Altistart 48 & Enclosed Altistart 48 soft starters
for three-phase asynchronous motors

eCatalog
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Introduction

The Altistart™ 48 soft starter offers advanced electronic soft start - soft stop performance and a six thyristor power configuration to provide smooth torque-controlled acceleration and deceleration for three-phase asynchronous motors between 2 - 1200 HP (3 - 900 kW). The Altistart 48 is rated for three-phase voltages 208 to 600 V, 50/60 Hz, and for normal and heavy duty applications.

The Altistart 48 features a patented advanced motor control algorithm called TCS, or Torque Control System. Without speed feedback, the Altistart 48 soft starter provides constant starting and stopping rates independent of motor loading, just like a more expensive AC drive. Setting the new industry standard for soft starters, the Altistart 48 controls the applied motor torque, making it ideal for a wider variety of applications than a traditional voltage ramp soft starter with current limit.

In pumping applications, the Altistart 48 uses its Torque Control System to eliminate hydraulic transients even if the load increases. This reduces the effect of hydraulic transients on the pump and reduces the risk of damage to the pump or the system. The Altistart 48 is supplied ready for use in a standard duty application with Class 30, Heavy duty (>30 s in presence of line supply) and Class 25, Class 20 (severe duty application), Class 15, Class 10 (standard duty application), Class 10-A, and sub-class 2 motor thermal overload protection. All devices include a built-in keypad display which can be used to modify the configuration to adapt it to the application and individual customer requirements.

Applications

Altistart 48 soft starters offer soft starting and deceleration functions, machine and motor protection functions, and functions for communicating with control systems. These functions are designed for use in the following normal or heavy duty applications in the buildings, food and beverage, and chemical industries:

- **Pumps**
  - Normal duty
    - Better control of hydraulic transients:
      - Gradual pressurization of fluid in lines
      - Reduction of pressure surges and valve surges (in presence of line supply)
      - Elimination of damage to filters or spouts (irrigation) and premature wear of lines, etc.
      - Less stress on pipes with the reduction of pressure-over-pressure phenomena
    - Independent adjustment of the load conditions
    - Protection against underload (running dry), loss or inversion of phases and in the event of a broken rotor
    - Automatic switching of the motor to freewheel mode on stopping, when the flow rate of the pump drops to a low level, to prevent overheating

- **Conveyors**
  - Normal duty
    - Gradual starting, reducing shocks and slipping of belts
    - Overload control to detect faults, hard spots or jamming, or underload control to detect breaks

- **Fans & high inertia machines**
  - Normal or Heavy duty (>30 s in presence of line supply)
    - Smooth starting, preventing stress on the drive chain and slipping of belts
    - “Smoke extraction” function
    - Limitation of current and voltage drops on starting
    - Catching on the fly of a fan rotating in reverse
    - Deactivation of overload caused by clogging or underload (broken fan motor transmission)
    - Braking torque on stopping

- **Compressors**
  - Normal or Heavy duty (>30 s in presence of line supply)
    - Elimination of slipping of belts
    - Reduction of current peaks
    - Protection event for special motors
    - Deactivation of inversion of direction of rotation of phases
    - Contact for automatic emptying on stopping

Product

The Altistart 48 is offered in the following voltage range: ATS48eeY for three-phase motors, 208 V to 600 V @ 50/60 Hz

The ATS48 soft starter is a cost-effective solution which can:
- Reduce machine operating costs by reducing mechanical stress and improving machine availability
- Reduce the stress placed on the electrical distribution system by reducing line current peaks and voltage drops during motor starts

These benefits allow you to save costs through more efficient and intelligent use of your application devices while protecting your equipment from other harmful starting and stopping methods.

Smarter starting with Torque Control System

The Altistart 48 offers many strong starting features including the patented Torque Control System (TCS). TCS applies the torque to the motor during the entire starting phase as long as the current required (Curve 1) does not exceed the limiting current (Is1). With TCS present in the starting process, the accelerating torque can be virtually constant over the entire speed range (Curve 2).

With conventional starting using only current limitation (Is1), the accelerating torque applied to the motor is equal to the motor torque minus the resistive torque. The accelerating torque increases in the starting range as the speed changes and is at its highest at the end of acceleration (Curve 4). This causes the load to be taken up very abruptly, which is not recommended for pump type applications.

It is also possible to configure the Altistart 48 to obtain a high torque on starting, for a rapid motor speed rise while limiting its temperature rise, and a lower torque at the end of starting for gradual loading. This control function is ideal for centrifugal pumps of for machines with high resistive torque on starting.

Conventional Starting with Current Limitation

![Conventional Starting with Current Limitation](image)

**Stopping with the Altistart 48**

- Freewheel stop: the motor coasts to a complete stop
- TCS soft stop: this type of stop is ideal for pumps. It can be used to effectively reduce pressure surges. Torque control on the ATS48 soft starter reduces the effect of hydraulic transients even if the load increases. This type of control makes adjustment easy. Adjustable from 1 to 60 seconds.
- InTele braking: this type of stop is suitable for high inertia applications because it reduces the stopping time of the machine.

**Altistart 48 with Torque Control System**

![Altistart 48 with Torque Control System](image)
Altistart 48 soft starters for asynchronous motors

Introduction

The Altistart™ 48 soft starter offers advanced electronic soft start - soft stop performance and a six thyristor power configuration to provide smooth torque-controlled acceleration and deceleration for three-phase asynchronous motors between 2 - 1200 HP (3 - 960 kW). The Altistart 48 is rated for three-phase voltages 250 to 690 V, 50/60 Hz, and for normal and heavy duty applications.

The Altistart 48 features a patented advanced motor control algorithm called TCS, or Torque Control System™. Without speed feedback, the Altistart 48 soft starter provides constant starting and stopping rates independent of motor loading, just like a more expensive AC drive. Setting the new industry standard for soft starters, the Altistart 48 controls the applied motor torque, making it ideal for a wider variety of applications than a traditional voltage ramp soft starter with current limit.

In pumping applications, the Altistart 48 uses its Torque Control System to eliminate the long start and stop times, hydraulic transients, and slamming of check valves associated with "pump version" voltage ramp soft starts. The high-performance algorithms of the Altistart 48 contribute significantly to its robustness and ease of setup.

The Altistart 48 is supplied ready for use in a standard duty application with Class 30, Class 20, Class 25, Class 30 (severe duty application), Class 15, Class 10 (standard duty application), Class 10-A, and sub-class 2 motor thermal overload protection. All devices include a built-in keypad display which can be used to modify the configuration to adapt it to the application and individual customer requirements.

Applications

Altistart 48 soft starters offer soft starting and deceleration functions, machine and motor protection functions, and functions for communicating with control systems. These functions are designed for use in the following normal or heavy duty applications in the buildings, food and beverage, and chemical industries:

**Application type** | **Functions performed by the Altistart 48**
--- | ---
**Pumps**
Normal duty | - Better control of hydraulic transients:
- Gradual pressurization of fluid in lines
- Reduction of pressure surges and valve surges (in presence of line supply)
- Elimination of damage to filters or spouts (irrigation) and premature wear of lines, etc.
- Less stress on in pipes with the reduction of pressure-over pressure phenomena
- Independent adjustment of the load conditions
- Protection against underload (running dry), loss or inversion of phases and in the event of a locked rotor
- Automatic switching of the motor to a freewheel mode on stopping, when the flow rate of the pump drops to a low level, to prevent overheating.
Conveyors
Normal duty | - Gradual starting, reducing shocks and slipping of belts
- Overload control to detect faults, hard spots or jamming, or underload control to detect breaks
Fans & high inertia machines
Normal or Heavy duty (>30% inertia) | - Smooth starting, preventing stress on the drive chain and slipping of belts
- "Smoke extraction" function
- Limitation of current and voltage drops on starting
- Catching on the fly of a fan rotating in reverse
- Dilation of overload caused by clogging or underload (broken fan motor transmission)
- Braking torque on stopping
Compressors
Normal or Heavy duty (>30% inertia) | - Elimination of slippage of belts
- Reduction of current peaks
- Protection even for special motors
- Dilation of inversion of direction of rotation of phases
- Contact for automatic stopping on standing

Product

The Altistart 48 is offered in the following voltage range: ATS48EY for three-phase motors, 208 V to 600 V @ 50/60 Hz

The ATS48 soft starter is a cost-effective solution which can:
- Reduce machine operating costs by reducing mechanical stress and improving machine availability
- Reduce the stress placed on the electrical distribution system by reducing line current peaks and voltage drops during motor starts

These benefits allow you to save costs through more efficient and intelligent use of your application devices while protecting your equipment from other harmful starting and stopping methods.

**Simmer starting with Torque Control System**

The Altistart 48 offers many strong starting features including the patented Torque Control System (TCS). TCS applies the torque to the motor during the entire starting phase as long as the current required (Curve 1) does not exceed the limiting current (Is1). With TCS present in the starting process, the accelerating torque can be virtually constant over the entire speed range (Curve 2).

With conventional starting using only current limitation (Is1), the accelerating torque applied to the motor is equal to the motor torque minus the resistive torque. The accelerating torque increases in the starting range as the speed changes and is at its highest at the end of acceleration (Curve 4). This causes the load to be taken up very abruptly, which is not recommended for pump type applications.

It is also possible to configure the Altistart 48 to obtain a high torque on starting, for a rapid motor speed rise while limiting its temperature rise, and a lower torque at the end of starting for gradual loading. This control function is ideal for centrifugal pumps of for machines with high resistive torque on starting.

**Stopping with the Altistart 48**

- Freewheel stop: the motor coasts to a complete stop.
- TCS soft stop: this type of stop is ideal for pumps. It can be used to effectively reduce pressure surges. Torque control on the ATS48 soft starter reduces the effect of hydraulic transients even if the load increases. This type of control makes adjustment easy. Adjustable from 1 to 60 seconds.
- InTele braking: this type of stop is suitable for high inertia applications because it reduces the stopping time of the machine.
Altistart 48 soft starters for asynchronous motors

Introduction

Product (continued)

Performance

Advanced soft starter performance
- Exclusive Torque Control System (TCS) patented by Schneider Electric
- Constant control of the torque supplied to the motor during acceleration and deceleration periods (significantly reducing pressure surges)
- Adjustments for ramp and the starting torque
- The soft starter can be bypassed using a contactor at the end of the starting period while maintaining electronic overload protection (bypass function)
- Wider frequency tolerance for generator set (source) power supplies

Protection

Intelligent machine and motor protection
- Built-in motor thermal overload protection
- Processing of information from PTC thermal probes
- Monitoring of the starting time
- Protection against underloads and overcurrents during continuous operation

Integration

Extended I/O functions for integration into control systems
- 4 logic inputs, 2 logic outputs, 3 relay outputs, and 1 analog output
- Pull-apart terminal connectors
- Function for configuring a second set of motor parameters and easy-to-adapt settings
- Display of electrical values, running conditions, and operating time
- RS-485 serial link for connection to a Modbus™ system

Communication

The ATS48 soft starter can be connected directly to a Modbus system using an RJ45 connector. It communicates over the RS-485 serial link (2-wires) using the Modbus system’s RTU protocol. The communication function provides access to the configuration, adjustment, control, and signaling functions of the soft starter.

The ATS48 soft starter can be connected to other buses or networks using the communication modules and accessories below.

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The ATS48 soft starter can be connected directly to a Modbus system using an RJ45 connector. It communicates over the RS-485 serial link (2-wires) using the Modbus system’s RTU protocol. The communication function provides access to the configuration, adjustment, control, and signaling functions of the soft starter.

The ATS48 soft starter can be connected to other buses or networks using the communication modules and accessories below.

Altistart 48 soft starters for asynchronous motors

Introduction

Product (continued)

Options & accessories

Remote display terminal

The Altistart 48 can be equipped with a remote display terminal. The remote keypad display can be mounted on the door of a wall-mounted or floor-standing enclosure. It has the same signaling display and configuration buttons as the keypad display integrated in the Altistart 48. A switch to lock access to the menus is located on the back of the keypad display.

Information is displayed in the form of codes or values in three 7-segment displays.
- ESC: Button for exiting the menus
- ENT: Validation button for entering a menu or confirming the new value selected
- 4 Buttons for scrolling through the menus

SoMove setup software

SoMove™ setup software is user-friendly software for PC designed for configuring the Altistart 48. SoMove software incorporates various functions for the device setup phases, such as:
- Configuration preparation
- Start-up
- Maintenance

To facilitate setup and maintenance of devices, SoMove software can use a direct USB/RJ45 cable link 1 or a Bluetooth® wireless link 2 & 3 to connect to the motor control device and communicate directly to it.

SoMove software is also compatible with the Multi-Loader configuration tool, used for copying device configurations to multiple devices. These tools can save a significant amount of time when loading, duplicating or editing configurations on a device.
Altistart 48 soft starters for asynchronous motors

Introduction

Product (continued)

Advanced soft starter performance
- Exclusive Torque Control System (TCS) patented by Schneider Electric
- Constant control of the torque supplied to the motor during acceleration and deceleration periods (significantly reducing pressure surges)
- Adjustments for ramp and the starting torque
- The soft starter can be bypassed using a contactor at the end of the starting period while maintaining electronic overload protection (bypass function)
- Wider frequency tolerance for generator set (source) power supplies

Intelligent machine and motor protection
- Built-in motor thermal overload protection
- Processing of information from PTC thermal probes
- Monitoring of the starting time
- Protection against underloads and overcurrents during continuous operation

Extended I/O functions for integration into control systems
- 4 logic inputs, 2 logic outputs, 3 relay outputs, and 1 analog output
- Pull-apart terminal connectors
- Function for configuring a second set of motor parameters and easy-to-adapt settings
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## Altistart 48
### soft starters for asynchronous motors

### Product (continued)

**Mounting recommendations**
- Install the Altistart 48 vertically, within ±10°.
- Do not place the Altistart 48 near sources of heat.
- Leave sufficient free space to ensure that the air required for cooling can circulate from the bottom to the top of the unit.

**Note:** The IP 00 version of the Altistart 48 must be fitted with a protective cover to protect personnel against electrical contact. Protective covers are available for the ATS48C11Y to ATS48C32Y. They should be ordered separately.

### Mounting in an enclosure

The following recommendations are for mounting an Altistart 48 in a metal wall-mounted or floor-standing enclosure with degree of protection Type 1 (IP 23) or Type 12 (IP 54).

- Observe the mounting recommendations above.
- To ensure proper air circulation in the soft starter:
  - Fit ventilation grilles.
  - Ensure that there is sufficient ventilation. If not, install forced ventilation with a filter. The openings and/or fans must provide a flow rate at least equal to that of the soft starter fans (see the table below).
- Use special filters with Type 12 (IP 54) protection.

### Fan Flow Rate Depending On The Soft Starter Rating

<table>
<thead>
<tr>
<th>ATS48 Soft Start</th>
<th>Flow rate CFM</th>
<th>Flow rate m³/hour</th>
</tr>
</thead>
<tbody>
<tr>
<td>ATS48D11Y and D18Y</td>
<td>24</td>
<td>14</td>
</tr>
<tr>
<td>ATS48D17Y</td>
<td>48</td>
<td>28</td>
</tr>
<tr>
<td>ATS48D21Y to C11Y</td>
<td>146</td>
<td>80</td>
</tr>
<tr>
<td>ATS48C11Y and C18Y</td>
<td>146</td>
<td>80</td>
</tr>
<tr>
<td>ATS48A21Y to C18Y</td>
<td>276</td>
<td>160</td>
</tr>
<tr>
<td>ATS48A21Y to C28Y</td>
<td>476</td>
<td>280</td>
</tr>
<tr>
<td>ATS48A21Y to C32Y and C38Y</td>
<td>1200</td>
<td>660</td>
</tr>
<tr>
<td>ATS48G21Y to M32Y</td>
<td>2040</td>
<td>1200</td>
</tr>
</tbody>
</table>

For non-ventilated Altistart 48 soft starters (ATS48D17Y and 48D22Y) in metal wall-mounted or floor-standing enclosures with Type 12 (IP 54) degree of protection, install no more than 2 in. (50 mm) below the soft starter to circulate the air inside the enclosure in order to avoid hot spots.

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### Functions

#### Adjustment

**Functions**

**Adjustment functions**

- **Nominal motor current (maximum permanent current)**
  - The nominal current of the soft starter can be adapted to the nominal motor current indicated on the nameplate.
  - Adjustment range: 0.4 to 1.3 times the soft starter nominal current.

- **Limiting current**
  - The maximum starting current can be adjusted.
  - Adjustment range: 150% to 700% of the nominal motor current. Limited to 500% of the maximum permanent current defined for the soft starter rating.

- **Acceleration ramp time**
  - During the starting phase, the ATS48 soft starter applies a torque ramp to the motor. The ramp time (ACC) corresponds to the time it takes the ramp to reach the nominal torque (starting at 0).
  - Adjustment range: 1 to 60 s.

- **Initial starting torque**
  - The initial torque (tq0) applied to the motor can be used to instantly overcome any resistive starting torque.
  - Adjustment range: 0 to 100% of the nominal motor torque.

- **Selection of the type of stop**
  - Three types of stop are available:
    - **InTele braking**
      - The braking torque level (brc) can be adjusted. The dynamic braking time (t1) corresponds to the time taken to decelerate from 100% to 20% of the nominal motor speed. To improve braking at the end of deceleration, the soft starter injects a DC current for an adjustable period of time (T1). It produces less motor heating than traditional DC injection braking.
    - **TCS soft stop**
      - This type of stop enables a centrifugal pump to decelerate gradually on a ramp in order to avoid a sudden stop. It can be used to dampen the hydraulic transient in order to significantly reduce pressure surges. The deceleration ramp time (tEC) can be adjusted. During deceleration, the pump flow rate decreases and becomes negligible at a certain speed. To continue to decelerate would serve no purpose. A torque threshold (EdC) can be set at which the motor will change to freewheel stop mode, avoiding the unnecessary heating of the motor and the pump.
    - **Freewheel motor stop** (default setting)
Introduction

Product (continued)
Mounting recommendations
- Install the Altistart 48 vertically, within ± 10°.
- Do not place the Altistart 48 near sources of heat.
- Leave sufficient free space to ensure that the air required for cooling can circulate from the bottom to the top of the unit.

Note: The IP 00 version of the Altistart 48 must be fitted with a protective cover to protect personnel against electrical contact. Protective covers are available for the AT54BCT1Y to AT54BCD1Y. They should be ordered separately.

Mounting in an enclosure
The following recommendations are for mounting Altistart 48 in a metal wall-mounted or floor-standing enclosure with degree of protection Type 1 (IP 23) or Type 12 (IP 54).
- Observe the mounting recommendations above.
- To ensure proper air circulation in the soft starter:
  - If ventilation grilles exist, ensure that there is sufficient ventilation. If not, install forced ventilation with a filter. The openings and/or fans must provide a flow rate at least equal to that of the soft starter fans (see the table below).
  - Use special filters with Type 12 (IP 54) protection.

Fan Flow Rate Depending On The Soft Starter Rating

<table>
<thead>
<tr>
<th>AT54B Soft Start</th>
<th>Flow rate CFM</th>
<th>Flow rate m³/hour</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT54B12NY and 12BY</td>
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<td>14</td>
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<tr>
<td>AT54B20YY</td>
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<td>28</td>
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<td>AT54B20YY to C17Y</td>
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<tr>
<td>AT54B20YY and C17Y</td>
<td>235</td>
<td>138</td>
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<td>AT54B20YY to C39Y</td>
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<td>AT54B20YY to C66Y</td>
<td>1020</td>
<td>600</td>
</tr>
<tr>
<td>AT54B20YY to M32Y</td>
<td>2040</td>
<td>1200</td>
</tr>
</tbody>
</table>

For non-ventilated Altistart 48 soft starters (AT54B12YY and 48D22YY) in metal wall-mounted or floor-standing enclosures with Type 12 (IP 54) degree of protection, install no more than 2 in. (50 mm) below the soft starter to circulate the air inside the enclosure in order to avoid hot spots.

Altistart 48 soft starters for asynchronous motors

Functions
Adjustment

Adjustment functions
- Nominal motor current (maximum permanent current):
  - The nominal current of the soft starter can be adapted to the nominal motor current indicated on the nameplate. Adjustment range: 0.4 to 1.3 times the soft starter nominal current.
- Limiting current:
  - The maximum starting current can be adjusted. Adjustment range: 150% to 700% of the nominal motor current. Limited to 500% of the maximum permanent current defined for the soft starter rating.

Acceleration ramp time
During the starting phase, the AT54B soft starter applies a torque ramp to the motor. The ramp time (ACC) corresponds to the time it takes the ramp to reach the nominal torque (starting at 0). Adjustment range: 1 to 60 s.

Initial starting torque
The initial torque (tq0) applied to the motor can be used to instantly overcome any resistive starting torque. Adjustment range: 0 to 100% of the nominal motor torque.

Selection of the type of stop
Three types of stop are available:
- InTele braking
  - The braking torque level (brc) can be adjusted. The dynamic braking time (T1) corresponds to the time taken to decelerate from 100% to 20% of the nominal motor speed. To improve braking at the end of deceleration, the soft starter injects a DC current for an adjustable period of time (T3). It produces less motor heating than traditional DC injection braking.
- TCS soft stop (pump application)
  - This type of stop enables a centrifugal pump to decelerate gradually on a ramp in order to avoid a sudden stop. It can be used to dampen the hydraulic transient in order to significantly reduce pressure surges. The deceleration ramp time (TDC) can be adjusted. During deceleration, the pump flow rate decreases and becomes negligible at a certain speed. To continue to decelerate would serve no purpose. A torque threshold (BDC) can be set at which the motor will change to freewheel stop mode, avoiding the unnecessary heating of the motor and the pump.
- Freewheel motor stop (default setting)

Functions
Introduction

Adjustment

Adjustment functions
- Nominal motor current (maximum permanent current):
  - The nominal current of the soft starter can be adapted to the nominal motor current indicated on the nameplate. Adjustment range: 0.4 to 1.3 times the soft starter nominal current.
- Limiting current:
  - The maximum starting current can be adjusted. Adjustment range: 150% to 700% of the nominal motor current. Limited to 500% of the maximum permanent current defined for the soft starter rating.

Acceleration ramp time
During the starting phase, the AT54B soft starter applies a torque ramp to the motor. The ramp time (ACC) corresponds to the time it takes the ramp to reach the nominal torque (starting at 0). Adjustment range: 1 to 60 s.

Initial starting torque
The initial torque (tq0) applied to the motor can be used to instantly overcome any resistive starting torque. Adjustment range: 0 to 100% of the nominal motor torque.

Selection of the type of stop
Three types of stop are available:
- InTele braking
  - The braking torque level (brc) can be adjusted. The dynamic braking time (T1) corresponds to the time taken to decelerate from 100% to 20% of the nominal motor speed. To improve braking at the end of deceleration, the soft starter injects a DC current for an adjustable period of time (T3). It produces less motor heating than traditional DC injection braking.
- TCS soft stop (pump application)
  - This type of stop enables a centrifugal pump to decelerate gradually on a ramp in order to avoid a sudden stop. It can be used to dampen the hydraulic transient in order to significantly reduce pressure surges. The deceleration ramp time (TDC) can be adjusted. During deceleration, the pump flow rate decreases and becomes negligible at a certain speed. To continue to decelerate would serve no purpose. A torque threshold (BDC) can be set at which the motor will change to freewheel stop mode, avoiding the unnecessary heating of the motor and the pump.
- Freewheel motor stop (default setting)
Motor thermal protection curves (cold)

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Motor Nominal Torque (Tn) ULL

<table>
<thead>
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<th>Time (sec)</th>
<th>Motor current (In)</th>
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</thead>
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<tr>
<td>20</td>
<td>100%</td>
</tr>
<tr>
<td>50</td>
<td>70%</td>
</tr>
<tr>
<td>100</td>
<td>50%</td>
</tr>
<tr>
<td>160</td>
<td>20%</td>
</tr>
</tbody>
</table>

Soft starters for asynchronous motors

Functions

Protection

Protection functions

Calculated motor thermal protection

The soft starter continuously calculates the temperature rise of the motor based on the nominal current and the actual current absorbed. In order to adapt the ATS48 soft starter to individual motors and applications, several protection classes are offered in accordance with standard IEC 60947-4-2: Class 10, Class 25, Class 20 (severe duty application), Class 15, Class 10 (standard duty application), Class 10 A, sub-class 2.

Different protection classes are defined for the starting capacities of the motor or a configurable logic output or displayed via the serial link. The “motor underload detected” fault (ULL) locks the soft starter and can be displayed via the serial link.

The tripping curves to the left are based on the relationship between the starting current (Is) and the adjustable nominal motor current (In).

Trip time for a standard duty application (class 10)

Is = 3 In Is = 4 In Is = 5 In Is = 3.5 In Is = 4 In Is = 5 In

46 sec 23 sec 15 sec 63 sec 48 sec 29 sec

Soft starter thermal protection

The soft starter is protected against thermal overloads by an analog thermal probe. PTC probes are integrated into the soft starter, thus avoiding the necessity of an external thermal protection device. The “PTC probe thermal overshoot” fault alarm can be indicated using a configurable logic output or displayed via the serial link. This function can be disabled.

The PTC probe temperature (Tp) is calculated by the soft starter using the following formula:

\[ Tp = \frac{RT_{PTC}}{RT_{ref}} \times 100 \]

where RT_{PTC} is the resistance of the PTC probe at the operating temperature, and RT_{ref} is the resistance of the PTC probe at the reference temperature.

The permissible overcurrent duration can be set between 0.1 and 60 s. This function is only active in steady state. The detection function (ULL) can trigger an alarm or a detected fault. The “current overload detected” fault (OLC) locks the soft starter and can be indicated by a configurable logic output or displayed via the serial link.

The cooling fan on the soft starter is switched on as soon as the heatsink temperature reaches 122°F (50°C). It is switched off when the temperature returns to 104°F (40°C).

Reset motor thermal state

Activating this function resets the motor thermal state calculated by the ATS48 to zero.

Motor thermal protection with PTC probes

PTC probes are integrated into the soft starter, thus avoiding the necessity of an external thermal protection device. The “PTC probe thermal overshoot” fault alarm can be indicated using a configurable logic output or displayed via the serial link. This function can be disabled.

Note: The PTC probe protection and calculated motor thermal protection functions are independent and can be active simultaneously.

Soft starter thermal protection

The soft starter is protected against thermal overloads by an analog thermal probe. The cooling fan on the soft starter is switched on as soon as the heatsink temperature reaches 122°F (50°C). It is switched off when the temperature returns to 104°F (40°C).

Protection against line phase inversion

This function can be used to detect the direction of rotation of the motor phases and, if it is enabled, to indicate a detected fault when the direction of rotation is reversed.

Time before restarting

This function can be used to avoid several consecutive starts which may cause:

- Thermal overheating of the application
- A detected thermal fault, which may require maintenance work
- Overcurrents if direction of rotation is reversed or reversed (run/stop command)

After a stop command, the motor can only restart after the preset time delay has elapsed. The motor is restarted when the time delay has elapsed if a run command is still valid or if a new run command is sent.

Adjustment range: 0 to 999 s.

Motor phase-loss detection

The function is used to adjust the sensitivity of the protection function to detect a loss of current or a low current in one of the three motor phases for at least 0.5 s or in all three motor phases for at least 0.2 s. The value of the minimum current level can be set between 5% and 10% of the soft starter nominal current.

Automatic restart

This function permits up to six restart attempts after locking on a detected fault at intervals of 60 s if the cause of the detected fault has been removed and if the run commands are still present. After the sixth attempt, the soft starter remains locked and the detected fault must be reset before a restart is permitted.

If the function is active, the fault relay remains activated if line phase loss, motor phase loss, or line frequency out of tolerance faults are detected. This function can only be used in 3-wire control.
Altistart 48
soft starters for asynchronous motors

Functions
Protection

Functions (continued)

Protection functions

Calculated motor thermal protection

The soft starter continuously calculates the temperature rise of the motor based on the nominal current and the actual current absorbed. In order to adapt the ATS48 soft starter to individual motors and applications, several protection classes are offered in accordance with standard IEC 60947-4-2: Class 30, Class 25, Class 20 (severe duty application), Class 15, Class 10 (standard duty application), Class 10 A, sub-class 2.

Different protection classes are defined for the starting capacities of the motor in accordance with standard IEC 60947-4-2: Class 30, Class 25, Class 20 (severe duty application) and Class 15, Class 10 (standard duty application). The soft starter is factory preset to Class 10.

The motor protection class can be changed via the logic inputs (LOC) or the serial link (if the function is enabled). After the motor has stopped or the soft starter has been switched off, the thermal state is calculated even if the control circuit is not energized.

The soft starter’s thermal control prevents the motor from restarting if the temperature rise is too high. If special motors are used which do not have thermal protection, provide external thermal protection via probes or thermal overload relays.

The soft starter is factory preset to Class 10.

The tripping curves to the left are based on the relationship between the starting current (Is) and the adjustable nominal motor current (In).

**Trip time (cold)**

<table>
<thead>
<tr>
<th>class (10)</th>
<th>Is = 3 In</th>
<th>Is = 4 In</th>
<th>Is = 5 In</th>
<th>Is = 3.5 In</th>
<th>Is = 4 In</th>
<th>Is = 5 In</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time (sec)</td>
<td>46 sec</td>
<td>23 sec</td>
<td>15 sec</td>
<td>63 sec</td>
<td>48 sec</td>
<td>29 sec</td>
</tr>
</tbody>
</table>

**Trip time (warm)**

<table>
<thead>
<tr>
<th>class (20)</th>
<th>Is = 3 In</th>
<th>Is = 4 In</th>
<th>Is = 5 In</th>
<th>Is = 3.5 In</th>
<th>Is = 4 In</th>
<th>Is = 5 In</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time (sec)</td>
<td>29 sec</td>
<td>12 sec</td>
<td>7.5 sec</td>
<td>32 sec</td>
<td>25 sec</td>
<td>15 sec</td>
</tr>
</tbody>
</table>

Reset motor thermal state

Activating this function resets the motor thermal state calculated by the ATS48 to zero.

Motor thermal protection with PTC probes

PTC probes are integrated into the soft starter, thus avoiding the necessity of an external thermal protection device. The PTC probe thermal overheat” fault op alarm can be indicated using a configurable logic output or displayed via the serial link. This function can be disabled.

Note: The PTC probe protection and calculated motor thermal protection functions are independent and can be active simultaneously.

Soft starter thermal protection

The soft starter is protected against thermal overloads by an analog thermal probe. The cooling fan on the soft starter is switched on as soon as the heatsink temperature reaches 122 °F (50 °C). It is switched off when the temperature returns to 104 °F (40 °C).

Motor underload protection

The soft starter detects a motor overload if the motor current falls below a preset torque threshold (ULL) for a specific (adjustable) period of time (OLL).

- The motor underload threshold can be set between 20% and 100% of the nominal motor torque. The permissible underload duration can be set between 1 and 60 s. The detection function (ULL) can trigger an alarm or a detected fault. The detection function can be disabled. The “motor undetected” alarm can be indicated by a configurable logic output or displayed via the serial link.

- The “motor undetected” fault (ULLF) locks the soft starter and can be disabled via the serial link.

Excessive acceleration time protection

This protection function can be used to detect a start which takes place in adverse conditions. Examples of such conditions include a locked rotor or a motor unable to reach its nominal rotation speed. If the start duration is longer than the set value (between 10 and 999 s), the soft starter enters detected fault mode. The function can be disabled.

Current overload protection

The soft starter detects a current overload if the motor current exceeds a preset overcurrent threshold (LOC) for a specific adjustable period of time (OLL). The overcurrent threshold can be set between 60% and 300% of the nominal motor current. The permissible overload duration can be set between 0.1 and 60 s. The function is only active in steady state. The detection function (OLL) can trigger an alarm or a detected fault. It can also be disabled. The “current overload detected” alarm can be indicated by a configurable logic output or displayed via the serial link. The “current overload detected” fault (OLLF) locks the soft starter and can be disabled via the serial link.

Protection against line phase inversion

This function can be used to detect a rotation of the motor phases and, if it is enabled, to indicate a detected fault when the direction of rotation is reversed.

Time before restarting

This function can be used to avoid several consecutive starts which may cause:
- Thermal overheating of the application
- A detected thermal fault, which may require maintenance work
- Overcurrents (if direction of rotation is reversed) or repeats (run/stop command)
- After a stop command, the motor can only restart after the preset time delay has elapsed. The motor is restarted when the time delay has elapsed if a run command is still valid or if a new run command is sent.

Adjustment range: 0 to 999 s.

Motor phase-loss detection

The function is used to adjust the sensitivity of the protection function to detect a loss of current or a low current in one of the three motor phases for at least 0.5 s or in all three motor phases for at least 0.2 s. The value of the minimum current level can be set between 5% and 10% of the soft starter nominal current.

Automatic restart

This function permits up to six restart attempts after locking on a detected fault at intervals of 60 s if the cause of the detected fault has been removed and if the run commands are still present. After the sixth attempt, the soft starter remains locked and the detected fault must be reset before a restart is permitted.

If the function is active, the fault relay remains activated if line phase loss, motor phase loss, or line frequency out of tolerance faults are detected. This function can only be used in 3-wire control.
### Altistart 48 Default Settings

<table>
<thead>
<tr>
<th>Function</th>
<th>Default setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal motor current</td>
<td>(depends on the soft starter rating)</td>
</tr>
<tr>
<td>Limiting current</td>
<td>400%</td>
</tr>
<tr>
<td>Acceleration ramp time</td>
<td>15 sec</td>
</tr>
<tr>
<td>Initial starting torque</td>
<td>20%</td>
</tr>
<tr>
<td>Selection of the type of stop</td>
<td>Freewheel stop</td>
</tr>
<tr>
<td>Motor thermal protection</td>
<td>Class 10</td>
</tr>
<tr>
<td>Time before restarting</td>
<td>2 sec</td>
</tr>
<tr>
<td>Motor phase loss threshold</td>
<td>10%</td>
</tr>
<tr>
<td>Line frequency</td>
<td>Automatic</td>
</tr>
<tr>
<td>RUN and STOP logic inputs</td>
<td>2-wire or 3-wire control via wiring</td>
</tr>
<tr>
<td>Logic input LI3</td>
<td>Forced freewheel stop</td>
</tr>
<tr>
<td>Logic input LI4</td>
<td>Local mode control (serial link disabled)</td>
</tr>
<tr>
<td>Logic output LO1</td>
<td>Thermal motor alarm</td>
</tr>
<tr>
<td>Logic output LO2</td>
<td>Motor powered</td>
</tr>
<tr>
<td>Relay output R1</td>
<td>Fault relay</td>
</tr>
<tr>
<td>Relay output R3</td>
<td>Motor powered</td>
</tr>
<tr>
<td>Analog output</td>
<td>Motor current</td>
</tr>
</tbody>
</table>

### Altistart 48 Soft Starters for Asynchronous Motors

#### Functions

**Advanced Adjustment**

<table>
<thead>
<tr>
<th>Function</th>
<th>Default setting</th>
</tr>
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<td>Logic input LI3</td>
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</tr>
<tr>
<td>Logic input LI4</td>
<td>Local mode control (serial link disabled)</td>
</tr>
<tr>
<td>Logic output LO1</td>
<td>Thermal motor alarm</td>
</tr>
<tr>
<td>Logic output LO2</td>
<td>Motor powered</td>
</tr>
<tr>
<td>Relay output R1</td>
<td>Fault relay</td>
</tr>
<tr>
<td>Relay output R3</td>
<td>Motor powered</td>
</tr>
<tr>
<td>Analog output</td>
<td>Motor current</td>
</tr>
</tbody>
</table>

#### Functions (continued)

**2nd motor adjustment functions**

In order to access the 2nd motor adjustment functions, one logic input must be assigned to the second set of motor parameters function. The adjustment functions and ranges are identical for both sets of motor parameters.

The settings are as follows (see page 9):

- Nominal motor current
- Limiting current
- Acceleration ramp time
- Initial starting torque
- Deceleration ramp time
- Threshold for changing to freewheel stop mode at the end of deceleration
- Maximum torque limit

#### Communication Functions

The Altistart 48 soft starter is supplied with an RS-485 multidrop serial link with Modbus systems protocol as standard. The serial link is configured in the Communication menu using:

- The address of the soft starter (0 to 31)
- The communication speed (4800, 9600, or 19200 bps)
- The format of the communication data. The following formats can be selected:
  - 8 data bits, odd parity, 1 stop bit
  - 8 data bits, even parity, 1 stop bit
  - 8 data bits, no parity, 1 stop bit
  - 8 data bits, no parity, 2 stop bits
- The time-out (1 to 60 sec)

### Altistart 48 Functions

#### Advanced Adjustment

##### Functions (continued)

**2nd motor adjustment functions**

In order to access the 2nd motor adjustment functions, one logic input must be assigned to the second set of motor parameters function. The adjustment functions and ranges are identical for both sets of motor parameters.

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- The time-out (1 to 60 sec)

### Altistart 48 Soft Starters for Asynchronous Motors

#### Functions

**Advanced Adjustment**

**Functions (continued)**

**Advanced adjustment functions**

- **Torque limit**
  - Used primarily for high inertia and constant torque conveyor applications, this function restricts the torque ramp reference to the preset value. For example, the function can be used to limit the torque to a constant value throughout the starting period.
  - Adjustment range: 10% to 200% of the nominal motor torque.

- **Voltage boost level**
  - This function can be used to avoid any “starting” torque (phenomenon caused by friction on stopping or by mechanical play). When a run command is sent, the soft starter applies a fixed voltage to the motor for a limited period of time before starting. The function can be disabled. The voltage setting value varies between 50% and 100% of the nominal motor voltage.

- **Test on low power motor**
  - This function can be used to test a starter on a motor with a much lower power than the soft starter. It can be used, for example, to check the electrical wiring of a device. The function is automatically cancelled when the soft starter is switched off. The next time the soft starter is switched on, the soft starter returns to its initial configuration.

- **Activation of the cascade function**
  - This function can be used to start and decelerate several cascaded motors with a single soft starter. In order to gain maximum benefit from torque control, it is advisable to use motors with power ratings between 0.5 and 1 times the power of the soft starter.

- **Line frequency**
  - The following frequencies can be selected for this function:
    - 50 Hz: The frequency fault monitoring tolerance is ± 20%.
    - 60 Hz: The frequency fault monitoring tolerance is ± 20%.
    - Automatic detection of the line frequency by the soft starter. The frequency fault monitoring tolerance is ± 6%.
  - 50 Hz and 60 Hz are recommended if the power supply is provided by an emergency standby generator set, given their high tolerance.

- **Reset kW/h or the operating time**
  - Sets the value of the power in kW/h or the operating time value to 0. The calculation of the values is updated once the reset command has been sent.

- **Return to factory settings**
  - This function can be used to reset each setting to its initial value (soft starter factory settings, see page 13).
Altistart 48
soft starters for
asynchronous motors

Functions
Advanced Adjustment

Functions (continued)
Advanced adjustment functions

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  This function can be used to reset each setting to its initial value (soft starter factory
  settings, see page 13).

Functions (continued)
2nd motor adjustment functions

In order to access the 2nd motor adjustment functions, one logic input must be
assigned to the second set of motor parameters function. The adjustment functions
and ranges are identical for both sets of motor parameters.

The settings are as follows (see page 9):
- Nominal motor current
- Limiting current
- Acceleration ramp time
- Initial starting torque
- Deceleration ramp time
- Threshold for changing to freewheel stop mode at the end of deceleration
- Maximum torque limit

Communication functions

The ALT48 soft starter is supplied with an RS-485 multidrop serial link with Modbus
systems protocol as standard. The serial link is configured in the Communication
menu using:
- The address of the soft starter (0 to 31)
- The communication speed (4800, 9600, or 19200 bps)
- The format of the communication data. The following formats can be selected:
  - 8 data bits, odd parity, 1 stop bit
  - 8 data bits, even parity, 1 stop bit
  - 8 data bits, no parity, 1 stop bit
  - 8 data bits, no parity, 2 stop bits
- The time-out (1 to 60 sec)

Altistart 48 Default Settings

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<tr>
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<th>Default setting</th>
</tr>
</thead>
<tbody>
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<td>(depends on the soft starter rating)</td>
</tr>
<tr>
<td>Limiting current</td>
<td>400%</td>
</tr>
<tr>
<td>Acceleration ramp time</td>
<td>10 sec</td>
</tr>
<tr>
<td>Initial starting torque</td>
<td>20%</td>
</tr>
<tr>
<td>Selection of the type of stop</td>
<td>Freewheel stop</td>
</tr>
<tr>
<td>Motor thermal protection</td>
<td>Class 10</td>
</tr>
<tr>
<td>Time before restarting</td>
<td>2 sec</td>
</tr>
<tr>
<td>Motor phase loss threshold</td>
<td>10%</td>
</tr>
<tr>
<td>Line frequency</td>
<td>Automatic</td>
</tr>
<tr>
<td>RUN and STOP logic inputs</td>
<td>On 3-wires control wiring</td>
</tr>
<tr>
<td>Logic input L3</td>
<td>Forced freewheel stop</td>
</tr>
<tr>
<td>Logic input L4</td>
<td>Local mode control (serial link disabled)</td>
</tr>
<tr>
<td>Logic output L01</td>
<td>Thermal motor alarm</td>
</tr>
<tr>
<td>Logic output L02</td>
<td>Motor powered</td>
</tr>
<tr>
<td>Relay output R1</td>
<td>Fault relay</td>
</tr>
<tr>
<td>Relay output R3</td>
<td>Motor powered</td>
</tr>
<tr>
<td>Analog output</td>
<td>Motor current</td>
</tr>
</tbody>
</table>
The following soft starter states are shown in the display of the current state:
- Soft starter without a run command and with no power supplied
- Soft starter without a run command and with power supplied
- Acceleration/deceleration in progress
- Steady state operation
- Braking in progress
- Soft starter in current limiting mode
- Starting time delay not elapsed

The active power consumed is displayed between 0 and 255%, where 100% corresponds to the power at the set nominal current and at full voltage.

The motor current is higher than the set threshold.

The operating time: consumes the set nominal current at full voltage.

The active power is displayed between 0 and 999 kA and in kilo hours between 1000 and 65536 hours. The active power is displayed between 0 and 255%, where 100% corresponds to the power at the set nominal current and at full voltage.

The phase rotation direction is accessible when the adjustment and configuration parameters are locked out.

The keypad display locking code can be used to protect access to the soft starter's adjustment and configuration parameters. Only the monitoring parameters are accessible when the adjustment and configuration parameters are locked out.

Functions (continued)
Application monitoring functions
- Power factor: displayed between 0.00 and 1.00
- Motor thermal state: 100% corresponds to the thermal state of the motor consuming the set nominal current
- Motor current: displayed in amperes between 0 and 999 A and in kA between 100 and 9999 kA
- Operating time: corresponding to the total number of soft starter operating hours during heating, acceleration, steady state, deceleration, braking, and continuous bypass operation. It is displayed in hours between 0 and 999 hours and in kilo hours between 1000 and 65536 hours. The active power is displayed between 0 and 255%, where 100% corresponds to the power at the set nominal current and at full voltage.
- Motor torque: displayed between 0 and 255%, where 100% corresponds to the nominal torque.
- Active power consumed: displayed in HP. The line voltage value must be configured. The accuracy of this setting depends on the error between the voltage configured and the actual voltage.
- The end of starting relay R2: Cannot be configured.
- The end of starting relay R2: Controls the bypass contactor on the soft starter. It is activated when the motor completes the starting phase. It is deactivated when a stop command is sent and in the event of a fault condition. The soft starter regains control when a braking or deceleration command is sent.
- Relay R3 application functions
- Analog current output AO application function:
  - Analog output AO provides an image of the following values: motor current, motor torque, motor thermal state, power factor, active power.
  - The following settings are associated with the analog output:
    - The type of signal supplied: 0-20 mA or 4-20 mA
    - The scale setting of the signal. The function associates the maximum amplitude of the analog output (20 mA) with a percentage of the nominal value of the parameter, which can be set between 50% and 100%.

Functions
- Decelerating stop
- InTide braking stop
- Forced freeheel stop
- Thermal protection
- Motor phase loss detection
- Tests on low power motor
- Cascaded motors

Function compatibility table

<table>
<thead>
<tr>
<th>Functions</th>
<th>Decelerating stop</th>
<th>InTide braking stop</th>
<th>Forced freeheel stop</th>
<th>Thermal protection</th>
<th>Motor phase loss detection</th>
<th>Tests on low power motor</th>
<th>Cascaded motors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Decelerating stop</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>InTide braking stop</td>
<td>No</td>
<td>N/A</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Forced freeheel stop</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>N/A</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Thermal protection</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>N/A</td>
<td>Yes</td>
<td>N/A</td>
<td>No</td>
</tr>
<tr>
<td>Motor phase loss detection</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>N/A</td>
<td>Yes</td>
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<td>No</td>
</tr>
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<td>Tests on low power motor</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>N/A</td>
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<td>N/A</td>
</tr>
<tr>
<td>Cascaded motors</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
</tbody>
</table>
Functions (continued)

Application monitoring functions

- Power factor: displayed between 0.00 and 1.00
- Motor thermal state: 100% corresponds to the thermal state of the motor consuming the set nominal current
- Motor current: displayed in amperes between 0 and 999 A and in kA between 1000 and 9999 kA
- Operating time: the total number of hours the soft starter operating during heating, acceleration, steady state, deceleration, braking, and continuous bypass operation. It is displayed in hours between 0 and 999 hours and in kilo hours between 1000 and 65536 hours
- The active power is displayed between 0 and 255%, where 100% corresponds to the power at the set nominal current and at full voltage.
- Motor torque: displayed between 0 and 255%, where 100% corresponds to the nominal torque.
- Active power consumed: displayed in HP. The line voltage value must be configured. The accuracy of this setting depends on the error between the theoretical and the actual voltage.
- The following soft starter states are shown in the display of the current state:
  - Soft starter without a run command and without power supplied
  - Soft starter without a run command and with power supplied
  - Acceleration/deceleration in progress
  - Steady state operation
  - Braking in progress
  - Soft starter in current limiting mode
  - Starting time delay not elapsed
- Last fault condition
- Phase rotation direction: Displays the direction of rotation (direct or indirect).
- Keypad display locking code

Logic input application functions

The Altistart 48 has 4 logic inputs:
- 2 logic inputs (RUN and STOP) are reserved for run/stop commands which can be sent in the form of maintained contacts or as pulsed contacts.
  - 2-wire control: Starting and stopping are controlled by a single logic input. Status 1 of the logic input controls stopping, status 0 controls stopping.
  - 3-wire control: Starting and stopping are controlled by 2 separate logic inputs. A stop is obtained on opening (status 0) the STOP input. The pulse on the RUN input is stored until the stop input opens.
- 2 logic inputs (L3 and L4) can be configured with the following functions:
  - Freewheel stop: When combined with a braked stop or decelerated stop command, activating the logic input will stop the motor in freewheel mode.
  - External detected fault: Enables the soft starter to detect an external, customer-defined fault event (such as level or pressure). When the contact is open, the soft starter enters detected fault mode.
  - Force to local control mode: When the soft starter is connected to a serial link, this function can be used to change from line mode (control via serial link) to local mode (control via the keypad display).
  - Reset motor thermal fault: Enables the motor thermal fault to be reset remotely.
  - Activation of the cascade function: With this function active, motor thermal protection is disabled and relay R1 is configured as the fault isolation relay. This function can be used to start and decelerate several motors one after the other with a single soft starter.
  - Reset all fault events: Enables all fault events to be reset remotely.
  - Second set of motor parameters: Enables a second set of parameters to be selected to start and decelerate two different motors with a single soft starter.
### Environmental specifications

#### Type of starter
- Altistart 48C14Y to 48M12Y

#### Conforming to standards
- EN 60947-4-2
- IEC 61000-4-2
- IEC 61000-4-3
- IEC 61000-4-4
- IEC 61000-4-5
- IEC 61000-4-6

#### Electromagnetic compatibility EMC
1. Conducted and radiated emissions
   - IEC 61000-6-2 class A for all starters
   - IEC 61000-6-3 level 2, Test levels:
     - By contact: 3 kV
     - In the air: 4 kV
2. Electrostatic discharge
   - IEC 61000-4-2 level 3
   - ESD < 5 kV
3. Immunity to radiated radio-frequency electromagnetic field
   - IEC 61000-4-3 level 3
   - EMI < 20 V/m
4. Immunity to electrical transients
   - IEC 61000-4-4 level 4
   - EMI < 1 kV peak
5. Surge immunity
   - IEC 61000-4-5 level 3
   - EMI < 2 kV peak
6. Damped oscillating waves
   - IEC 61000-4-6 level 3
   - EMI < 1 kV peak

#### Pollution
- Maximum ambient pollution level
  - Level 3
  - Conforming to IEC 60664-1

#### Vibration resistance
- 1.5 mm RMS from 2 to 13 Hz

#### Shock resistance
- 6.5 mm/s² RMS peak
- Conforming to IEC 62268-2-7

#### Humidity
- 95% non-condensing, no dripping water
- Conforming to IEC 60664-2-2

#### Temperature
- Ambient air temperature around the device
  - Storage: -15°C...55°C (-5°F...130°F)
  - Operation: -10°C...50°C (14°F...122°F) with current derating of 3% per degree above 10°F (4°C) for up to 100°F (80°C) and 5°C per degree above 10°F (4°C) for 100°F (80°C) to 130°F (55°C)
  - Maximum operating altitude: 3300 ft (1000 m) without derating
  - Above this, derate the maximum current by 2% per additional 330 ft (100 m) to a maximum of 6600 ft (2000 m)

#### Operating position
- Maximum permanent angle in relation to the normal vertical mounting position

#### Maximum switching capacity on inductive load
- 1.8 A for 230 Vac and 30 Vdc

#### Minimum control circuit consumption
- Maximum control circuit consumption
- Soft starters ATS48C14Y, C17Y, C21Y, C22Y, C23Y, C32Y
  - 5 W
- Soft starters ATS48C41Y, M12Y
  - 10 W
- Soft starters ATS48D32Y, D47Y
  - 20 W

#### Maximum number of ATS48 soft starters connected
- 18

#### Transmission speed
- RS-485 multidrop serial link integrated in the starter, for Modbus Systems, with RJ45 connector
- 4800, 9600 or 19200 bps

#### Input for PTC probe
- Total resistance of probe circuit 750 Ω
- Motor power input 750 Ω
- Max. current 200 mA
- Accuracy ± 5% of the maximum value

#### Power factor correction capacitors
- Only up to 170 A
  - SCR: 0.5 p.u.
  - Bridge: 0.5 p.u.

#### Feedback signal
- RS-485 output
  - State 0 if V < 5 V, State 1 if V > 11 V
  - (maximum 30 V) I max. 8 mA

#### Communication
- RS-485 multiplexed serial link integrated in the starter for Modbus Systems, with FLAS connector transceiver speed: 4800, 9600 or 19200 bps
- Maximum number of ATS48 soft starters connected: 18

#### Current settings
- The nominal motor current, In, can be adjusted from 0.4 to 1.3 times the starter nominal current.

#### Protection
- Internal source available
  - One 24 V output, isolated and protected against short-circuits and overloads.
  - Output voltage 24 V ± 10%
  - Max. current 200 mA

#### Analog output AO
- Current output 0 to 20 mA
- Accuracy ± 25%. Max. current 200 mA

#### Line Protection
- Phase failure protection, indicated by relay output
- Phase failure protection, indicated by phased output

#### Shaft protection
- Power factor correction capacitors can only be used upstream of the ATS48 soft start and only powered up at the end of starting.
- The soft start must be grounded to meet regulations concerning leakage current (≤ 0.35 mA).
- If the installation involves several soft starts on the same supply line, each soft start must be grounded separately.

### Altistart 48 soft starters for asynchronous motors

#### Specifications

### Electrical specifications

#### Operating category
- NC 50a
- Conforming to IEC 60947-4-2

#### Three-phase supply voltage
- V 208 V -15% to 690 V +10%

#### Input frequency
- Hz 50 Hz (50 Hz) or 60 Hz (60 Hz) ± 20% (must be set)

#### Nominal soft starter current
- A 17 A to 1200 A

#### SCR
- PIV 1800 PIV

#### Motor power
- HP 2 (120 Vac for 3 to 900 Vac)

#### Voltage indicated on the motor nameplate
- V 268 Vb 690 V

#### Soft starter control circuit supply voltage
- V 115 V -15% to 230 V ± 10%, 50/60 Hz

#### Relay output
- (2 configurable outputs)
  - 3 relay outputs (R1, R2, R3), normally open contacts 1 to D. Minimum switching capacity: 10 mA for 5 Vdc.
  - Maximum switching capacity on inductive load: 1.8 A for 230 Vac and 30 Vdc.
  - Maximum nominal operating voltage is 440 Vac.
  - Factory setting: R2 assigned as the fault relay (configurable)
  - R2 assigned as the end of starting relay to control the soft start bypass relay
  - R3 assigned as motor powered (configurable)

#### Logic inputs LI
- (2 configurable inputs)
  - 4 logic inputs (I1, I2, I3, I4), Impedance: 4.3 kΩ, isolated + 24 V input (maximum 30 V) for DC
  - State 0 if V ≤ 5 V, State 1 if V > 11 V

#### Internal source available
- One 24 V output, isolated and protected against short-circuits and overloads.
- Accuracy ± 25%. Max. current 200 mA

#### Logic outputs LO
- (configurable)
  - 2 logic outputs L01 and L02 with 0 V common, compatible with level 1 PLC, according to standard IEC 664-64
  - 24 V input (maximum + 30 V) for LO1 and L02
  - Maximum LO output current: 200 mA if external 24 V power supply is used

#### Analog output AO
- (configurable)
  - Current output 0 to 5 mA or 4 to 20 mA
  - Maximum load impedance: 500 Ω
  - Accuracy ± 5% of the maximum value

#### Maximum I/O connection capacity
- 32 AWG (2.5 mm²)

#### Protection
- Thermal
  - Built-in, starter and motor (calculated and/or thermal protection with PTC probes)
- Line Protection
  - Phase failure protection, indicated by output relay

#### Current settings
- The nominal motor current, In, can be adjusted from 0.4 to 1.3 times the starter nominal current.
- Adjustment of the maximum starting current from 1.5 to 7 times the motor In, limited to 5 times the starter nominal current.

#### Starting mode
- By torque control with starter current limited to 5 in maximum
- Factory setting: 4 in for standard operation on 15 in torque ramp

#### Shopping mode
- Freewheel stop
- Freewheel stop (factory setting)
Altistart 48
soft starters for asynchronous motors

Environmental specifications

<table>
<thead>
<tr>
<th>Environmental specifications</th>
<th>Specifications</th>
</tr>
</thead>
</table>

**Type of starter**
- Altistart 48

**Conforming to standards**
- The ATS48 soft starters have been developed and tested in accordance with international standards. In particular with the starter product standard EN/IEC 60947-4-2.

**Electromagnetic compatibility EMC**
- Conducted and radiated emissions:
  - IEC 61800-4-2 for starters up to 170 A: ATS48D17Y to 48C17Y (Must bypass at end of starting).
- Electromagnetic discharge:
  - IEC 61800-4-3, level 3, Test levels:
    - By contact: 4 kV
    - In the air: 6 kV
- Immunity to radiated radio-frequency electromagnetic field:
  - IEC 61800-4-3, level 3, Test levels:
    - Phased/space: 1 kV
    - Phase/ground: 2 kV
- Surge immunity:
  - IEC 61800-4-5, level 3, Test levels:
    - Power supply cables: 4 kV
    - Control cables: 2 kV
- Damped oscillating waves:
  - IEC 61800-4-10, level 3, Test levels:
    - Phased/space: 1 kV
    - Phase/ground: 2 kV

**Marking**
- Marking in accordance with the harmonized standard EN/IEC 60947-4-2.

**Product certifications**
- CCC, Csa, C-Tick, Dnv, Gost, Nom 117, Seppro, Tcf, and Ul

**Degree of protection**
- For ATS48D17Y, 46C11Y: IP 20 (IP 20 if no connections)
- For ATS48C14Y, 48M12Y: IP 54

**Soft starter noise level**
- Soft starters ATS48D32Y to D47Y: 52 dBA
- Soft starters ATS48D42Y to D52Y: 58 dBA
- Soft starters ATS48C14Y to C17Y: 60 dBA
- Soft starters ATS48C21Y to C32Y: 55 dBA
- Soft starters ATS48C14Y to C17Y: 60 dBA
- Soft starters ATS48C21Y to C32Y: 55 dBA
- Soft starters ATS48C41Y to C66Y: 50 dBA
- Soft starters ATS48C62Y to C11Y: 58 dBA

**Fans**
- For ATS48D17Y and D22Y: Natural convection
- For ATS48D23Y, M32Y: Forced convection. The fans are activated automatically when a temperature threshold is reached. For fans data, see below.

**Maximum ambient pollution**
- Level 3
- Conforming to IEC 60664-1

**Vibration resistance**
- 1.5 mm for 2 to 13 Hz
- 1 mm from 13 to 200 Hz
- Conforming to EN 60068-2-6

**Shock resistance**
- 15 g at 11 ms
- Conforming to IEC 60068-2-27

**Relative humidity**
- 95% non-condensing, no dripping water
- Conforming to EN 60664-2-3

**Ambient air temperature around the device**
- **Storage**
  - IP: 15 to 35 °C (59 to 95 °F) (without derating)
  - W: 14 °F (2 °C) to 104 °F (40 °C) without derating
  - 15 °F (0 °C) to 122 °F (50 °C) with current derating of 5% per degree above 104 °F (40 °C)
- **Operation**
  - IP: 15 to 35 °C (59 to 95 °F) (without derating)
  - W: 14 °F (2 °C) to 104 °F (40 °C) without derating
  - 15 °F (0 °C) to 122 °F (50 °C) with user supplied shielding/housing contacts
- **Maximum operating altitude**
  - 3300 ft (1000 m) without derating
  - Above this, derate heating/cooling by 1% for each 1000 ft above 3300 ft (1000 m)

**Operating position**
- Maximum permissible angle in relation to the normal vertical mounting position
- 8 ° at 25 °C (77 °F), according to IEC 60 738-A

**Input power**
- **Frequency**
  - 50/60 Hz ± 5% (automatic), 50 Hz or 60 Hz ± 20% (must be set)
- **Input voltage**
  - 208 V -15% to 690 V +10%
  - Three-phase supply voltage

**Current ratings**
- ATS48D17Y to D22Y: 17 A to 1200 A
- ATS48C79Y to M12Y: 4 logic inputs: Stop, Run, LI3, LI4; Impedance: 4.3 kΩ
- **With fans operating**
- R1 assigned as motor powered (configurable)
- RG assigned as the fault relay (configurable)
- R3 assigned as motor powered (configurable)
- RS-485 multidrop serial link integrated in the starter, for Modbus Systems, with RJ45 connector

**Connections**
- 3 relay outputs (R1, R2, R3), normally open contacts 1 N.O. (maximum: 30 V; max. 8 mA)
- Maximum switching capacity on inductive load: 1.8 A for 230 Vac and 30 Vdc (power factor=0.5 and L/R=20 ms)
- Maximum nominal operating voltage is 400 Vac.
- Factory setting: R1 assigned as the fault relay (configurable)
- RG assigned as the end of starting relay to control the soft start bypass relay R3 assigned as motor powered (configurable)

**Logic inputs LI**
- 4 logic inputs (Stop, Run, LI3, LI4); Impedance: 4.3 kΩ, isolated + 24 V input (maximum: 30 V; max. 8 mA)
- State 0: V < 5 V, State 1: V > 11 V

**Internal source available**
- 1.24 V output, isolated and protected against short-circuits and overloads
- Accuracy: ±5%, Max. current: 200 mA

**Logic inputs LO**
- 2 logic outputs LO1 and LO2; W/ 0 V common; compatible with level 1 PLC; according to standard IEC 60664-4
- + 24 V input (minimum: + 12 V; maximum: + 30 V) to LOx
- Maximum LO output current: 200 mA if external 24 V power supply is used

**Analog output AO**
- 4 logic inputs (Stop, Run, LI3, LI4); Impedance: 4.3 kΩ, isolated + 24 V input (maximum: 30 V; max. 8 mA)
- State 0: V < 5 V, State 1: V > 11 V

**Internal source available**
- 1.24 V output, isolated and protected against short-circuits and overloads
- Accuracy: ±5%, Max. current: 200 mA

**Input for PTC probe**
- Total resistance of probe circuit 750 kΩ at 25 °C (77 °F), according to IEC 60 738-A

**Maximum I/O connection capacity**
- 32 AWG (0.5 mm²)

**Communication**
- RS-485 multidrop serial link integrated in the starter, for Modbus Systems, with RS-485 connector
- Frequency: 9600/9600 bps with parity = 0, 8 data, 1 stop bit

**Protection**
- Thermal: Built-in: starter and motor (calculated and/or thermal protection with PTC probes)
- Line Protection: Phase failure protection; indicated by output relay

**Current settings**
- The nominal motor current, In, can be adjusted from 0.4 to 1.3 times the starter nominal current
- Adjustment of the maximum starting current from 1.5 to 7 times the motor In, limited to 5 times the starter nominal current

**Starting mode**
- By torque control with starter current limited to 5 In maximum
- Setting mode: 4 for standard operation on 15 s torque ramp

**Shutting mode**
- Freewheel stop
- Controlled brake stop

**Note**
- Power factor correction capacitors can only be used upstream of the ATS48 soft start and only powered up at the end of starting.
- The soft starter must be grounded to meet regulations concerning leakage currents (≤ 30 mA). If the installation involves several soft starts on the same supply line, each soft starter must be grounded separately.
Altistart 48
collectors for
asynchronous motors

Specifications
I/O & Control

I/O & Control specifications

The control terminals are fitted with one way plug-in connectors.

Maximum connection capacity: 2.5 mm² (12 AWG)

Maximum tightening torque: 0.4 Nm (3.5 lb-in)

ATS48 control terminals

<table>
<thead>
<tr>
<th>Terminal</th>
<th>Function</th>
<th>Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>CL1</td>
<td>AT48 control power supply</td>
<td>AT48exx V: 208 V to 690 V + 10% - 15%, 50/60 Hz</td>
</tr>
<tr>
<td>R1A</td>
<td>Normally open (N/O) contact of programmable relay R1</td>
<td>Minimum switching capacity: ● 10 mA for V &lt; 250 V</td>
</tr>
<tr>
<td>R1C</td>
<td>Normally open (N/O) contact of end of starting relay R1</td>
<td>Maximum switching capacity on inductive load (≤ 0.5 and L/R ≤ 20 ms): ● 1.8 A for 250 V and 30 V c</td>
</tr>
<tr>
<td>R2A</td>
<td>Normally open (N/O) contact of programmable relay R2</td>
<td>Maximum voltage: 400 V</td>
</tr>
<tr>
<td>R2C</td>
<td>Normally open (N/O) contact of programmable relay R2</td>
<td></td>
</tr>
<tr>
<td>R3A</td>
<td>Normally open (N/O) contact of programmable relay R3</td>
<td></td>
</tr>
<tr>
<td>R3C</td>
<td>Normally open (N/O) contact of programmable relay R3</td>
<td></td>
</tr>
<tr>
<td>STOP</td>
<td>Stop starter (state 0 = stop)</td>
<td></td>
</tr>
<tr>
<td>RUN</td>
<td>Run starter (state 1 = run if STOP is at 1)</td>
<td>4 x 24 V logic inputs with 4.3 kW impedances (max. 30 V max. 8 mA)</td>
</tr>
<tr>
<td>LI4</td>
<td>Programmable input</td>
<td>state 1: U &gt; 11 V - I &lt; 5 mA</td>
</tr>
<tr>
<td>LI3</td>
<td>Programmable input</td>
<td>state 0: U &lt; 5 V - I &lt; 2 mA</td>
</tr>
<tr>
<td>LI2</td>
<td>Programmable input</td>
<td></td>
</tr>
<tr>
<td>24V</td>
<td>Logic input power supply</td>
<td>±24 V ± 25% isolated and protected against short circuits and overloads.</td>
</tr>
<tr>
<td>LD+</td>
<td>Logic input power supply</td>
<td>To be connected to 24 V or an external source.</td>
</tr>
<tr>
<td>LD0</td>
<td>Logic output power supply</td>
<td></td>
</tr>
<tr>
<td>AO1</td>
<td>Programmable logic outputs</td>
<td>2 open collector outputs, compatible with level 1 PLCs (IEC 65A-68 standard)</td>
</tr>
<tr>
<td>AO2</td>
<td>Programmable logic outputs</td>
<td>● Power supply: ±24 V min. 12 V, max. 30 V</td>
</tr>
<tr>
<td>COM</td>
<td>Programmable output</td>
<td>● Maximum current 200 mA per output with an external source</td>
</tr>
<tr>
<td>PTC1</td>
<td>Input for PTC probes</td>
<td>Total resistance of probe circuit 750 Ω at 77 °F (25 °C) (≤ 250 W probes in series, for example)</td>
</tr>
<tr>
<td>PTC2</td>
<td>Input for PTC probes</td>
<td></td>
</tr>
<tr>
<td>RJ45</td>
<td>Connector for: ● Remote terminal ● PowerSuite ● Communication bus</td>
<td>RS-485 Modbus</td>
</tr>
</tbody>
</table>

Torque Characteristic

Asynchronous motor

Ts: Across the line starting torque

Ts: Across the line starting current

Altistart 22

Ts: Total torque range available with an Altistart 48, which is dependent on the current limit (Is1) setting.

Load

Tr: Resistive torque must always be less than the Ts1 torque, or the motor will not start.

Selection Criteria

In addition to the chosen application, the choice of starter will depend on the following main criteria:

- AC mains voltage supply: ● Three-phase AC voltage: 208–690 V
- Power and nominal current (In) indicated on the motor name plate
- Duty cycle
- Starting current capacity

Whether an application is a standard duty or severe duty application determines the limiting values of the current and the duty cycle ratings.

Duty cycle

S1 motor duty: Duty cycle of starting followed by operation at constant load enabling the thermal stability to be reached.

S4 motor duty: Duty cycle of starting, operation at constant load, and an idle period. This cycle is characterized by a load factor.

These motor duties are described in more detail in IEC 60034-1.

Starting current capacity - Standard duty

In standard duty applications, the ATS48 soft starter is designed to provide:

- S1 motor duty: - Starting at 4 In for 23 seconds with a cold motor
  - Starting at 4 In for 46 seconds with a cold motor
- S4 motor duty (with a load factor of 50% and 10 starts per hour): - Starting at 3 In for 23 seconds
  - Starting at 4 In for 12 seconds
  - or an equivalent thermal cycle

The motor thermal protection conforms to Class 30, Class 25, Class 20 (severe duty application), Class 15, Class 10 (standard duty application), Class 10 A, and sub-class 2 motor thermal overload protection (see page 10).

Starting current capacity - Severe duty

In severe duty applications, the ATS48 soft starter is designed to provide:

- S1 motor duty: - Starting at 4 In for 48 seconds with a cold motor
  - Starting at 3 In for 90 seconds with a cold motor
- S4 motor duty (with a load factor of 50% and 5 starts per hour): - Starting at 4 In for 23 seconds
  - or an equivalent thermal cycle

The motor thermal protection conforms to Class 30, Class 25, Class 20 (severe duty application), Class 15, Class 10 (standard duty application), Class 10 A, and sub-class 2 motor thermal overload protection (see page 10).

Selection Criteria

Selecting the soft starter

First, identify the application type and corresponding starting current on page 20. Once the application type has been identified, select the soft starter from page 23 or 24 according to the supply voltage and the motor power.

Note: If the ATS48 soft starter is installed inside an enclosure, observe the mounting and derating recommendations on page 8.
Altistart 48 soft starters for asynchronous motors

Specifications
I/O & Control

I/O & Control specifications

The control terminals are fitted with one way plug-in connectors.

Maximum connection capacity: 2.5 mm² (12 AWG)

Maximum tightening torque: 0.4 Nm (3.5 lbf•in)

ATS48 terminal control terminals

<table>
<thead>
<tr>
<th>Terminal</th>
<th>Function</th>
<th>Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>CL1</td>
<td>AT48 control power supply</td>
<td>208 V to 600 V + 10% - 15%, 50/60 Hz</td>
</tr>
<tr>
<td>R1A</td>
<td>Normally open (N/O) contact of programmable relay R1</td>
<td>16 mA or 2 V (250 mA)</td>
</tr>
<tr>
<td>R1B</td>
<td>Normally open (N/O) contact of end of starting relay R1</td>
<td>1.8 A for 250 V and 30 V c</td>
</tr>
<tr>
<td>R2A</td>
<td>Normally open (N/O) contact of programmable relay R2</td>
<td>10 mA or 2 V (125 mA)</td>
</tr>
<tr>
<td>R2B</td>
<td>Normally open (N/O) contact of end of starting relay R2</td>
<td>1.8 A for 250 V and 30 V c</td>
</tr>
<tr>
<td>R3A</td>
<td>Normally open (N/O) contact of programmable relay R3</td>
<td>10 mA or 2 V (125 mA)</td>
</tr>
<tr>
<td>R3B</td>
<td>Normally open (N/O) contact of end of starting relay R3</td>
<td>1.8 A for 250 V and 30 V c</td>
</tr>
<tr>
<td>STOP</td>
<td>Logic starter (state 0 = stop)</td>
<td></td>
</tr>
<tr>
<td>RUN</td>
<td>Run starter (state 1 = run if STOP is at 1)</td>
<td>4 x 24 V logic inputs with 4.3 kW impedance (max. 8 mA)</td>
</tr>
<tr>
<td>LI3</td>
<td>Programmable input</td>
<td>(1) U &gt; 11 V - I &gt; 5 mA</td>
</tr>
<tr>
<td>LI4</td>
<td>Programmable input</td>
<td>(2) U &gt; 5 V - I &gt; 2 mA</td>
</tr>
<tr>
<td>24V</td>
<td>Logic input power supply</td>
<td>±24 V ± 25% isolated and protected against short-circuits and overloads</td>
</tr>
<tr>
<td>LD+</td>
<td>Logic output power supply</td>
<td>To be connected to 24 V or an external source</td>
</tr>
<tr>
<td>LD1</td>
<td>Programmable logic outputs</td>
<td>2 open collector outputs, compatible with level 1 PLC (IEC 65A-68 standard)</td>
</tr>
<tr>
<td>LD2</td>
<td>Programmable logic outputs</td>
<td>Power supply ±24 V, min. 12 V, max. 30 V</td>
</tr>
<tr>
<td>AO1</td>
<td>Programmable analog output</td>
<td>Output can be configured as D = 20 mA or A = 4 - 20 mA</td>
</tr>
<tr>
<td>COM</td>
<td>I/O common</td>
<td>0 V</td>
</tr>
<tr>
<td>PTC1</td>
<td>Input for PTC probes</td>
<td>Total resistance of probe circuit 750 W at 77 °F (25 °C) (3 x 250 W probes in series, for example)</td>
</tr>
<tr>
<td>PTC2</td>
<td>Input for PTC probes</td>
<td></td>
</tr>
<tr>
<td>RJ45</td>
<td>Connector for</td>
<td>Remote terminal, PowerSuite, Communication bus</td>
</tr>
</tbody>
</table>

Asynchronous motor
Ts: Across the line starting torque
Tt: Across the line starting current

Torque Characteristic

<table>
<thead>
<tr>
<th>% Motor Speed</th>
<th>% Torque</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>0.25</td>
<td>0.75%</td>
</tr>
<tr>
<td>0.5</td>
<td>1.5%</td>
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<td>0.75</td>
<td>3%</td>
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<tr>
<td>1</td>
<td>5%</td>
</tr>
<tr>
<td>1.25</td>
<td>7.5%</td>
</tr>
<tr>
<td>1.5</td>
<td>10%</td>
</tr>
<tr>
<td>1.75</td>
<td>12.5%</td>
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<tr>
<td>2</td>
<td>15%</td>
</tr>
<tr>
<td>2.25</td>
<td>17.5%</td>
</tr>
<tr>
<td>2.5</td>
<td>20%</td>
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<td>2.75</td>
<td>22.5%</td>
</tr>
<tr>
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<td>25%</td>
</tr>
<tr>
<td>3.25</td>
<td>27.5%</td>
</tr>
<tr>
<td>3.5</td>
<td>30%</td>
</tr>
<tr>
<td>3.75</td>
<td>32.5%</td>
</tr>
<tr>
<td>4</td>
<td>35%</td>
</tr>
</tbody>
</table>

Selection Criteria

In addition to the chosen application, the choice of starter will depend on the following main criteria:

- AC mains voltage supply:
  - Three-phase AC voltage: 208-690 V
- Power and nominal current (In) indicated on the motor name plate
- Duty cycle
- Starting current capacity

Whether an application is a standard duty or severe duty application determines the limiting values of the current and the duty cycle ratings.

- Duty cycle

S1 motor duty: Duty cycle of starting followed by operation at constant load enabling the thermal stability to be reached.

S4 motor duty: Duty cycle of starting, operation at constant load, and an idle period. This cycle is characterized by a load factor.

These motor duties are described in more detail in IEC 60034-1.

Starting current capacity - Standard duty

In standard duty applications, the ATS48 soft starter is designed to provide:

- S1 motor duty:
  - Starting at 4 In for 23 seconds with a cold motor
  - Starting at 4 In for 46 seconds with a cold motor
- S4 motor duty (with a load factor of 50% and 10 starts per hour):
  - Starting at 3 In for 23 seconds
  - Starting at 4 In for 12 seconds
  - or an equivalent thermal cycle

The motor thermal protection conforms to Class 30, Class 25, Class 20 (severe duty application), Class 15, Class 10 (standard duty application), Class 10 A, and sub-class 2 motor thermal overload protection (see page 10).

Starting current capacity - Severe duty

In severe duty applications, the ATS48 soft starter is designed to provide:

- S1 motor duty:
  - Starting at 4 In for 48 seconds with a cold motor
  - Starting at 4 In for 90 seconds with a cold motor
- S4 motor duty (with a load factor of 50% and 5 starts per hour):
  - Starting at 4 In for 23 seconds
  - or an equivalent thermal cycle

The motor thermal protection conforms to Class 30, Class 25, Class 20 (severe duty application), Class 15, Class 10 (standard duty application), Class 10 A, and sub-class 2 motor thermal overload protection (see page 10).

Selecting the soft starter

First, identify the application type and corresponding starting current on page 20. Once the application type has been identified, select the soft starter from page 22 or 23 according to the supply voltage and the motor power.

Note: If the ATS48 soft starter is installed inside an enclosure, observe the mounting and derating recommendations on page 8.
Altistart 48 soft starters for asynchronous motors

**Selection Criteria**

**Application Types**

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

<table>
<thead>
<tr>
<th>Type of machine</th>
<th>Functions performed by the ATS48</th>
<th>Starting current (%I_n)</th>
<th>Starting time (s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Centrifugal pump</td>
<td></td>
<td>300</td>
<td>5 to 15</td>
</tr>
<tr>
<td></td>
<td>Protection against underloads</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Inversion of direction of phase</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Contact for automatic draining</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Piston pump</td>
<td></td>
<td>350</td>
<td>5 to 10</td>
</tr>
<tr>
<td></td>
<td>Protection against overloads</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Inversion of direction of phase</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Contact for automatic emptying</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Screw compressor</td>
<td></td>
<td>300</td>
<td>5 to 10</td>
</tr>
<tr>
<td></td>
<td>Protection against inversion</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>of direction of phase rotation</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Contact for automatic emptying</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Compressor</td>
<td>Overload control for detecting</td>
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<tr>
<td></td>
<td>faults or overload control for</td>
<td></td>
<td></td>
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<td></td>
<td>detecting breaks</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lifting screw</td>
<td>Overload control for detecting</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>hard spots or overload control</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>for detecting breaks</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Drag lift</td>
<td>Overload control for detecting</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>jamming or overload control for</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>detecting breaks</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lift</td>
<td>Overload control for detecting</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>jamming or overload control for</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>detecting breaks</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Contacting with variable load</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agitator</td>
<td>The current display indicates the</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>density of the product</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mixer</td>
<td>The current display indicates the</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>density of the product</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Refiner</td>
<td>Torque control on starting and</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>stopping</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Standard Applications**

- **Deacceleration (reduction in pressure surge)**
- **Protection against underloads or inversion of the phase rotation direction**
- **Contact for automatic draining on stopping**
- **Protection against inversion of direction of phase rotation**
- **Contact for automatic emptying on stopping**

**Severe Applications**

- **Braking for fast stop**
- **Contact for automatic emptying on stopping**
- **Protection against inversion of direction of phase rotation**
- **Contact for automatic draining on stopping**
- **Protection, even for special motors**
- **Deceleration (reduction in pressure surge)**
- **Protection against underloads or inversion of the phase rotation direction**
- **Contact for automatic draining on stopping**

**Special Uses**

Additional criteria can influence the selection of the ATS48 soft starter:

- **Starting/Bypass Contactor**
  - Refer to the recommended wiring diagrams on pages 32-34.
  - The soft starter can be bypassed by a contactor at the end of starting (to limit the heat dissipated by the soft starter). This shorting/bypass contactor is controlled by the soft starter and the current measurements. Thermal protection remains active when the soft starter is bypassed.

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

- **Brush Motor**
  - The ATS48 soft starter can operate with a bypassed stator resistance motor or with a resistance lug. The starting torque is modified in accordance with the motor resistance. If necessary, maintain a low resistance in order to obtain the required torque to overcome the resistive torque on starting. A bypassed brush motor has a very low starting torque. A high stator current is required to obtain the sufficient starting torque.
  - Over-size the soft starter so that the value of the limiting current is 7 times that of the nominal current.
  - NOTE: Ensure that the starting torque of the motor, equal to 7 times the nominal current, is greater than the resistive torque.
  - NOTE: The ATS48 soft starter torque control enables excellent soft starting despite the limiting current being 7 times the nominal current required to start the motor.

- **2-Speed Motor**
  - The ATS48 soft starter can operate with a 2-speed motor. A motor demagnetization period must elapse before changing from low speed to high speed in order to avoid antiphase between the line supply and the motor, which would generate very high currents.
  - Select the soft starter using the three main criteria, see pages 19-21.

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

- **Miscellaneous Application Precautions**
  - Do not use the ATS48 soft starter upstream of loads other than motors (for example transformer and resistor type loads).
  - Do not connect power factor correction capacitors to the terminals of a motor controlled by an Altistart 48.
## Altistart 48 soft starters for asynchronous motors

### Selection Criteria

#### Application Types

**Depending on the type of machine, the applications are categorized as standard or severe duty based on the starting characteristics. Examples are given in the table below.**

<table>
<thead>
<tr>
<th>Type of machine</th>
<th>Functions performed by the ATS48</th>
<th>Starting current (%I&lt;sub&gt;n&lt;/sub&gt;)</th>
<th>Starting time (s)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Centrifugal pump</strong></td>
<td>♦ Deceleration (reduction in pressure spurt)</td>
<td>300</td>
<td>5 to 15</td>
</tr>
<tr>
<td></td>
<td>♦ Protection against underloads or inversion of the phase rotation direction</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Piston pump</strong></td>
<td>♦ Control of running dry and direction of rotation of the pump</td>
<td>350</td>
<td>5 to 15</td>
</tr>
<tr>
<td><strong>Cold compressor</strong></td>
<td>♦ Protection: even for special motors</td>
<td>300</td>
<td>5 to 10</td>
</tr>
<tr>
<td><strong>Screw compressor</strong></td>
<td>♦ Protection against inversion of direction of phase rotation</td>
<td>300</td>
<td>3 to 20</td>
</tr>
<tr>
<td></td>
<td>♦ Contact for automatic drawing on stopping</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Piston compressor</strong></td>
<td>♦ Protection against inversion of direction of phase rotation</td>
<td>350</td>
<td>5 to 10</td>
</tr>
<tr>
<td></td>
<td>♦ Contact for automatic emptying on stopping</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Conveyor, transporter</strong></td>
<td>♦ Overload control for detecting faults or unload control for detecting breaks</td>
<td>300</td>
<td>3 to 10</td>
</tr>
<tr>
<td><strong>Lifting screw</strong></td>
<td>♦ Overload control for detecting hard spots or unload control for detecting breaks</td>
<td>300</td>
<td>3 to 10</td>
</tr>
<tr>
<td><strong>Drag lift</strong></td>
<td>♦ Overload control for detecting jamming or unload control for detecting breaks</td>
<td>400</td>
<td>2 to 10</td>
</tr>
<tr>
<td><strong>Lift</strong></td>
<td>♦ Overload control for detecting jamming or unload control for detecting breaks</td>
<td>350</td>
<td>5 to 10</td>
</tr>
<tr>
<td></td>
<td>♦ Contacting with variable load</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Agitator</strong></td>
<td>♦ The current display indicates the density of the product</td>
<td>350</td>
<td>5 to 20</td>
</tr>
<tr>
<td><strong>Mixer</strong></td>
<td>♦ The current display indicates the density of the product</td>
<td>350</td>
<td>5 to 10</td>
</tr>
<tr>
<td><strong>Refiner</strong></td>
<td>♦ Torque control on starting and stopping</td>
<td>300</td>
<td>5 to 30</td>
</tr>
</tbody>
</table>

#### Standard Applications

- **Fan**
  - Detection of overloads caused by clogging or underloads (motor fan transmission broken)
  - Braking torque on stopping
- **Centrifugal compressor**
  - Protection against inversion of direction of phase rotation
  - Contact for automatic emptying on stopping
- **Circular saw, band saw**
  - Braking for fast stop

#### Standard/Severe Applications

- **Pulp, butchery knives**
  - Torque control on starting
- **Grinder**
  - Braking to limit vibrations during stopping, overloaded
  - Control to detect jamming
- **Crusher**
  - Braking to limit vibrations during stopping, overloaded
  - Control to detect jamming
- **Press**
  - Braking to increase the number of cycles

#### Severe Applications

- **2-Speed Motor**
  - The Altistart 48 soft starter can operate with a 2-speed motor. A motor demagnetization period must elapse before changing from low speed to high speed in order to avoid antiphase between the line supply and the motor, which would generate very high currents.
  - Select the soft starter using the three main criteria, see pages 19-21.

### Miscellaneous Application Precautions

- Do not use the Altistart 48 soft starter upstream of loads other than motors (for example, transformer and resistor type loads).

### Special Uses

**Additional criteria can influence the selection of the ATS48 soft starter:**

#### Starting/Bypass Contactor

Refer to the recommended wiring diagrams on pages 30-34.

The soft starter can be bypassed by a contactor at the end of starting (to limit the heat dissipated by the soft starter). The shorting/bypassing contactor is controlled by the soft starter and the current measurements. Thermal protection remains active when the soft starter is bypassed.

#### Multiple Motors

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

#### Brush Motor

The Altistart 48 soft starter can operate with a bypassed stator resistance motor or with a resistance lug. The starting torque is modified in accordance with the motor resistance. If necessary, maintain a low resistance in order to obtain the required torque to overcome the resistive torque on starting. A bypassed brush motor has a very low starting torque. A high stator current is required to obtain the sufficient starting torque.

Oversize the soft starter so that the value of the limiting current is 7 times that of the nominal current.

**NOTE:** Ensure that the starting torque of the motor, equal to 7 times the nominal current, is greater than the resistive torque.

**NOTE:** The ATS48 soft starter torque control enables excellent soft starting despite the limiting current being 7 times the nominal current required to start the motor.

### Long Motor Cable Lengths

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

### Additional Criteria

- Do not oversize the soft starter so that the value of the limiting current is 7 times that of the nominal current.
- Do not connect power factor correction capacitors to the terminals of a motor controlled by an Altistart 48.
### Selection Tables
#### Normal Duty Applications

<table>
<thead>
<tr>
<th>Motor</th>
<th>Power indicated on rating plate</th>
<th>Soft start - soft stop unit, 208...690 V supply (&gt; 10% - 15%), 50/60 Hz</th>
<th>Maximum permanent current in class 10</th>
<th>Soft starter rated current</th>
<th>Part number</th>
<th>Frame size</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>208 V</td>
<td>230 V</td>
<td>440 V</td>
<td>460 V</td>
<td>500 V</td>
<td>575 V</td>
<td>690 V</td>
<td></td>
</tr>
<tr>
<td>HP kW</td>
<td>HP kW</td>
<td>HP kW</td>
<td>HP kW</td>
<td>HP kW</td>
<td>HP kW</td>
<td>HP kW</td>
<td>A</td>
</tr>
<tr>
<td>2</td>
<td>2.2</td>
<td>3.3</td>
<td>4</td>
<td>5</td>
<td>6.6</td>
<td>8</td>
<td>10.8</td>
</tr>
<tr>
<td>3</td>
<td>4</td>
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<td>500</td>
<td>800</td>
<td>1200</td>
<td>1500</td>
<td>2500</td>
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</tbody>
</table>

### Specifications
#### Heavy Duty Applications

<table>
<thead>
<tr>
<th>Motor</th>
<th>Power indicated on rating plate</th>
<th>Soft start - soft stop unit, 208...690 V supply (&gt; 10% - 15%), 50/60 Hz</th>
<th>Maximum permanent current in class 10</th>
<th>Soft starter rated current</th>
<th>Part number</th>
<th>Frame size</th>
<th>Weight</th>
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<tbody>
<tr>
<td>208 V</td>
<td>230 V</td>
<td>440 V</td>
<td>460 V</td>
<td>500 V</td>
<td>575 V</td>
<td>690 V</td>
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</tr>
<tr>
<td>HP kW</td>
<td>HP kW</td>
<td>HP kW</td>
<td>HP kW</td>
<td>HP kW</td>
<td>HP kW</td>
<td>HP kW</td>
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<td>500.5</td>
<td>750</td>
<td>1250</td>
<td>2000</td>
<td>2500</td>
<td>4100</td>
<td>10.8</td>
</tr>
<tr>
<td>100</td>
<td>750.5</td>
<td>1100</td>
<td>1800</td>
<td>3000</td>
<td>3500</td>
<td>6000</td>
<td>10.8</td>
</tr>
<tr>
<td>150</td>
<td>1100</td>
<td>2200</td>
<td>3600</td>
<td>6000</td>
<td>7000</td>
<td>12000</td>
<td>10.8</td>
</tr>
<tr>
<td>200</td>
<td>2200</td>
<td>5000</td>
<td>8000</td>
<td>12000</td>
<td>15000</td>
<td>25000</td>
<td>10.8</td>
</tr>
</tbody>
</table>

(1) The wound rotor motor current must not exceed the maximum permanent current in class 10.
## Altistart 48
soft starters for asynchronous motors

### Normal Duty Applications

<table>
<thead>
<tr>
<th>Motor</th>
<th>208 V</th>
<th>230 V</th>
<th>440 V</th>
<th>460 V</th>
<th>500 V</th>
<th>575 V</th>
<th>690 V</th>
</tr>
</thead>
<tbody>
<tr>
<td>HP</td>
<td>kW</td>
<td>A</td>
<td>HP</td>
<td>kW</td>
<td>HP</td>
<td>kW</td>
<td>HP</td>
</tr>
<tr>
<td>3</td>
<td>2.2</td>
<td>A</td>
<td>4</td>
<td>3.3</td>
<td>5</td>
<td>3.7</td>
<td>7.5</td>
</tr>
<tr>
<td>5</td>
<td>4.4</td>
<td>A</td>
<td>7.5</td>
<td>5.5</td>
<td>10</td>
<td>7.5</td>
<td>15</td>
</tr>
<tr>
<td>7.5</td>
<td>10.0</td>
<td>A</td>
<td>15.0</td>
<td>11.0</td>
<td>20</td>
<td>17.5</td>
<td>25</td>
</tr>
<tr>
<td>10</td>
<td>15.0</td>
<td>A</td>
<td>20.0</td>
<td>15.0</td>
<td>25</td>
<td>18.5</td>
<td>30</td>
</tr>
<tr>
<td>15</td>
<td>20.0</td>
<td>A</td>
<td>25.0</td>
<td>16.0</td>
<td>30</td>
<td>23.0</td>
<td>35</td>
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<tr>
<td>20</td>
<td>26.0</td>
<td>A</td>
<td>30.0</td>
<td>18.0</td>
<td>35</td>
<td>29.0</td>
<td>40</td>
</tr>
<tr>
<td>25</td>
<td>32.0</td>
<td>A</td>
<td>35.0</td>
<td>20.0</td>
<td>40</td>
<td>34.0</td>
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*The relaxed motor current must not exceed the maximum permanent current in class 10.*

### Specifications

<table>
<thead>
<tr>
<th>Heavy Duty Applications</th>
<th>Motor</th>
<th>208 V</th>
<th>230 V</th>
<th>440 V</th>
<th>460 V</th>
<th>500 V</th>
<th>575 V</th>
<th>690 V</th>
</tr>
</thead>
<tbody>
<tr>
<td>HP</td>
<td>kW</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>A</td>
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<td>2</td>
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<td>7.5</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>A</td>
</tr>
<tr>
<td>7.5</td>
<td>11.0</td>
<td>A</td>
<td>A</td>
<td>A</td>
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<td>A</td>
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<td>A</td>
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<td>30</td>
<td>35.0</td>
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<td>A</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>A</td>
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</table>

*The selected part number must not exceed the maximum permanent current in class 10.*

---

### Selection Tables

#### Normal Duty Applications

<table>
<thead>
<tr>
<th>Part number Frame size Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
</tr>
<tr>
<td>lbs</td>
</tr>
<tr>
<td>AT54D17Y</td>
</tr>
<tr>
<td>4.9</td>
</tr>
<tr>
<td>AT54D21Y</td>
</tr>
<tr>
<td>4.9</td>
</tr>
<tr>
<td>AT54D31Y</td>
</tr>
<tr>
<td>4.9</td>
</tr>
<tr>
<td>AT54D32Y</td>
</tr>
<tr>
<td>4.9</td>
</tr>
<tr>
<td>AT54D41Y</td>
</tr>
<tr>
<td>4.9</td>
</tr>
</tbody>
</table>

#### Heavy Duty Applications

<table>
<thead>
<tr>
<th>Part number Frame size Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
</tr>
<tr>
<td>lbs</td>
</tr>
<tr>
<td>AT54D17Y</td>
</tr>
<tr>
<td>4.9</td>
</tr>
<tr>
<td>AT54D21Y</td>
</tr>
<tr>
<td>4.9</td>
</tr>
<tr>
<td>AT54D41Y</td>
</tr>
<tr>
<td>4.9</td>
</tr>
</tbody>
</table>

---

**Frames:**

A: Permanent current in class 10

B: Soft start - soft stop unit, 208…690 V (+10%, -10%), 50/60 Hz

C: Maximum permanent current in class 10

D: Soft starter rated current

E: Part number

F: Frame size

G: Weight

---

### Footnotes

(1) The relaxed motor current must not exceed the maximum permanent current in class 10.
**Altistart 48**

**soft starters for asynchronous motors**

### Dimensions

#### Frame Size A

<table>
<thead>
<tr>
<th>Frame size</th>
<th>ATS48 unit</th>
<th>(W x D x H)</th>
<th>in</th>
<th>mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>ATS48D17Y...</td>
<td>6.3 x 7.5 x 10.8</td>
<td>160 x 190 x 275</td>
<td></td>
</tr>
</tbody>
</table>

#### Frame size B

<table>
<thead>
<tr>
<th>Frame size</th>
<th>ATS48 unit</th>
<th>(W x D x H)</th>
<th>in</th>
<th>mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>ATS48D27Y...</td>
<td>7.5 x 9.3 x 11.4</td>
<td>190 x 235 x 290</td>
<td></td>
</tr>
</tbody>
</table>

### Dimensions

#### Frame size A

**Front view**

![Frame size A Front view](image)

#### Frame size B

**Front view**

![Frame size B Front view](image)

---

**Schneider Electric**

---
### Altistart 48 soft starters for asynchronous motors

#### Frame Size A

**Dimensions**

<table>
<thead>
<tr>
<th>Frame size</th>
<th>ATS48 unit</th>
<th>(W x D x H)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>ATS48D17Y, ATS48D47Y</td>
<td>6.3 x 7.5 x 10.8, 160 x 190 x 275</td>
</tr>
</tbody>
</table>

#### Frame Size B

**Dimensions**

<table>
<thead>
<tr>
<th>Frame size</th>
<th>ATS48 unit</th>
<th>(W x D x H)</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>ATS48D62Y, ATS48C11Y</td>
<td>7.5 x 9.3 x 11.4, 190 x 235 x 290</td>
</tr>
</tbody>
</table>

---

### Dimensions

**Frame size ATS48 unit**

(W x D x H) in mm

- **ATS48D17Y, ATS48D47Y**
  - 6.3 x 7.5 x 10.8, 160 x 190 x 275

- **ATS48D62Y**
  - 10.8 x 7.4, 275 x 190 x 11.4

- **ATS48C11Y**
  - 7.4 x 10.6, 190 x 235 x 11.4

---

### Other Dimensions

- **ATS48D17Y, ATS48D47Y**
  - 4 x ø 0.28 [7.0]
  - 10.6 x 7.4, 270 x 190 x 11.4

- **ATS48D62Y**
  - 6.3, 160 x 190 x 275

- **ATS48C11Y**
  - 10.6, 270 x 235 x 11.4
Altistart 48 soft starters for asynchronous motors

### Dimensions
#### Frame Size C

<table>
<thead>
<tr>
<th>Frame size</th>
<th>ATS48 unit</th>
<th>(W x D x H)</th>
<th>(in x mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>ATS48C14Y...</td>
<td>7.9 x 10.4 x 13.4</td>
<td>200 x 265 x 340</td>
</tr>
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</table>

#### Frame Size B

#### Front view

#### Frame size D

#### Dimensions

<table>
<thead>
<tr>
<th>Frame size</th>
<th>ATS522 unit</th>
<th>(W x D x H)</th>
<th>(in x mm)</th>
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</thead>
<tbody>
<tr>
<td>D</td>
<td>ATS54C21Y...</td>
<td>12.6 x 10.4 x 15</td>
<td>320 x 265 x 380</td>
</tr>
</tbody>
</table>

#### Frame size D

#### Front view

#### Side view
Altistart 48 soft starters for asynchronous motors

### Dimensions

#### Frame Size C

<table>
<thead>
<tr>
<th>Frame size</th>
<th>ATS48 unit</th>
<th>(W x D x H)</th>
<th>in</th>
<th>mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>ATS48C14Y, ATS48C17Y</td>
<td>7.9 x 10.4 x 13.4</td>
<td>200 x 265 x 340</td>
<td></td>
</tr>
</tbody>
</table>

#### Frame Size C

<table>
<thead>
<tr>
<th>Frame size</th>
<th>ATS48 unit</th>
<th>(W x D x H)</th>
<th>in</th>
<th>mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>ATS48C14Y, ATS48C17Y</td>
<td>7.9 x 10.4 x 13.4</td>
<td>200 x 265 x 340</td>
<td></td>
</tr>
</tbody>
</table>

#### Frame Size D

<table>
<thead>
<tr>
<th>Frame size</th>
<th>ATS48 unit</th>
<th>(W x D x H)</th>
<th>in</th>
<th>mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>D</td>
<td>ATS48C21Y, ATS48C23Y</td>
<td>12.6 x 10.4 x 15.0</td>
<td>300 x 265 x 380</td>
<td></td>
</tr>
</tbody>
</table>

### Dimensions

#### Frame size C

#### Frame size D

*Images and dimensions are not included in the natural text representation.*
### Altistart 48 soft starters for asynchronous motors

#### Dimensions

<table>
<thead>
<tr>
<th>Frame size</th>
<th>ATS22 unit</th>
<th>(W x D x H)</th>
<th>mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>E</td>
<td>ATS48C41Y, ATS48C66Y</td>
<td>10.8 x 11.8 x 26.4</td>
<td>400 x 300 x 670</td>
</tr>
</tbody>
</table>

#### Frame size E

- **Front view**
- **Side view**

#### Frame size F

- **Front view**
- **Side view**

---

### Dimensions

<table>
<thead>
<tr>
<th>Frame size</th>
<th>ATS22 unit</th>
<th>(W x D x H)</th>
<th>mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>F</td>
<td>ATS48C79Y, ATS48M12Y</td>
<td>30.3 x 12.4 x 35.1</td>
<td>770 x 3.15 x 8.9</td>
</tr>
</tbody>
</table>

#### Frame size F

- **Front view**
- **Side view**
### Altistart 48 soft starters for asynchronous motors

#### Dimensions

<table>
<thead>
<tr>
<th>Frame size</th>
<th>(W x D x H)</th>
</tr>
</thead>
<tbody>
<tr>
<td>E</td>
<td>30.3 x 12.4 x 35.1</td>
</tr>
<tr>
<td></td>
<td>770 x 3.15 x 8.9</td>
</tr>
</tbody>
</table>

#### Frame size E

**Front view**

**Side view**

<table>
<thead>
<tr>
<th>Frame size</th>
<th>ATS22 unit</th>
<th>(W x D x H)</th>
</tr>
</thead>
<tbody>
<tr>
<td>E</td>
<td>ATS48C41Y</td>
<td>10.8 x 11.8 x 26.4</td>
</tr>
<tr>
<td></td>
<td>ATS48C66Y</td>
<td>300 x 300 x 670</td>
</tr>
</tbody>
</table>

#### Frame size F

**Front view**

**Side view**

<table>
<thead>
<tr>
<th>Frame size</th>
<th>ATS22 unit</th>
<th>(W x D x H)</th>
</tr>
</thead>
<tbody>
<tr>
<td>F</td>
<td>ATS48C79Y</td>
<td>30.3 x 12.4 x 35.1</td>
</tr>
<tr>
<td></td>
<td>ATS48M12Y</td>
<td>770 x 3.15 x 8.9</td>
</tr>
</tbody>
</table>

---

**Note:** Dimensions are in millimeters (mm).
Altistart 48 soft starters for asynchronous motors

Accessories & Options
Configuration tools

SoMove setup software
This software enables the user to configure, set, debug and organize maintenance tasks for the Altistart 48. It can also be used to customize the integrated display terminal menus.

<table>
<thead>
<tr>
<th>Description</th>
<th>Part number</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>SoMove setup software</td>
<td>Free Download</td>
<td></td>
</tr>
</tbody>
</table>

USB/RJ45 cable
Used to connect a PC to the device.

<table>
<thead>
<tr>
<th>Description</th>
<th>Part number</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>USB/RJ45 cable</td>
<td>TCSWAAC13FB</td>
<td>0.1</td>
</tr>
</tbody>
</table>

Modbus/Uni-Telway-Bluetooth® adaptor
Used to enable any non-Bluetooth® device to communicate via Bluetooth® wireless link(1).

<table>
<thead>
<tr>
<th>Description</th>
<th>Part number</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Modbus/Uni-Telway-Bluetooth®</td>
<td>TCSWHAM3MM02P</td>
<td>0.1</td>
</tr>
</tbody>
</table>

Multi-Loader tool
For copying a configuration on a PC or drive and duplicating it on another drive.

<table>
<thead>
<tr>
<th>Description</th>
<th>Part number</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Multi-Loader tool</td>
<td>VW3A8111S</td>
<td>0.6</td>
</tr>
</tbody>
</table>

User manual for the Altistart 48. It can also be used to customize the integrated display

This software enables the user to configure, set, debug and organize maintenance tasks for the Altistart 48. It can also be used to customize the integrated display terminal menus.

USB/RJ45 cable
Used to connect a PC to the device.

<table>
<thead>
<tr>
<th>Description</th>
<th>Part number</th>
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</tr>
</thead>
<tbody>
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<td>0.1</td>
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</thead>
<tbody>
<tr>
<td>Multi-Loader tool</td>
<td>VW3A8111S</td>
<td>0.6</td>
</tr>
</tbody>
</table>

Remote display terminal
The remote keypad display can be mounted on the door of a wall-mounted or floor-standing enclosure. It has the same signalling display and configuration buttons as the keypad display integrated in the Altistart 48. A switch to lock access to the menus is located on the back of the keypad display.

It includes:
- The remote keypad display
- A mounting kit containing a cover, screws and an IP 65 seal on the front panel
- A 9.82 ft (3 m) cable with a 9-pin SUB-D connector (keypad side) and an RJ45 connector (ATS48 side)

<table>
<thead>
<tr>
<th>Description</th>
<th>Part number</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Remote display terminal</td>
<td>VW3G48101</td>
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</tr>
</tbody>
</table>

Communication modules
Connection via splitter box and RJ45 connectors

<table>
<thead>
<tr>
<th>Description</th>
<th>Length</th>
<th>Part number</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Modbus splitter box</td>
<td></td>
<td>LUSGC2</td>
<td>1.1</td>
</tr>
<tr>
<td>DeviceNet/Modbus gateway</td>
<td></td>
<td>LUTF9</td>
<td>0.5</td>
</tr>
<tr>
<td>Cable for Modbus serial link</td>
<td>1</td>
<td>VW3A82050F03</td>
<td>0.06</td>
</tr>
<tr>
<td>Modbus T-junction boxes (with integrated cable)</td>
<td>1</td>
<td>VW3A82050F03</td>
<td>0.4</td>
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</tbody>
</table>

Remote display terminal kit
A 9.82 ft (3 m) cable with a 9-pin SUB-D connector (keypad side) and an RJ45 connector (ATS48 side)

<table>
<thead>
<tr>
<th>Description</th>
<th>Part number</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Remote display terminal kit</td>
<td>VW3G48101</td>
<td>0.4</td>
</tr>
</tbody>
</table>

Accessories
Protection shrouds for power terminals
The units ATS48C14Y, ATS48C17Y, ATS48C21Y, ATS48C25Y, and ATS48C32Y have 9 unprotected power terminals. Those terminals can be fitted with protection shrouds. The protection shrouds are to be used with eyelet connections.

<table>
<thead>
<tr>
<th>Description</th>
<th>Part number</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Set of 6 power terminal</td>
<td>LA6F702</td>
<td>0.7</td>
</tr>
<tr>
<td>protection shrouds (1)</td>
<td>LA6F703</td>
<td>0.7</td>
</tr>
</tbody>
</table>

Remote display terminal
The remote keypad display can be mounted on the door of a wall-mounted or floor-standing enclosure. It has the same signalling display and configuration buttons as the keypad display integrated in the Altistart 48. A switch to lock access to the menus is located on the back of the keypad display.

It includes:
- The remote keypad display
- A mounting kit containing a cover, screws and an IP 65 seal on the front panel
- A 9.82 ft (3 m) cable with a 9-pin SUB-D connector (keypad side) and an RJ45 connector (ATS48 side)

<table>
<thead>
<tr>
<th>Description</th>
<th>Part number</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Remote display terminal</td>
<td>VW3G48101</td>
<td>0.4</td>
</tr>
</tbody>
</table>

Communication modules
Connection via splitter box and RJ45 connectors

<table>
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<tr>
<th>Description</th>
<th>Length</th>
<th>Part number</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Modbus splitter box</td>
<td></td>
<td>LUSGC2</td>
<td>1.1</td>
</tr>
<tr>
<td>DeviceNet/Modbus gateway</td>
<td></td>
<td>LUTF9</td>
<td>0.5</td>
</tr>
<tr>
<td>Cable for Modbus serial link</td>
<td>1</td>
<td>VW3A82050F03</td>
<td>0.06</td>
</tr>
<tr>
<td>Modbus T-junction boxes (with integrated cable)</td>
<td>1</td>
<td>VW3A82050F03</td>
<td>0.4</td>
</tr>
</tbody>
</table>

Remote display terminal kit
A 9.82 ft (3 m) cable with a 9-pin SUB-D connector (keypad side) and an RJ45 connector (ATS48 side)

<table>
<thead>
<tr>
<th>Description</th>
<th>Part number</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Remote display terminal kit</td>
<td>VW3G48101</td>
<td>0.4</td>
</tr>
</tbody>
</table>

Accessories
Protection shrouds for power terminals
The units ATS48C14Y, ATS48C17Y, ATS48C21Y, ATS48C25Y, and ATS48C32Y have 9 unprotected power terminals. Those terminals can be fitted with protection shrouds. The protection shrouds are to be used with eyelet connections.

<table>
<thead>
<tr>
<th>Description</th>
<th>Part number</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Set of 6 power terminal</td>
<td>LA6F702</td>
<td>0.7</td>
</tr>
<tr>
<td>protection shrouds (1)</td>
<td>LA6F703</td>
<td>0.7</td>
</tr>
</tbody>
</table>

Remote display terminal
The remote keypad display can be mounted on the door of a wall-mounted or floor-standing enclosure. It has the same signalling display and configuration buttons as the keypad display integrated in the Altistart 48. A switch to lock access to the menus is located on the back of the keypad display.

It includes:
- The remote keypad display
- A mounting kit containing a cover, screws and an IP 65 seal on the front panel
- A 9.82 ft (3 m) cable with a 9-pin SUB-D connector (keypad side) and an RJ45 connector (ATS48 side)

<table>
<thead>
<tr>
<th>Description</th>
<th>Part number</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Remote display terminal</td>
<td>VW3G48101</td>
<td>0.4</td>
</tr>
</tbody>
</table>
Altistart 48 soft starters for asynchronous motors

### Accessories & Options

#### Configuration tools

**SoMove setup software**

This software enables the user to configure, set, debug and organize maintenance tasks for the Altistart 48. It can also be used to customize the integrated display terminal menus.

<table>
<thead>
<tr>
<th>Description</th>
<th>Part number</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>SoMove setup software</td>
<td>Free Download</td>
<td></td>
</tr>
</tbody>
</table>

- Includes:
  - SoMove setup software for PC in English, French, German, Italian, Spanish and Chinese
  - DTM (Device Type Managers) and technical documentation for variable speed drives, starters and servo motors
  - USB/Bluetooth® adaptor
  - Modbus/Uni-Telway-Bluetooth® adaptor for PC
  - USB-RJ45 cable

**USB/Bluetooth® cable**

Used to connect a PC to the device.

<table>
<thead>
<tr>
<th>Description</th>
<th>Part number</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>USB/Bluetooth® cable</td>
<td>TCSWHAM3M002P</td>
<td>0.1 0.1</td>
</tr>
</tbody>
</table>

**Modbus/Uni-Telway-Bluetooth® adapter for PC**

Used to enable any non-Bluetooth® device to communicate via Bluetooth® wireless link.(1)

<table>
<thead>
<tr>
<th>Description</th>
<th>Part number</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Modbus/Uni-Telway-Bluetooth® adapter for PC</td>
<td>TCSWHAC13FB</td>
<td>0.1 0.1</td>
</tr>
</tbody>
</table>

**USB-RJ45 cable for PC**

Used to enable any non-Bluetooth® PC to communicate via Bluetooth® wireless link (2).

<table>
<thead>
<tr>
<th>Description</th>
<th>Part number</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>USB-RJ45 cable for PC</td>
<td>VW3AA111S</td>
<td>0.6 0.3</td>
</tr>
</tbody>
</table>

**Multi-Loader tool**

For copying a configuration on a PC or drive and duplicating it on another drive.

<table>
<thead>
<tr>
<th>Description</th>
<th>Part number</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Multi-Loader tool</td>
<td>VW3AA121</td>
<td>2.0 0.9</td>
</tr>
</tbody>
</table>

**DeviceNet/Modbus gateway**

<table>
<thead>
<tr>
<th>Description</th>
<th>Part number</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>DeviceNet/Modbus gateway</td>
<td>VW3A8306TF10</td>
<td>0.4 0.2</td>
</tr>
</tbody>
</table>

**Remote display terminal**

The remote keypad display can be mounted on the door of a wall-mounted or floor-standing enclosure. It has the same signalling display and configuration buttons as the keypad display integrated in the Altistart 48. A switch to lock access to the menus is located on the back of the keypad display.

<table>
<thead>
<tr>
<th>Description</th>
<th>Part number</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Remote display terminal</td>
<td>VW3G48101</td>
<td>0.4 0.2</td>
</tr>
</tbody>
</table>

**Communication modules**

Connection via splitter box and RJ45 connectors

<table>
<thead>
<tr>
<th>Description</th>
<th>Length</th>
<th>Part number</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Modbus splitter box with 10 RJ45 connectors and 1 screw terminal block</td>
<td>-</td>
<td>LU9GC3</td>
<td>1.1 0.5</td>
</tr>
<tr>
<td>DeviceNet/Modbus gateway with 1 DeviceNet RJ45 connector and 1 RJ45 Modbus connector</td>
<td>-</td>
<td>LU9PF9</td>
<td>0.5 .23</td>
</tr>
<tr>
<td>Cables for Modbus serial link with 2 RJ45 connectors</td>
<td>1 0.3</td>
<td>VW3A8306R03</td>
<td>0.06 0.03</td>
</tr>
<tr>
<td>3 1</td>
<td>VW3A8306R10</td>
<td>0.2 0.1</td>
<td></td>
</tr>
<tr>
<td>10 3</td>
<td>VW3A8306R20</td>
<td>0.23 0.1</td>
<td></td>
</tr>
<tr>
<td>Modbus T-junction boxes (with integrated cable)</td>
<td>1 0.3</td>
<td>VW3A8306TF03</td>
<td>0.4 0.2</td>
</tr>
<tr>
<td>3 1</td>
<td>VW3A8306TF10</td>
<td>0.4 0.2</td>
<td></td>
</tr>
</tbody>
</table>

**Line terminators**

<table>
<thead>
<tr>
<th>R</th>
<th>120Ω</th>
<th>E</th>
<th>1.0Ω</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

---

(1) Check the manufacturer’s specification.
(2) Available only for the following devices:
- ATV12, ATV12P, ATV13P, ATV61 and ATV71 drives
- ATS22 and ATS48 soft starters
- ATV 12, ATV 312, ATV 31, ATV 61 and ATV 71 drives

**Protection shrouds for power terminals**

The units ATS48C14Y, ATS48C17Y, ATS48C21Y, ATS48C25Y, and ATS48C32Y have 9 unprotected power terminals. Those terminals can be fitted with protection shrouds. The protection shrouds are to be used with eyepitfall connectors.

<table>
<thead>
<tr>
<th>Description</th>
<th>Part number</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Set of 5 power terminal protection shrouds</td>
<td>AT54C14Y and AT54C17Y</td>
<td>LAFP702 0.7 0.3</td>
</tr>
<tr>
<td>ATS48C21Y, ATS48C25Y, and ATS48C32Y</td>
<td>LAFP703 0.7 0.3</td>
<td></td>
</tr>
</tbody>
</table>

---

(1) The soft starters have 9 unprotected power terminals.
**Altistart 48 soft starters** for asynchronous motors

**Non-reversing with shunt trip fault isolation**

![Wiring Diagram]

1. Connect control power transformer for 120 V secondary voltage.
2. For freewheeling control operation, add SC with associated control wiring.
3. Relay contact located on ATS48 controller.
5. Use RCR relay logic for 120 V secondary control with the RCR relay logic from the ATS48 (see DETAIL A).

**Non-reversing with isolation contactor**

![Wiring Diagram]

1. Connect control power transformer for 120 V secondary voltage.
2. For freewheeling control operation, add SC with associated control wiring.
3. Relay contact located on ATS48 controller.
5. Use RCR relay logic for 120 V secondary control with the RCR relay logic from the ATS48 (see DETAIL A).

* = User supplied
Reversing with isolation contactors

Wiring Diagrams

Altistart 48
soft starters for
asynchronous motors

Description of components in wiring diagrams

<table>
<thead>
<tr>
<th>Item</th>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>IC1</td>
<td>Isolation Contactor (Fwd)</td>
<td>The isolation contactor logic closes IC1 upon a start command and opens IC1 after the stop is complete. The RCR (or FRR and RRR for reversing) are time contacts that must have a time delay greater than the deceleration ramp time or the braking time. When a start signal is applied, the time delay must be set for a time that will allow a complete deceleration of the motor residual voltage. The isolation contactor will open immediately upon a fault event. The pilot relay (IC1A) is required when the IC1 contactor coil exceeds the ATS48 relay output ratings.</td>
</tr>
<tr>
<td>IC2</td>
<td>Isolation Contactor (Rev)</td>
<td>Used for reversing applications only, the IC2 must be mechanically interlocked to IC1. A reversing contactor may be used for the combination of IC1 and IC2. In general, the operation of IC2 is identical to IC1. The pilot relay (IC2A) is required when the IC2 contactor coil exceeds the ATS48 relay output ratings.</td>
</tr>
<tr>
<td>SC</td>
<td>Shorting Contactor</td>
<td>The shorting contactor is used to reduce the heat dissipated by the soft starter when the motor is operating at full speed and voltage. The soft starter provides proper sequencing if this contactor by the “end-start-up” relay. When the start is completed, the shorting contactor will be de-energized to close. The shorting contactor will continue to monitor the motor thermal state and provide motor overload protection. Upon a stop command, the SC contactor will open, transferring the motor current to the ATS48 soft starter to allow for controlled deceleration if desired. The pilot relay (SCA) is required when the SC contactor coil exceeds the ATS48 relay output ratings.</td>
</tr>
<tr>
<td>TS</td>
<td>Transient Suppressors</td>
<td>Transient suppression of all relay and contactor coils (except ST) is recommended to minimize the possibility of electrical interference with the soft starter electronics and to increase relay contact life.</td>
</tr>
<tr>
<td>RCR</td>
<td>Run Command Relay</td>
<td>Used in shunt trip fault isolation installations only if 120 V control of the ATS48 soft starter is required. Used in non-reversing installations with a isolation contactor for proper sequencing of contactor logic. When energized, RCR initiates the start sequence. When de-energized, stopping is initiated. Operator controls can be either pushbutton switch or start/stop push buttons. RCR remains energized during a fault event. Once the fault condition has been cleared, RCR must be de-energized by a “stop” command then re-energized to restart the soft starter.</td>
</tr>
<tr>
<td>FRR</td>
<td>Run Forward Relay</td>
<td>Used for reversing applications only, the coil duplicates the functionality of RCR for the forward direction and is interlocked with the FRR relay.</td>
</tr>
<tr>
<td>RRR</td>
<td>Run Reverse Relay</td>
<td>Used for reversing applications only, this coil duplicates the functionality of RCR for the reverse direction and is interlocked with the RRR relay.</td>
</tr>
<tr>
<td>ST</td>
<td>Short Trip Coil</td>
<td>This coil is attached to the short trip coil on the disconnect and will energize 2 seconds after a soft start detected fault by the TR timer contact. This delay is to prevent nuisance tripping of the circuit breaker during soft starter power-up or during line undervoltage conditions.</td>
</tr>
<tr>
<td>TR</td>
<td>Trip Relay</td>
<td>Used in shunt trip circuit breaker logic only; coil energized upon a soft starter detected fault.</td>
</tr>
<tr>
<td>FR</td>
<td>Fault Relay</td>
<td>The fault relay is energized during normal operation and de-energized if the soft starter detected fault contacts open or if the motor thermal switch (if supplied) opens. FR also provides additional contacts for the soft starter fault output.</td>
</tr>
</tbody>
</table>
**Wiring Diagrams**

### Altistart 48 soft starters for asynchronous motors

#### Reversing with isolation contactors

![Wiring Diagram](image)

**Description of components in wiring diagrams**

<table>
<thead>
<tr>
<th>Item</th>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>IC1</td>
<td>Isolation Contactor (Forward)</td>
<td>This isolation contactor logic closes IC1 upon a start command and opens IC1 after the start is complete. The RCR (or RFR and RRR for reversing) are timed contacts that must have a time delay greater than the deceleration ramp time or the braking time. When a start command is selected, the time delay must be set so that a time that will allow a complete decay of the motor residual voltage. The isolation contactor will open immediately upon a fault event. The pilot relay (IC1A) is required when the IC1 contactor coil exceeds the ATS48 relay output ratings.</td>
</tr>
<tr>
<td>IC1A</td>
<td>Isolation Contactor (Rev)</td>
<td>Used for reversing applications only, the IC2 must be mechanically interlocked to IC1. A reversing contactor may be used for the combination of IC1 and IC2. In general, the operation of IC2 is identical to IC1. The pilot relay (IC1A) is required when the IC1 contactor coil exceeds the ATS48 relay output ratings.</td>
</tr>
<tr>
<td>IC2</td>
<td>Shunting Contactor and Pilot Relay</td>
<td>The shorting shunting contactor is used to reduce the heat dissipated by the soft starter when the motor is operating at full speed and voltage. The soft starter provides proper sequencing if this is not a proper sequencing of the contactor logic. When the start is completed, the shunting contactor will be commanded to close. The soft starter will continue to monitor the motor thermal state and provide motor overload protection. Upon a stop command, the SC contactor will open, transferring the motor current to the ATS48 soft starter to allow for controlled deceleration if desired. The pilot relay (SCA) is required when the SC contactor coil exceeds the ATS48 relay output ratings.</td>
</tr>
<tr>
<td>TS</td>
<td>Transient Suppressors</td>
<td>These suppressors of all relay and contactor coils (except IC1) are recommended to minimize the possibility of electrical interference with the soft starter electronics and to increase relay contact life.</td>
</tr>
<tr>
<td>RCR</td>
<td>Run Command Relay</td>
<td>Used in short trip fault isolation installations only if 120 V control of the ATS48 soft starter is required. Used in non-reversing installations with a isolation contactor for proper sequencing of the contactor logic. When energized, RCR initiates the start sequence. When de-energized, stopping is initiated. Operator controls can be either on/off selector switch, RCR selector switch or start/stop push buttons. RCR remains energized during a fault event. Once the fault condition has been cleared, RCR must be de-energized by a “Stop” command then re-energized to restart the soft starter.</td>
</tr>
<tr>
<td>RFR</td>
<td>Run Forward Relay</td>
<td>Used for reversing applications only, the coil duplicates the functionality of RCR for the forward direction and is interlocked with the RRR relay.</td>
</tr>
<tr>
<td>RRR</td>
<td>Run Reverse Relay</td>
<td>Used for reversing applications only, the coil duplicates the functionality of RCR for the reverse direction and is interlocked with the RFR relay.</td>
</tr>
<tr>
<td>ST</td>
<td>Shunt Trip Coil</td>
<td>This coil is connected to the shunt trip coil on the disconnect and will energize 2 seconds after a soft start detected fault by the TR timer contact. The time delay is to prevent nuisance tripping of the circuit breaker during soft starter power-up or during line undervoltage conditions.</td>
</tr>
<tr>
<td>TR</td>
<td>Trip Relay</td>
<td>Used in shunt trip breaker logic only. coil energized upon a soft starter detected fault.</td>
</tr>
<tr>
<td>FR</td>
<td>Fault Relay</td>
<td>The fault relay is energized during normal operation and de-energizes if the soft starter selected fault contacts open or if the motor thermal switch (if supplied) opens. FR also provides additional contacts for the soft starter fault output.</td>
</tr>
</tbody>
</table>
Asynchronous motors
Soft starters for
Altistart 48

<table>
<thead>
<tr>
<th>Induction Motor</th>
<th>ATS48 Soft Starter</th>
<th>F44</th>
</tr>
</thead>
<tbody>
<tr>
<td>208 V</td>
<td>230 V</td>
<td>575 V</td>
</tr>
<tr>
<td>3</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>7.5</td>
<td>10</td>
<td>20</td>
</tr>
<tr>
<td>10</td>
<td>—</td>
<td>25</td>
</tr>
<tr>
<td>—</td>
<td>15</td>
<td>30</td>
</tr>
<tr>
<td>15</td>
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<tr>
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<td>900</td>
</tr>
<tr>
<td>350</td>
<td>400</td>
<td>1100</td>
</tr>
</tbody>
</table>

(1) Motor full load currents through 308 VAC/480 VAC, 200 VDC and 200 VDC have been taken from the National Electric Code NFPA 70-2000. Table 820.40. Above rated voltage, motor full load currents are calculated using 1.15 factor for 480 VAC and 1.05 for 200 VDC. Motors listed are for standard duty applications. For severe duty applications, select the next larger soft starter size.

(2) The ambient temperature indicated in the table represents the temperature of the air surrounding the ATS48 soft starter. Any additional temperature factors associated with the enclosure system or actual ambient temperature must be considered when determining the actual rated current (ICL) of the soft starter. For operating ambient above 40 °C (104 °F) without a shunt trip coil, the rated current (ICL) of the soft starter must be de-rated by 2% per °C.

(3) The use of transient suppressors across all contactor coils is recommended. Refer to the latest editions of Schneider Electric's full line product catalogs for selection of transient suppressors.

(4) According to the National Electric Code, branch circuit overcurrent protection must be provided for each soft starter.

(5) Reversing contactors for C11 through M12 soft starters must be assembled from components. Parts quantities for a basic contactor assembly, minus the power connection links and terminals, are indicated in Table 4-1. Refer to Table 3 of Schneider Electric’s full line product catalogs for selection of the proper components. Reversing contactors for C79 through M12 soft starters are designed for vertical interlocking of the individual contactors. Horizontally interlocked contactors are used for D17 through C59 soft starters.

(6) Fuse holder part number references are for Class J fuses only based on Ferraz Shawmut spring reinforced with box type connectors acceptable for Al/Cu wiring. Class L fuses require bolt-on fuse holders. "—" indicates non-applicable.

(7) The molded case switches and circuit breakers selected require the addition of operator mechanisms to allow operation from the exterior of an enclosure. Refer to the latest editions of Schneider Electric’s full line product catalogs for operator mechanism information. When using a shunt trip relay for SCR fault isolation, order a disconnect switch with suffix -1021 for addition of connections to user-supplied power bus work.

(8) The D Line contactor is available as a reversing configuration. For these applications, change the IC1 part number prefix from LC1- to LC2- to order the IC1 and IC2 combination complete with shunt trip coil.

(9) Devices rated above 660 A have not been coordinated with circuit breakers. You must use a Class L fuse for overcurrent protection with ATS48 soft starter models C79, M10, and M12.

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### Suggested Components for Standard Duty Applications

<table>
<thead>
<tr>
<th>Induction Motor</th>
<th>ATS48 Soft Starter</th>
<th>FU4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated HP (1)</td>
<td>ATS48 Soft Starter</td>
<td>Device Rated Current</td>
</tr>
<tr>
<td>250 V</td>
<td>230 V</td>
<td>375 V</td>
</tr>
<tr>
<td>3</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>5</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>7.5</td>
<td>10</td>
<td>20</td>
</tr>
<tr>
<td>20</td>
<td>25</td>
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</tr>
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<tr>
<td>300</td>
<td>350</td>
<td>900</td>
</tr>
<tr>
<td>400</td>
<td>450</td>
<td>1000</td>
</tr>
</tbody>
</table>

(1) Motor full load currents through 500 hp@460 V, 250 hp@230 V, and 200 hp@208 V are taken from the National Electric Code (NFPA 70-2002, Table 310.15(B)(16)). Allowable motor charging current shall be calculated based upon I^2 * T (in Amps) for 460 V and I^2 * T (in Amps) for 230 V Motors listed for alternative duty applications. For severe duty applications, select the next larger soft starter size.

### Additional Suggested Components for Standard Duty Applications

| Additional Suggested Components for Standard Duty Applications (10) |
|-------------------------|-------------------------|-------------------------|-------------------------|
| Suggested Components    | Standard Duty   | Suggested Components    | Standard Duty   |
| Induction Motor | ATS48 Soft Starter | Contactors (1), (2), (3) | Disconnect (8) |
| Rated HP (1)   | ATS48 Soft Starter | IC1 | IC2 | Mechanical Interlock | Shorting Contact (AC1) | Power Fuses | Fuse Block (8) | Molded Case | Circuit Breaker |
| 250 V | 230 V | 375 V |
| 3  | 3 | 3 | 3 | ATS48D17Y | LC1D170 | LC1D170 | (8) | LC1D210 | J/25 | J/25 | 6006 M6 JGL36000S5 15 15 15 15 |
| 5  | 5 | 5 | 5 | ATS48D25Y | LC1D255 | LC1D255 | (8) | LC1D315 | J/35 | J/35 | 6006 M6 JGL36000S5 15 15 15 15 |
| 7.5 | 7.5 | 7.5 | 7.5 | ATS48D35Y | LC1D320 | LC1D320 | (8) | LC1D420 | J/50 | J/50 | 6006 M6 JGL36000S5 15 15 15 15 |
| 20  | 20 | 20 | 20 | ATS48D80Y | LC1D800 | LC1D800 | (8) | LC1D800 | J/120 | J/120 | 6010 M6 JGL36000S5 15 15 15 15 |
| 25  | 25 | 25 | 25 | ATS48D100Y | LC1D1000 | LC1D1000 | (8) | LC1D1000 | J/160 | J/160 | 6010 M6 JGL36000S5 15 15 15 15 |

(1) All coils are selected for 120 V, 60 Hz operation. Refer to the Digest for additional coil voltages or auxiliary contact configurations. One block may be added to each contactor.

### Additional Suggested Components

- **Suggested Components for Standard Duty Applications**
- **Suggested Components for High Duty Applications**

---

(1) Motor full load currents through 500 hp@460 V, 250 hp@230 V, and 200 hp@208 V are taken from the National Electric Code (NFPA 70-2002, Table 310.15(B)(16)). Allowable motor charging current shall be calculated based upon I^2 * T (in Amps) for 460 V and I^2 * T (in Amps) for 230 V Motors listed for alternative duty applications. For severe duty applications, select the next larger soft starter size.

(2) Power terminals are not included with LC1-F contactors. For additional ordering information visit www.schneider-electric.com.

(3) All coils are selected for 120 V, 60 Hz operation. Refer to the Digest for additional coil voltages or auxiliary contact configurations. One block may be added to each contactor.

(4) Fuse holder part number references are for Class J fuses only based on Ferraz Shawmut spring reinforced with box type connectors acceptable for Al/Cu wiring. Class L fuses require bolt-on mechanical interlocks.

(5) Reversing contactors for C11 through M12 soft starters must be assembled from components. Parts quantities for a basic contactor assembly, minus the power connection links and terminals, are indicated before each part number. Refer to the latest editions of Schneider Electric’s full line product catalogs for power connector link and terminal kits. Reversing contactor interlock units are indicated before each part number. Refer to the latest editions of Schneider Electric’s full line product catalogs for power connector link and terminal kits. Reversing contactor interlock units are indicated before each part number.

(6) Fuse holder part number references are for Class J fuses only. Based on Ferraz Shawmut spring reinforced with box type connectors acceptable for Al/Cu wiring. Class L fuses require bolt-on mechanical interlocks.

(7) The molded case switches and circuit breakers selected require the addition of operator mechanisms to allow operation from the exterior of an enclosure. Refer to the latest editions of Schneider Electric’s full line product catalogs for power connector link and terminal kits. Reversing contactor interlock units are indicated before each part number.

(8) The ambient temperature indicated in the table represents the temperature of the air surrounding the ATS48软起动器. Any additional temperature factors associated with the enclosure system or actual installation ambient temperature must be considered when determining the actual rated current (I_{CL}) of the soft starter. Factors associated with the enclosure system or actual installation ambient temperature must be considered when determining the actual rated current (I_{CL}) of the soft starter.

(9) Power terminals are not included with LC1-F contactors. For additional ordering information visit www.schneider-electric.com.

(10) For UL508A combinations, go to www.schneider-electric.com.
The following graphs illustrate the starting curves of commonly used starting methods for starting a motor.

Conventional starting curves

The following graphs illustrate the starting curves of commonly used starting methods for starting a motor.

Direct starting

- Starting current: 4 to 8 times the nominal current
- Starting torque: 0.5 to 1.5 times the nominal torque
- Characteristics:
  - Motor with 3 terminals, low and medium power
  - On-load starting
  - High current peak and voltage drop
  - Simple device
  - Sudden starting for the mechanism
- No parameter adjustment

Wye delta starting

- Starting current: 1.6 to 2.6 times the nominal current
- Starting torque: 0.5 to 4 times the nominal torque
- Characteristics:
  - Motor with 6 terminals
  - No-load or low resistive torque starting
  - High current peaks and torque when changing to "Wye Delta" mode
  - Subject to mechanical stress when starting
- No parameter adjustment

Primary resistor starting

- Starting current: 4.5 times the nominal current
- Starting torque: 0.5 to 0.75 times the nominal torque
- Characteristics:
  - Motor with 3 terminals, high power
  - Starting with increasing resistive torque
  - High current peak
  - A large, bulky device requiring maintenance
  - Subject to mechanical stress when starting
- No parameter adjustment

Autotransformer starting

- Starting current: 1.7 to 4 times the nominal current
- Starting torque: 0.4 to 0.85 times the nominal torque
- Characteristics:
  - Motor with 3 terminals, high power
  - Large voltage drop and current peak when connected at full voltage
  - A complex, bulky device requiring maintenance
  - Subject to mechanical stress when starting
- No parameter adjustment

Advantages of starting with the Altistart 48

- Simple and effective settings, whatever the load.
- Smooth control of hydraulic transients with a single acceleration ramp.
- Starting without mechanical stress
- Hydraulic transients during acceleration and deceleration in pump applications

Conventional electronic starting

- To rectify problems caused by:
  - Mechanical stress when starting
  - Hydraulic transients during acceleration and deceleration in pump applications

Conventional electronic starting requires the use of several current limits or the switching of several voltage ramps. The settings become complicated and must be modified every time the load changes.

Starting with the Altistart 48

The Aistart 48 soft starter's torque control enables:
- Starting without mechanical stress
- Smooth control of hydraulic transients with a single acceleration ramp
- Simple and effective settings, whatever the load.
Altistart 48 soft starters for asynchronous motors

**Conventional Starting Curves**

The following graphs illustrate the starting curves of commonly used starting methods for starting a motor.

**Conventional starting curves**

**Direct starting**

- Starting current: 4 to 8 times the nominal current
- Starting torque: 0.5 to 1.5 times the nominal torque
- Characteristics:
  - Motor with output terminals, low and medium power
  - On-load starting
  - High current peak and voltage drop
  - Simple device
  - Sudden starting for the mechanism
- No parameter adjustment

(1) Load torque

(2) Direct Starting

**Wye delta starting**

- Starting current: 1.8 to 2.6 times the nominal current
- Starting torque: 0.5 times the nominal torque
- Characteristics:
  - Motor with 6 terminals
  - No-load or low resistive torque starting
  - High current peaks and torque when changing to "Wye Delta" mode
  - Subject to mechanical stress when starting
- No parameter adjustment

(1) Load torque

(2) Direct Starting

**Primary resistor starting**

- Starting current: 4.5 times the nominal current
- Starting torque: 0.5 to 0.75 times the nominal torque
- Characteristics:
  - Motor with 3 terminals, high power
  - Starting with increasing resistive torque
  - High current peak
  - A large, bulky device requiring maintenance
  - Subject to mechanical stress when starting
- No parameter adjustment

(1) Load torque

(2) Direct Starting

**Autotransformer starting**

- Starting current: 1.7 to 4 times the nominal current
- Starting torque: 0.4 to 0.85 times the nominal torque
- Characteristics:
  - Motor with 3 terminals, high power
  - Large voltage drop and current peak when connected at full voltage
  - A complex, bulky device requiring maintenance
  - Subject to mechanical stress when starting
- No parameter adjustment

(1) Load torque

(2) Direct Starting

Advantages of starting with the Altistart 48

**Conventional Electronic Starting With Voltage Ramp And Current Limit**

- A soft starter with 6 thyristors connected head-to-tail in each line phase is used to power the three-phase asynchronous motor by gradually increasing the voltage on start-up.
  - Depending on the firing time and angle of the thyristors, it can be used to supply a voltage which will gradually increase at a fixed frequency.
  - The gradual increase in the output voltage can either be controlled by the acceleration ramp, or by the value of the limiting current, or linked to both parameters.

(1) Load torque

**Schematic diagram**

- Figure 1 shows the behavior of the torque in relation to the starting current. Limiting the starting current to Is results in a value which is equal to the ratio of the square of currents as Is to Is1.

Example

On a motor with the following characteristics: Ts = 2 Tn for Is = 6In, current limiting at Is = 3 In or 0.5 Is results in a starting torque: Ts1 = Ts x (0.5)2 = 2 Tn x 0.25 = 0.5 Tn. (Tn is motor rated torque. In is motor rated current.)

**Conventional electronic starting**

To rectify problems caused by:
- Mechanical stress when starting
- Hydraulic transients during acceleration and deceleration in pump applications

Conventional electronic starting requires the use of several current limits or the switching of several voltage ramps. The settings become complicated and must be modified every time the load changes.

**Starting with the Altistart 48**

The Altistart 48 soft starter's torque control enables:
- Starting without mechanical stress
- Smooth control of hydraulic transients with a single acceleration ramp
- Simple and effective settings, whatever the load.
Introduction

The Enclosed Altistart 48 is a soft starter designed for asynchronous motors, featuring smooth starting and stopping functions. It comes with a patented Torque Control System (TCS) that ensures linear acceleration and deceleration, independent of motor load. The device is pre-engineered and designed to handle various applications, from 3 HP to 600 HP at 600 V. The Altistart 48 offers protection against motor overload, phase failure, and overheating, ensuring reliable performance.

Applications

The Enclosed Altistart 48 is ideal for a wide range of applications, including:
- Pumps
- Conveyors
- Fans & high inertia machines
- Compressors

Benefits of the Enclosed Altistart 48

- Reduces torque during starting
- Reduced current peaks on the supply during starting
- Smooth acceleration and deceleration
- Advanced protection
- Service entrance rating
- SoMove setup software

Product

The Enclosed Altistart 48 is available in different enclosure types and is designed for use on emergency/standby generators, ensuring reliable performance even in critical applications. It can be customized to meet specific requirements, providing a cost-effective solution for motor control.
Introduction

The Altistart 48 Enclosed Soft Starter Controller packages the advanced functionality of the Altistart 48 soft start - soft stop unit and a disconnect means in a Type 1, Type 12, or Type 3R stand-alone enclosure. It is a state-of-the-art, integrated solution for soft starting and soft stopping of standard three-phase asynchronous induction motors from 3 HP to 600 HP at 600 V. This industry-leading package greatly improves your machine's performance and reliability while cutting installation costs.

The Altistart 48 soft starter enclosed in this offer features many strong motor starting and stopping functions. The patented Torque Control System (TCS) provides linear starting and stopping control independent of motor load. This feature of the Altistart 48 controls the applied motor torque, making it ideal for a wider variety of applications than a traditional voltage ramp soft start with current limit. More information on the functionalities of the Altistart 48 device enclosed in this offer can be found beginning on page 4 of this catalog.

The Enclosed Altistart 48 is rated for normal and heavy duty applications. It is available with a fusible disconnect (Class 6838) or with a circuit breaker (Class 8639). The device software is factory configured to match the power and control options purchased with the enclosed controller for simple set-up.

Applications

The Enclosed Altistart 48 offers soft starting and deceleration functions, machine and motor protection functions, and functions for communicating with control systems. These functions are designed for use in the following normal or heavy duty applications in the buildings, food and beverage, and chemical industries:

<table>
<thead>
<tr>
<th>Application type</th>
<th>Functions performed by the Altistart 48</th>
</tr>
</thead>
</table>
| Pumps: Normal duty | - Better control of hydraulic transients
- Gradual pressurization of fluid in lines
- Reduction of pressure surges and valve surges (in presence of line supply)
- Elimination of damage to filters or spouts (irrigation) and premature wear of lines, etc.
- Less stress on pipes with the reduction of pressure-over pressure phenomena
- Independent adjustment of the load conditions
- Protection against underload (running dry), loss or inversion of phases and in the event of a locked motor
- Automatic switching of the motor to freewheel mode on stopping, when the flow rate of the pump drops to a low level, to prevent overheating. |
| Conveyors: Normal duty | - Gradual starting, reducing shocks and slipping of belts
- Overload control to detect faults, hard spots or jamming, or underload control to detect breaks |
| Fans & high inertia machines: Normal or Heavy duty (>30 A) | - Smooth starting, preventing stress on the drive chain and slipping of belts
- “Smoke extraction” function
- Limitation of current and voltage drops on starting
- Catching on the fly of a fan rotating in reverse
- Detection of overload caused by clogging or underload (broken fan motor transmission)
- Braking torque on stopping |
| Compressors: Normal or Heavy duty (>30 A) | - Elimination of slipping of belts
- Reduction of current peaks
- Protection over for special motors
- Detection of inversion of direction of rotation of phases
- Contact for automatic emptying on stopping |

Benefits of the Enclosed Altistart 48

- **Reduced torque during starting**
  - Prevents damage to material in process
  - Increases the life of your machine and reduces downtime
- **Reduced current peaks on the supply during starting**
  - Lower's plant capacity requirements
  - Reduces voltage sag on installations with limited capacity
  - Eliminates detrimental effects on other equipment driven from a weak supply
- **Smooth acceleration and deceleration independent of changes in motor load**
  - Ideal for most fans, centrifugal pumps, or other variable-torque loads
  - Can eliminate water hammer and check valve slamming even on difficult pumping applications
- **Advanced protection for the motor and the installation**
  - Selectable overload protection classes, overload pre-alarm, phase loss and reversal protection, stall protection during starting, protection from material jams while running, and underload detection
- **Service entrance rating**
  - Provides a factory-installed ground neutral assembly with ground wire and label for use as service entrance rated equipment
- **SoMove setup software**
  - Use the user-friendly SoMove setup software to easily configure, set-up, and maintain the Altistart 48
Altistart 48 soft starters for asynchronous motors

Introduction

Enclosed Altistart 48 soft starters for asynchronous motors

Specifications

Environmental specifications

Degree of protection
- Type 1: Indoor use primarily to provide a degree of protection against limited amounts of falling dirt.
- Type 12: Indoor use primarily to provide a degree of protection against circulating dust, falling dirt, and dripping noncorrosive liquids.
- Type 3R: Outdoor use primarily to provide a degree of protection against rain, sleet, and damage from ice formation.
- Enclosures are painted ANSI #49

Conformity to standards
UL listed per UL508; CSA Certified per CSA 22.2 No. 14
Immunity to radioelectrical interference: conforms to IEC 61000-4-3 Level 3.
Operational test vibration: Conforms to IEC 60068-2-6, 1.5 mm peak from 2 to 13 Hz, 1 gn from 13 to 200 Hz
Seismic qualification: Available as an optional feature (MOD Y10). Provides a qualification label and hardware qualified to seismic rating per ICC ES AC156 for compliance to the seismic provisions of the International Building Code and ASCE 7.
Transit test to shock: Conforms to the National Safe Transit Association and International Safe Transit Association test for packages weighing 100 lbs and over.

Ambient air temperature
- Operation: Ambient conditions in installed area from 32 to 104 °F (0 to 40 °C) Type 1 and 12; 32 to 122 °F (0 to 50 °C) Type 3R
- Storage: -13 to 158 °F (-25 to +70 °C)

Maximum ambient pollution: Conforms to IEC 60664-1, Pollution Degree 3

Maximum relative humidity: 95% without condensation or dripping water conforming to IEC 60068-2-78

Maximum operating altitude: 1000 m (3280 ft.), derate by 2.2% for each additional 100 m (328 ft) up to 3000 m (9842 ft) maximum.

Electrical specifications

3-phase Supply Voltage
- 208 Vac ± 10%
- 230 Vac ± 10%
- 460 Vac ± 15%
- 575 Vac ± 10%

Control Voltage
- 115 Vac [Control Power Transformer (CPT) included as standard]
- 24 Vac ± 10%
- 480 Vac ± 10%
- 575 Vac ± 10%

Frequency
- 50/60 Hz ± 5%

Rated Current
- 17 A to 1200 A

Motor Power
- 3 to 600 hp

Motor Voltage
- 208, 220, 230, 440, 480, 575, 600 Vac

Starting Duty (Standard Duty)
- Starting at 400% of In for 23 s, or 300% of In for 46 s, from a cold state
- Starting at 100% of In for 12 s, or 200% of In for 23 s, with a load factor of 50% and 10 starts per hour or an equivalent thermal cycling

(1) In is the controller full load current listed on the nameplate.

Product (continued)

Product features
Starting and Stopping
- Four types of starting:
  - Torque control system (TCS) soft starting - adjustable from 1 to 60 seconds
  - TCS with boost - adjustable from 50 to 100% of main voltage
  - Current limit - adjustable from 150 to 500% of controller rating
  - Voltage ramping
- Three types of stopping:
  - Freewheel or coast to stop
  - TCS soft stop - adjustable from 1 to 60 seconds
  - InTele™ braking - adjustable from 50 to 100%

Protection
- Motor thermal overload, motor phase loss and soft starter thermal protection
- Line supply failure, over-current fault, and locked rotor fault protection
- Line frequency outside limits of ±5% or ±20%
- EGSA compliance with Class 3 application (drop operation) generators
- Seismic qualified (floor mount configurations) to the International Code Council Evaluation Service (ICC ES)
- Protection options:
  - Phase reversal
  - Stall and jam
  - Thermal overload pre-alarm
  - Current threshold alarm
  - Under-load fault detection

Monitoring and indication
- Door-mounted keypad
  - Displays setup parameters and fault codes for the previous five fault events
  - Real-time indication via the digital keypad
  - Motor current
  - Load torque
  - Motor thermal starter
  - Power factor
  - Detected fault status
- Three logic outputs
  - Motor thermal overload or indication of motor current present
  - Current threshold alarm
  - Motor under-load alarm

Decelerated stop by torque control during time (dEC) with threshold (EdC) for changing to freewheel stop mode: EdC = 40% of nominal motor torque
Altistart 48 with Torque Control System™

**Product (continued)**

**Product features:**
- Starting and Stopping
  - Torque control system (TCS) soft starting - adjustable from 1 to 60 seconds
  - TCS with boost - adjustable from 50 to 100% of main voltage
  - Current limit - adjustable from 150 to 500% of controller rating
  - Voltage ramping
- Three types of stopping:
  - Freewheel or coast to stop
  - TCS soft stop - adjustable from 1 to 60 seconds
  - InTele™ braking - adjustable from 50 to 100%

**Protection**
- Motor thermal overload, motor phase loss and soft starter thermal protection
- Line supply failure, over-current fault, and locked rotor fault protection
- EGSA compliance with Class 3 application (drop operation) generators
- Seismic qualified (floor mount configurations) to the International Code Council Evaluation Service (ICC ES)

**Protection options:**
- Phase reversal
- Stall and jam
- Thermal overload pre-alarm
- Current threshold alarm
- Under-load fault detection

**Monitoring and indication**
- Door-mounted keypad:
  - Displays setup parameters and fault codes for the previous five fault events
  - Real-time indication via the digital keypad
  - Motor current
  - Load torque
  - Motor thermal starter
  - Power factor
  - Detected fault status
- Three logic outputs:
  - Motor thermal overload or indication of motor current present
  - Current threshold alarm
  - Motor under-load alarm

**Environmental specifications**

- **Degree of protection**
  - Type 1: Indoor use primarily to provide a degree of protection against limited amounts of falling dirt.
  - Type 12: Indoor use primarily to provide a degree of protection against circulating dust, falling dirt, and dripping noncorrosive liquids.
  - Type 3R: Outdoor use primarily to provide a degree of protection against rain, sleet, and damage from ice formation.
- **Conformity to standards**
  - UL listed per UL508; CSA Certified per CSA 22.2 No. 14
  - Conforms to IEC 60069-2-6, IEC 60069-1, and IEC 62271-100
- **Operational test vibration**
  - Conforms to IEC 60069-2-6, IEC 60069-1, and IEC 62271-100
- **Seismic qualification**
  - Available as an optional feature (MOD Y10). Provides a qualification label and hardware qualified to seismic rating per ICC ES AC156 for compliance to the seismic provisions of the International Building Code and ASCE 7.
- **Transit test to shock**
  - Conforms to the National Safe Transit Association and International Safe Transit Association test for packages weighing 100 lbs and over.

**Electrical specifications**

- **3-phase Supply Voltage**
  - 208 Vac ± 10%
  - 230 Vac ± 15%
  - 460 Vac ± 15%
  - 575 Vac ± 10%
- **Control Voltage**
  - 115 Vac [Control Power Transformer (CPT) included as standard]
- **Frequency**
  - 50/60 Hz ± 5%
- **Rated Current**
  - 17 A to 1200 A
- **Motor Voltage**
  - 4 to 500 hp
- **Motor/ Voltage**
  - 208, 220, 240, 460, 575, 600 V
- **Starting Duty (Standard Duty)**
  - Starting at 400% of In for 23 s, or 300% of In for 46 s from a cold start
  - Starting at 400% of In for 12 s, or 300% of In for 23 s, with a load factor of 50% and 10 starts per hour or an equivalent thermal cycling

*(TCS) or the controller full load current based on the nameplate*
Enclosed Altistart 48 Specifications

Operation specifications

Methods of Starting

- Torque Ramp: Adjustable from 1 to 60 s by keypad
- Current Limitation: Adjustable from 150% to 500% of controller rated current (In) by keypad
- Booster Startup Pulse: Full voltage starting for 5 cycles of 50 to 100% mains voltage, selectable by keypad

Methods of Stopping

- Freewheel: Used to stop on stop command
- Torque Deceleration Ramp: Adjustable from 1 to 60 s by keypad
- InTel Braking: Selectable by keypad

Status and Diagnostics:
- Digital display of motor and controller status, including:
  - Ready/Non-Detected Fault
  - Motor Current
  - Motor Torque
  - Motor Thermal State
  - Power Factor

Protection specifications

Motor
- Thermal Overload: With Full Voltage Bypass: A bimetallic or solid state Class 20 (MOD A10) overload relay is integral to the ATS48 soft starters. Without Full Voltage Bypass: A solid state thermal overload is integral to the ATS48 soft starter. Overload class is selectable as 10, 20, or 30 via keypad. Range is 50% to 150% of ATS48 soft starter rated current.
- Shunt-Trip Disconnect: Removes all power from the controller cabinet when the Altistart 48 detects a fault condition.
- Isolation Contactor: Removes supply power from the Silicon Control Rectifier (SCR) power circuit and motor when the motor is not running or when the Altistart 48 detects a fault condition.
- Overcurrent Protection: A current limiting protection device (OLP) provides Type 1 coordination to the short-circuit current withstand ratings.
- Shorting Contactor: A shorting contactor reduces temperature rise within the enclosure by eliminating the extra loss of the SCRs. Control of the contactor allows all forms of stopping.
- Thermal Switch: Controllers rated for 72 A and greater have 2 thermal switches, one controls the fan, the other helps protect against overheating.

Short circuit current ratings

<table>
<thead>
<tr>
<th>Enclosure Size</th>
<th>Horsepower Rating</th>
<th>IEEE830 Flexible Disconnect</th>
<th>IEEE830 Circuit Breaker</th>
</tr>
</thead>
<tbody>
<tr>
<td>A-C</td>
<td>208 V</td>
<td>230 V</td>
<td>460 V</td>
</tr>
<tr>
<td></td>
<td>3-50</td>
<td>140</td>
<td>15-125</td>
</tr>
<tr>
<td>D</td>
<td>60-100</td>
<td>75-125</td>
<td>150-250</td>
</tr>
<tr>
<td>E</td>
<td>125-200</td>
<td>150-250</td>
<td>300-500</td>
</tr>
<tr>
<td></td>
<td>85K</td>
<td>65K</td>
<td>75K</td>
</tr>
</tbody>
</table>

(1) 150K is only available when option 610 is selected. See page 51.

Enclosed Altistart 48 Selection criteria

**Altistart 48**

**Methods of Starting**

- Torque Characteristic

Asynchronous motor

Ts1: Across the line starting torque
Ts: Across the line starting current

Altistart 48:

- Total torque range available with an Altistart 48, which is dependent on the current limit (Ts1) setting.

Load

- Tr: Resitive torque must always be less than the Ts1 torque.
- or the motor will not start

**Selection Criteria**

In addition to the chosen application, the choice of starter will depend on the following main criteria:

- **AC mains voltage supply:** - Three-phase AC voltage: 208, 240, 480, or 600V
- **Power and nominal current (In) indicated on the motor name plate**
- **Duty cycle**
- **Starting current capacity**

Whether an application is a standard duty or severe duty application determines the limiting values of the current and the duty cycle ratings.

- **Duty cycle**
  - S1 motor duty: Duty cycle of starting followed by operation at constant load enabling the thermal stability to be reached.
  - S4 motor duty: Duty cycle of starting, operation at constant load, and an idle period

This cycle is characterized by a load factor:

- In standard duty applications, the ATS48 soft starter is designed to provide:
  - S1 motor duty:
    - Starting at 4 in for 23 seconds with a cold motor
    - Starting at 3 in for 46 seconds with a cold motor
  - S4 motor duty (with a load factor of 50% and 10 starts per hour):
    - Starting at 4 in for 12 seconds
    - Starting at 3 in for 23 seconds
    - or an equivalent thermal cycle

The motor thermal protection conforms to Class 30, Class 25, Class 20 (severe duty application), Class 10, and sub-class 2 motor thermal overload protection (see page 10).

- **Starting current capacity - Standard duty**
- In severe duty applications, the ATS48 soft starter is designed to provide:
  - S1 motor duty:
    - Starting at 4 in for 46 seconds with a cold motor
    - Starting at 3 in for 90 seconds with a cold motor
  - S4 motor duty (with a load factor of 50% and 5 starts per hour):
    - Starting at 4 in for 23 seconds
    - or an equivalent thermal cycle

The motor thermal protection conforms to Class 30, Class 25, Class 20 (severe duty application), Class 10, and sub-class 2 motor thermal overload protection (see page 10).

- **Selection of the Soft Starter**
  - First, identify the application type and corresponding starting current on page 48.
  - Once the application type has been identified, begin building your unique part number using the information presented on pages 48-51, according to your supply voltage and the motor power requirements.
Altistart 48
soft starters for
asynchronous motors

Operation specifications

Methods of Starting

<table>
<thead>
<tr>
<th>Torque Ramp</th>
<th>Adjustable from 1:1 to 60:1 by keypad</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current Limitation</td>
<td>Adjustable from 150% to 500% of controller rated current (Itr) by keypad</td>
</tr>
<tr>
<td>Booster Startup Pulse</td>
<td>Full voltage starting for 5 cycles of 50 to 500% mains voltage, selectable by keypad</td>
</tr>
</tbody>
</table>

Methods of Stopping

<table>
<thead>
<tr>
<th>Freewheel</th>
<th>Used to stop on stop command</th>
</tr>
</thead>
<tbody>
<tr>
<td>Torque Deceleration Ramp</td>
<td>Adjustable from 1:1 to 60:1 by keypad</td>
</tr>
<tr>
<td>In/Tele Braking</td>
<td>Selectable by keypad</td>
</tr>
</tbody>
</table>

Status and Diagnostics:

- Digital display of motor and controller status, including:
  - Ready/NotReady/Ready/Detected Fault
  - Motor Current
  - Motor Torque
  - Motor Thermal State
  - Power Factor

Protection specifications

Motor

- Thermal Overload
  - With Full Voltage Bypass: A bimetallic or solid state Class 20 (Moog-A120) overload relay is integral to the ATS48 soft starters.
  - Without Full Voltage Bypass: A solid state thermal overload is integral to the ATS48 soft starter. Overload class is selectable as 10, 20, or 30 via keypad. Range is 50% to 100% of ATS48 soft starter current.
- Shunt-Trip Disconnect
  - Removes all power from the controller cabinet when the Altistart 48 detects a fault condition.
- Isolation Contactor
  - Removes supply power from the Silicon Control Rectifier (SCR) power circuit and motor when the motor is not running or when the Altistart 48 detects a fault condition.
- Controller
  - Overcurrent Protection
    - An overcurrent protection device (OPD) provides Type 1 coordination to the short-circuit current withstand ratings.
  - Shunting Contactor
    - A standard shunting contactor reduces temperature rise within the enclosure by eliminating the watts loss of the SCRs.
    - Control of the contactor allows all forms of stopping.
  - Thermal Switch
    - Controls rated for 17-62 A have one thermal switch to help protect against overheating.
    - Controllers rated 72 A and greater have 2 thermal switches, one controls the fast, the other helps protect against overheating.

Short circuit current ratings

<table>
<thead>
<tr>
<th>Enclosure</th>
<th>Horsepower Rating</th>
<th>IEC36 Flexible Disconnect</th>
<th>IEC36 Circuit Breaker</th>
</tr>
</thead>
<tbody>
<tr>
<td>A-C</td>
<td>208 V</td>
<td>220 V</td>
<td>375 V</td>
</tr>
<tr>
<td></td>
<td>3-50</td>
<td>50:1</td>
<td>125:150</td>
</tr>
<tr>
<td>D</td>
<td>60-100</td>
<td>75-125</td>
<td>150-250</td>
</tr>
<tr>
<td>E</td>
<td>125-200</td>
<td>160-250</td>
<td>300-500</td>
</tr>
</tbody>
</table>

(1) 100K is only available when option 610 is selected. See page 51.

Altistart 48
soft starters for
asynchronous motors

Selection criteria

In addition to the chosen application, the choice of starter will depend on the following main criteria:

- AC mains voltage supply:
  - Three-phase AC voltage: 208, 240, 480, or 600V
  - Power and nominal current (In) indicated on the motor name plate
- Duty cycle
- Starting current capacity

Whether an application is a standard duty or severe duty application determines the limiting values of the current and the duty cycle ratings.

- Duty cycle
  - S1 motor duty: Duty cycle of starting followed by operation at constant load enabling the thermal stability to be reached.
  - S4 motor duty: Duty cycle of starting, operation at constant load, and an idle period

Methods of Starting

First, identify the application type and corresponding starting current on page 48. Once the application type has been identified, begin building your unique part number using the information presented on pages 48-51, according to your supply voltage and the motor power requirements.
## Altistart 48
### soft starters for asynchronous motors

**Selection criteria**

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

### Standard Applications

<table>
<thead>
<tr>
<th>Type of machine</th>
<th>Functions performed by the ATS48</th>
</tr>
</thead>
<tbody>
<tr>
<td>Centrifugal pump</td>
<td>Deceleration (reduction in pressure surges) Protection against underloads or inversion of the phase rotation direction</td>
</tr>
<tr>
<td>Piston pump</td>
<td>Control of turning dry and direction of rotation of the pump</td>
</tr>
<tr>
<td>Screw compressor</td>
<td>Protection against inversion of direction of phase rotation Contact for automatic draining on stopping</td>
</tr>
<tr>
<td>Piston compressor</td>
<td>Protection against inversion of direction of phase rotation</td>
</tr>
<tr>
<td>Screw compressor</td>
<td>Protection against inversion of direction of phase rotation Contact for automatic draining on stopping</td>
</tr>
<tr>
<td>Compressor</td>
<td>Overload control for detecting faults or underload control for detecting breaks</td>
</tr>
<tr>
<td>Lifting screw</td>
<td>Overload control for detecting hard spots or underload control for detecting breaks</td>
</tr>
<tr>
<td>Drag lift</td>
<td>Overload control for detecting jamming or underload control for detecting breaks</td>
</tr>
<tr>
<td>Lift</td>
<td>Overload control for detecting jamming or underload control for detecting breaks</td>
</tr>
<tr>
<td>Agitator</td>
<td>The current display indicates the density of the product</td>
</tr>
<tr>
<td>Mixer</td>
<td>The current display indicates the density of the product</td>
</tr>
<tr>
<td>Refiner</td>
<td>Torque control on starting and stopping</td>
</tr>
</tbody>
</table>

### Standard/Severe Applications

<table>
<thead>
<tr>
<th>Type of machine</th>
<th>Functions performed by the ATS48</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fan</td>
<td>Detection of overloads caused by clogging or underloads (motor fan/24V or oil)</td>
</tr>
<tr>
<td>Centrifugal pump</td>
<td>Protection against inversion of direction of phase rotation</td>
</tr>
<tr>
<td>Circular saw, band saw</td>
<td>Braking for fast stop</td>
</tr>
</tbody>
</table>

### Severe Applications

<table>
<thead>
<tr>
<th>Type of machine</th>
<th>Functions performed by the ATS48</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pulper, butchery knife</td>
<td>Torque control on starting</td>
</tr>
<tr>
<td>Grinder</td>
<td>Braking to limit vibrations during stopping, overload control to detect jamming</td>
</tr>
<tr>
<td>Crusher</td>
<td>Braking to limit vibrations during stopping, overload control to detect jamming</td>
</tr>
<tr>
<td>Press</td>
<td>Braking to increase the number of cycles</td>
</tr>
</tbody>
</table>

## Special uses

Contact Seneca Enclosed Drives TAG for additional application information and pricing for those applications requiring:
- Two-speed or delta-wye motors. The ATS48 soft starter can operate with a 2-speed motor. A motor demagnetizing period must elapse before changing from low speed to high speed in order to avoid anti-phase between the line supply and the motor, which would generate very high currents.
- Motors other than NEMA® Design B
- High efficiency motors
- Low slip motors
- Power factor correction capacitors. Do not connect power factor correction capacitors to the terminals of a motor controlled by an ATS48 soft starter. The power factor capacitors must be controlled and connected to a line side contactor sequenced by the ATS48 at and of starting.
- Controller oversizing of more than 50%
- Non-standard trip characteristics
- Modifications not listed in this pricing guide
- Horsepower greater than those listed in this pricing guide
- Long motor cable lengths. Very long motor cables cause voltage drops due to the resistance of the cable. If the voltage drop is significant, it could affect the current consumption and the torque available. This criterion must be taken into account when selecting the motor and the starter.
- Miscellaneous application precautions. Do not use the ATS48 controller upstream of loads other than motors (i.e., transformers and resistance type loads).
Altistart 48
soft starters for asynchronous motors

Selection criteria

Enclosed Altistart 48
soft starters for asynchronous motors

Selection criteria

Application types

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

<table>
<thead>
<tr>
<th>Type of machine</th>
<th>Functions performed by the ATS48</th>
<th>Starting current (%ln)</th>
<th>Starting time (s)</th>
</tr>
</thead>
</table>
| Centrifugal pump |● Deceleration (reduction in pressure surges)  
● Protection against underloads or inversion of the phase rotation direction | 300 | 5 to 15 |
| Piston pump |● Control of starting dry and direction of rotation of the pump | 350 | 5 to 10 |
| Screw compressor |● Protection against inversion of direction of phase rotation  
● Contact for automatic draining on stopping | 300 | 5 to 10 |
| Screw compressor |● Protection against inversion of direction of phase rotation  
● Contact for automatic emptying on stopping | 300 | 3 to 20 |
| Piston compressor |● Protection against inversion of direction of phase rotation  
● Contact for automatic emptying on stopping | 350 | 5 to 10 |
| Piston compressor |● Protection against inversion of direction of phase rotation  
● Contact for automatic emptying on stopping | 300 | 3 to 10 |
| Piston compressor |● Overload control for detecting faults or underload control for detecting breaks  
● Contact for automatic draining on stopping | 300 | 3 to 10 |
| Piston compressor |● Overload control for detecting hard spots or underload control for detecting breaks | 400 | 2 to 10 |
| Lift |● Overload control for detecting jamming or underload control for detecting breaks | 350 | 5 to 10 |
| Drag lift |● Overload control for detecting jamming or underload control for detecting breaks | 300 | 5 to 10 |
| Circular saw, band saw |● Braking for fast stop | 300 | 10 to 60 |
| Pulper, butchery knife |● Torque control on starting and stopping | 400 | 3 to 10 |
| Grinder |● Braking to limit vibrations during stopping, overheated  
● Control to detect jamming | 450 | 5 to 60 |
| Crusher |● Braking to limit vibrations during stopping, overheated  
● Control to detect jamming | 450 | 10 to 40 |
| Press |● Braking to increase the number of cycles | 450 | 20 to 60 |

Standard Applications

<table>
<thead>
<tr>
<th>Type of machine</th>
<th>Functions performed by the ATS48</th>
<th>Starting current (%ln)</th>
<th>Starting time (s)</th>
</tr>
</thead>
</table>
| Fan |● Detection of overloads caused by clogging or underloads (motor fan transmission broken)  
● Braking torque on stopping | 300 | 10 to 40 |
| Centrifugal compressor |● Protection against inversion of direction of phase rotation  
● Contact for automatic emptying on stopping | 350 | 10 to 40 |
| Circular saw, band saw |● Braking for fast stop | 300 | 10 to 60 |

Standard/Severe Applications

<table>
<thead>
<tr>
<th>Type of machine</th>
<th>Functions performed by the ATS48</th>
<th>Starting current (%ln)</th>
<th>Starting time (s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pulper, butchery knife</td>
<td>● Torque control on starting</td>
<td>400</td>
<td>3 to 10</td>
</tr>
</tbody>
</table>
| Grinder |● Braking to limit vibrations during stopping, overheated  
● Control to detect jamming | 450 | 5 to 60 |
| Crusher |● Braking to limit vibrations during stopping, overheated  
● Control to detect jamming | 450 | 10 to 40 |
| Press |● Braking to increase the number of cycles | 450 | 20 to 60 |

Severe Applications

Special uses

Contact Seneca Enclosed Drives TAG for additional application information and pricing for those applications requiring:

- Two-speed or delta-wye motors. The ATS48 soft starter can operate with a 2-speed motor. A motor demagnetizing period must elapse before changing from low speed to high speed in order to avoid anti-phase between the line supply and the motor, which would generate very high currents.
- Motors other than NEMA® Design B
- High efficiency motors
- Low slip motors
- Power factor correction capacitors. Do not connect power factor correction capacitors to the terminals of a motor controlled by an ATS48 soft starter. The power factor capacitors must be controlled and connected to a line side contactor sequenced by the ATS48 at end of starting.
- Controller oversizing of more than 50%
- Non-standard trip characteristics
- Modifications not listed in this pricing guide
- Horsepower greater than those listed in this pricing guide
- Long motor cable lengths. Very long motor cables cause voltage drops due to the resistance of the cable. If the voltage drop is significant, it could affect the current consumption and the torque available. This criterion must be taken into account when selecting the motor and the starter.
- Miscellaneous application precautions. Do not use the ATS48 controller upstream of loads other than motors (i.e., transformers and resistance type loads)
Enclosed Altistart 48 Selection table

The following table assists in selecting an Enclosed Altistart 48 controller based on the voltage supply, horsepower rating, and frame size requirements for your specific application. For the complete list of criteria needed to make your selection, navigate to page 46 using the “Selection Criteria” button to the left.

To access detailed CAD drawings of a specific Enclosed Altistart 48 configuration, use the “CAD Drawings” button to the left.

### Enclosed Altistart 48

**Class 8638 and 8639:** Weights & Dimensions

**Motor rating plate**

<table>
<thead>
<tr>
<th>HP</th>
<th>HP</th>
<th>HP</th>
<th>HP</th>
<th>A</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
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<tr>
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</tr>
<tr>
<td>5</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

**Nominal motor current (R):**

<table>
<thead>
<tr>
<th>208 V</th>
<th>230 V</th>
<th>460 V</th>
<th>575 V</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.5</td>
<td>3.0</td>
<td>3.5</td>
<td>4.0</td>
</tr>
<tr>
<td>3.0</td>
<td>3.7</td>
<td>4.2</td>
<td>4.7</td>
</tr>
<tr>
<td>3.5</td>
<td>4.2</td>
<td>4.7</td>
<td>5.3</td>
</tr>
<tr>
<td>4.0</td>
<td>4.7</td>
<td>5.3</td>
<td>6.0</td>
</tr>
<tr>
<td>4.5</td>
<td>5.3</td>
<td>6.0</td>
<td>6.7</td>
</tr>
</tbody>
</table>

**Weight & Dimensions:**

<table>
<thead>
<tr>
<th>Frame size</th>
<th>Power indicator on motor rating plate</th>
<th>Type 1 enclosure</th>
<th>Type 2 enclosure</th>
<th>Type 3R enclosure</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Power Circuit N Non-reversing w/ isolation contactor</td>
<td>Power Circuit R Reversing w/ isolation contactor</td>
<td>Power Circuit S Shunt trip coil w/ molded case</td>
<td>Power Circuit R Reversing w/ isolation contactor</td>
</tr>
<tr>
<td>B</td>
<td>3.43”x 24.69” x 13.08” – 110 lbs.</td>
<td>3.43”x 24.69” x 13.08” – 110 lbs.</td>
<td>3.43”x 24.69” x 13.08” – 110 lbs.</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>45.81” x 94.6” x 94.8” – 125 lbs.</td>
<td>45.81” x 94.6” x 94.8” – 125 lbs.</td>
<td>45.81” x 94.6” x 94.8” – 125 lbs.</td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>62.43” x 18.69” x 13.08” – 200 lbs.</td>
<td>62.43” x 18.69” x 13.08” – 200 lbs.</td>
<td>62.43” x 18.69” x 13.08” – 200 lbs.</td>
<td></td>
</tr>
</tbody>
</table>

**Frame size:**

- A: 208 V
- B: 230 V
- C: 460 V
- D: 575 V

**Power indicated on motor rating plate:**

- HP
- HP
- HP
- HP
- A

**Type of enclosure:**

- Power Circuit N Non-reversing w/ isolation contactor
- Power Circuit R Reversing w/ isolation contactor
- Power Circuit S Shunt trip coil w/ molded case

**Horsepower rating:**

A) 3 hp
B) 5 hp
C) 7.5 hp
D) 10 hp
E) 15 hp
F) 20 hp
G) 25 hp
H) 30 hp

**Stop-Run selector switch:**

- Power Circuit R Reversing w/ isolation contactor
- Power Circuit S Shunt trip coil w/ molded case

**Stop-Run selector switch:**

- Not available on Power Circuit S (Shunt Trip)
- Not available on Power Circuit R (reversing)
- Not available on Power Circuit R (reversing)
- Not available on Power Circuit R (reversing)

**Enclosure type:**

- G = UL Type 1 general purpose
- H = UL Type 12K industrial use, dual/mop light
- J = UL Type 3R outdoor use

**Voltage:**

- 2 = 208 V ac
- 4 = 460 V ac
- 5 = 575 V ac

**Power circuit options:**

- S = Shunt trip coil
- N = Non-reversing with isolation contactor
- R = Reversing with isolation contactor

**Power circuit options:**

- Not available on Power Circuit S (Shunt Trip)
- Not available on Power Circuit R (reversing)
- Not available on Power Circuit R (reversing)
- Not available on Power Circuit R (reversing)

**Controls:**

- A06 = Start/stop pushbuttons
- B06 = Forward, stop, and reverse pushbuttons
- C06 = Hand-off-auto (HOA) selector switch
- D06 = Stop-run selector switch
- E06 = Hand-auto-selector switch, start/stop pushbuttons

**Pilot light cluster #1:**

- Provides a two-position selector switch and start/stop push buttons (3-wire control)

**Pilot light cluster #2:**

- Provides a single-phase ammeter fed from the Altistart 48 analog output. Dial is in percent of device rated current.

**Pilot light cluster #3:**

- Provides a single-phase ammeter fed from the Altistart 48 analog output. Dial is in percent of device rated current.

**Rule:**

- Provides standard red "RUN" and green "OFF" pilot lights. Provides standard red "RUN" and green "OFF" pilot lights for status indication.

**Rule:**

- Consists of red "RUN" and green "OFF" pilot lights. Provides standard red "RUN" and green "OFF" pilot lights for status indication.

**Rule:**

- Consists of red "RUN" (push-to-test) and green "OFF" (push-to-test) pilot lights.

**Rule:**

- Consists of red "RUN" (push-to-test) and green "OFF" (push-to-test) pilot lights.

**Rule:**

- Consists of red "RUN" (push-to-test) and green "OFF" (push-to-test) pilot lights.

**Rule:**

- Consists of red "RUN" (push-to-test) and green "OFF" (push-to-test) pilot lights.

**Rule:**

- Consists of red "RUN" (push-to-test) and green "OFF" (push-to-test) pilot lights.

**Control options:**

- A05 = Start/stop push buttons
- B05 = Forward-stop-reverse selector switch
- C05 = Hand-off-auto selector switch
- D05 = Stop-run selector switch
- E05 = Hand-auto-selector switch and start/stop push buttons

**Monitor display options:**

- A08 = Modbus™
- C09 = Ethernet TCP/IP
- D09 = DeviceNet™
- E09 = Ethernet PC

**Miscellaneous options:**

- *The complete list of Miscellaneous options is located on pages 50 & 51.*
## Enclosed Altistart 48

### Selection Table

The following table assists in selecting an Enclosed Altistart 48 controller based on the voltage supply, horsepower rating, and frame size requirements for your specific application. For the complete list of criteria needed to make your selection, navigate to page 45 using the “Selecting Criteria” button to the left.

To access detailed CAD drawings of a specific Enclosed Altistart 48 configuration, use the "CAD Drawings" button to the left.

### Enclosed Altistart 48

#### Enclosed Altistart 48  Selection table

<table>
<thead>
<tr>
<th>Frame size</th>
<th>208 V</th>
<th>230 V</th>
<th>460 V</th>
<th>575 V</th>
<th>Type 1 enclosure</th>
<th>Power Circuit R Non-reversing / isolation contactor</th>
<th>Power Circuit S Non-reversing / molded case</th>
<th>Power Circuit R Reversing / isolation contactor</th>
<th>Power Circuit S Reversing / molded case</th>
<th>Power Circuit S Reversing / trip coil</th>
<th>Power Circuit R Reversing / trip coil</th>
</tr>
</thead>
<tbody>
<tr>
<td>HP HP HP HP A</td>
<td>34.69x</td>
<td>24.69x</td>
<td>30.00x</td>
<td>30.00x</td>
<td>34.69x</td>
<td>24.69x</td>
<td>30.00x</td>
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<td>24.69x</td>
<td>30.00x</td>
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</tbody>
</table>

#### Enclosed Altistart 48  Options

<table>
<thead>
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<th>Controller class</th>
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<th>C</th>
<th>G</th>
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<th>A07</th>
<th>B08</th>
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</tr>
</tbody>
</table>

### Altistart 48

#### soft starters for asynchronous motors

- **Selection table**
- **Options**

### Pilot light cluster options

- **Pilot light cluster #1**
  - Provides a seven-digit analog, non-resettable elapsed run time meter. Provides standard non-resettable elapsed run time meter.
  - Rule: Not available with Power Circuit R (reversing)

- **Pilot light cluster #2**
  - Consists of red "RUN" and green "OFF" pilot lights. Provides standard red "RUN" and green "OFF" pilot lights for status indication.
  - Rule: Not available with Power Circuit S (Shunt Trip)

- **Pilot light cluster #3**
  - Consists of red "RUN" and green "FAULT" pilot lights. Provides standard red "RUN" and green "FAULT" pilot lights for status indication.
  - Rule: Not available with Power Circuit S (Shunt Trip)

### Control options

- **A05**
  - Start/Stop push buttons
  - Provides black start and red stop push buttons (2-wire control scheme).
  - Rule: Not available on Power Circuit R (reversing)

- **B05**
  - Forward-Stop-Reversing selector switch
  - Provides three-position selector switch to select between forward, off, and reverse. Uses 2-wire control.
  - Rule: Available for Power Circuit R (reversing) configurations only

- **C05**
  - Hand-Off-Auto selector switch
  - Provides a two-position selector switch.
  - Rule: Not available on Power Circuit R (reversing)

- **D05**
  - Hand-Auto selector switch and Start/Stop push buttons
  - Provides a two-position selector switch and start/stop push buttons (3-wire control).
  - Rule: Not available on Power Circuit R (reversing)

### Meter display options

- **A08**
  - Provides a seven-digit analog, non-resettable elapsed run time meter.
  - Rule: Not available on Type 3R Enclosures

### Miscellaneous options

- **A09**
  - Provides an additional selector switch.
  - Rule: Not available on Power Circuit R (reversing)
Altistart 48 soft starters for asynchronous motors

6839 48U C G 4 S A06 A07 B08 A09 A10

- 1 2 3 4 5 6 7 8 9 10

Class
- Controller style
6830 = Fused disconnect
6839 = Circuit breaker disconnect

Type
- 1 Controller style
48U = Enclosed Altistart 48 Soft Starter Controller

2 Horsepower rating
A = 3 hp
B = 5 hp
C = 7.5 hp
D = 10 hp
E = 15 hp
F = 20 hp
G = 25 hp
H = 30 hp

Enclosure type
G = UL Type 1 general purpose
A = UL Type 12K industrial use, dust/dirt tight
H = UL Type 3R outdoor use

Power circuit options
S = Shunt trip coil
N = Non-reversing with isolation contactor
R = Reversing with isolation contactor

Control options
A06 = Start/stop pushbuttons
B06 = Forward, stop, and reverse pushbuttons
C06 = Hand-off-auto (HOA) selector switch
D06 = Stop-run selector switch
E06 = Hand-auto selector switch, start/stop pushbuttons

Miscellaneous options
- * The complete list of Miscellaneous options is located on pages 58 & 51.

Communications cards
Factory installed communication features shall be available as a custom engineered option utilizing the RJ45 communications port for control and annunciation of the soft starter in “Inc.” mode.

A09 Modbus™
Provides Modbus communications (native protocol)

C09 Ethernet TCP/IP
Provides Ethernet gateway communications protocol

D09 DeviceNet™
Provides DeviceNet gateway communications protocol

E09 Ethernet IP
Provides Ethernet IP gateway communications protocol

Modular options
- Mod Modbus™
- C09 Ethernet TCP/IP
- D09 DeviceNet™
- E09 Ethernet IP

Miscellaneous options
- Full-voltage bypass (AC5)
- Provides an AC3 duty rated bypass/shunting contactor, normally-closed selector switch, Class 20 bi-metal motor OL relay, door mounted OL reset push-button for across-the-line starting capability.

Rule: Only available for Power Circuit C (Shunt trip) XSV fused fault isolation scheme.

B10 VA additional control VR capacity for customer use

C10 Power-up ON delay (start relay)
Provides an electronic time delay adjustable from 0.1 to 60 seconds. Relay is pre-wired to start current for users to set delay time upon power-up of control

D10 Emergency stop push button
Provides a push-button for immediate removal of power

E10 UL® label
Provides a Canadian Underwriters Laboratories label when required by local code requirements.

F10 Auxiliary contacts for run mode
Provides 1 Form C contact rated 5 A @ 120 Vac (8501 Type R relay or equivalent) wired to terminal blocks for customer use. Contacts change state when soft starter is sending current to the motor. Controlled by the RS relay programmed for “Inc.”

G10 Auxiliary contacts for full-voltage bypass run mode
Provides 1 Form C contact rated 5 A @ 120 Vac (8501 Type R relay or equivalent) wired to terminal blocks for customer use. Contacts change state when soft starter is sending current to the motor. Controlled by the RS relay programmed for “Inc.”

H10 Auxiliary contacts for auto mode
Provides an auxiliary starter mode (auto) contact that will energize a relay with 1 Form C contact rated 5 A @ 120 Vac (8051 Type R relay or equivalent) wired to terminal blocks for customer use.

J10 Auxiliary contacts for detected fault mode
Provides an auxiliary starter mode (auto) contact that will energize a relay with 1 Form C contact rated 5 A @ 120 Vac (8051 Type R relay or equivalent) wired to terminal blocks for customer use.

Mod
- A06 Start/stop pushbuttons
- B06 Forward, stop, and reverse pushbuttons
- C06 Hand-off-auto (HOA) selector switch
- D06 Stop-run selector switch
- E06 Hand-auto selector switch, start/stop pushbuttons

Control options
- Voltage
- A = 575 V ac
- B = 460 V ac
- C = 230 V ac
- D = 208 V ac
- G = 120 V ac

Miscellaneous options (continued)
- 100K circuit breaker rating
- 1.25 2.0 5.0 10.0 15.0 20.0 25.0 30.0 50.0 100.0 300.0 500.0

M10 Spare terminal blocks
Provides up to (10) spare terminal blocks unassembled for customer use. Since Pinless style terminal blocks will be used, extra terminal points will be provided as standard: 20 terminal points are available for standard all control wiring (including any additional customer spare terminal points).

P10 Permanent wire markers
Provides a permanent sleeve type wire marker on control wiring assemblies

Q10 ANSI 951 enclosure paint (custom engineered option)
Provides the option to completely replace enclosure paint scheme to standard ANSI 951 paint instead of ANSI 409 paint.

R10 MOV/Surge arrester (custom engineered option)
Provides supplementary MOV protection using a Class 6671 SDG250 Surge-arrester secondary surge arrester hard-wired and factory mounted.

V10 OSHA® seismic qualification
Provides special labels and documents to comply with the seismic requirements of the California Office of Statewide Planning and Development (OSHPD)

W10 NEMA® style contacts (custom engineered option)
Provides horsepower rated NEMA rated contacts instead of AC3 rated IECidityla® or F-line contacts.

X10 Seismic qualification label
Provides a self-certification identification label with compliance to 2000 IBC, NFPA™, ANSI 951, 1989 UBC, 1997 UBC, 1998 NESC, 1999 NESC, ASCE-7-02 seismic qualification/certification criteria. The label will be uniform for all enclosed products. Enclosures shall contain additional printing as defined by the seismic qualification/certification criteria.

Rule: Not available for Enclosures Sizes A-C (wall mounted enclosures)

Service Entrance Rating
Provides a UL1059 approved inmoulded ground neutral lug assembly, mounting bracket with bonded enclosure ground wire suitable for use as service entrance equipment.

Rule: Service Entrance Rating is only available for Type 4X enclosure and is not available with the Model E10 (UL Label).

10k circuit breaker rating
Provides a UL1059 approved inmoulded ground neutral lug assembly, mounting bracket with bonded enclosure ground wire suitable for use as service entrance equipment.

Rule: Service Entrance Rating is only available for Type 4X enclosure and is not available with the Model E10 (UL Label).

510 Dual motor overload and branch circuit protection (voltage sensitive identified option)
Provides extended range high ambient equipment rating above 104 °F (40 °C) to 122 °F (50 °C) without de-rating.

Rule: Valid on available Class 8639 circuit breaker disconnect configurations only.

Emergency stop mounted keypad display
Removes the keypad display from outside the enclosure door. The keypad on the Altistart 48 can be used for programming and communication.

Neutral door mounted keypad display
Removes the keypad display from outside the enclosure door. The keypad on the Altistart 48 can be used for programming and communication.

OSHPD seismic qualification
Provides special labels and documents to comply with the seismic requirements of the California Office of Statewide Planning and Development (OSHPD)

NEMA® style contacts (custom engineered option)
Provides horsepower rated NEMA rated contacts instead of AC3 rated IECidityla® or F-line contacts.

OSHPD seismic qualification
Provides special labels and documents to comply with the seismic requirements of the California Office of Statewide Planning and Development (OSHPD)

NEMA® style contacts (custom engineered option)
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Altistart 48
soft starters for
asynchronous motors

8639
48U C G 4 S
A06 A07 B08 A09 A10

Communications cards
Factory installed communication features shall be available as a custom engineered option utilizing the RJ45 communications port for control and annunciation of the soft starter in "Train" mode.

Type
Controller style
48U = Enclosed Altistart 48 Soft Starter Controller

Horsepower rating
A = 3 hp
B = 5 hp
C = 7.5 hp
D = 10 hp
E = 15 hp
F = 20 hp
G = 25 hp
H = 30 hp
R = 200 hp

Enclosure type
G = UL Type 1 general purpose
A = UL Type 12K industrial use, dust-tight top
H = UL Type 3R outdoor use

Voltage
2 = 208 V ac
A = 460 V ac
C = 230 V ac
S = 575 V ac

Power circuit options
S = Short trip coil
N = Non-reversing with isolation contactor
R = Reversing with isolation contactor

Mod
A06 = Start/stop pushbuttons
B06 = Forward, stop, and reverse pushbuttons
C06 = Hand-off-auto (HOA) selector switch
D06 = Stop-run selector switch
E06 = Hand-auto selector switch; start/stop pushbuttons

Mod A10
"UL" label
Provides a Canadian Underwriters Laboratories label when required by local code requirements.

Auxiliary contacts for run mode
F10 = Provides 1 Form C contact rated 5 A @ 120 Vac (8620 Type R relay or equivalent) wired to terminal blocks for customer use. Contacts change state when soft starter is sending current to the motor. Controlled by the RS relay programmed for "on".

Auxiliary contacts for full voltage bypass run mode
G10 = Provides 1 Form C contact rated 5 A @ 120 Vac (8620 Type R relay or equivalent) wired to terminal blocks for customer use. Contacts change state when soft starter is sending current to the motor. Controlled by the RS relay programmed for "on".

Service Entrance Rating
X10 = Provides extended range high ambient equipment rating above 104 °F (40 °C) (equivalent to Class "C" without derating).

M10 = Provides up to (10) spare terminal blocks; unassembled for customer use. Spare style terminal blocks will be used, extra terminal points will be provided as standard: 20 terminal points are available for standard all control wiring (including any additional customer spare terminal points).

P10 = Provides the complete list of Miscellaneous options is located on pages 50 & 51.
Quality Assurance Procedures

This document provides information regarding the quality assurance processes and procedures that are in place for the manufacturing of Altistart 48 (ATS48) soft-start/soft-stop units. Schneider Electric utilizes quality assurance processes and procedures to verify the integrity of components and the assembly process. This document provides a summary of these processes and procedures.

Outline of Test Process and Procedures

Data is gathered on each unit and tracked via the unique serial number of each unit. Test during production validates all electrical and software parameters. Final verification sample testing is conducted at various points in the manufacturing process for each soft starter. Test sampling size is 1 commercial reference per size per week.

In addition to the processes and procedures detailed above, the ISO certified manufacturing facility test stations have instructions for visual quality checks and electrical inspection. The visual quality check list includes a physical inspection for proper connections, proper assembly torques, mechanical integrity and proper documentation.

The quality assurance procedures detailed above are in place for the manufacturing of Altistart 48. These processes are established to monitor and confirm the quality of the product line that has been designed in from the outset.

- Individual unit data tracked by unique serial number
- Electrical parameters
- Software parameters
- Final verification sample testing
- ISO certified visual quality checks
  - Proper connections
  - Proper assembly torques
  - Mechanical integrity
  - Proper documentation

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Altistart 48
soft starters for asynchronous motors

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- Individual unit data tracked by unique serial number
- Electrical parameters
- Software parameters
- Final verification sample testing
- ISO certified visual quality checks
  - Proper connections
  - Proper assembly torques
  - Mechanical integrity
  - Proper documentation

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Solutions for every stage of your equipment’s life cycle

Schneider Electric™ provides services far beyond meeting your immediate needs for application or equipment repair. We take a long-term, holistic approach to determine your facility and operational needs and develop a strategy for improving the performance of your people, systems, and processes.

Schneider Electric provides services from system design and consulting, to maintenance support, modernization of your installation, and project delivery. Schneider Electric provides the people, tools, and processes to help maximize your business’s infrastructure.

Our expertise enables you to cut costs, reduce energy consumption, and keep your systems up and running through routine maintenance, added enhancements, and migrations to new state-of-the-art functionality.

> Start-up and commissioning
Expert installation support to provide assistance in the start-up of your new system. Services include a comprehensive power-up and diagnostic check on system components to minimize risk and optimize operation.

> Technical training
Training offered on-site, off-site, or online for Schneider Electric automation products taught by professional instructors with up-to-date knowledge of our latest hardware and software.

> Remote technical support
Comprehensive online and phone support from experts specially trained on Schneider Electric drive products, helping to reduce downtime and costs and optimize your system’s life cycle.

> On-site technical support
Support service to perform regular maintenance, upgrades, and conversion assistance, installation and troubleshooting, even in emergency situations.

> Preventative maintenance
Maintenance programs to scan for and proactively detect, potential issues or problems with your automation system to help you avoid the costs of unscheduled downtime and short equipment service life. Also serves to extend the life of your installed base by using our services to properly maintain your equipment.

> Industrial repair services
Repair capabilities for over 400,000 part numbers from more than 2,500 manufacturers at our Greensboro, NC repair facility. Repair is available for both Schneider Electric and non-Schneider Electric equipment.

> Spare parts management
Save money and reduce downtime through our parts management program. An on-site assessment is performed to determine parts and inventory levels needed to ensure proper system operation and reduce downtime and inventory costs.

> Migration and modernization
Realize the productivity benefits of the latest Schneider Electric automation technology by using our assessment tools to identify and implement replacement of your legacy automation products, regardless of brand. We make extensive use of existing hardware and wiring for a cost-effective solution with minimal downtime.

> Software renewals
Access the latest software, firmware, and custom options to ensure you always have the latest functionality available to optimize your system’s life cycle.

> Extended warranty
Extend your Schneider Electric standard manufacturer warranty from one year to five years. Protection plans are tailored to your needs reducing costs and out-of-service time.

When it comes to your automation equipment, we can help you

- Increase productivity
- Improve reliability and safety
- Mitigate risk and limit downtime
- Keep equipment up-to-date
- Extend the life of your installed base
- Cut costs and increase savings
- Improve your return on investment

Talk to someone you can trust

The Altivar family of variable speed AC drives and the Altistart family of soft starters presents the most advanced and user-friendly solutions in the marketplace. Featuring proprietary motor control algorithms to achieve optimal reaction times and complete scalability to match your application requirements for speed, size, and protection, the complete line of Altivar and Altistart products provides the flexibility and performance to:

- Meet the needs of a broad range of industries, including HVAC, pump, material handling, hoisting, packaging and many more.
- Reduce your energy costs using proprietary energy-saving technologies available only from Schneider Electric.
- Improve your uptime by simplifying installation, commissioning and maintenance by providing advanced diagnostics, industry-leading voltage ride thru capability and seismic qualified products.

We also work with you to deliver the benefits of a global service and support of a global service and support organization to further increase the value of working with Schneider Electric. Our product specialists, industry experts, distributors, partners, and the countless other members of the Schneider Electric family are dedicated to helping you make the most of your energy everyday. Contact your local sales representative today to learn how Schneider Electric can improve operational performance and help your business to achieve a competitive advantage. Or visit www.schneider-electric.com

> Drive Product Support Group
For support and assistance, contact the Drive Product Support Group. The Drive Product Support Group is staffed from 8:00 am until 6:00 pm Eastern time to assist with product selection, start-up, and diagnosis of product or application problems.

EMERGENCY Technical phone support is available 24 hours a day, 365 days a year.

Toll-Free: 1-888-778-2733
E-mail: drive.products.support@us.schneider-electric.com
Fax: 918-217-6508

> Schneider Electric Service (On-Site)
The Schneider Electric Services division is committed to providing quality on-site service that consistently meets customer expectations. Services respond to your requests, seven days a week, 24 hours a day.

Phone: 1-888-778-2733

> Schneider Electric Customer Training
Schneider Electric offers a variety of instructor-led skill enhancing and technical product training programs for customers. For a complete list of drives/soft starter training with dates, locations, and pricing please call:

Phone: 978-975-9306
Fax: 978-975-2821

> Customer Care Center
(Assist with stock checks, assist with claims, and assist with order management issues)

To provide additional support, Schneider Electric has rolled out new Technical Service Representatives in local offices which have the strongest needs. Due to time zone changes and different time operation requirements business operation times vary.

Phone: 888-778-2733
Fax: 888-329-9773
Solutions for every stage of your equipment’s life cycle

Schneider Electric™ provides services far beyond meeting your immediate needs for application or equipment repair. We take a long-term, holistic approach to determine your facility and operational needs and develop a strategy for improving the performance of your people, systems, and processes.

Schneider Electric provides services from system design and consulting, to maintenance support, modernization of your installation, and project delivery. Schneider Electric provides the people, tools, and processes to help maximize your business’s infrastructure.

Our expertise enables you to cut costs, reduce energy consumption, and keep your systems up and running through routine maintenance, added enhancements, and migrations to new state-of-the-art functionality.

> **Start-up and commissioning**

Expert installation support to provide assistance in the start-up of your new system. Services includes a comprehensive power-up and diagnostic check on system components to minimize risk and optimize operation.

> **Technical training**

Training offered on-site, off-site, or online for Schneider Electric automation products taught by professional instructors with up-to-date knowledge of our latest hardware and software.

> **Remote technical support**

Comprehensive online and phone support from experts specially trained on Schneider Electric drive products, helping to reduce downtime and costs and optimize your system’s life cycle.

> **On-site technical support**

Support service to perform regular maintenance, upgrades, and conversion assistance, small application and programming assistance, on-the-job training, equipment repair, support and troubleshooting, even in emergency situations.

> **Preventative maintenance**

Maintenance programs to scan for and proactively detect, potential issues or problems with your automation system to help you avoid the costs of unscheduled downtime and short equipment service life. Also serves to extend the life of your installed base by using our services to properly maintain your equipment.

> **Industrial repair services**

Repair capabilities for over 400,000 part numbers from more than 2,500 manufacturers at our Greensboro, NC repair facility. Repair is available for both Schneider Electric and non-Schneider Electric equipment.

> **Spare parts management**

Save money and reduce downtime through our parts management program. An on-site assessment is performed to determine parts and inventory levels needed to ensure proper system operation and reduce downtime and inventory costs.

> **Migration and modernization**

Realize the productivity benefits of the latest Schneider Electric automation technology by using our assessment tools to identify and implement replacement of your legacy automation products, regardless of brand. We make extensive use of existing hardware and wiring for a cost-effective solution with minimal downtime.

> **Software renewals**

Access the latest software, firmware, and custom options to ensure you always have the latest functionality available to optimize your system’s life cycle.

> **Extended warranty**

Extend your Schneider Electric standard manufacturer warranty from one year to five years. Protection plans are tailored to your needs reducing costs and out-of-service time.
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