



# Altivar Soft Starter ATS01

Soft Starters for simple machines from  
0.37 to 15kW

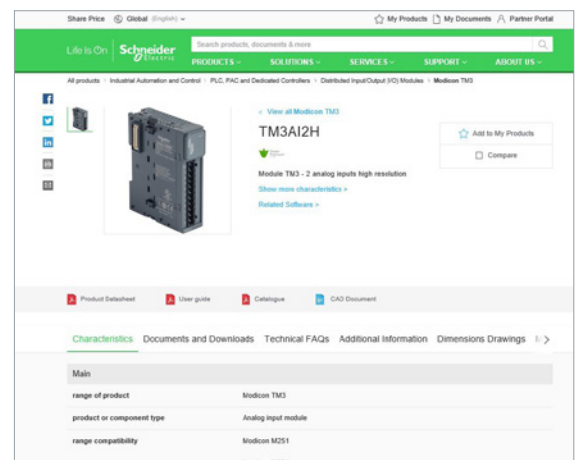
# Quick access to product information

## Get technical information about your product

References

**Modicon TM3**  
I/O expansion modules for Modicon controllers  
Analog I/O modules

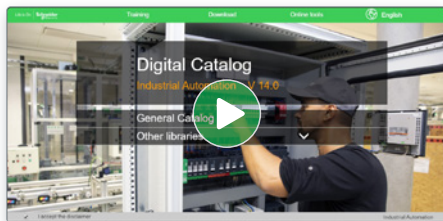
| Number and type of channels         | Input range  | Output range             | Resolution                   | Input terminal (Modicon) | Reference | Weight |
|-------------------------------------|--|--------------------------|------------------------------|--------------------------|-----------|--------|
| 2 enhancement inputs                | -10...+10 VDC<br>0...20 mA, 4...20 mA  | 10 mA or<br>10 mA + sign | 12 bits or<br>12 bits + sign | TER312                   | TM3AI2H   | 0,110  |
| 4 enhancement inputs                | -10...+10 VDC<br>0...20 mA, 4...20 mA  | 10 mA or<br>10 mA + sign | 12 bits or<br>12 bits + sign | TER312                   | TM3AI4H   | 0,120  |
| 4 enhancement or temperature inputs | -10...+10 VDC<br>0...20 mA, 4...20 mA<br>PT100, RTD, Ni100, Ni200, Ni500, Ni1000, Pt100, Pt200 | 10 mA or<br>10 mA + sign | 12 bits or<br>12 bits + sign | TER312                   | TM3AI4T   | 0,120  |
| 4 differential temperature inputs   | -10...+10 VDC<br>0...20 mA, 4...20 mA  | 10 mA or<br>10 mA + sign | 12 bits or<br>12 bits + sign | TER312                   | TM3AI4D   | 0,120  |
| 2 enhancement                       | -10...+10 VDC  | 10 mA or<br>10 mA + sign | 12 bits or<br>12 bits + sign | TER312                   | TM3AI2H   | 0,110  |



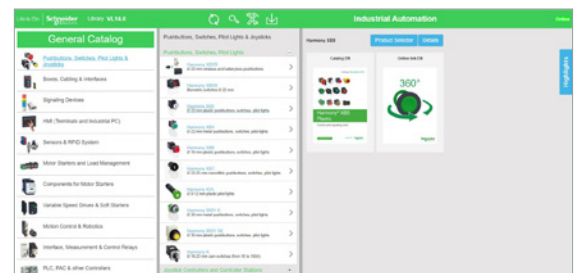
Each commercial reference presented in a catalog contains a hyperlink. Click on it to obtain the technical information of the product:

- Characteristics, Dimensions and drawings, Mounting and clearance, Connections and schemas, Performance curves
- Product image, Instruction sheet, User guide, Product certifications, End of life manual

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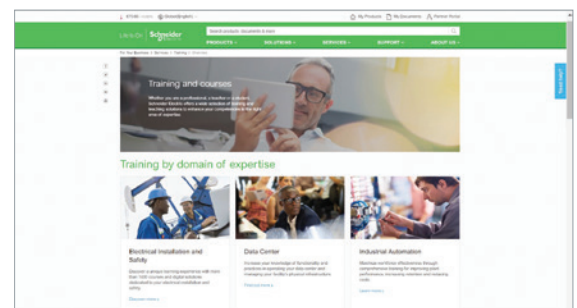


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# Altivar

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### ■ Altivar Soft Starter ATSU01 and TeSys U

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# Soft starters for asynchronous motors

## Applications

## Starting simple machines

## Controlled starting and deceleration of simple machines



| Power range for 50...60 Hz line supply (kW/HP)<br>(connection to the motor power supply line) |  |
|---|--|
| Single-phase 110...230 V (kW)   |  |
| Three-phase 200...240 V (kW/HP)   |  |
| Three-phase 200...480 V (kW/HP)   |  |
| Three-phase 208...600 V (kW/HP)   |  |
| Three-phase 208...690 V (kW/HP)   |  |
| Three-phase 230...415 V (kW)  |  |
| Three-phase 230...440 V (kW)  |  |
| Three-phase 380...415 V (kW)  |  |
| Three-phase 440...480 V (HP)  |  |

| 0.37...11/0.5...15 | 0.75...15/1...20  |
|--------------------|-------------------|
| 0.37...2.2         | –                 |
| –                  | 0.75...7.5/1...10 |
| 0.37...11/0.5...15 | –                 |
| –                  | –                 |
| –                  | –                 |
| –                  | –                 |
| –                  | –                 |
| –                  | 1.5...15          |
| –                  | 2...20            |

| Drive | Number of controlled phases |
|-------|-----------------------------|
| –     | Type of control             |
| –     | Operating cycle             |

|   |   |
|---|---|
| 1 | 2 |
| – | – |
| – | – |

| Functions      | Integrated     |
|----------------|----------------|
| Bypass         | –              |
| Number of I/Os | –              |
| –              | Analog inputs  |
| –              | Logic inputs   |
| –              | Analog outputs |
| –              | Logic outputs  |
| –              | Relay outputs  |

|            |   |
|------------|---|
| Integrated | – |
| –          | – |
| –          | – |
| –          | – |
| –          | – |
| –          | – |

| Communication | Integrated             |
|---------------|------------------------|
| –             | Available as an option |

|   |   |
|---|---|
| – | – |
| – | – |

| Standards and certifications |
|------------------------------|
| IEC/EN 60947-4-2             |
| CE, UL, CSA, C-Tick, and CCC |

|                              |
|------------------------------|
| IEC/EN 60947-4-2             |
| CE, UL, CSA, C-Tick, and CCC |

| References  |
|-------------|
| ATS01N1●●●● |
| ATS01N2●●●● |

|             |
|-------------|
| ATS01N1●●●● |
| ATS01N2●●●● |

| Pages |
|-------|
| 8     |

|   |
|---|
| 8 |
|---|

## Controlled starting and deceleration of simple and complex machines



| 4...400/3...500 | 3...630 | 3...900/3...1,200 |
|-----------------|---------|-------------------|
| –               | –       | –                 |
| –               | –       | –                 |
| –               | –       | –                 |
| 4...400/3...500 | –       | –                 |
| –               | –       | 3...900/3...1,200 |
| –               | 3...630 | –                 |
| 4...355         | –       | –                 |
| –               | –       | –                 |
| –               | –       | –                 |

|                           |                             |
|---------------------------|-----------------------------|
| 3                         | –                           |
| Configurable voltage ramp | TCS (Torque Control System) |
| Standard                  | Standard and severe         |
| Integrated                | Available as an option      |
| 1 PTC probe               | –                           |
| 3                         | 4                           |
| –                         | 1                           |
| –                         | 2                           |
| 2 (CO)                    | 3                           |

| Modbus | Integrated                                |
|--------|---|
| –      | Fipio, PROFIBUS DP, DeviceNet, Modbus TCP |

|   |   |
|---|---|
| – | – |
| – | – |

| Standards and certifications   |
|--------------------------------|
| IEC/EN 60947-4-2, EMC class A  |
| CE, UL, CSA, C-Tick, GOST, CCC |

| Standards and certifications                             |
|--|
| IEC/EN 60947-4-2, EMC class A and B                      |
| CE, UL, CSA, DNV, C-Tick, GOST, CCC, NOM, SEPRO, and TCF |

| References |
|------------|
| ATS22●●●●  |
| ATS48●●●Q  |
| ATS48●●●Y  |

|           |
|-----------|
| ATS22●●●● |
| ATS48●●●Q |
| ATS48●●●Y |

|   |   |
|---|---|
| Please refer to the "Altistart 22" catalog. | Please refer to the "Altistart 48" catalog. |
|---|---|

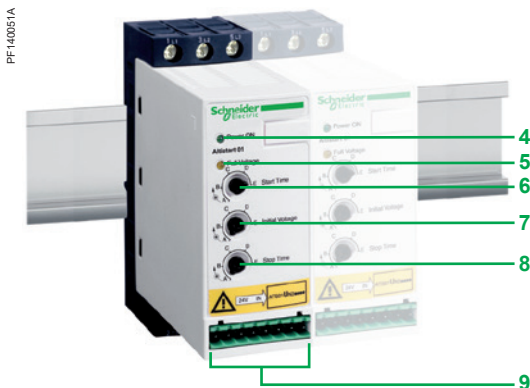
|   |   |
|---|---|
| Please refer to the "Altistart 22" catalog. | Please refer to the "Altistart 48" catalog. |
|---|---|

# Soft starters for asynchronous motors

## Altivar Soft Starter ATS01



ATS01N1●●●



ATS01N2●●●

### Presentation

The Altivar Soft Starter ATS01 operates as a soft start/soft stop unit for asynchronous motors.

The Altivar Soft Starter ATS01 enhances the starting performance of asynchronous motors by allowing them to start gradually, smoothly, and in a controlled manner. It helps to prevent mechanical shocks, which cause wear and tear, and subsequent maintenance work and production downtime.

The Altivar Soft Starter ATS01 limit the starting torque without torque control system and current peaks on starting on machines that do not require a high starting torque. It is designed for the following simple applications:

- conveyors
- conveyor belts
- pumps
- fans
- compressors
- automatic doors and gates
- Overhead Traveling Cranes (Horizontal Loads)
- belt-driven machinery, etc.

The Altivar Soft Starter ATS01 is compact, easy to install, and can be mounted side-by-side (1).

It complies with standards IEC/EN 60947-4-2, and carries UL, CSA, C-Tick, and CCC certifications, and CE marking.

The Altivar Soft Starter ATS01 soft start/soft stop unit offer comprises 3 ranges:

■ **ATS01N1●●●** soft starters

- These control one phase of the motor power supply (single-phase or three-phase) to limit the starting torque.
- They feature an internal bypass relay except N103 (smallest one).
- For IE2 motors power ratings range from 0.37 kW to 11 kW.
- Motor supply voltages range from 110 V to 480 V, 50/60 Hz. For 110 V, 230 V applications there is no need for extra power supply, the line voltage can be used. 400 V and 480 V applications an external power supply is necessary.

■ **ATS01N2●●●** soft start/soft stop units

- These control two phases of the motor power supply to limit the starting current and for deceleration.
- They feature an internal bypass relay.
- Motor power ratings range from 0.75 kW to 15 kW (2).
- The motor supply voltages are as follows: 230 V, 400 V, and 480 V, 50/60 Hz. The use of a line contactor is not necessary on machines where electrical isolation is not required.

■ **ATSU01N2●●●** soft start/soft stop units

See [page 10](#).

(1) Side-By-Side Conditions:

The maximum starts per hour are 2 under following worst case conditions:

Ramp-up time: 10 s

Motor current 5x rated softstarter current

Ambient temperature 40°C

Applications with shorter ramp-up times and/or lower motor current and/or lower ambient temperature the cycle time can be increased.

E.g. ramp-up time 5 s -> starts per hour are 4 or motor current 3x Ie -> starts per hour are 4 For stronger conditions 15 mm distance are necessary.

(2) Please pay attention and consider for the operation of IE3 motors while dimensioning of softstarters the resulting higher starting currents.

For the use of IE3 motors it is needed to dimension and design the softstarters one size higher.

# Soft starters for asynchronous motors

## Altivar Soft Starter ATS01

### Description

- Altivar Soft Starter ATS01 (ATS01N1●●●) are equipped with:
  - a potentiometer **1** for setting the starting time
  - a potentiometer **2** for adjusting the starting voltage threshold according to the motor load
  - 2 inputs **3**:
    - 1 x 24 V  $\overline{\text{---}}$  input or 1 x 110...240 V  $\sim$  input for powering the control part that controls the motor
  
- Altivar Soft Starter ATS01 soft start/soft stop units (ATS01N2●●●) are equipped with:
  - a potentiometer **6** for setting the starting time
  - a potentiometer **8** for setting the deceleration time
  - a potentiometer **7** for adjusting the starting voltage threshold according to the motor load
  - 1 green LED **4** to indicate that the unit is powered up
  - 1 yellow LED **5** to indicate that the motor is powered at nominal voltage, if it is connected to the starter
  - a connector **9** for:
    - 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 motor has reached a standstill at the end of the deceleration stage

### Equivalence table for contact references

| Functions                    | ATS01N2●●●LU/QN/RT           |
|------------------------------|------------------------------|
| Relay outputs                | R1A                          |
|                              | R1C                          |
| External power supply 0 V    | C0M                          |
| Stop command                 | LI1                          |
| Run command                  | LI2                          |
| Control section power supply | LI + (+ 24 V positive logic) |
| BOOST                        | BOOST                        |
| End of starting              | LO1                          |
| 115 V external power supply  | —                            |

# Soft starters for asynchronous motors

## Altivar Soft Starter ATS01

### Cycle time calculation

Start/Stop per hour:

Determining the permissible starting frequency

The starting frequency depends on the:

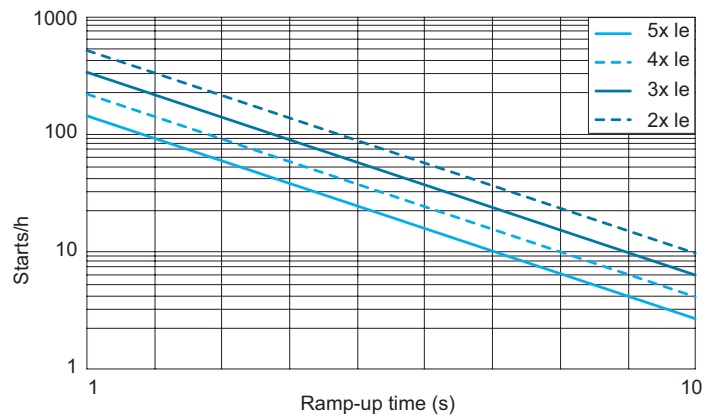
- starting current or the heat loss across the power semiconductors
- current carrying capacity and the temperature increase of the power semiconductors.
- heat sink's capability of absorbing the heat loss and passing the temperature increase on to the environment

The following diagrams are to assist you in determining the maximum starting frequency per hour, i.e., on the basis of the given maximum starting current and for various starting times. Should the requested starting frequency not be reached, a different device series has to be chosen.

Example: In a drive, a 15 kW-motor is to be started. A maximum starting current of 120 A has been measured. This approximately corresponds to the 4-times nominal current. The device employed is a ATS01N232. From the applicable chart it is now possible to read off a max. starting frequency per hour lying between 280 (starting time = 1 s) and 28 (starting time = 10 s).

### Cycle time: ATS01N103...222

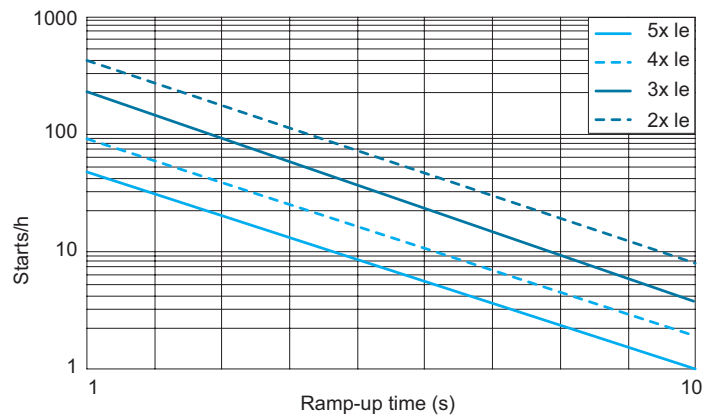
Motor ramp-up current relating rated softstarter current



**Note:** Over 40 °C ambient temperature, oversize the starter by 1 is mandatory for ATS01N103...222 ranges.

### Cycle time: ATS01N232

Motor ramp-up current relating rated softstarter current





# Soft starters for asynchronous motors

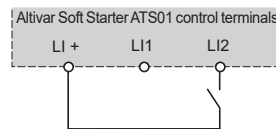
## Altivar Soft Starter ATS01

### Functions

#### ■ 2-wire control

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

#### ATS01N2●●LU/QN/RT



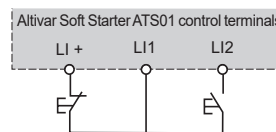
Wiring diagram for 2-wire control

#### ■ 3-wire control

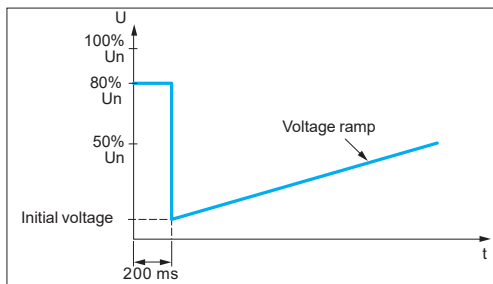
The run and stop commands are controlled by 2 different logic inputs.

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



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

#### ■ Starting time

Controlling the starting time means that the time of the voltage ramp applied to the motor can be adjusted to obtain a gradual starting time, dependent 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 applies a fixed voltage to the motor for a limited time before starting.

#### ■ End of starting

□ Application function via logic output LO1

ATS01N206●● to ATS01N232●● 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.

# Soft starters for asynchronous motors

## Altivar Soft Starter ATS01



ATS01N103FT



ATS01N212QN

| Soft starters for 0.37 to 11 kW motors  |                               |                 |                                       |  |               |             |             |  |  |
|---|-------------------------------|-----------------|---------------------------------------|--|---------------|-------------|-------------|--|--|
| Motor   |                               | Starter         |                                       |  |               |             |             |  |  |
| Motor power (1)   |                               | Nominal current | Dimensions                            |  | Reference (2) | Weight      |             |  |  |
| Single-phase  | Three-phase                   |                 | W x D x H                             |  |               |             |             |  |  |
| 230 V   | 110 V 230 V 230 V 400 V 460 V | A               | mm/in.                                |  |               | kg/lb       |             |  |  |
| kW  | HP kW HP kW HP                |                 |                                       |  |               |             |             |  |  |
| <b>Single-phase 110...230 V or three-phase 110...480 V supply voltage, 50/60 Hz</b> |                               |                 |                                       |  |               |             |             |  |  |
| 0.37  | – 0.37 0.5 1.1 0.5            | 3               | 22.5 x 100.4 x 100/0.89 x 3.95 x 3.94 |  |               | ATS01N103FT | 0.160/0.353 |  |  |
| 0.75  | – 0.75 1 1.1 1.5 2.2 2        | 6               | 22.5 x 100.4 x 100/0.89 x 3.95 x 3.94 |  |               | ATS01N106FT | 0.160/0.353 |  |  |
| 1.1   | 1 1.5 2 4 5                   | 9               | 45 x 130.7 x 124/1.77 x 5.15 x 4.88   |  |               | ATS01N109FT | 0.280/0.617 |  |  |
| 1.5   | 1.5 2.2 3 5.5 7.5             | 12              | 45 x 130.7 x 124/1.77 x 5.15 x 4.88   |  |               | ATS01N112FT | 0.280/0.617 |  |  |
| 2.2   | 2 3 5 7.5 10 3 4 5.5 7.5 11   | 25              | 45 x 130.7 x 124/1.77 x 5.15 x 4.88   |  |               | ATS01N125FT | 0.350/0.772 |  |  |

| Accessories                         |                          |           |              |
|-------------------------------------|--------------------------|-----------|--------------|
| Description                         | For use with starter     | Reference | Weight kg/lb |
| Adapter for mounting on DZ5 MB rail | ATS01N103FT, ATS01N106FT | RHZ66     | 0.005/0.011  |

| Soft start/soft stop units for 0.75 to 15 kW motors (3) |             |                 |                                     |  |               |                         |
|---|-------------|-----------------|-------------------------------------|--|---------------|-------------------------|
| Motor   |             | Starter         |                                     |  |               |                         |
| Motor power (1)   |             | Nominal current | Dimensions                          |  | Reference (2) | Weight                  |
| Single-phase  | Three-phase |                 | W x D x H                           |  |               |                         |
| kW  | HP          | A               | mm/in.                              |  |               |                         |
| <b>Three-phase supply voltage: 200...240 V 50/60 Hz</b> |             |                 |                                     |  |               |                         |
| 0.75/1.1  | 1/1.5       | 6               | 45 x 130.7 x 124/1.77 x 5.15 x 4.88 |  |               | ATS01N206LU 0.420/0.926 |
| 1.5   | 2           | 9               | 45 x 130.7 x 124/1.77 x 5.15 x 4.88 |  |               | ATS01N209LU 0.420/0.926 |
| 2.2/3   | 3/–         | 12              | 45 x 130.7 x 124/1.77 x 5.15 x 4.88 |  |               | ATS01N212LU 0.420/0.926 |
| 4/5.5   | 5/7.5       | 22              | 45 x 130.7 x 154/1.77 x 5.15 x 6.06 |  |               | ATS01N222LU 0.560/1.235 |
| 7.5   | 10          | 32              | 45 x 130.7 x 154/1.77 x 5.15 x 6.06 |  |               | ATS01N232LU 0.560/1.235 |
| <b>Three-phase supply voltage: 380...415 V 50/60 Hz</b> |             |                 |                                     |  |               |                         |
| 1.5/2.2/3   | –           | 6               | 45 x 130.7 x 124/1.77 x 5.15 x 4.88 |  |               | ATS01N206QN 0.420/0.926 |
| 4   | –           | 9               | 45 x 130.7 x 124/1.77 x 5.15 x 4.88 |  |               | ATS01N209QN 0.420/0.926 |
| 5.5   | –           | 12              | 45 x 130.7 x 124/1.77 x 5.15 x 4.88 |  |               | ATS01N212QN 0.420/0.926 |
| 7.5/11  | –           | 22              | 45 x 130.7 x 154/1.77 x 5.15 x 6.06 |  |               | ATS01N222QN 0.560/1.235 |
| 15  | –           | 32              | 45 x 130.7 x 154/1.77 x 5.15 x 6.06 |  |               | ATS01N232QN 0.560/1.235 |
| <b>Three-phase supply voltage: 440...480 V 50/60 Hz</b> |             |                 |                                     |  |               |                         |
| –   | 2/3         | 6               | 45 x 130.7 x 124/1.77 x 5.15 x 4.88 |  |               | ATS01N206RT 0.420/0.926 |
| –   | 5           | 9               | 45 x 130.7 x 124/1.77 x 5.15 x 4.88 |  |               | ATS01N209RT 0.420/0.926 |
| –   | 7.5         | 12              | 45 x 130.7 x 124/1.77 x 5.15 x 4.88 |  |               | ATS01N212RT 0.420/0.926 |
| –   | 10/15       | 22              | 45 x 130.7 x 154/1.77 x 5.15 x 6.06 |  |               | ATS01N222RT 0.560/1.235 |
| –   | 20          | 32              | 45 x 130.7 x 154/1.77 x 5.15 x 6.06 |  |               | ATS01N232RT 0.560/1.235 |

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

(2) For motor thermal protection, use a GVME thermal-magnetic motor circuit breaker (see combinations page 9).

(3) Control power supply built into the starter.

# Soft starters for asynchronous motors

Altivar Soft Starter ATS01

400 V power supply, type 1 coordination

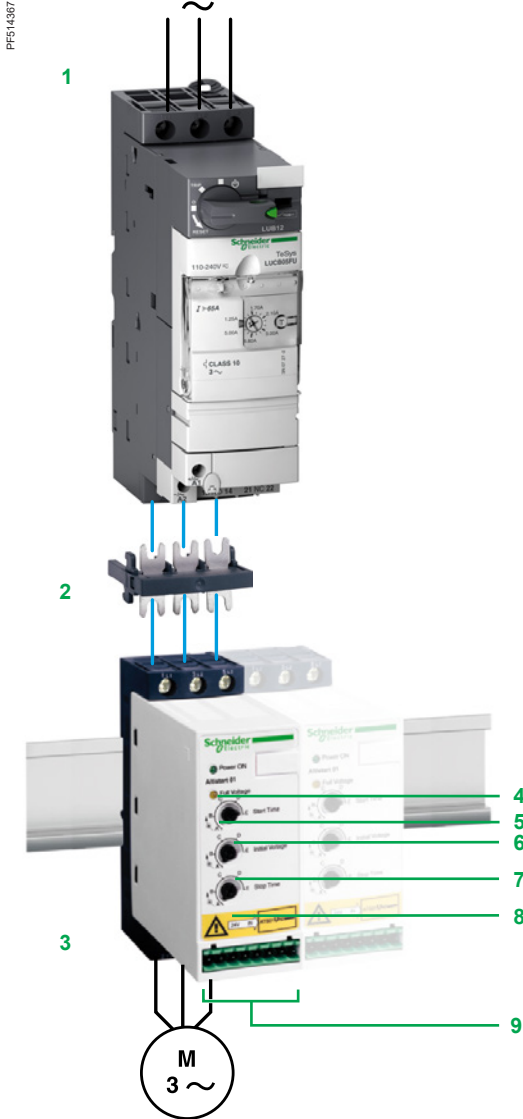
## Compatible components according to IEC 60947-4-1 and IEC 60947-4-2

Combine either circuit breaker (light green columns), contactor, and starter, or switch/fuse (dark green columns), contactor, and starter

| Motor |      | Starter<br>Class 10 | Circuit breaker | Rating | Contactor           | Switch or<br>disconnect<br>switch<br>(base unit) | aM fuses<br>Reference | Rating | I <sup>2</sup> t<br>A <sup>2</sup> s | Thermal<br>overload relay |
|-------|------|---------------------|-----------------|--------|---------------------|--|-----------------------|--------|--------------------------------------|---------------------------|
| kW    | A    |                     |                 | A      |                     |  |                       | A      |                                      |                           |
| M1    |      | A1                  | Q1              |        | KM1, KM2, KM3       | Q2   |                       |        |                                      | F4                        |
| 0.37  | 0.98 | ATS01N103FT         | GV2ME05         | 1      | LC1K06 or<br>LC1D09 | LS1D2531   | DF2CA02               | 2      | 265                                  | LR2K0306<br>LRD05         |
| 0.55  | 1.5  | ATS01N103FT         | GV2ME06         | 1.6    | LC1K06 or<br>LC1D09 | LS1D2531   | DF2CA02               | 2      | 265                                  | LR2K0307<br>LRD06         |
| 0.75  | 2    | ATS01N103FT         | GV2ME07         | 2.5    | LC1K06 or<br>LC1D09 | LS1D2531   | DF2CA02               | 2      | 265                                  | LR2K0308<br>LRD07         |
| 1.1   | 2.5  | ATS01N103FT         | GV2ME08         | 4      | LC1K06 or<br>LC1D09 | LS1D2531   | DF2CA04               | 4      | 265                                  | LR2K0308<br>LRD08         |
|       |      | ATS01N206QN         | GV2ME08         | 4      | LC1K06 or<br>LC1D09 | LS1D2531   | DF2CA04               | 4      | 265                                  | LR2K0308<br>LRD08         |
| 1.5   | 3.5  | ATS01N106FT         | GV2ME08         | 4      | LC1K06 or<br>LC1D09 | LS1D2531   | DF2CA06               | 6      | 265                                  | LR2K0310<br>LRD08         |
|       |      | ATS01N206QN         | GV2ME08         | 4      | LC1K06 or<br>LC1D09 | LS1D2531   | DF2CA06               | 6      | 265                                  | LR2K0310<br>LRD08         |
| 2.2   | 5    | ATS01N106FT         | GV2ME10         | 6.3    | LC1K06 or<br>LC1D09 | LS1D2531   | DF2CA08               | 8      | 265                                  | LR2K0312<br>LRD10         |
|       |      | ATS01N206QN         | GV2ME10         | 6.3    | LC1K09 or<br>LC1D09 | LS1D2531   | DF2CA08               | 8      | 265                                  | LR2K0312<br>LRD10         |
| 3     | 6.5  | ATS01N106FT         | GV2ME14         | 9      | LC1K09 or<br>LC1D09 | LS1D2531   | DF2CA12               | 12     | 265                                  | LR2K0314<br>LRD12         |
|       |      | ATS01N206QN         | GV2ME14         | 9      | LC1K09 or<br>LC1D09 | LS1D2531   | DF2CA12               | 12     | 265                                  | LR2K0314<br>LRD12         |
| 4     | 8.4  | ATS01N109FT         | GV2ME14         | 9      | LC1K09 or<br>LC1D09 | LS1D2531   | DF2CA12               | 12     | 610                                  | LR2K0316<br>LRD14         |
|       |      | ATS01N209QN         | GV2ME14         | 9      | LC1K09 or<br>LC1D09 | LS1D2531   | DF2CA12               | 12     | 610                                  | LR2K0316<br>LRD14         |
| 5.5   | 11   | ATS01N112FT         | GV2ME16         | 13     | LC1K12 or<br>LC1D12 | LS1D2531   | DF2CA16               | 16     | 610                                  | LR2K0321<br>LRD16         |
|       |      | ATS01N212QN         | GV2ME16         | 13     | LC1K12 or<br>LC1D12 | LS1D2531   | DF2CA16               | 16     | 610                                  | LR2K0321<br>LRD16         |
| 7.5   | 14.8 | ATS01N125FT         | GV2ME20         | 17     | LC1D18              | LS1D2531   | DF2CA20               | 20     | 6050                                 | LRD21                     |
|       |      | ATS01N222QN         | GV2ME20         | 17     | LC1D18              | LS1D2531   | DF2CA20               | 20     | 6050                                 | LRD21                     |
| 9     | 18.1 | ATS01N125FT         | GV2ME21         | 21     | LC1D25              | LS1D2531   | DF2CA25               | 25     | 6050                                 | LRD21                     |
|       |      | ATS01N222QN         | GV2ME21         | 21     | LC1D25              | LS1D2531   | DF2CA25               | 25     | 6050                                 | LRD21                     |
| 11    | 21   | ATS01N125FT         | GV2ME22         | 23     | LC1D25              | LS1D2531   | DF2CA25               | 25     | 6050                                 | LRD22                     |
|       |      | ATS01N222QN         | GV2ME22         | 23     | LC1D25              | LS1D2531   | DF2CA25               | 25     | 6050                                 | LRD22                     |
| 15    | 28.5 | ATS01N232QN         | GV2ME32         | 32     | LC1D32              | GK1EM  | DF2EA40               | 40     | 7200                                 | LRD3353                   |

# Soft starters for asynchronous motors

## Altivar Soft Starter ATSU01 and TeSys U



### Presentation

The Altivar Soft Starter ATSU01 is a soft start/soft stop unit for asynchronous motors. It is designed primarily for combinations with **TeSys U** starter-controllers.

When used in combination with a **TeSys U 1** controller by means of a connector **2**, the Altivar Soft Starter ATSU01 **3** is a power option that provides the “soft start/soft stop” function. The result is a unique, innovative motor starter.

Using the Altivar Soft Starter ATSU01 enhances the starting performance of asynchronous motors by allowing them to start gradually, smoothly, and in a controlled manner. It helps to prevent mechanical shocks, which cause wear and tear, and subsequently limits the amount of maintenance work and production downtime.

The Altivar Soft Starter ATSU01 limits the starting torque and current peaks on starting on machines that do not require a high starting torque.

The Altivar Soft Starter ATSU01 is designed for the following simple applications:

- conveyors
- conveyor belts
- pumps
- fans
- compressors
- automatic doors and gates
- small cranes
- belt-driven machinery

The Altivar Soft Starter ATSU01 is compact and easy to install. It complies with standards IEC/EN 60947-4-2, and carries UL, CSA, C-Tick, and CCC certifications, and CE marking.

### ■ ATSU01N2●●LT soft start/soft stop units

- These control two phases of the motor power supply to limit the starting current and for deceleration.
  - They feature an internal bypass relay.
  - 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

- Altivar Soft Starter ATSU01 soft start/soft stop units are equipped with:
  - a potentiometer for setting the starting time **6**
  - a potentiometer for setting the deceleration time **8**
  - a potentiometer for adjusting the starting voltage threshold according to the motor load **7**
  - 1 green LED **4** to indicate that the unit is powered up
  - 1 yellow LED **5** to indicate that the motor is powered at nominal voltage, if it is connected to the starter
  - a connector **9** for:
    - 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 that an error has been detected on the starter power supply or that the motor has reached a standstill at the end of the deceleration stage

# Soft starters for asynchronous motors

## Altivar Soft Starter ATSU01 and TeSys U

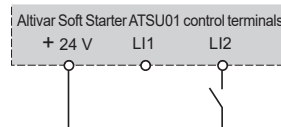
### Description of a TeSys U starter-controller

Please refer to the “TeSys U starters - open version” catalog.

### ATSU01N2●●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 starting and state 0 controls stopping.



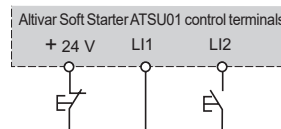
Wiring diagram for 2-wire control

#### ■ 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

#### ■ Starting time:

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

#### ■ Voltage boost function via logic input

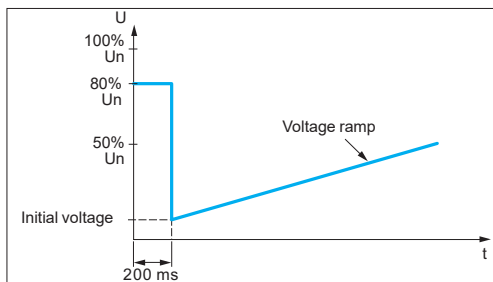
Activating the BOOST logic input enables the function for supplying a starting overtorque capable of overcoming any mechanical friction.

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

#### ■ End of starting

□ Application function for logic output LO1

ATSU01N2●●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.



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

# Soft starters for asynchronous motors

## Altivar Soft Starter ATSU01 and TeSys U

DF504015



ATSU01N222LT

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

| Motor   |       |                 |       | Starter              |   | Reference    | Weight          |
|---|-------|-----------------|-------|----------------------|---|--------------|-----------------|
| Motor power (1)   |       | Nominal current |       | Dimensions W x D x H |   |              |                 |
| 230 V   | 230 V | 400 V           | 460 V | A                    | mm/<br>in.                              |              | kg/<br>lb       |
| kW  | HP    | kW              | HP    |                      |   |              |                 |
| <b>Three-phase supply voltage: 200...480 V 50/60 Hz</b> |       |                 |       |                      |   |              |                 |
| 0.75  | 1     | 1.5             | 2     | 6                    | 45 x 130.7 x 124/<br>1.77 x 5.15 x 4.88 | ATSU01N206LT | 0.340/<br>0.750 |
| 1.1   | 1.5   | 2.2             | 3     |                      |   |              |                 |
|   |       | 3               |       |                      |   |              |                 |
| 1.5   | 2     | –               | 5     | 9                    | 45 x 130.7 x 124/<br>1.77 x 5.15 x 4.88 | ATSU01N209LT | 0.340/<br>0.750 |
| –   | –     | 4               | –     |                      |   |              |                 |
| 2.2   | 3     | 5.5             | 7.5   | 12                   | 45 x 130.7 x 124/<br>1.77 x 5.15 x 4.88 | ATSU01N212LT | 0.340/<br>0.750 |
| 3   | –     | –               | –     |                      |   |              |                 |
| 4   | 5     | 7.5             | 10    | 22                   | 45 x 130.7 x 124/<br>1.77 x 5.15 x 4.88 | ATSU01N222LT | 0.490/<br>1.080 |
| 5.5   | 7.5   | 11              | 15    |                      |   |              |                 |
| 7.5   | 10    | 15              | 20    | 32                   | 45 x 130.7 x 124/<br>1.77 x 5.15 x 4.88 | ATSU01N232LT | 0.490/<br>1.080 |

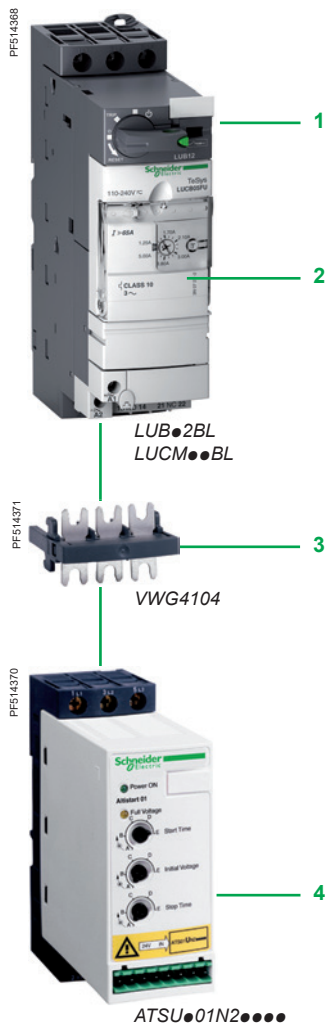
### Accessory

| Description                                      | For use with starter | Reference | Weight<br>kg/<br>lb |
|--|----------------------|-----------|---------------------|
| Power connector between ATSU01N2●●LT and TeSys U | ATSU01N2●●LT         | VW3G4104  | 0.020/<br>0.044     |

(1) Standard motor power ratings, HP power ratings indicated according to standard UL508.

# Soft starters for asynchronous motors

## Altivar Soft Starter ATSU01 and TeSys U



### TeSys U starter and soft start unit combinations

Numerous possibilities for combinations and options are offered. Please refer to the “TeSys U starters - open version” catalog.

| Motor power |       |       | Soft start unit | TeSys U    |                  |
|-------------|-------|-------|-----------------|------------|------------------|
| 230 V       | 400 V | 460 V |                 | Power base | Control unit (1) |
| kW/HP       | kW    | HP    |                 |            |                  |
| 0.75/1      | 1.5   | 2     | ATSU01N206LT    | LUB12      | LUC●05BL         |
| 1.1/1.5     | 2.2/3 | 3     | ATSU01N206LT    | LUB12      | LUC●12BL         |
| 1.5/2       | –     | –     | ATSU01N209LT    | LUB12      | LUC●12BL         |
| –           | 4     | 5     | ATSU01N209LT    | LUB12      | LUC●12BL         |
| 2.2/3       | –     | –     | ATSU01N212LT    | LUB12      | LUC●12BL         |
| 3/–         | 5.5   | 7.5   | ATSU01N212LT    | LUB32      | LUC●18BL         |
| 4/5         | 7.5   | 10    | ATSU01N222LT    | LUB32      | LUC●18BL         |
| 5.5/7.5     | 11    | 15    | ATSU01N222LT    | LUB32      | LUC●32BL         |
| 7.5/10      | 15    | 20    | ATSU01N232LT    | LUB32      | LUC●32BL         |

Example of combining a motor-starter with:

- 1 power base for non-reversing DOL starting (LUB●2BL)
- 2 control unit (LUCM●●BL)
- 3 power connector (VW3G4104)
- 4 Altivar Soft Starter ATSU01 (ATSU01N2●●LT) soft start/soft stop unit

(1) Depending on the configuration required for the TeSys U starter, replace the ● with A for standard, B for advanced, and M for multifunction.

---

| A            |    |
|--------------|----|
| ATS01N103FT  | 8  |
| ATS01N106FT  | 8  |
| ATS01N109FT  | 8  |
| ATS01N112FT  | 8  |
| ATS01N125FT  | 8  |
| ATS01N206LU  | 8  |
| ATS01N206QN  | 8  |
| ATS01N206RT  | 8  |
| ATS01N209LU  | 8  |
| ATS01N209QN  | 8  |
| ATS01N209RT  | 8  |
| ATS01N212LU  | 8  |
| ATS01N212QN  | 8  |
| ATS01N212RT  | 8  |
| ATS01N222LU  | 8  |
| ATS01N222QN  | 8  |
| ATS01N222RT  | 8  |
| ATS01N232LU  | 8  |
| ATS01N232QN  | 8  |
| ATS01N232RT  | 8  |
| ATSU01N206LT | 12 |
| ATSU01N209LT | 12 |
| ATSU01N212LT | 12 |
| ATSU01N222LT | 12 |
| ATSU01N232LT | 12 |

| R     |   |
|-------|---|
| RHZ66 | 8 |

| V        |    |
|----------|----|
| VW3G4104 | 12 |



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