# Product data sheet

Specifications



## Soft starter, Altivar Soft Starter ATS490, 170A, 208 to 690V AC, control supply 110 to 230V AC

ATS490C17Y

**Product availability: Stock - Normally stocked in distribution facility**

## Main

| | |
|---|---|
| **Range of Product** | Altivar Soft Starter ATS490 |
| **Product or Component Type** | Soft starter |
| **Product destination** | Asynchronous motors |
| **Product Specific Application** | Process and infrastructures |
| **Device short name** | ATS490 |
| **Phase** | 3 phase |
| **Utilisation category** | AC-3A<br>AC-53A |
| **Ue power supply voltage** | 208...690 V AC - 15...10 %) |
| **power supply frequency** | 50...60 Hz - 20...20 % |
| **[Ie] rated operational current** | Normal duty 170 A in line 104 °F (40 °C)) |
| **Service factor at Ie** | 100 |
| **rated current in heavy duty** | 140 A at 104 °F (40 °C) heavy duty |
| **Torque control** | True |
| **IP Degree of Protection** | IP00 |
| **Motor power kW** | 45 kW 230 V in the motor supply line normal duty<br>90 kW 400 V in the motor supply line normal duty<br>90 kW 440 V in the motor supply line normal duty<br>110 kW 500 V in the motor supply line normal duty<br>110 kW 525 V in the motor supply line normal duty<br>132 kW 660 V in the motor supply line normal duty<br>160 kW 690 V in the motor supply line normal duty<br>37 kW 230 V in the motor supply line heavy duty<br>75 kW 400 V in the motor supply line heavy duty<br>75 kW 440 V in the motor supply line heavy duty<br>90 kW 500 V in the motor supply line heavy duty<br>90 kW 525 V in the motor supply line heavy duty<br>110 kW 660 V in the motor supply line heavy duty<br>110 kW 690 V in the motor supply line heavy duty<br>90 kW 230 V to the motor delta terminals normal duty<br>132 kW 400 V to the motor delta terminals normal duty<br>75 kW 230 V to the motor delta terminals heavy duty<br>110 kW 400 V to the motor delta terminals heavy duty |
| **Maximum Horse Power Rating** | 50 hp 208 V normal duty<br>60 hp 230 V normal duty<br>125 hp 460 V normal duty<br>150 hp 575 V normal duty<br>40 hp 208 V heavy duty<br>50 hp 230 V heavy duty<br>100 hp 460 V heavy duty<br>125 hp 575 V heavy duty |
| **With safety function Safe torque off (STO)** | True |
| **Safe Torque Off (STO)** | STO (safe torque off): SIL 1 conforming to IEC 61508<br>STO (safe torque off): PL c/category 2 conforming to ISO 13849 |

Price is “List Price” and may be subject to a trade discount – check with your local distributor or retailer for actual price.

Disclaimer: This documentation is not intended as a substitute for and is not to be used for determining suitability or reliability of these products for specific user applications

| | |
|---|---|
| **Cybersecurity functions** | True |
| **Cybersecurity level and standard** | Security level (SL) 1 IEC 62443-4-2 |
| **Communication Port Protocol** | Modbus serial<br>Modbus TCP/EtherNet/IP |
| **Option card** | Communication module CANopen daisy chain<br>Communication module CANopen Sub-D<br>Communication module CANopen open style<br>Communication module Profibus DP V1<br>Communication module PROFINET |

## Complementary

| | |
|---|---|
| **Device connection** | In the motor supply line<br>Inside delta |
| **Overload current profile** | 400 % Ie for 13 s |
| **On-load factor** | 50 % |
| **Operating cycles/hour** | 10 cyc/h |
| **[Us] control circuit voltage** | 110...230 V AC 50-60 Hz - 15...10 % |
| **Apparent power** | 80 VA |
| **Integrated motor overload protection** | True |
| **motor thermal protection class** | Class 10E |
| **Protection type** | Phase failure mains<br>Thermal protection starter<br>Thermal protection motor<br>Current overload motor<br>Motor underload motor<br>Excessive acceleration time motor<br>Motor phase loss detection motor<br>Protection against line phase inversion mains<br>External thermal protection motor<br>Protection delta inside wiring starter<br>Short-circuit between motor phase and earth motor |
| **current limiting %In (5 x Ie maximum)** | 150…700 % |
| **[In] Rated current pwr loss specifctn** | 170 A |
| **Power loss static current independent** | 19 W |
| **Power loss per device current dependent** | 38 W |
| **Power loss during starting** | 2101 W during starting at 40 °C at 400% Ie |
| **Standards** | EN/IEC 60947-4-2<br>UL 60947-4-2<br>IEC 60664-1 |
| **Product Certifications** | CE<br>cULus<br>UKCA<br>RCM<br>CCC<br>DNV<br>ATEX<br>EAC<br>KC |
| **Marking** | CE<br>CULus<br>UKCA<br>RCM<br>CCC<br>ATEX<br>EAC<br>KC |

| | |
|---|---|
| **[Uc] control circuit voltage** | 24 V DC |
| **Discrete input number** | 5 |
| **Discrete input type** | DI1) digital input, 4.4 kOhm<br>DI2) digital input, 4.4 kOhm<br>DI3) digital input, 4.4 kOhm<br>DI4) digital input, 4.4 kOhm<br>STO) digital input, > 1 kOhm |
| **Input compatibility** | DI1 discrete input level 1 PLC EN/IEC 61131-2<br>DI2 discrete input level 1 PLC EN/IEC 61131-2<br>DI3 discrete input level 1 PLC EN/IEC 61131-2<br>DI4 discrete input level 1 PLC EN/IEC 61131-2<br>STO discrete input level 1 PLC EN/IEC 61131-2 |
| **Discrete input logic** | Digital input DI1 0...< 5 V <= 2 mA > 11 V, >= 5 mA<br>Digital input DI2 0...< 5 V <= 2 mA > 11 V, >= 5 mA<br>Digital input DI3 0...< 5 V <= 2 mA > 11 V, >= 5 mA<br>Digital input DI4 0...< 5 V <= 2 mA > 11 V, >= 5 mA<br>Digital input STO 0...< 5 V <= 2 mA > 11 V, >= 5 mA |
| **Relay output number** | 3 |
| **Relay output type** | Relay outputs R1A, R1C NO<br>Relay outputs R2A, R2C NO<br>Relay outputs R3A, R3C NO |
| **Minimum switching current** | 100 mA 12 V DC relay outputs |
| **Maximum switching current** | Relay outputs 2 A / 250 V AC for AC-15 100000 cycles following IEC 60947-5-1<br>Relay outputs 2 A / 30 V DC for DC-13 150000 cycles following IEC 60947-5-1 |
| **Discrete output number** | 2 |
| **Discrete output type** | Programmable digital output DQ1 <= 30 V 100 mA<br>Programmable digital output DQ2 <= 30 V 100 mA |
| **Output compatibility** | Open collector level 1 PLC IEC 65A-68 |
| **Analogue input number** | 1 |
| **Analogue input type** | AI1/PTC1 : PTC/PT 100/PT 1000/KTY84 temperature probe<br>PTC2 : PTC/PT 100/PT 1000/KTY84 temperature probe<br>PTC3 : PTC/PT 100/PT 1000/KTY84 temperature probe |
| **Analogue output number** | 1 |
| **Analogue output type** | Current output AQ1 : 0...20 mA/4...20 mA , impedance< 500 Ohm<br>Voltage output AQ1 : 0...10 V , impedance> 470 Ohm |
| **Communication port protocol** | Modbus serial<br>Modbus TCP/EtherNet/IP |
| **Connector type** | 1 RJ45 for connecting Modbus serial<br>1 RJ45 for connecting Modbus TCP/EtherNet/IP |
| **Physical interface** | 2-wire RS 485<br>100-BASE-TX category 5 or industrial Ethernet |
| **Transmission frame** | RTU<br>TCP/UDP |
| **Transmission Rate** | 4.8…38.4 kbps<br>100 BASE TX |
| **Data format** | 8 bits, configurable odd, even or no parity 1or 2 stop |
| **Number of addresses** | 0…247 Modbus serial |
| **Method of access** | Slave Modbus serial |
| **Type of polarization** | No impedance Modbus serial |
| **Display screen available** | True |
| **Operating position** | Vertical +/- 10 degree |
| **Height** | 14.02 in (356 mm) |

| | |
|---|---|
| **Width** | 6.3 in (160 mm) |
| **Depth** | 9.3 in (235 mm) |
| **Net Weight** | 22.05 lb(US) (10 kg) |
| **internal bypass** | True |
| **Function Available** | Pre-heating<br>Smoke extraction<br>Second motor set<br>Deceleration with torque control<br>Braking<br>Boost<br>Line contactor control<br>Reverse contactor control<br>Anti-jam<br>Jog<br>Borehole pump starting<br>Condition monitoring<br>Power monitoring<br>Cybersecure firmware update |
| **material declaration** | True |

# Environment

| | |
|---|---|
| **Electromagnetic compatibility** | Conducted and radiated emissions level A conforming to IEC 60947-4-2<br>Damped oscillating waves level 3 conforming to IEC 61000-4-18<br>Electrostatic discharge level 3 conforming to IEC 61000-4-2<br>Immunity to electrical transients level 4 conforming to IEC 61000-4-4<br>Immunity to radiated radio-electrical interference level 3 conforming to IEC 61000-4-3<br>Voltage/current impulse level 3 conforming to IEC 61000-4-5<br>Immunity to conducted interference caused by radio-electrical fields level 3 conforming to EN/IEC 61000-4-6 |
| **Pollution degree** | Level 3 |
| **[Uimp] rated impulse withstand voltage** | 6 kV |
| **[Ui] Rated Insulation Voltage** | 690 V |
| **Environmental class (during operation)** | Class 3C3 according to IEC 60721-3-3<br>Class 3S3 according to IEC 60721-3-3 |
| **Ambient air temperature for operation** | -13…104 °F (-25…40 °C) (without derating)<br>104…140 °F (40…60 °C) (with current derating of 1 % per °C above 40 °C) |
| **Ambient Air Temperature for Storage** | -40…158 °F (-40…70 °C) |
| **Ambient air transport temperature** | -40…158 °F (-40…70 °C) |
| **Operating altitude** | <= 6561.68 ft (2000 m) without derating<br>> 2000...4800 m with current derating 1 % per 100 m above 2000 m |
| **Relative humidity** | 5…95 % without condensation or dripping water EN/IEC 60068-2-3 |
| **Maximum deflection under vibratory load (during operation)** | 1.5 mm at 2...13 Hz |
| **Maximum deflection under vibratory load (during storage)** | 1.75 mm at 2...9 Hz |
| **Maximum deflection under vibratory load (during transport)** | 1.75 mm at 2...9 Hz |
| **Maximum acceleration under vibrational stress (during operation)** | 1 gn at 13…200 Hz |
| **Maximum acceleration under vibratory load (during storage)** | 1 gn at 9…200 Hz<br>1.5 gn at 200…500 Hz |
| **Maximum acceleration under vibratory load (during transport)** | 1 gn at 9…200 Hz<br>1.5 gn at 200…500 Hz |
| **Maximum acceleration under shock impact (during operation)** | 15 gn at 11 ms |
| **Maximum acceleration under shock load (during storage)** | 10 gn at 11 ms |

| | |
|---|---|
| **Maximum acceleration under shock load (during transport)** | 10 gn at 11 ms |

## Ordering and shipping details

| | |
|---|---|
| **Category** | US1CP1G22588 |
| **Discount Schedule** | CP1G |
| **GTIN** | 3606486948859 |
| **Returnability** | Yes |
| **Country of origin** | ID |

## Packing Units

| | |
|---|---|
| **Unit Type of Package 1** | PCE |
| **Nbr. of units in pkg.** | 1 |
| **Package 1 Height** | 8.858 in (22.500 cm) |
| **Package 1 Width** | 10.827 in (27.500 cm) |
| **Package 1 Length** | 17.913 in (45.500 cm) |
| **Package weight(Lbs)** | 25.325 lb(US) (11.487 kg) |
| **Unit Type of Package 2** | S06 |
| **Number of Units in Package 2** | 6 |
| **Package 2 Height** | 29.528 in (75.000 cm) |
| **Package 2 Width** | 23.622 in (60.000 cm) |
| **Package 2 Length** | 31.496 in (80.000 cm) |
| **Package 2 Weight** | 176.370 lb(US) (80.000 kg) |

## Contractual warranty

| | |
|---|---|
| **Warranty (in months)** | 18 |

## Environmental Data

Schneider Electric aims to achieve Net Zero status by 2050 through supply chain partnerships, lower impact materials, and circularity via our ongoing “Use Better, Use Longer, Use Again” campaign to extend product lifetimes and recyclability.

Environmental Data explained >

How we assess product sustainability >

### Environmental footprint

| | |
|---|---|
| Total lifecycle Carbon footprint | **1 798 kg CO2 eq.** |
| Carbon footprint of the manufacturing phase [A1 to A3] | **186 kg CO2 eq.** |
| Carbon footprint of the distribution phase [A4] | **2 kg CO2 eq.** |
| Carbon footprint of the installation phase [A5] | **2 kg CO2 eq.** |
| Carbon footprint of the use phase [B2, B3, B4, B6] | **1 586 kg CO2 eq.** |
| Carbon footprint of the end-of-life phase [C1 to C4] | **21 kg CO2 eq.** |
| Environmental Disclosure | **Product Environmental Profile** |

## Use Better

### Materials and Substances

| | |
|---|---|
| Packaging made with recycled cardboard | **Yes** |
| Packaging without single use plastic | **No** |
| SCIP Number | **Ad580e30-2d60-4293-925f-7543321d7bab** |
| EU RoHS Directive | **Compliant By Exemption** |
| REACh Regulation | **Reference contains Substances of Very High Concern above the threshold** |
| California proposition 65 | **WARNING: This product can expose you to chemicals including: Lead and lead compounds, which is known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov** |
| PVC free | **Yes** |

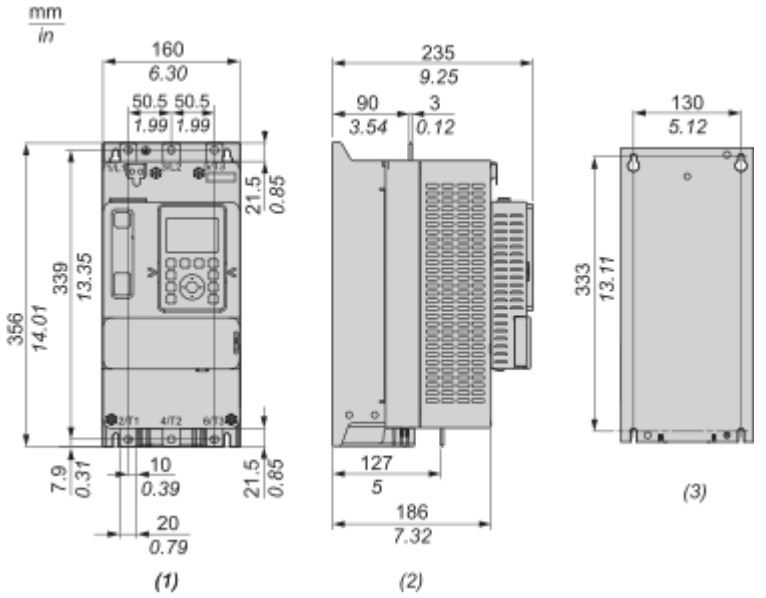
## Use Again

### Repack and remanufacture

| | |
|---|---|
| Recyclability potential, in % | **78** |
| Removable battery | **Yes** |
| Take-back | **No** |
| WEEE Label | **The product must be disposed on European Union markets following specific waste collection and never end up in rubbish bins.** |

Dimensions Drawings

## Dimensions

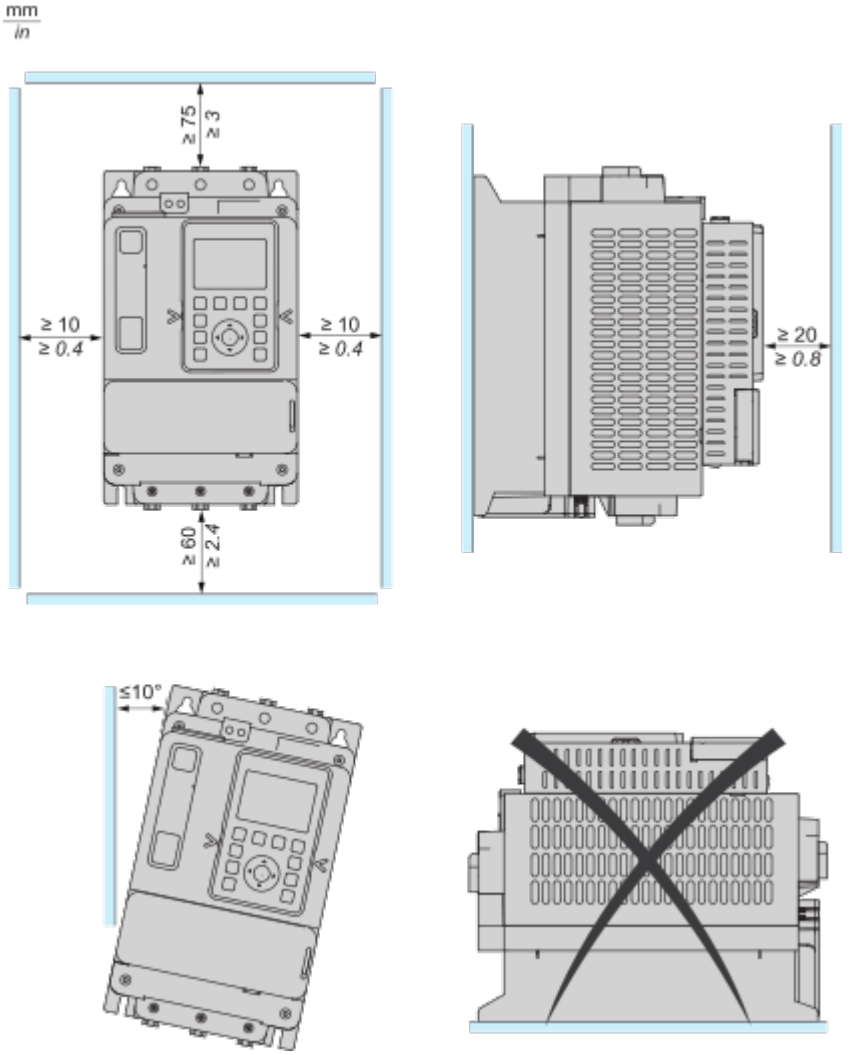



**(1)** : Front
**(2)** : Side
**(3)** : Rear

## Mounting and Clearance

### Mounting Position

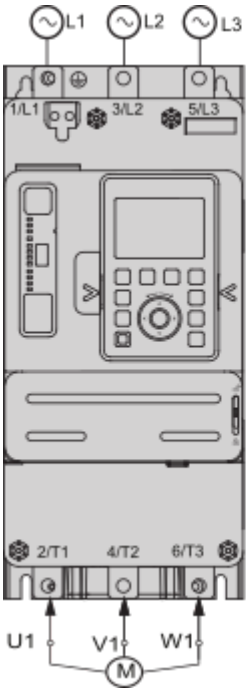
The soft starter is designed to be mounted inside cabinets vertically at ± 10° for cooling purposes.
Respect the minimum clearances so that the cooling air can circulate from the bottom to the top of the soft starter. The minimum clearances apply to any device close to the soft starter such as circuit breakers, fuses and contactors.
Do not install the soft starter above heating elements.

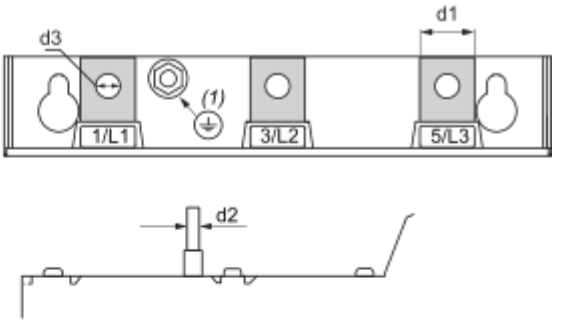


Connections and Schema

## Wiring

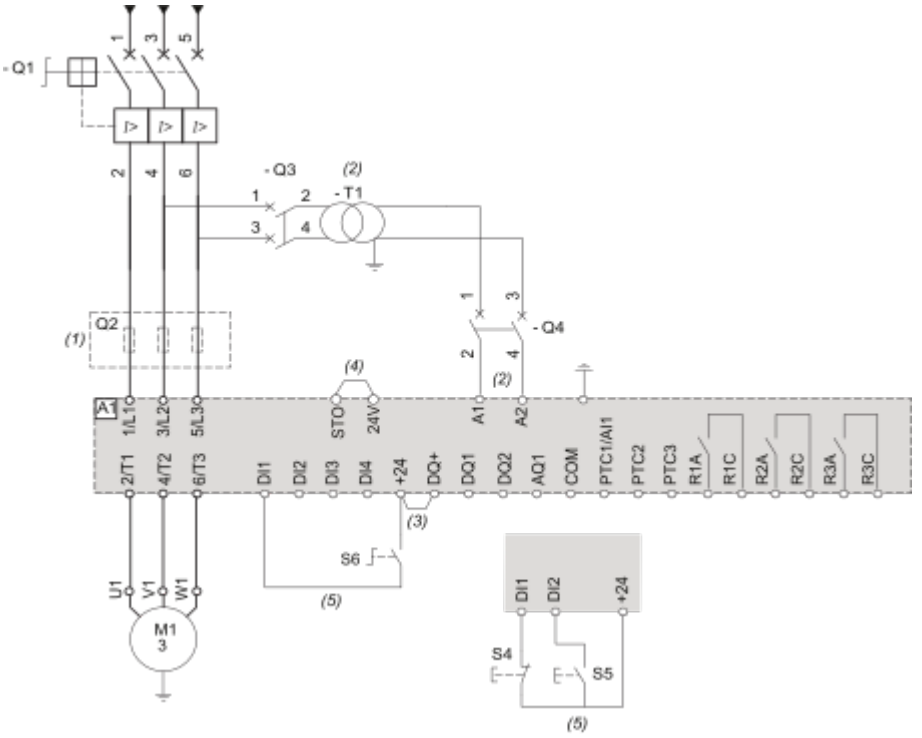
### Wiring the Power Part




**1/L1, 3/L2, 5/L3** : Mains supply inputs
**2/T1, 4/T2, 6/T3** : Outputs to motor
**(1)** : Ground connection

### Connection In Line, No Line Contactor, Type 1 or 2 Coordination, 2-wire or 3-wire control



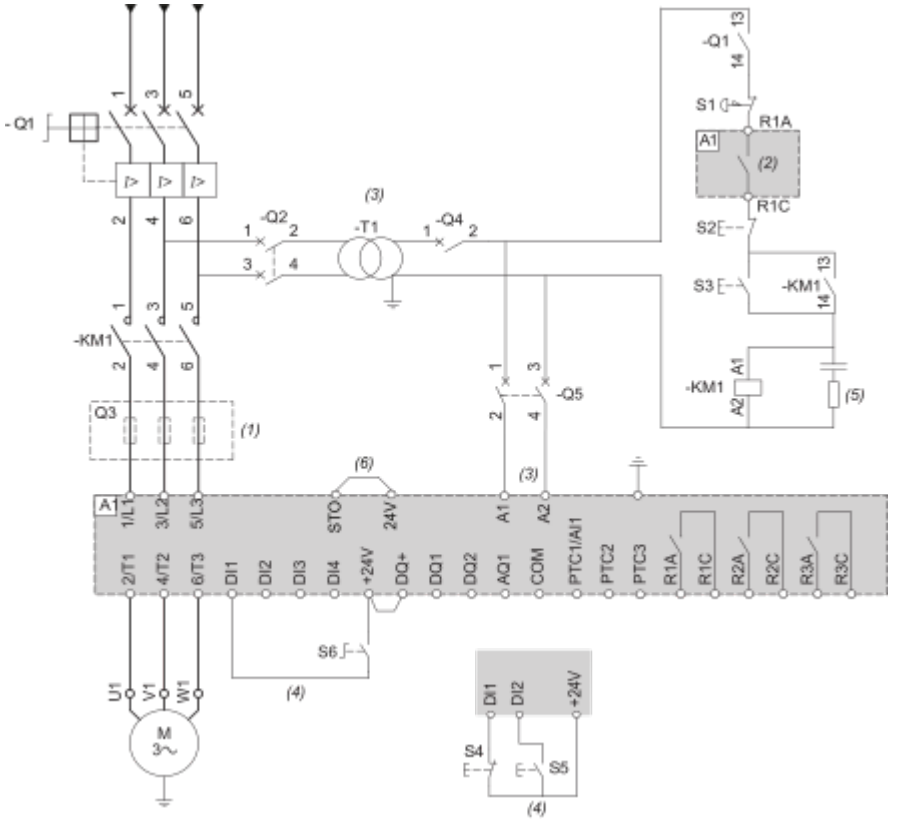

**(1)** : Installation of additional fast-acting fuses is mandatory to upgrade to type 2 coordination according to IEC 60947–4–2.

**(2)** : The transformer must supply 110...230 Vac +10% - 15%, 50/60Hz.
**(3)** : 24Vdc supply on DQ+ if usage of DQ outputs.
**(4)** : STO Safe Torque Off
**(5)** : 3–wire control and 2–wire control.

| Designation | Component | Description |
|---|---|---|
| Q1 | Circuit breaker | Short circuit protection device for the motor |
| Q2 | Fast acting fuses | Short circuit protection device of the soft starter to be used only when type 2 coordination |
| Q3 | Circuit breaker | Short circuit protection device for the primary of the transformer |
| Q4 | Circuit breaker | Short circuit protection device for the secondary of the transformer |
| S4 | Normally close contact push- button | STOP command for 3-wire control |
| S5 | Normally open contact push- button | RUN command for 3-wire control |
| S6 | Selector switch, 2 positions, stay–put, normally open contact | RUN/STOP command for 2-wire control |

### Connection In Line, With Line Contactor, Type 1 or 2 Coordination, 2-wire or 3-wire control

**Line contactor controlled by Power ON and Power OFF push-buttons or on detected error**
Use relay output R1 set to **[Operating State Fault]** (factory setting)



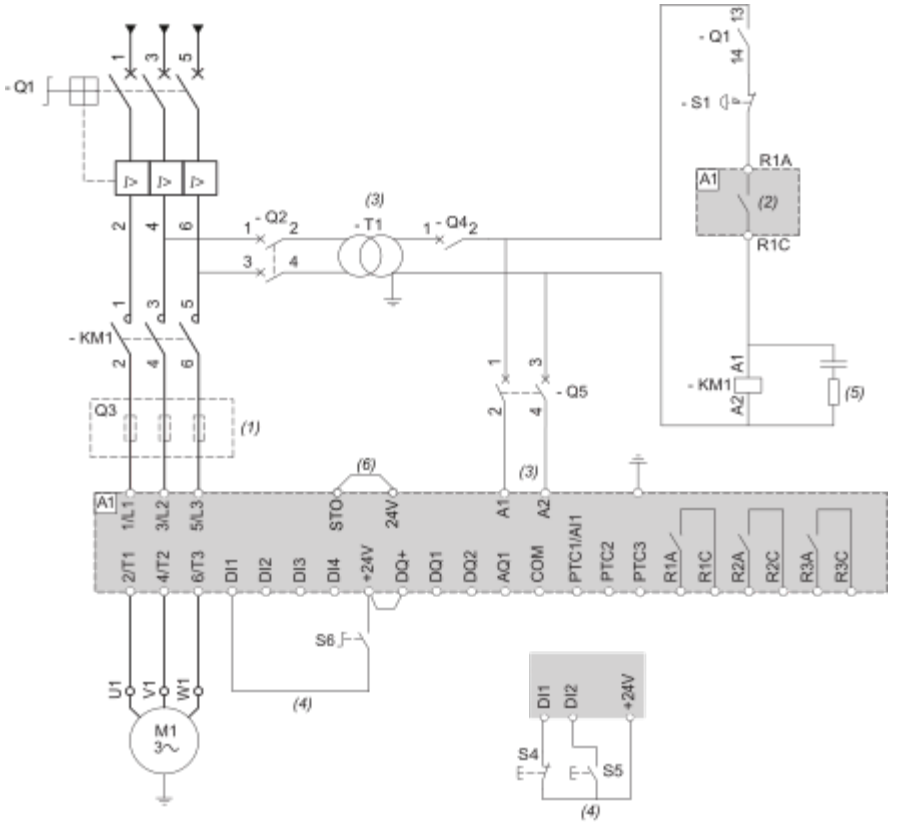

**(1)** : Installation of additional fast-acting fuses is mandatory to upgrade to type 2 coordination according to IEC 60947–4–2.
**(2)** : Take into account the electrical characteristics of the relays.
**(3)** : The transformer must supply 110...230 Vac +10% - 15%, 50/60Hz.
**(4)** : 3–wire control and 2–wire control.

**(5)** : Select the appropriate voltage surge suppressor.
**(6)** : STO Safe Torque Off

| Designation | Component | Description |
|---|---|---|
| Q1 | Circuit breaker | Short circuit protection device for the motor |
| Q2 | Circuit breaker | Short circuit protection device for the primary of the transformer |
| Q3 | Fast acting fuses | Short circuit protection device of the soft starter to be used only when type 2 coordination |
| Q4 | Circuit breaker | Short circuit protection device for the secondary of the transformer |
| Q5 | Circuit breaker | Short circuit protection device for the control part of the soft starter |
| KM1 | Contactor | Line contactor |
| S1 | Emergency Stop push-button | Emergency Stop to de-energized KM1 line contactor |
| S2 | Normally close push-button | Power OFF |
| S3 | Normally open push-button | Power ON |
| S4 | Normally close contact push-button | STOP command for 3-wire control |
| S5 | Normally open contact push-button | RUN command for 3-wire control |
| S6 | Selector switch, 2 positions, stay–put, normally open contact | RUN/STOP command for 2-wire control |

### Connection In Line, With Line Contactor, Type 1 or 2 Coordination, 2-wire control

**Line contactor controlled based on RUN & STOP or on detected error.**
Use relay output R1 set to **[Mains Contactor]**




**(1)** : Installation of additional fast-acting fuses is mandatory to upgrade to type 2 coordination according to IEC 60947–4–2.
**(2)** : Take into account the electrical characteristics of the relays.
**(3)** : The transformer must supply 110...230 Vac +10% - 15%, 50/60Hz.
**(4)** : 2–wire control and 3–wire control.
**(5)** : Select the appropriate voltage surge suppressor.
**(6)** : STO Safe Torque Off.

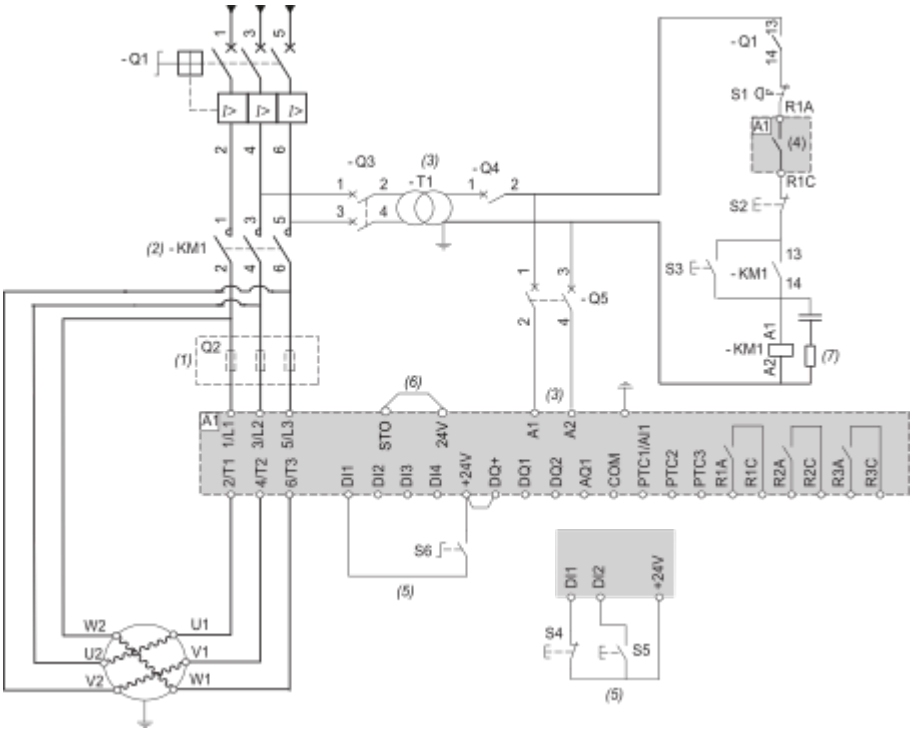
| Designation | Component | Description |
|---|---|---|
| Q1 | Circuit breaker | Short circuit protection device for the motor |
| Q2 | Circuit breaker | Short circuit protection device for the primary of the transformer |
| Q3 | Fast acting fuses | Short circuit protection device of the soft starter to be used only when type 2 coordination according to IEC 60947-4-2 is required |
| Q4 | Circuit breaker | Short circuit protection device for the secondary of the transformer |
| Q5 | Circuit breaker | Short circuit protection device for the control part of the soft starter |
| KM1 | Contactor | Line contactor |
| S1 | Emergency Stop push-button | Emergency Stop to de-energized KM1 line contactor |
| S4 | Normally close contact push-button | STOP command for 3-wire control |
| S5 | Normally open contact push-button | RUN command for 3-wire control |

| | | |
|---|---|---|
| S6 | Selector switch, 2 positions, stay–put, normally open contact | RUN/STOP. command for 2–wire control |

## Connection Inside the Delta, Type 1 and 2 Coordination, 2-wire or 3-wire

**Line contactor controlled based on RUN and STOP command or detected error**

Use relay output R1 set to **[Operating State Fault]** (factory setting).




**(1)** : Installation of additional fast-acting fuses is mandatory to upgrade to type 2 coordination according to IEC 60947–4–2.
**(2)** : KM1 is mandatory to avoid uncontrolled voltage on the motor.
**(3)** : The transformer must supply 110...230 Vac +10% — 15%, 50/60Hz.
**(4)** : Take into account the electrical characteristics of the relays, especially when connecting to high rating contactor.
**(5)** : 3–wire control, 2–wire control.
**(6)** : STO Safe Torque Off.
**(7)** : Select the appropriate voltage surge suppressor.

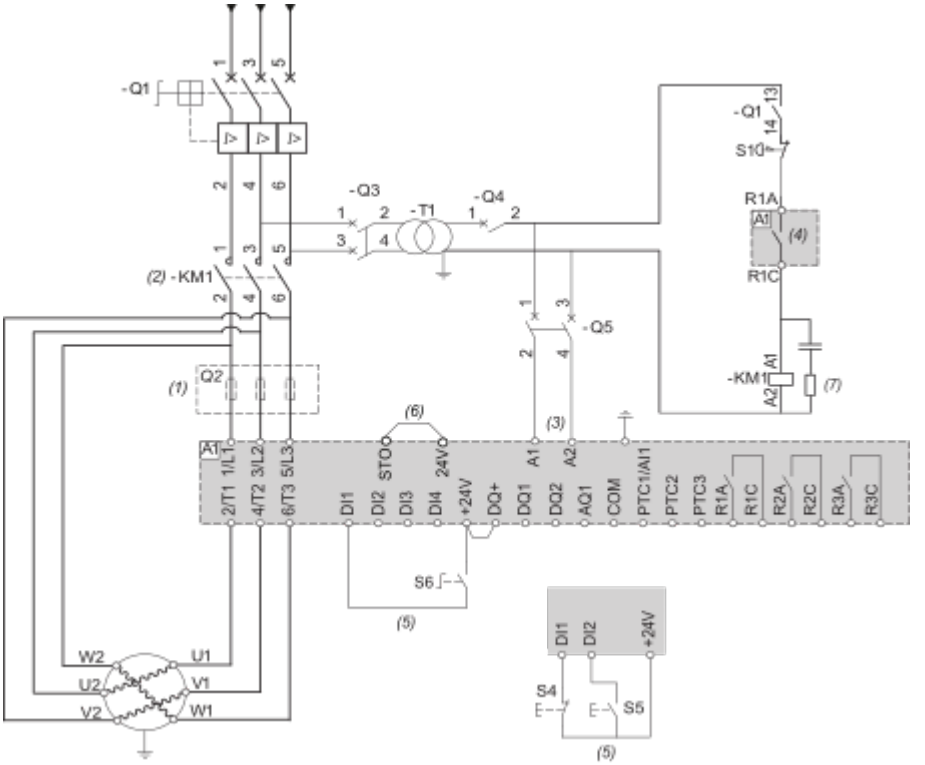
| Designation | Component | Description |
|---|---|---|
| Q1 | Circuit breaker | Short circuit protection device for the motor |
| Q2 | Fast acting fuses | Short circuit protection device of the soft starter to be used only when type 2 coordination according to IEC 60947-4-2 is required |
| Q3 | Circuit breaker | Short circuit protection device for the primary of the transformer |
| Q4 | Circuit breaker | Short circuit protection device for the secondary of the transformer |
| Q5 | Circuit breaker | Short circuit protection device for the control part of the soft starter |
| KM1 | Contactor | Line contactor |
| S1 | Emergency Stop push-button | Emergency Stop to de-energized KM1 line contactor |

| | | |
|---|---|---|
| S2 | Normally close push-button | Power OFF |
| S3 | Normally open push-button | Power ON |
| S4 | Normally close contact push-button | STOP command for 3-wire control |
| S5 | Normally open contact push-button | RUN command for 3-wire control |
| S6 | Selector switch, 2 positions, stay–put, normally open contact | RUN/STOP. command for 2–wire control |

### Connection Inside the Delta, Type 1 or 2 Coordination, 2-wire or 3–wire

**Line contactor controlled based on RUN and STOP command or detected error**

Use relay output R1 set to [Mains Contactor]

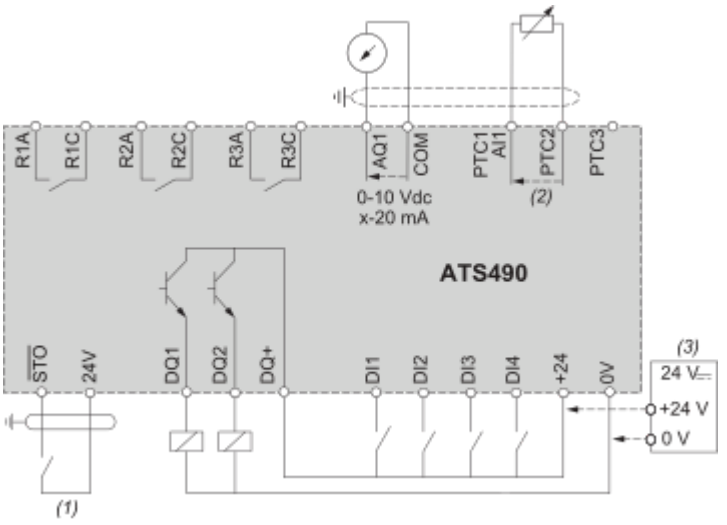



**(1)** : Installation of additional fast-acting fuses is mandatory to upgrade to type 2 coordination according to IEC 60947–4–2.
**(2)** : KM1 is mandatory to avoid uncontrolled voltage on the motor.
**(3)** : The transformer must supply 110...230 Vac +10% — 15%, 50/60Hz.
**(4)** : Take into account the electrical characteristics of the relays.
**(5)** : 3–wire control and 2–wire control.
**(6)** : STO Safe Torque Off.
**(7)** : Select the appropriate voltage surge suppressor.

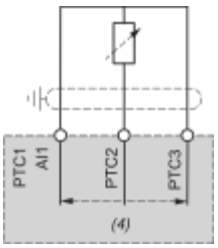
| Designation | Component | Description |
|---|---|---|
| Q1 | Circuit breaker | Short circuit protection device for the motor |
| Q2 | Circuit breaker | Short circuit protection device for the primary of the transformer |

| | | |
|---|---|---|
| Q3 | Fast acting fuses | Short circuit protection device of the soft starter to be used only when type 2 coordination |
| Q4 | Circuit breaker | Short circuit protection device for the secondary of the transformer |
| Q5 | Circuit breaker | Short circuit protection device for the control part of the soft starter |
| KM1 | Contactor | Line contactor |
| S1 | Emergency Stop push-button | Emergency Stop to de-energized KM1 line contactor |
| S4 | Normally close contact push-button | STOP command for 3-wire control and power Off |
| S5 | Normally open contact push-button | RUN command for 3-wire control and power On |
| S6 | Selector switch, 2 positions, stay–put, normally open contact | RUN/STOP command for 2–wire control |

### Control Block Wiring Diagram




**R1A, R1C, R2A, R2C, R3A, R3C** : Programmable NO relays
**DI1, DI2, DI3, DI4** : Digital inputs
**AQ1** : Analogue output
**PTC1/AI1, PTC2, PTC3** : Motor thermal sensor connection
**DQ1, DQ2, DQ+** : Digital outputs
STO : Safety function STO input
**(1)** : STO Safe Torque Off
**(2)** : 2 wire PTC/PT100/PT1000/KTY
**(3)** : Optional, in case of +24 External Supply usage
**PT100, PT1000 Thermal Probe 3 Wires :**




**(4)** : 3 wire PT100/PT1000

Image of product / Alternate images

**Alternative**






1/L1
3/L2
5/L3
2/T1
4/T2
6/T3



