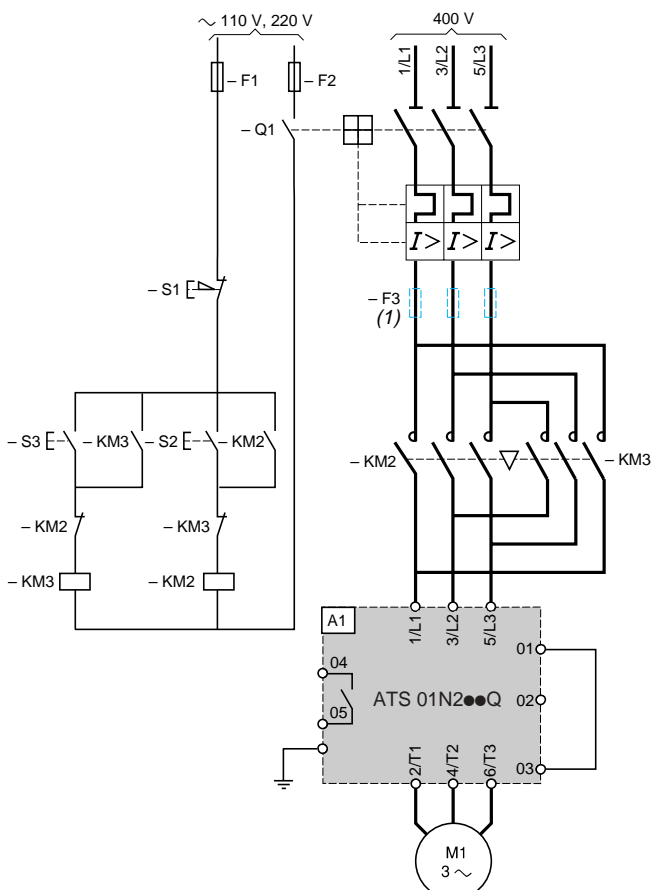
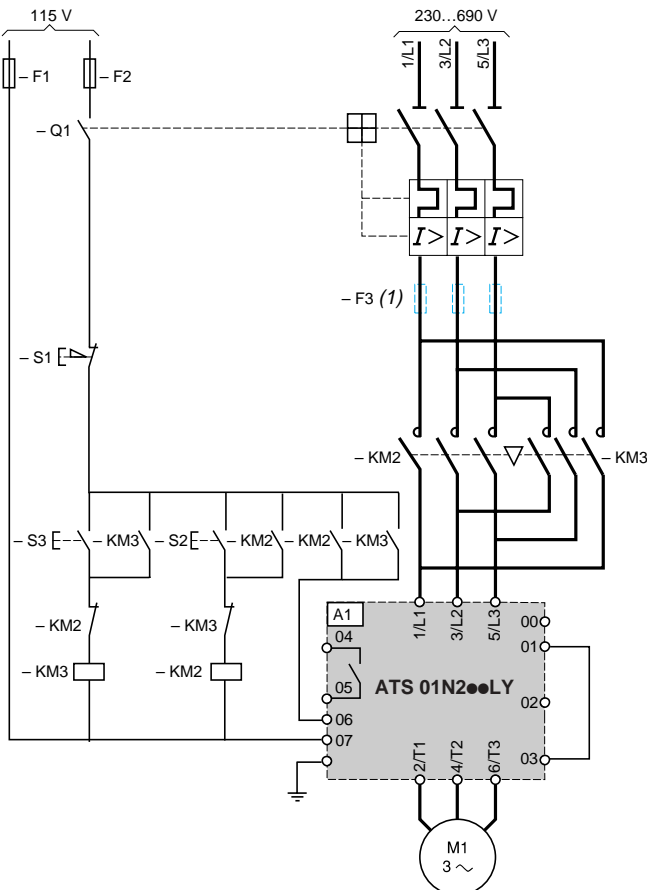
(1) For type 2 coordination.

(1) For type 2 coordination.

Automatic control with reversal of operating direction, without deceleration (freewheel)

ATS 01N230LY to ATS 01N285LY

ATS 01N244Q to ATS 01N285Q



(1) For type 2 coordination.

(1) For type 2 coordination.

Soft starters for asynchronous motors

Altistart 01

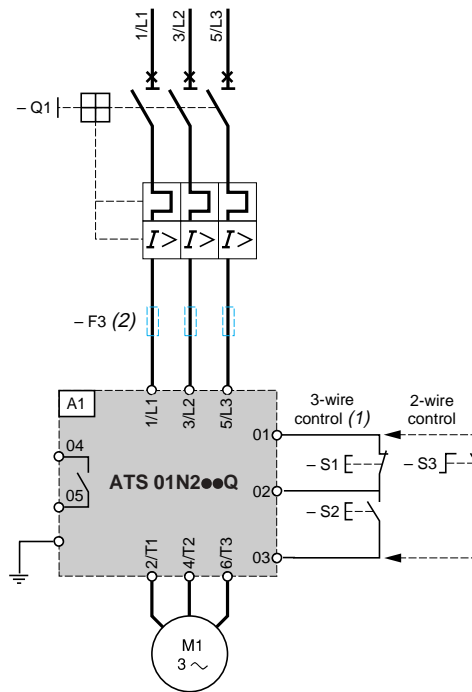
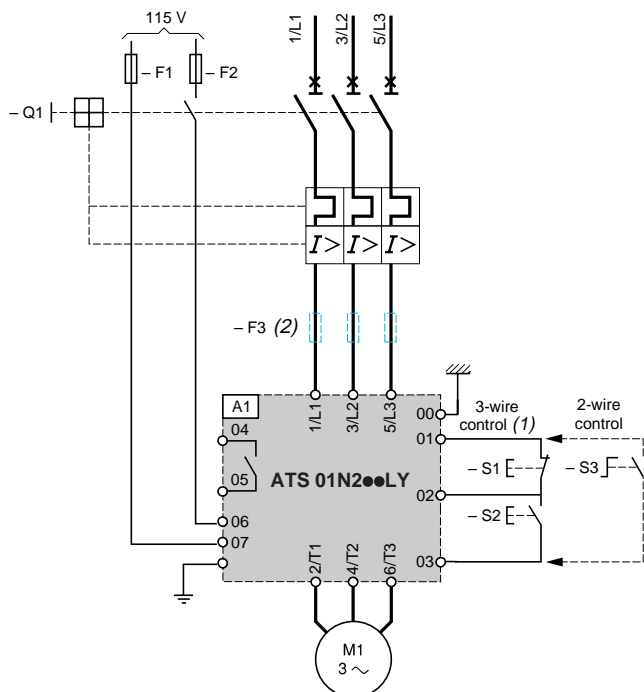
For 15 to 75 kW motors

ATS 01N2●●LY and ATS 01N2●●Q soft start/soft stop units (continued)

Automatic control with or without deceleration (freewheel), without contactor

ATS 01N230LY to ATS 01N285LY

ATS 01N244Q to ATS 01N285Q



(1) Use shielded wires above 1 m.
(2) For type 2 coordination.

(1) Use shielded wires above 1 m.
(2) For type 2 coordination.

Compatible components (For full references, see pages 1/16 and 1/17 or refer to our catalogue: "Motor starter solutions - Control and protection components".)

Code	Description
A1	Soft start/soft stop unit
Q1	GV3 or GV7 circuit-breaker
KM2, KM3	LC1 ●●● + LA4 DA2U
F1, F2	Control protection fuses
F3	3 fast-acting fuses
S1, S2, S3	XB4 B or XB5 B pushbuttons

Soft starters for asynchronous motors

Altistart 01

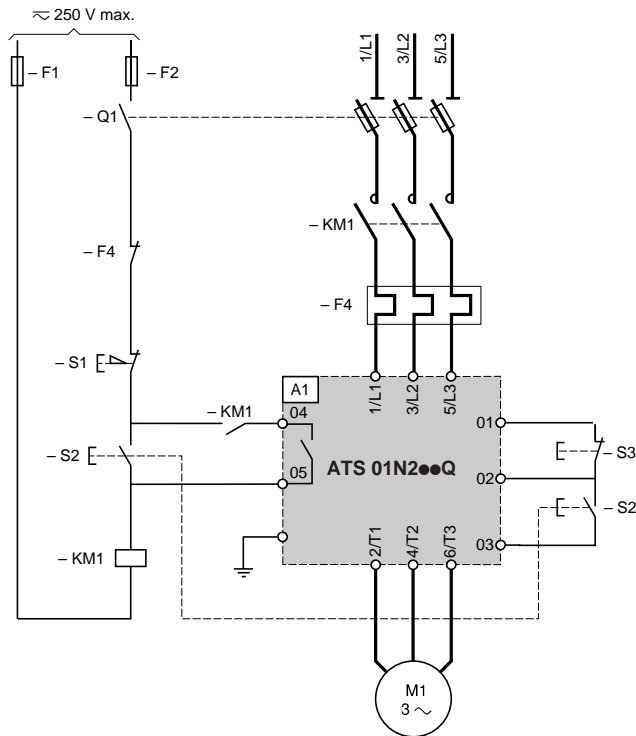
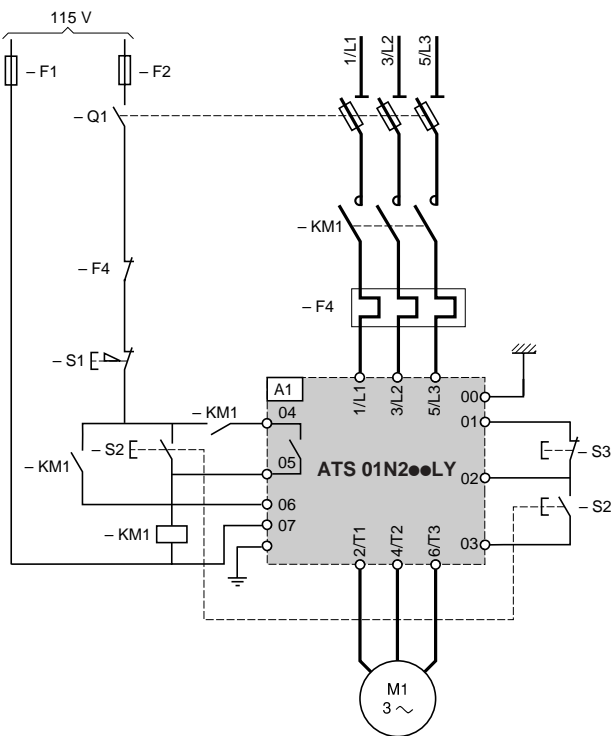
For 15 to 75 kW motors

ATS 01N2●●LY and ATS 01N2●●Q soft start/soft stop units (continued)

Automatic control with or without deceleration (freewheel), with contactor

ATS 01N230LY to ATS 01N285LY

ATS 01N244Q to ATS 01N285Q



Compatible components (For full references, see pages 1/16 and 1/17 or refer to our catalogue: "Motor starter solutions - Control and protection components".)

Code	Description
A1	Soft start/soft stop unit
Q1	GK1 disconnector
KM1	LC1 ●●● + LA4 DA2U
F1, F2	Control protection fuses
F4	LR2 D thermal overload relay
S1, S2, S3	XB4 B or XB5 B pushbuttons

Soft starters for asynchronous motors

Altistart 01

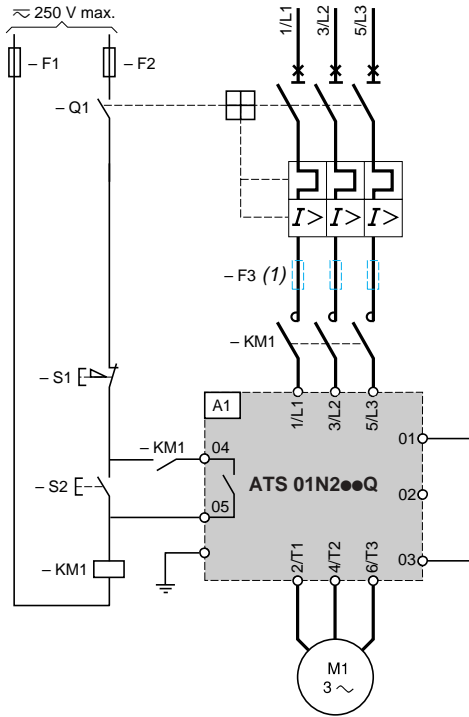
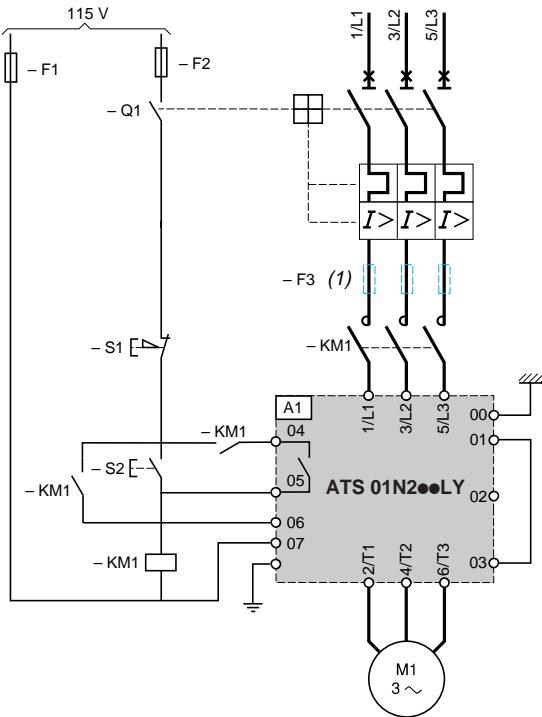
For 15 to 75 kW motors

ATS 01N2●●LY and ATS 01N2●●Q soft start/soft stop units (continued)

Automatic control without deceleration (freewheel), with a maintaining function

ATS 01N230LY to ATS 01N285LY

ATS 01N244Q to ATS 01N285Q



(1) For type 2 coordination.

Compatible components (For full references, see pages 1/16 and 1/17 or refer to our catalogue: "Motor starter solutions - Control and protection components".)

Code	Description
A1	Soft starter
Q1	GV3 circuit-breaker
KM1	LC1 ●●● + LA4 DA2U
F1, F2	Control protection fuses
F3	3 fast-acting fuses
S1, S2	XB4 B or XB5 B pushbuttons

Soft starters for asynchronous motors

Altistart 01

400 V power supply, type 1 coordination

Components to be combined in accordance with standards IEC 60947-1 and IEC 60947-4-2

Combine either circuit-breaker (light blue columns), contactor, starter, or switches/fuses (dark blue columns), contactor, starter

Motor		Starter Class 10	Type of circuit-breaker Telemecanique	Rating	Type of contactor	Type of switch or switch disconnecter (base unit)	Am fuses Reference	Rating	I ² t	Thermal overload relay
kW	A			A				A	A ² s	
M1		A1	Q1		KM1, KM2, KM3	Q2				F4
0.37	0.98	ATS 01N103FT	GV2 ME05	1	LC1 K06 or LC1 D09	LS1 D2531	DF2 CA02	2	265	LR2 K0306 LRD 05
0.55	1.5	ATS 01N103FT	GV2 ME06	1.6	LC1 K06 or LC1 D09	LS1 D2531	DF2 CA02	2	265	LR2 K0307 LRD 06
0.75	2	ATS 01N103FT	GV2 ME07	2.5	LC1 K06 or LC1 D09	LS1 D2531	DF2 CA02	2	265	LR2 K0308 LRD 07
1.1	2.5	ATS 01N103FT	GV2 ME08	4	LC1 K06 or LC1 D09	LS1 D2531	DF2 CA04	4	265	LR2 K0308 LRD 08
		ATS 01N206QN	GV2 ME08	4	LC1 K06 or LC1 D09	LS1 D2531	DF2 CA04	4	265	LR2 K0308 LRD 08
1.5	3.5	ATS 01N106FT	GV2 ME08	4	LC1 K06 or LC1 D09	LS1 D2531	DF2 CA06	6	265	LR2 K0310 LRD 08
		ATS 01N206QN	GV2 ME08	4	LC1 K06 or LC1 D09	LS1 D2531	DF2 CA06	6	265	LR2 K0310 LRD 08
2.2	5	ATS 01N106FT	GV2 ME10	6.3	LC1 K06 or LC1 D09	LS1 D2531	DF2 CA08	8	265	LR2 K0312 LRD 10
		ATS 01N206QN	GV2 ME10	6.3	LC1 K09 or LC1 D09	LS1 D2531	DF2 CA08	8	265	LR2 K0312 LRD 10
3	6.5	ATS 01N106FT	GV2 ME14	9	LC1 K09 or LC1 D09	LS1 D2531	DF2 CA12	12	265	LR2 K0314 LRD 12
		ATS 01N206QN	GV2 ME14	9	LC1 K09 or LC1 D09	LS1 D2531	DF2 CA12	12	265	LR2 K0314 LRD 12
4	8.4	ATS 01N109FT	GV2 ME14	9	LC1 K09 or LC1 D09	LS1 D2531	DF2 CA12	12	610	LR2 K0316 LRD 14
		ATS 01N209QN	GV2 ME14	9	LC1 K09 or LC1 D09	LS1 D2531	DF2 CA12	12	610	LR2 K0316 LRD 14
5.5	11	ATS 01N112FT	GV2 ME16	13	LC1 K12 or LC1 D12	LS1 D2531	DF2 CA16	16	610	LR2 K0321 LRD 16
		ATS 01N212QN	GV2 ME16	13	LC1 K12 or LC1 D12	LS1 D2531	DF2 CA16	16	610	LR2 K0321 LRD 16
7.5	14.8	ATS 01N222QN	GV2 ME20	17	LC1 D18	LS1 D2531	DF2 CA20	20	6050	LRD 21
9	18.1	ATS 01N222QN	GV2 ME21	21	LC1 D25	LS1 D2531	DF2 CA25	25	6050	LRD 21
11	21	ATS 01N222QN	GV2 ME22	23	LC1 D25	LS1 D2531	DF2 CA25	25	6050	LRD 22
15	28.5	ATS 01N232QN	GV2 ME32	32	LC1 D32	GK1 EM	DF2 EA40	40	7200	LR2 D3353
18.5	35	ATS 01N244Q	GV3 ME40	40	LC1 D38	GK1 EM	DF2 EA40	40	8000	LR2 D3355
22	42	ATS 01N244Q	GV3 ME63	63	LC1 D50	GK1 FM	DF2 FA63	63	8000	LR2 D3357
30	57	ATS 01N272Q	GV3 ME63	63	LC1 D65	GK1 FM	DF2 FA63	63	9000	LR2 D3359
37	69	ATS 01N272Q	GV3 ME80	80	LC1 D80	GK1 FM	DF2 FA80	80	9000	LR2 D3363
45	81	ATS 01N285Q	GV7 RE100	100	LC1 D95	GK1 FM	DF2 FA100	100	9000	LR2 D3365

Soft starters for asynchronous motors

Altistart 01

690V power supply, type 1 coordination

Components to be combined in accordance with standards IEC 60947-1 and IEC 60947-4-2

Combine either circuit-breaker (light blue columns), contactor, starter, or switches/fuses (dark blue columns), contactor, starter

Motor		Starter Class 10	Type of circuit-breaker		Type of contactor	Type of switch or switch disconnecter (base unit)	Am fuses Reference	I ² t		Thermal overload relay
kW	A		Telemecanique	Rating				Rating	A	
M1		A1	Q1		KM1	Q2			F4	
30	33	ATS 01N230LY	GV3 ME40 + GV3 A01	25...40	LC1 D50	GK1 EM	DF2 EA40	40	7200	LR2 D3355
37	40	ATS 01N244LY	GV3 ME63 + GV3 A01	40...63	LC1 D65	GK1 FM	DF2 FA63	63	8000	LR2 D3359
55	58	ATS 01N272LY	GV3 ME80 + GV3 A01	56...80	LC1 D115	GK1 FM	DF2 FA80	80	9000	LR2 D3363
75	75.7	ATS 01N285LY	GV7 RE100 + GV7 A11	60...100	LC1 D150	GK1 FM	DF2 FA100	100	9000	LR2 D3365

2 - Altistart U01 soft starters for asynchronous motors

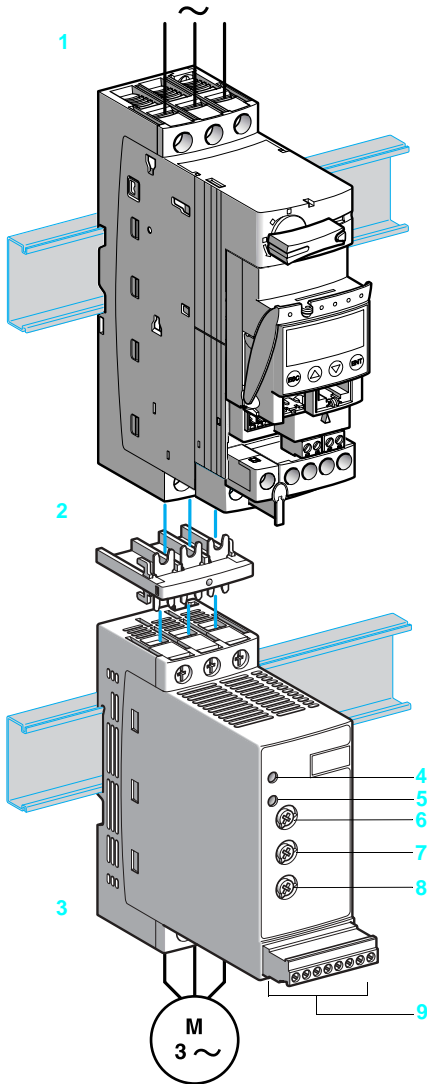
■ Presentation	pages 2/2 and 2/3
■ Characteristics	pages 2/4 and 2/5
■ References	page 2/6
■ Dimensions	page 2/7
■ Schemes	pages 2/8 to 2/11



Soft starters for asynchronous motors

Altistart U01 and TeSys model U

2
DF563860



Presentation

The Altistart U01 is a soft start/soft stop unit for asynchronous motors. It is designed primarily for combinations with **TeSys model U** controller-starters.

When combined with a **TeSys model U 1** controller by means of a connector **2**, the Altistart U01 **3** is a power option which provides the “Soft start/soft stop” function. The result is a unique, innovative motor starter.

Using the Altistart U01 starter enhances the starting performance of asynchronous motors by allowing the motor to start gradually, smoothly and in a controlled manner. It can also prevent mechanical shocks which lead to wear and tear, and limits the amount of maintenance work and production downtime. The Altistart U01 limits the starting torque and current peaks on starting, on machines which do not require a high starting torque.

The Altistart U01 is designed for the following simple applications:

- conveyors
- conveyor belts
- pumps
- fans
- compressors
- automatic doors
- small cranes
- belt-driven machines, etc.

The Altistart U01 is compact, easy to install, complies with standards IEC/EN 60947-4-2, with UL, CSA and C-Tick certifications, and has CE marking.

■ ATSU 01N2●●LT soft start/soft stop units

- Control two phases of the motor power supply to limit the starting current and for deceleration.
 - Motor power ratings range from 0.75 kW to 15 kW.
 - Motor supply voltages range from 200 V to 480 V, 50/60 Hz.
- An external power supply is required for controlling the starter.

Description

■ Altistart U01 soft start/soft stop units are equipped with:

- a potentiometer for controlling the starting time **6**
- a potentiometer for controlling the deceleration time **8**
- a potentiometer for adjusting the start voltage threshold according to the motor load **7**
- 1 green indicator LED **4**: device switched on
- 1 yellow indicator LED **5**: motor powered at nominal voltage
- a connector **9**:
 - 2 logic inputs for Run/Stop commands
 - 1 logic input for the BOOST function
 - 1 logic output to indicate the end of starting
 - 1 relay output to indicate the starter has a power supply fault or the motor has stopped at the end of the deceleration ramp.

Soft starters for asynchronous motors

Altistart U01 and TeSys model U

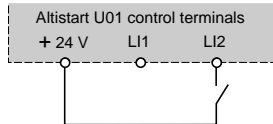
Description of a TeSys model U controller-starter

Please consult our "TeSys model U Starters-open version" specialist catalogue.

ATSU 01N2●●LT soft start unit functions

■ 2-wire control:

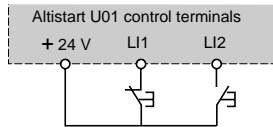
The run and stop commands are controlled by a single logic input. State 1 of logic input LI2 controls the run process and state 0 controls the stop process.



Wiring diagram for 2-wire control

■ 3-wire control:

The run and stop commands are controlled by 2 different logic inputs. Stopping is achieved when logic input LI1 opens (state 0). The pulse on input LI2 is maintained until input LI1 opens.



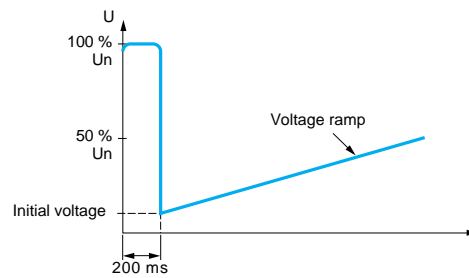
Wiring diagram for 3-wire control

■ Starting time

The starting time setting can be used to adjust the voltage ramp time applied to the motor and to obtain a gradual starting time depending on the motor load.

■ Voltage BOOST function via logic input:

Activating the BOOST logic input enables the function for supplying a starting overtorque capable of overcoming any mechanical friction. When the input is at state 1, the function is active (input connected to the + 24 V) and the starter supplies a fixed voltage to the motor for a limited time before starting.



Application of a voltage BOOST equal to 100% of the nominal motor voltage

■ End of starting

□ Logic output LO1 application function

ATSU 01N2●●LT soft start/soft stop units are equipped with an open collector logic output LO, which indicates the end of starting when the motor has reached nominal speed.

■ Fault relay

ATSU 01N2●●LT soft start/soft stop units have a relay which opens when a fault is detected.

The contact of relay R1A-R1C closes when the LI2 run command is sent and opens when the motor voltage approaches 0V on a decelerated stop or instantly in the event of a fault.

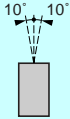
This information can be used for controlling the line contactor and achieving motor deceleration (by maintaining the line contactor until the motor has stopped).

Soft starters for asynchronous motors

Altistart U01 and TeSys model U

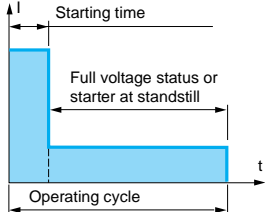
2

Environment

Type of starter		ATSU 01N2●●LT	
Conformity to standards		Altistart U01 electronic starters have been developed to conform to the strictest international standards and the recommendations relating to electrical industrial control devices (IEC, EN), in particular standard IEC/EN 60947-4-2.	
Electromagnetic compatibility EMC			
Conducted and radiated emissions		CISPR 11 level B, IEC 60947-4-2, level B	
Harmonics		IEC 1000-3-2, IEC 1000-3-4	
EMC immunity		EN 50082-2, EN 50082-1	
Electrostatic discharge		IEC 61000-4-2 level 3	
Immunity to radiated radio-electrical interference		IEC 61000-4-3 level 3	
Immunity to electrical transients		IEC 61000-4-4 level 4	
Voltage/current impulse		IEC 61000-4-5 level 3	
Conducted and radiated emissions		IEC 61000-4-6 level 3	
Immunity to conducted interference caused by radio-electrical fields		IEC 61000-4-11	
Damped oscillating waves		IEC 61000-4-12 level 3	
€€ marking		The starters bear €€ marking in accordance with the European low voltage directives IEC/EN 60947-4-2.	
Product certification		UL, CSA and C-Tick	
Degree of protection		IP 20	
Degree of pollution		2 conforming to IEC/EN 60947-4-2	
Vibration resistance		1.5 mm peak to peak from 3 to 13 Hz, 1 gn from 13 to 150 Hz conforming to IEC/EN 60068-2-6	
Shock resistance		15 gn for 11 ms conforming to IEC/EN 60068-2-27	
Relative humidity		5...95% without condensation or dripping water, conforming to IEC/EN 60068-2-3	
Ambient temperature around the unit	Storage	°C	- 25...+ 70 conforming to IEC/EN 60947-4-2
	Operation	°C	- 10...+ 40 without derating, up to 50°C with current derating of 2% per °C above 40°C
Maximum operating altitude		m	1000 without derating (above this, derate the current by 2.2% per additional 100 m)
Operating position Maximum permanent angle in relation to the normal vertical mounting position			

Electrical characteristics

Type of starter		ATSU 01N2●●LT						
Category of use		Conforming to IEC 60947-4-2						
Rated operating voltage		3-phase ~ voltage	V					
Frequency			Hz					
Output voltage			Maximum 3-phase voltage equal to line supply voltage.					
Control supply voltage			≐ 24 V, 100 mA ± 10%					
Rated operating current			A					
Adjustable starting time			s					
Adjustable deceleration time			s					
Starting torque			%					
			30...80% of starting torque of motor connected directly on the line supply					
Type of starter		ATSU	01N206LT	01N209LT	01N212LT	01N222LT	01N232LT	
Control power supply consumption			≐ 24 V, 65 mA			≐ 24 V, 100 mA		
Power dissipated		At full load at end of starting	W	1.5	1.5	1.5	2.5	2.5
		In transient state at 5 times the rated operating current	W	61.5	91.5	121.5	222.5	322.5
Type of starter		ATSU 01N206LT to ATSU 01N222LT			ATSU 01N232LT			
Use								
Starting time		s	1	5	1	5		
Maximum number of cycles per hour			310	20	180	10		



Soft starters for asynchronous motors

Altistart U01 and TeSys model U

2

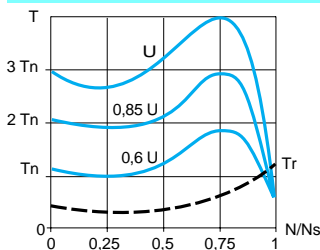
Electrical characteristics (continued)

Logic input power supply (electrically isolated between power and control) + 24 V, COM		24 V \pm 10% Isolated Max. current 100 mA
Logic inputs LI1, LI2, BOOST Stop, run and boost on start-up functions		Logic inputs with impedance 27 kohms; 24 V power supply (U max 40 V) Max current 8 mA State 0 if U < 5 V and I < 0.2 mA State 1 if U > 13 V and I > 0.5 mA
Logic output LO1 End of starting signal		Open collector logic output External 24 V power supply (minimum 6 V maximum 30 V) Max current 200 mA
Relay output R1A R1C		Normally open (N/O) contact (contact open in fault mode) Minimum switching capacity: 10 mA for \sim 6 V Max. switching capacity on inductive load (cos ϕ = 0.5 and L/R = 20 ms): 2 A for \sim 250 V or \sim 30 V (AC-15) Max. operating voltage 440 V
LED signalling	Green LED Yellow LED	Starter powered up Nominal voltage reached

Connections (Maximum connection capacity and tightening torque)

Power circuit			Connection onto \varnothing 4 mm screw terminals	
Flexible wire without cable end	1 conductor	mm ²	1.5...10	8 AWG
	2 conductors	mm ²	1.5...6	10 AWG
Flexible wire with cable end	1 conductor	mm ²	1...6	10 AWG
	2 conductors	mm ²	1...6	10 AWG
Rigid wire	1 conductor	mm ²	1...10	8 AWG
	2 conductors	mm ²	1...6	10 AWG
Tightening torque		N.m	1.9...2.5	
Control circuit			Screw connector	
Flexible wire without cable end	1 conductor	mm ²	0.5...2.5	14 AWG
	2 conductors	mm ²	0.5...1.5	16 AWG
Flexible wire with cable end	1 conductor	mm ²	0.5...1.5	16 AWG
	2 conductors	mm ²	0.5...1.5	16 AWG
Rigid wire	1 conductor	mm ²	0.5...2.5	14 AWG
	2 conductors	mm ²	0.5...1	17 AWG
Tightening torque		N.m	0.5	

Torque characteristics (typical curves)



The diagram opposite shows the torque/speed characteristic of a cage motor in relation to the supply voltage.
The torque varies in line with the square of the voltage at a fixed frequency. The gradual increase in the voltage prevents the instantaneous current peak on power-up.

Soft starters for asynchronous motors

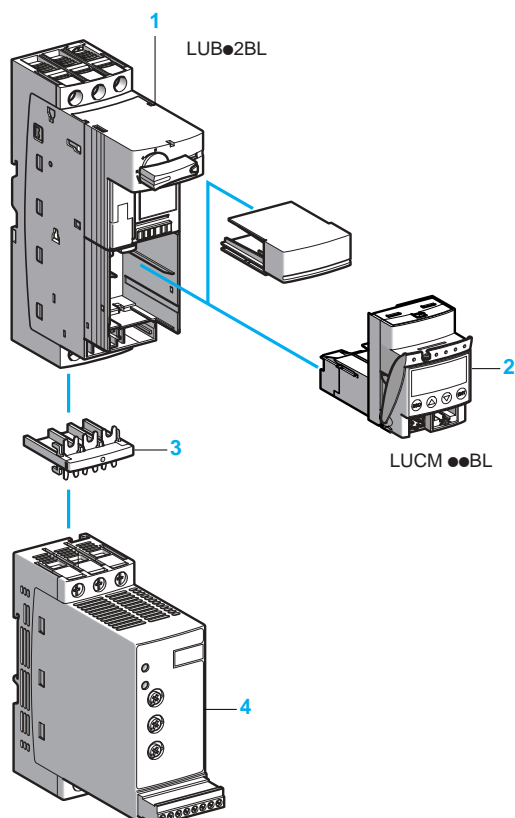
Altistart U01 and TeSys model U

DF531714



ATSU 01N222LT

DF510862



ATSU 01N2●●LT

Soft start/soft stop unit for 0.75 to 15 kW motors (can be combined with the TeSys model U starter)

Motor				Starter		
Motor power (1)				Nominal current	Reference	Weight
230 V 230 V		400 V	460 V			
kW	HP	kW	HP	A		kg
3-phase supply voltage: 200...480 V 50/60 Hz						
0.75	1	1.5	2	6	ATSU 01N206LT	0.340
1.1	1.5	2.2	3			
1.5	2	3	5	9	ATSU 01N209LT	0.340
-	-	4	-			
2.2	3	5.5	7.5	12	ATSU 01N212LT	0.340
3	-	-	-			
4	5	7.5	10	22	ATSU 01N222LT	0.490
5.5	7.5	11	15			
7.5	10	15	20	32	ATSU 01N232LT	0.490

Accessories

Description	Used for starter	Reference	Weight kg
Power connector between ATSU 01N2●●LT and TeSys model U	ATSU 01N2●●LT	VW3 G4104 ▲	0.020

TeSys model U starter and soft start unit combinations

Numerous possibilities for combinations and options are offered. Please consult the "TeSys model U Starters-open version" specialist catalogue.

Motor power			Soft starter	TeSys model U	
230 V	400 V	460 V		Power base	Control unit (2)
Voltage	kW/HP	kW	HP		
0.75/1	1.5	2	ATSU 01N206LT	LUB 12	LUC● 05BL
1.1/1.5	2.2	3	ATSU 01N206LT	LUB 12	LUC● 12BL
1.5/2	3	-	ATSU 01N209LT	LUB 12	LUC● 12BL
-	4	5	ATSU 01N209LT	LUB 12	LUC● 12BL
2.2/3	-	-	ATSU 01N212LT	LUB 12	LUC● 12BL
3/-	5.5	7.5	ATSU 01N212LT	LUB 32	LUC● 18BL
4/5	7.5	10	ATSU 01N222LT	LUB 32	LUC● 18BL
5.5/7.5	11	15	ATSU 01N222LT	LUB 32	LUC● 32BL
7.5/10	15	20	ATSU 01N232LT	LUB 32	LUC● 32BL

Example of a starter-motor combination with:

- 1 non-reversing power base for DOL starting (LUB●2BL)
- 2 control unit (LUCM●●BL)
- 3 power connector (VW3 G4104)
- 4 Altistart U01 soft start/soft stop unit (ATSU 01N2●●LT)

(1) Standard motor power ratings, HP power ratings indicated according to standard UL 508.
 (2) Depending on the configuration of the chosen TeSys model U starter, replace the ● with A for standard, B for expandable, and M for multifunction.

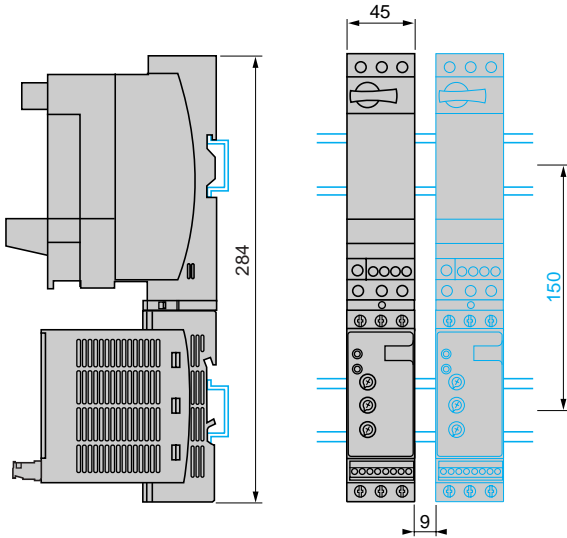
▲ Available 2nd quarter 2004

Soft starters for asynchronous motors

Altistart U01 and TeSys model U

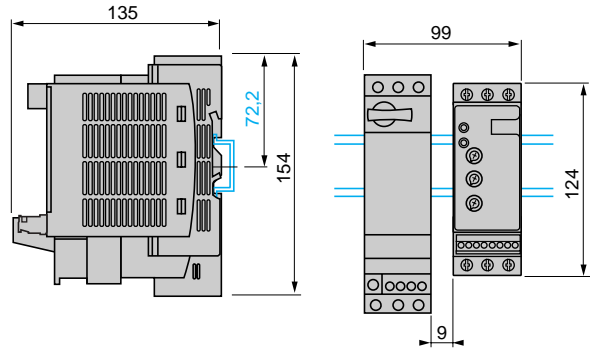
**TeSys model U combination (non-reversing power base) and
ATSU 01N206LT to ATSU 01N212LT**

Mounting on  (35 mm) rail with VW3 G4104 connector




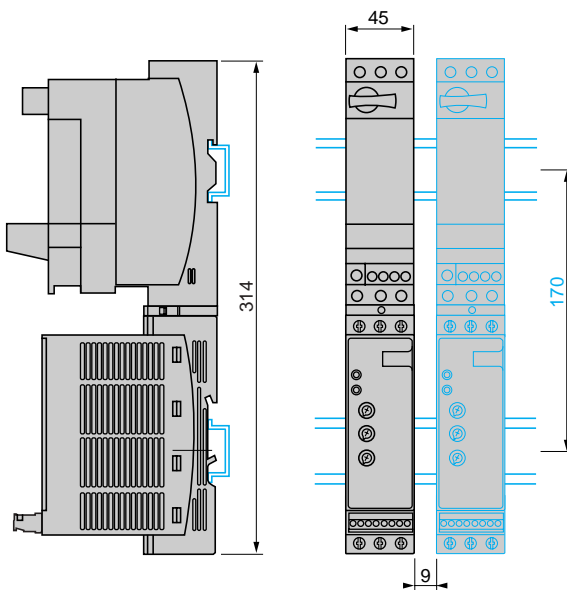
**TeSys model U combination (non-reversing or reversing power
base) and ATSU 01N206LT to ATSU 01N212LT**

Side by side mounting



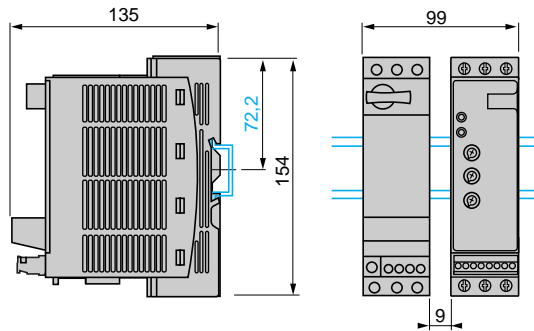
**TeSys model U combination (non-reversing power base) and
ATSU 01N222LT to ATSU 01N232LT**

Mounting on  (35 mm) rail with VW3 G4104 connector

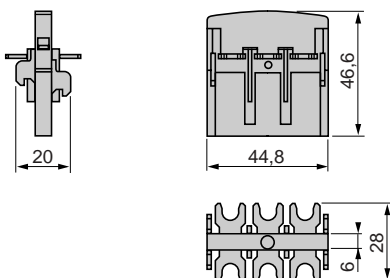


**TeSys model U combination (non-reversing or reversing power
base) and ATSU 01N222LT to ATSU 01N232LT**

Side by side mounting



VW3 G4104 connector

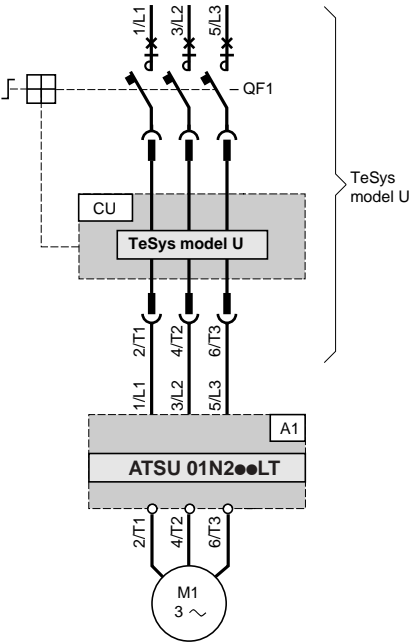


Soft starters for asynchronous motors

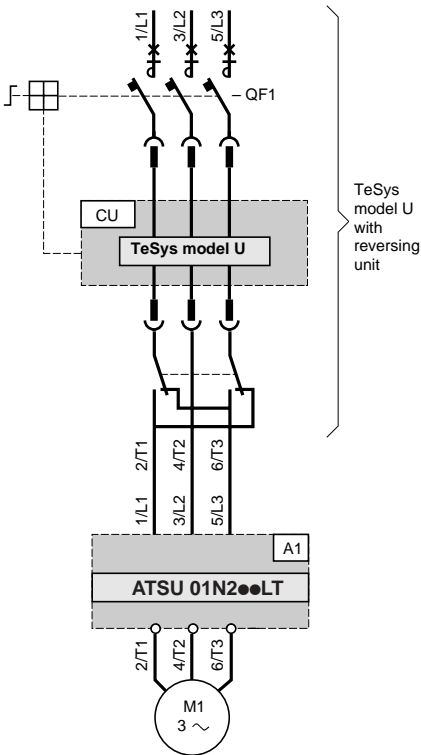
Altistart U01 and TeSys model U
For 0.75 to 15 kW motors

ATSU 01N2●●LT soft start/soft stop units

Power wiring



Power wiring with reversing unit



Compatible components (For full references, see pages 1/16 and 1/17 or consult our "Motor starter solutions - control and protection components" specialist catalogue.)

Code	Description
A1	Soft start/soft stop unit
QF1	TeSys model U controller-starter
CU	TeSys model U control unit

Soft starters for asynchronous motors

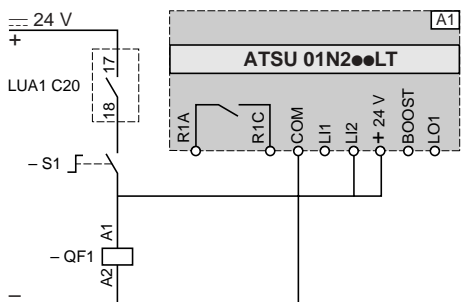
Altistart U01 and TeSys model U

For 0.75 to 15 kW motors

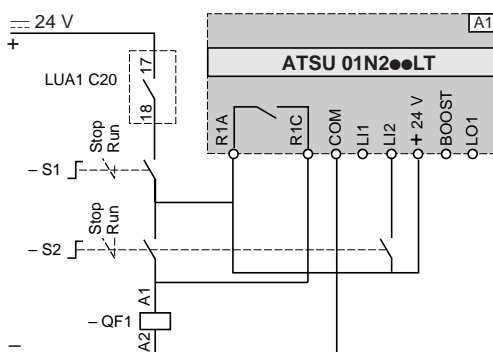
ATSU 01N2●●LT soft start/soft stop units (continued)

Automatic 2-wire control

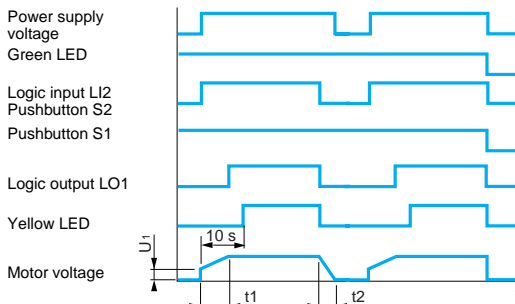
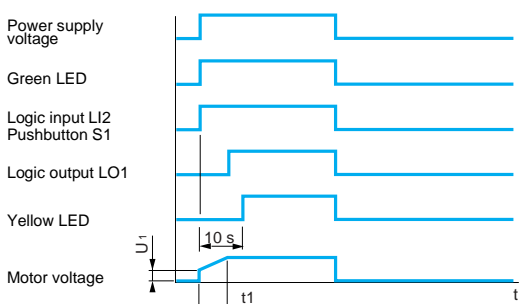
Without deceleration



With and without deceleration

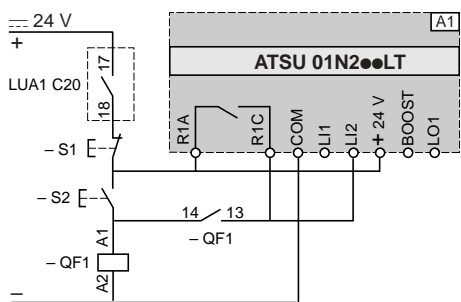


Functional diagrams

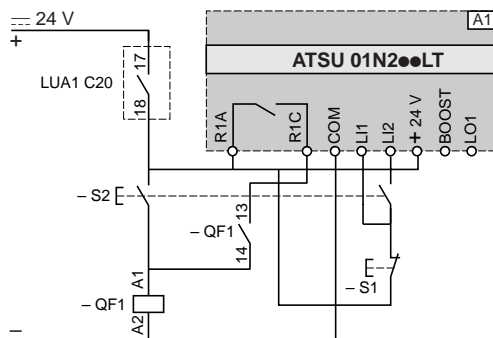


Automatic 3-wire control

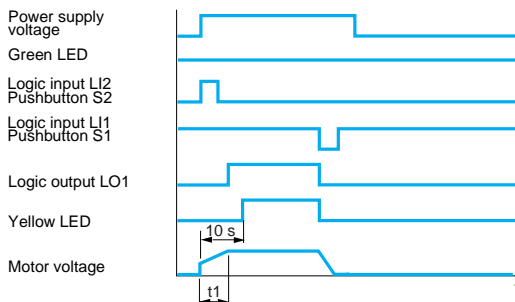
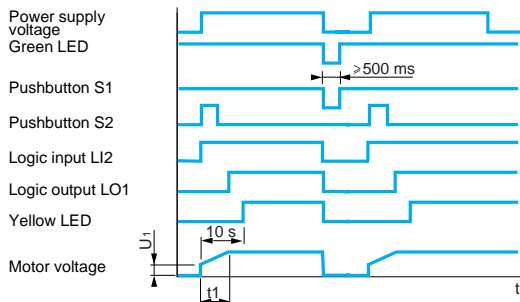
Without deceleration



With deceleration



Functional diagrams



A1: Soft start/soft stop unit
 S1, S2: XB4 B or XB5 B pushbuttons
 QF1: TeSys model U controller-starter
 t1: Acceleration time can be controlled by a potentiometer
 t2: Deceleration time can be controlled by a potentiometer
 U₁: Starting time can be controlled by a potentiometer

Soft starters for asynchronous motors

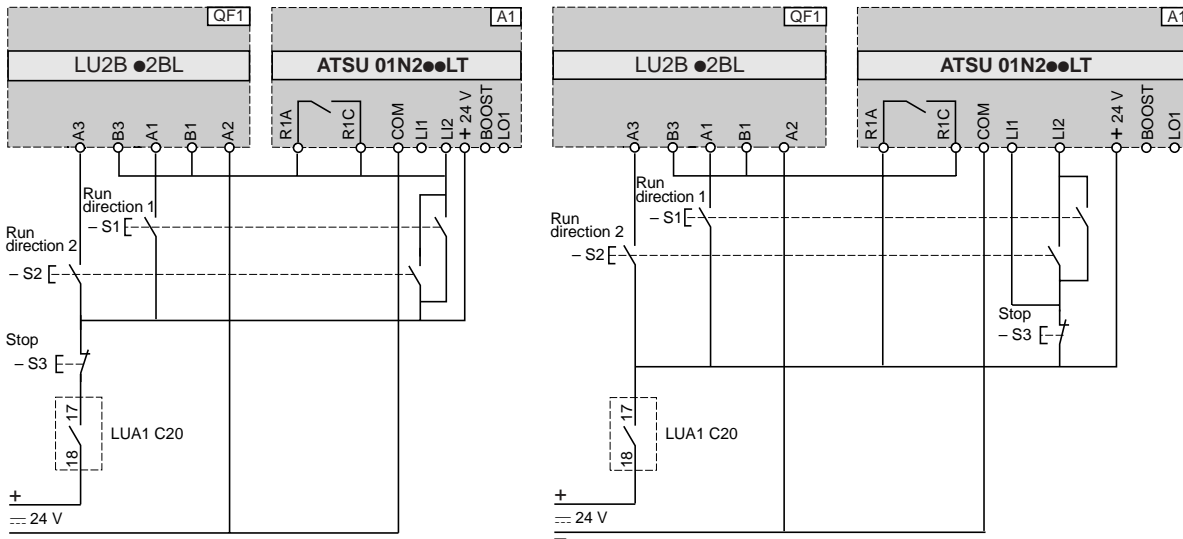
Altistart U01 and TeSys model U
For 0.75 to 15 kW motors

ATSU 01N2●●LT soft start/soft stop units (continued)

Automatic 3-wire control, with reversing unit

Without deceleration

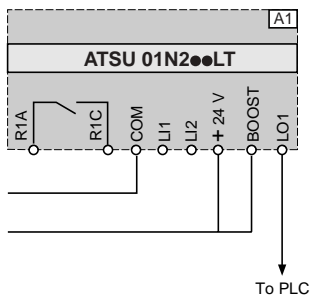
With deceleration



QF1: TeSys model U controller-starter with reversing unit
A1: Soft start/soft stop unit
S1, S2, S3: XB4 B or XB5 B pushbuttons
S3: minimum depression time 500 ms

QF1: TeSys model U controller-starter with reversing unit
A1: Soft start/soft stop unit
S1, S2, S3: XB4 B or XB5 B pushbuttons

Boost on starting and end of starting signal



A1: Soft start/soft stop unit

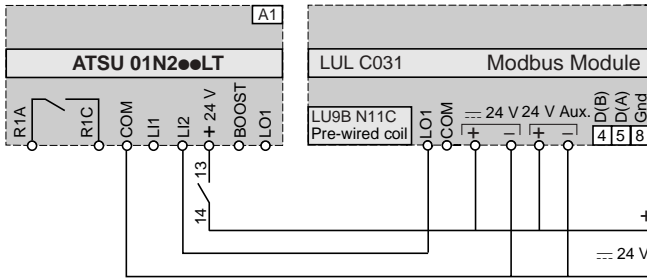
Soft starters for asynchronous motors

Altistart U01 and TeSys model U
For 0.75 to 15 kW motors

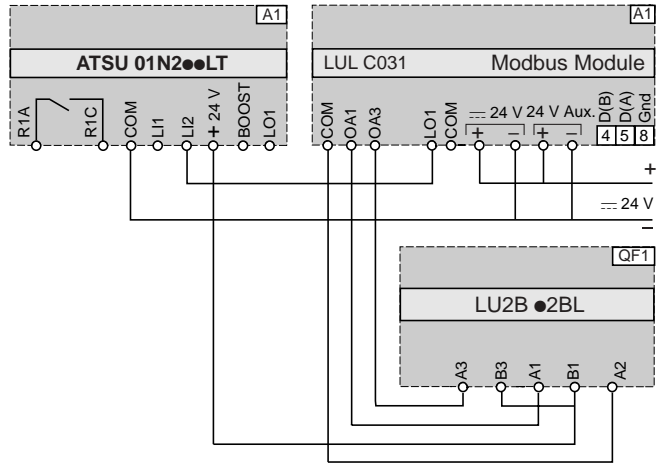
ATSU 01N2●●LT soft start/soft stop units (continued)

Automatic control with Modbus communication module, with and without deceleration

Without reversing unit



With reversing unit



Function	Register	Bit	Value
Powering down TeSys U and ATSU			
-	704	0	0
Automatic control without deceleration			
Run	700	0	1
Stop	704	0	0
Automatic control with deceleration			
Run	700	0	1
Soft stop	700	0	0

Function	Register	Bit	Value
Powering up TeSys U and ATSU			
Forward	704	0	1
Reverse	704	1	1
Powering down TeSys U and ATSU			
Forward	704	0	0
Reverse	704	1	0
Automatic control without deceleration			
Run	700	0	1
Stop forward	704	0	0
Stop reverse	704	1	0
Automatic control with deceleration (forward or reverse)			
Run	700	0	1
Soft stop	700	0	0

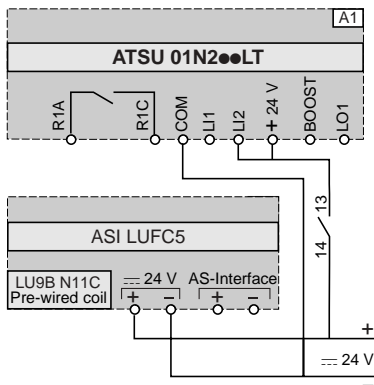
A1: Soft start/soft stop unit

A1: Soft start/soft stop unit

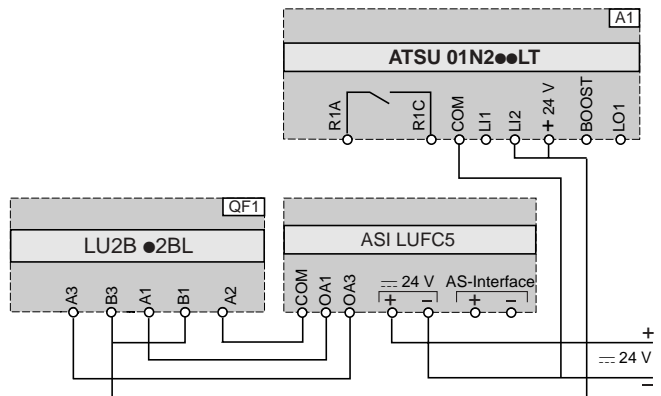
QF1: TeSys model U controller-starter with reversing unit

Automatic control with AS-Interface communication module, without deceleration

Without reversing unit



With reversing unit



Function	Bit	Value
Power-up and automatic control without deceleration		
Run	D0	1
Stop	D0	0

Function	Bit	Value
Power-up and automatic control without deceleration		
Run forward	D0	1
Stop	D0	0
Run reverse	D1	1
Stop	D1	0

A1: Soft start/soft stop unit

A1: Soft start/soft stop unit

QF1: TeSys model U controller-starter with reversing unit