

# Product data sheet

Specifications



## Soft starter, Altivar Soft Starter ATS490, 1000A, 208 to 690V AC, control supply 110 to 230V AC

ATS490M10Y

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

### Main

<b>Range of Product</b>	Altivar Soft Starter ATS490
<b>Product or Component Type</b>	Soft starter
<b>Product destination</b>	Asynchronous motors
<b>Product Specific Application</b>	Process and infrastructures
<b>Device short name</b>	ATS490
<b>Phase</b>	3 phase
<b>Utilisation category</b>	AC-3A AC-53A
<b>Ue power supply voltage</b>	208...690 V AC - 15...10 %
<b>power supply frequency</b>	50...60 Hz - 20...20 %
<b>[Ie] rated operational current</b>	Normal duty 1000 A in line 104 °F (40 °C))
<b>Service factor at Ie</b>	100
<b>rated current in heavy duty</b>	790 A at 104 °F (40 °C) heavy duty
<b>IP Degree of Protection</b>	IP00
<b>Motor power kW</b>	250 kW 230 V in the motor supply line normal duty 500 kW 400 V in the motor supply line normal duty 630 kW 440 V in the motor supply line normal duty 630 kW 500 V in the motor supply line normal duty 630 kW 525 V in the motor supply line normal duty 900 kW 660 V in the motor supply line normal duty 900 kW 690 V in the motor supply line normal duty 220 kW 230 V in the motor supply line heavy duty 400 kW 400 V in the motor supply line heavy duty 500 kW 440 V in the motor supply line heavy duty 500 kW 500 V in the motor supply line heavy duty 500 kW 525 V in the motor supply line heavy duty 710 kW 660 V in the motor supply line heavy duty 710 kW 690 V in the motor supply line heavy duty 710 kW 400 V to the motor delta terminals normal duty 355 kW 230 V to the motor delta terminals heavy duty 630 kW 400 V to the motor delta terminals heavy duty
<b>Maximum Horse Power Rating</b>	350 hp 208 V normal duty 350 hp 230 V normal duty 800 hp 460 V normal duty 1000 hp 575 V normal duty 250 hp 208 V heavy duty 300 hp 230 V heavy duty 600 hp 460 V heavy duty 800 hp 575 V heavy duty
<b>With safety function Safe torque off (STO)</b>	True
<b>Safe Torque Off (STO)</b>	STO (safe torque off): SIL 1 conforming to IEC 61508 STO (safe torque off): PL c/category 2 conforming to ISO 13849
<b>Cybersecurity functions</b>	True

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

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

## Complementary

<b>Device connection</b>	In the motor supply line Inside delta
<b>Overload current profile</b>	400 % I <sub>e</sub> for 13 s
<b>On-load factor</b>	50 %
<b>Operating cycles/hour</b>	10 cyc/h
<b>[Us] control circuit voltage</b>	110...230 V AC 50-60 Hz - 15...10 %
<b>Apparent power</b>	300 VA
<b>Integrated motor overload protection</b>	True
<b>motor thermal protection class</b>	Class 10E
<b>Protection type</b>	Phase failure mains Thermal protection starter Thermal protection motor Current overload motor Motor underload motor Excessive acceleration time motor Motor phase loss detection motor Protection against line phase inversion mains External thermal protection motor Protection delta inside wiring starter Short-circuit between motor phase and earth motor
<b>current limiting %I<sub>n</sub> (5 x I<sub>e</sub> maximum)</b>	150...700 %
<b>[In] Rated current pwr loss specifctn</b>	1000 A
<b>Power loss static current independent</b>	19 W
<b>Power loss per device current dependent</b>	251 W
<b>Power loss during starting</b>	13619 W during starting at 40 °C at 400% I <sub>e</sub>
<b>Standards</b>	EN/IEC 60947-4-2 UL 60947-4-2 IEC 60664-1
<b>Product Certifications</b>	CE UKCA RCM CCC DNV ATEX EAC KC cULus
<b>Marking</b>	CE UKCA RCM CCC ATEX EAC KC CULus
<b>[Uc] control circuit voltage</b>	24 V DC

<b>Discrete input number</b>	5
<b>Discrete input type</b>	DI1) digital input, 4.4 kOhm DI2) digital input, 4.4 kOhm DI3) digital input, 4.4 kOhm DI4) digital input, 4.4 kOhm STO) digital input, > 1 kOhm
<b>Input compatibility</b>	DI1 discrete input level 1 PLC EN/IEC 61131-2 DI2 discrete input level 1 PLC EN/IEC 61131-2 DI3 discrete input level 1 PLC EN/IEC 61131-2 DI4 discrete input level 1 PLC EN/IEC 61131-2 STO discrete input level 1 PLC EN/IEC 61131-2
<b>Discrete input logic</b>	Digital input DI1 0...< 5 V <= 2 mA > 11 V, >= 5 mA Digital input DI2 0...< 5 V <= 2 mA > 11 V, >= 5 mA Digital input DI3 0...< 5 V <= 2 mA > 11 V, >= 5 mA Digital input DI4 0...< 5 V <= 2 mA > 11 V, >= 5 mA Digital input STO 0...< 5 V <= 2 mA > 11 V, >= 5 mA
<b>Relay output number</b>	3
<b>Relay output type</b>	Relay outputs R1A, R1C NO Relay outputs R2A, R2C NO Relay outputs R3A, R3C NO
<b>Minimum switching current</b>	100 mA 12 V DC relay outputs
<b>Maximum switching current</b>	Relay outputs 2 A / 250 V AC for AC-15 100000 cycles following IEC 60947-5-1 Relay outputs 2 A / 30 V DC for DC-13 150000 cycles following IEC 60947-5-1
<b>Discrete output number</b>	2
<b>Discrete output type</b>	Programmable digital output DQ1 <= 30 V 100 mA Programmable digital output DQ2 <= 30 V 100 mA
<b>Output compatibility</b>	Open collector level 1 PLC IEC 65A-68
<b>Analogue input number</b>	1
<b>Analogue input type</b>	AI1/PTC1 : PTC/PT 100/PT 1000/KTY84 temperature probe PTC2 : PTC/PT 100/PT 1000/KTY84 temperature probe PTC3 : PTC/PT 100/PT 1000/KTY84 temperature probe
<b>Analogue output number</b>	1
<b>Analogue output type</b>	Current output AQ1 : 0...20 mA/4...20 mA , impedance< 500 Ohm Voltage output AQ1 : 0...10 V , impedance> 470 Ohm
<b>Communication port protocol</b>	Modbus serial Modbus TCP/EtherNet/IP
<b>Connector type</b>	1 RJ45 for connecting Modbus serial 1 RJ45 for connecting Modbus TCP/EtherNet/IP
<b>Physical interface</b>	2-wire RS 485 100-BASE-TX category 5 or industrial Ethernet
<b>Transmission frame</b>	RTU TCP/UDP
<b>Transmission Rate</b>	4.8...38.4 kbps 100 BASE TX
<b>Data format</b>	8 bits, configurable odd, even or no parity 1or 2 stop
<b>Number of addresses</b>	0...247 Modbus serial
<b>Method of access</b>	Slave Modbus serial
<b>Type of polarization</b>	No impedance Modbus serial
<b>Display screen available</b>	True
<b>Operating position</b>	Vertical +/- 10 degree
<b>Height</b>	22.8 in (580 mm)
<b>Width</b>	17.2 in (436 mm)

Depth	13.8 in (350 mm)
Product Weight	143.3 lb(US) (65 kg)
internal bypass	True
Function Available	Pre-heating Smoke extraction Second motor set Deceleration with torque control Braking Boost Line contactor control Reverse contactor control Anti-jam Jog Borehole pump starting Condition monitoring Power monitoring Cybersecure firmware update
material declaration	True

## Environment

Electromagnetic compatibility	Conducted and radiated emissions level A conforming to IEC 60947-4-2 Damped oscillating waves level 3 conforming to IEC 61000-4-18 Electrostatic discharge level 3 conforming to IEC 61000-4-2 Immunity to electrical transients level 4 conforming to IEC 61000-4-4 Immunity to radiated radio-electrical interference level 3 conforming to IEC 61000-4-3 Voltage/current impulse level 3 conforming to IEC 61000-4-5 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 Class 3S3 according to IEC 60721-3-3
Ambient air temperature for operation	-13...104 °F (-25...40 °C) (without derating) 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 > 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 1.5 gn at 200...500 Hz
Maximum acceleration under vibratory load (during transport)	1 gn at 9...200 Hz 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	3606486948941
Returnability	Yes
Country of origin	CN

## Packing Units

Unit Type of Package 1	PCE
Nbr. of units in pkg.	1
Package 1 Height	23.8 in (60.5 cm)
Package 1 Width	23.6 in (60 cm)
Package 1 Length	31.5 in (80 cm)
Package weight(Lbs)	187.4 lb(US) (85 kg)

## Contractual warranty

Warranty (in months)	18
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## 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	7 822 kg CO2 eq.
Carbon footprint of the manufacturing phase [A1 to A3]	1 029 kg CO2 eq.
Carbon footprint of the distribution phase [A4]	16 kg CO2 eq.
Carbon footprint of the installation phase [A5]	36 kg CO2 eq.
Carbon footprint of the use phase [B2, B3, B4, B6]	6 608 kg CO2 eq.
Carbon footprint of the end-of-life phase [C1 to C4]	134 kg CO2 eq.
Environmental Disclosure	<a href="#">Product Environmental Profile</a>

### Use Better



#### Materials and Substances

Packaging made with recycled cardboard	Yes
Packaging without single use plastic	No
SCIP Number	D03e37f0-1ba5-467b-bdf3-5355bb2c8efe
EU RoHS Directive	<a href="#">Compliant By Exemption</a>
REACH Regulation	<a href="#">Reference contains Substances of Very High Concern above the threshold</a>
California proposition 65	<b>WARNING:</b> 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 <a href="http://www.P65Warnings.ca.gov">www.P65Warnings.ca.gov</a>
PVC free	Yes

### Use Longer



#### Lifetime extension

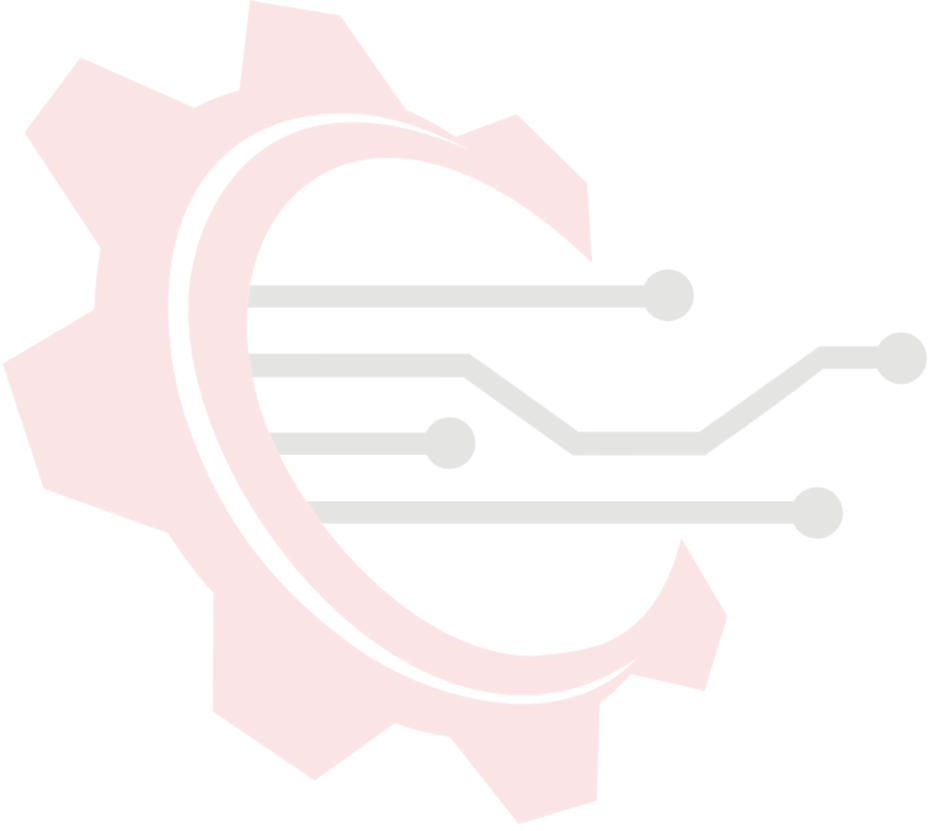
Repair	No
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### Use Again



#### Repack and remanufacture

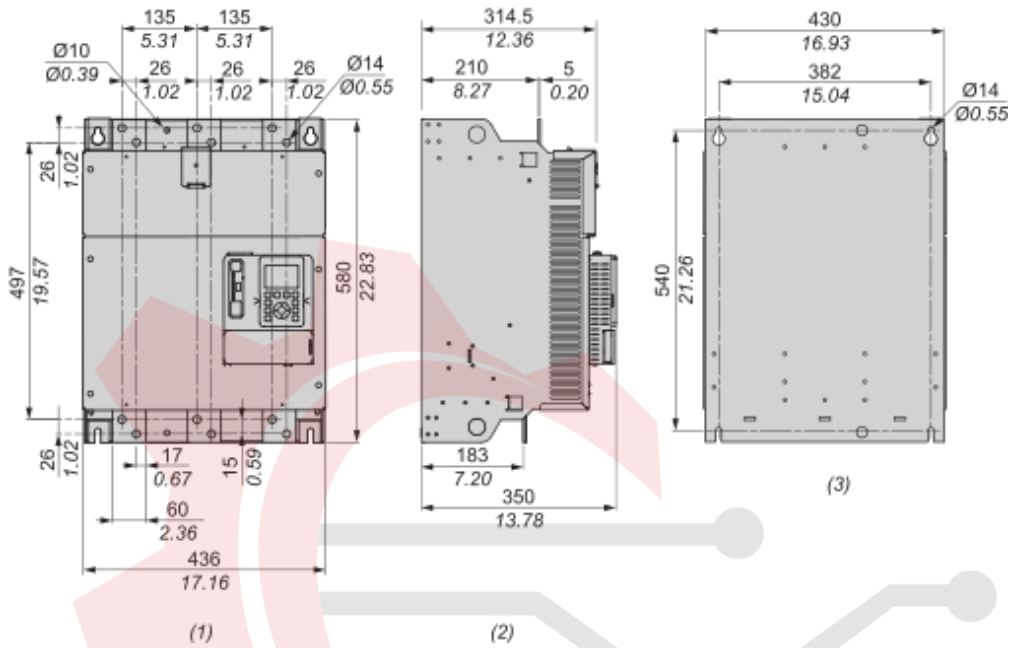
Recyclability potential, in %	85
Circularity Profile	<a href="#">End of Life Information</a>
Removable battery	Yes
Take-back	No



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Dimensions Drawings

Dimensions



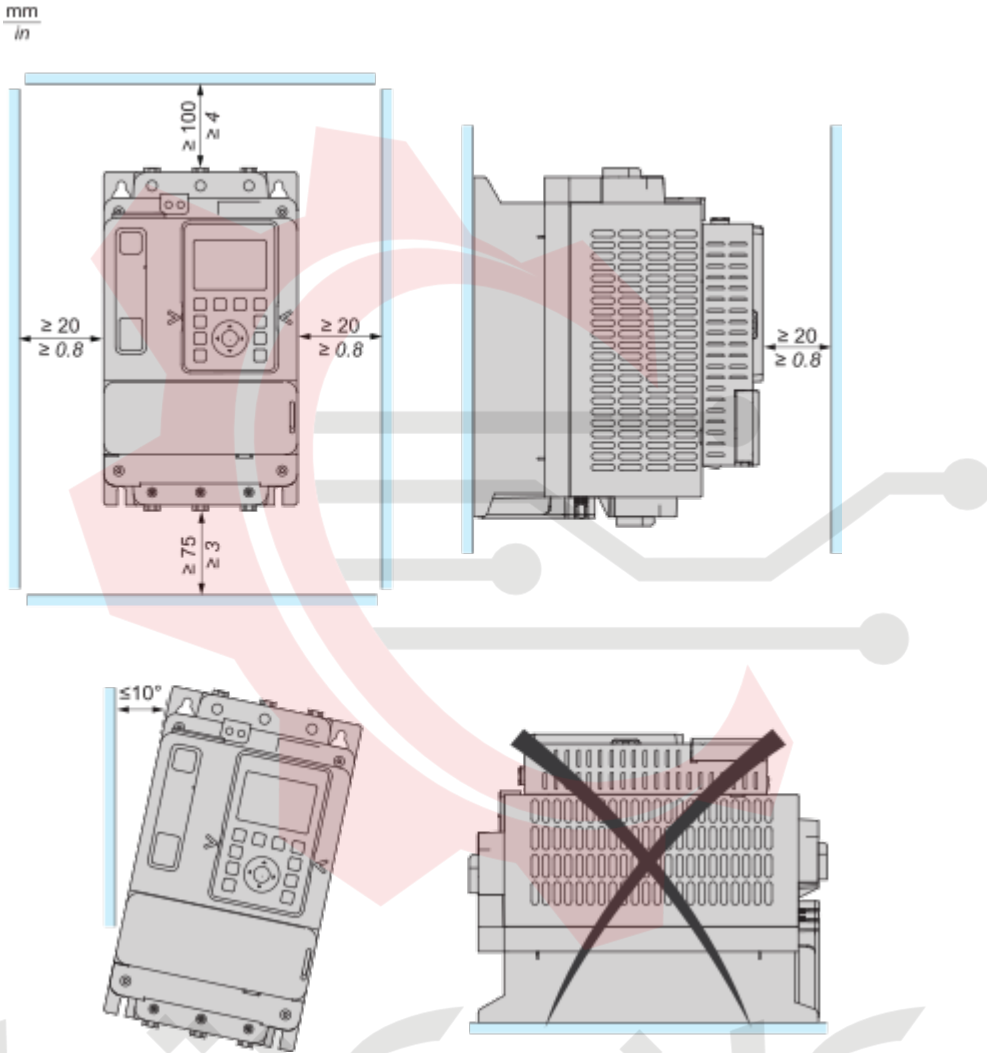
- (1) : Front
- (2) : Side
- (3) : Rear

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Mounting and Clearance

Mounting Position

The soft starter is designed to be mounted inside cabinets vertically at  $\pm 10^\circ$  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.

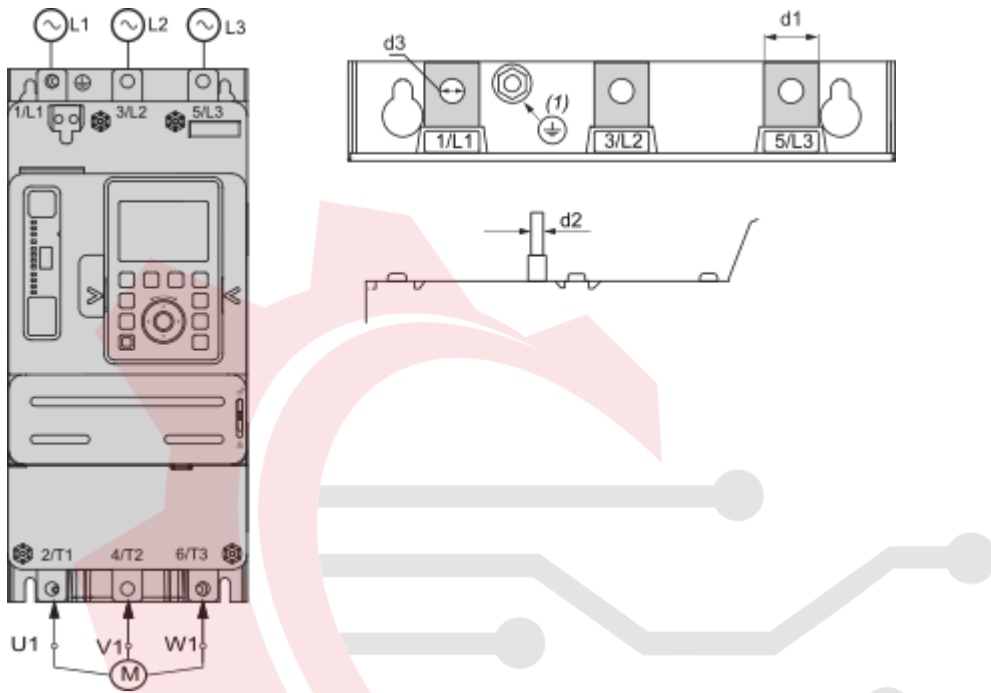


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Connections and Schema

Wiring

Wiring the Power Part

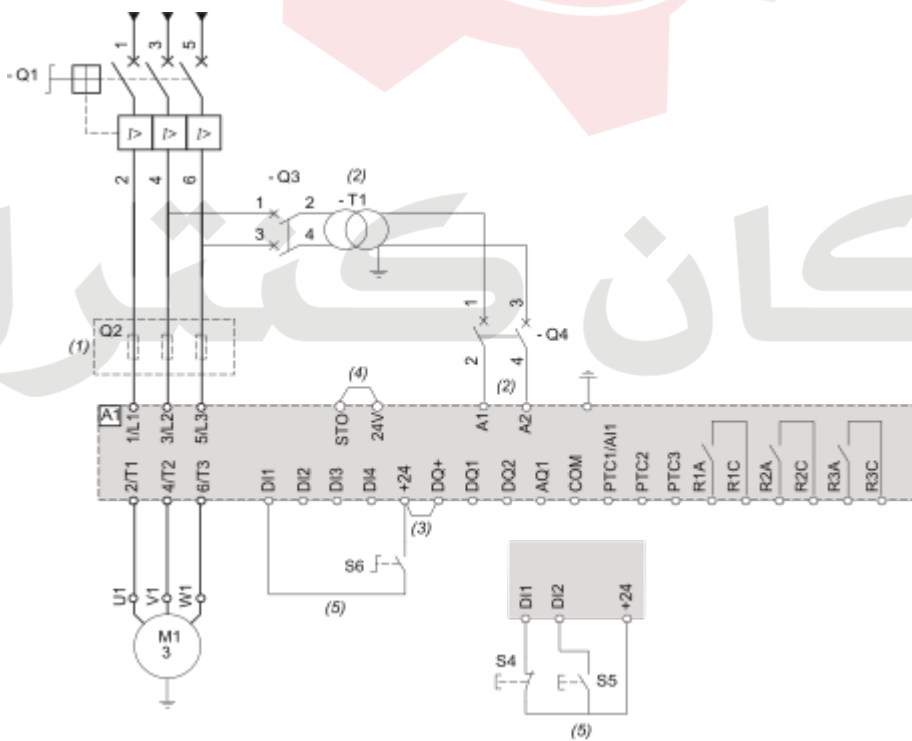


1/L1, 3/L2, 5/L3 : Mains supply inputs

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



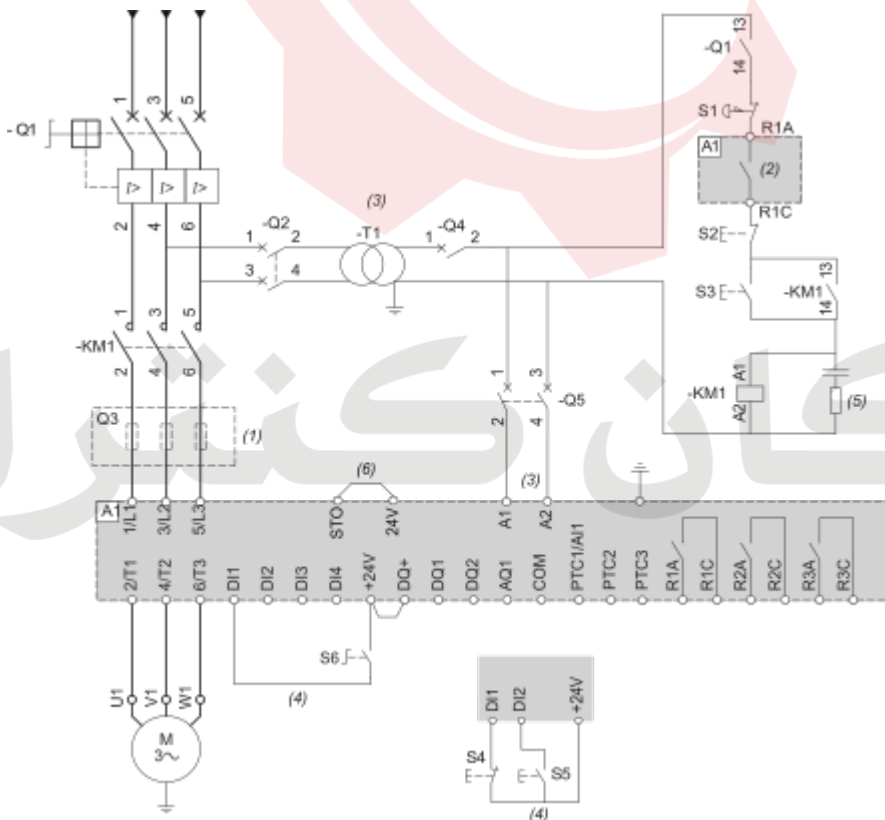
(1) : Installation of additional fast-acting fuses is mandatory to upgrade to type 2 coordination according to IEC 60947-4-2.

- (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

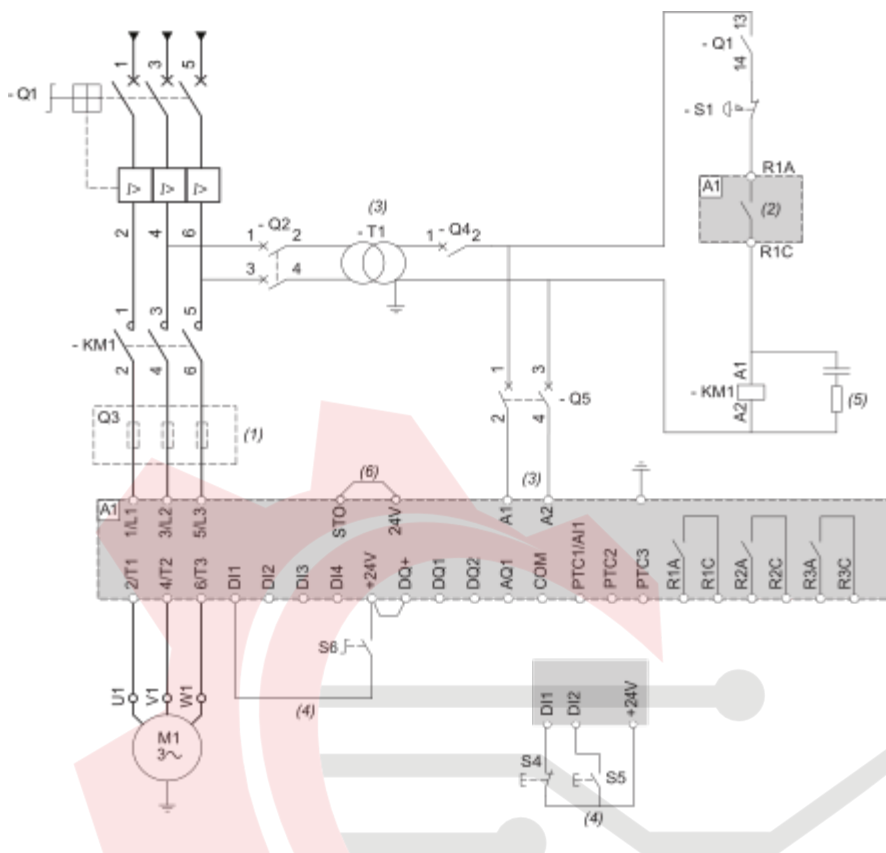
Designation	Component	Description
Q1	Circuit breaker	Short circuit protection device for the motor
Q2	Circuit breaker	Short circuit protection device for the primary of the transformer
Q3	Fast acting fuses	Short circuit protection device of the soft starter to be used only when type 2 coordination
Q4	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]

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- (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.

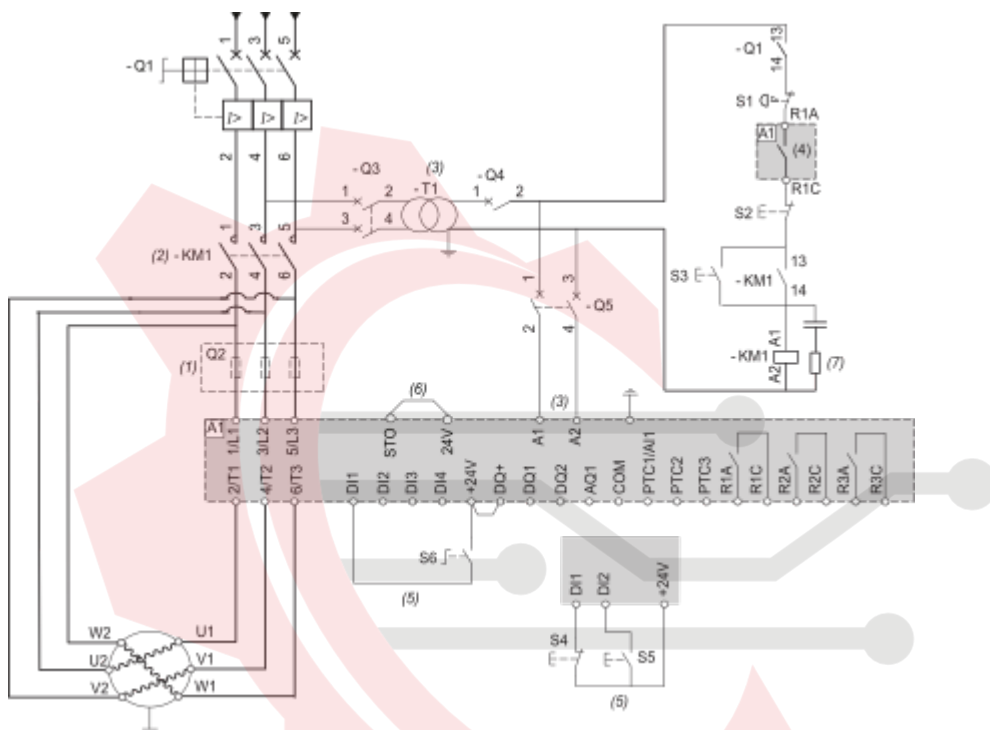
Designation	Component	Description
Q1	Circuit breaker	Short circuit protection device for the motor
Q2	Circuit breaker	Short circuit protection device for the primary of the transformer
Q3	Fast acting fuses	Short circuit protection device of the soft starter to be used only when type 2 coordination according 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	Contactar	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
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**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.

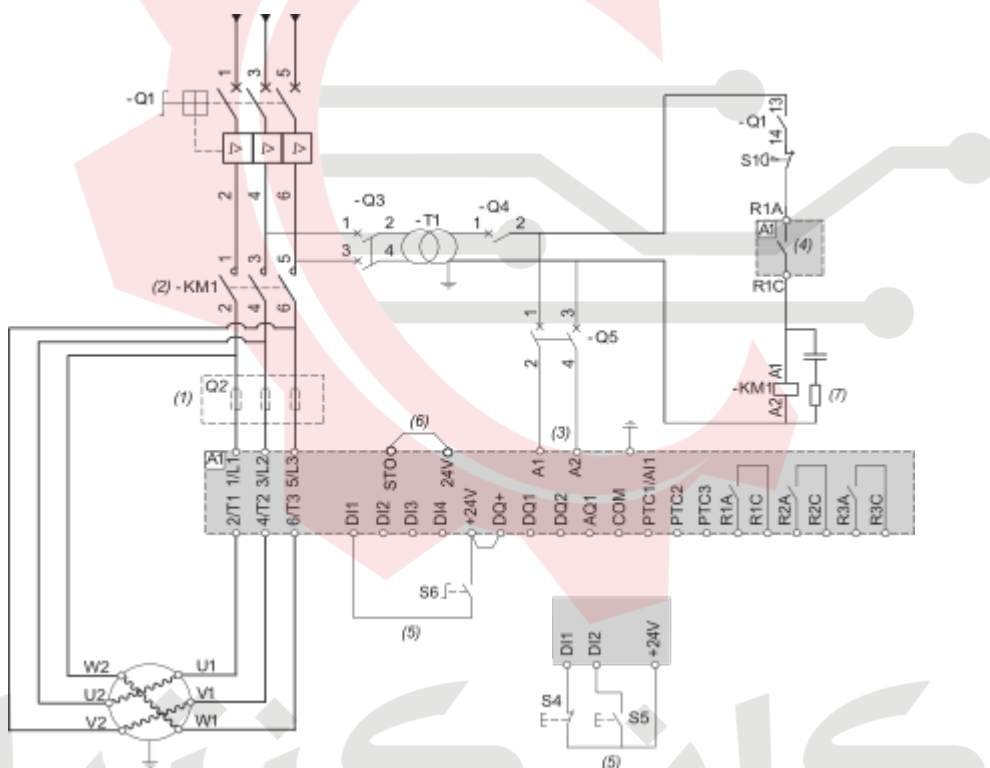
Designation	Component	Description
Q1	Circuit breaker	Short circuit protection device for the motor
Q2	Fast acting fuses	Short circuit protection device of the soft starter to be used only when type 2 coordination according to IEC 60947-4-2 is required
Q3	Circuit breaker	Short circuit protection device 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	Contactors	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]

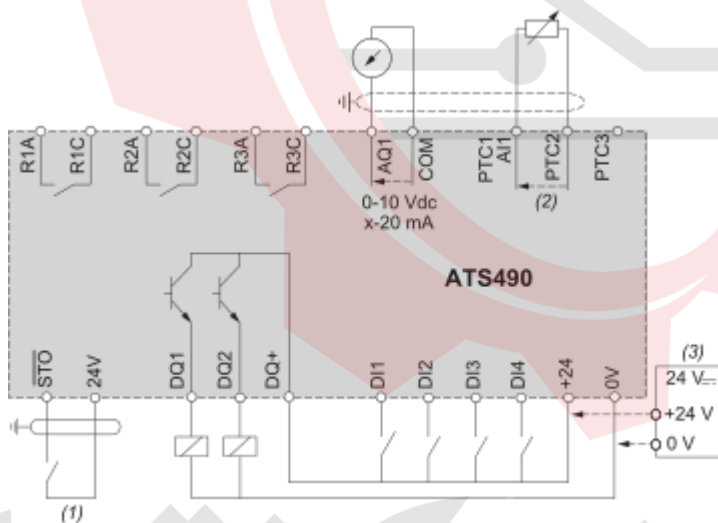


- (1) : Installation of additional fast-acting fuses is mandatory to upgrade to type 2 coordination according to IEC 60947-4-2.
- (2) : KM1 is mandatory to avoid uncontrolled voltage on the motor.
- (3) : The transformer must supply 110...230 Vac +10% — 15%, 50/60Hz.
- (4) : Take into account the electrical 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

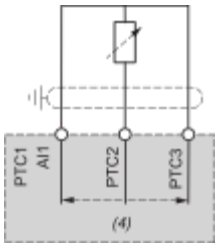
STO : Safety function STO input

(1) : STO Safe Torque Off

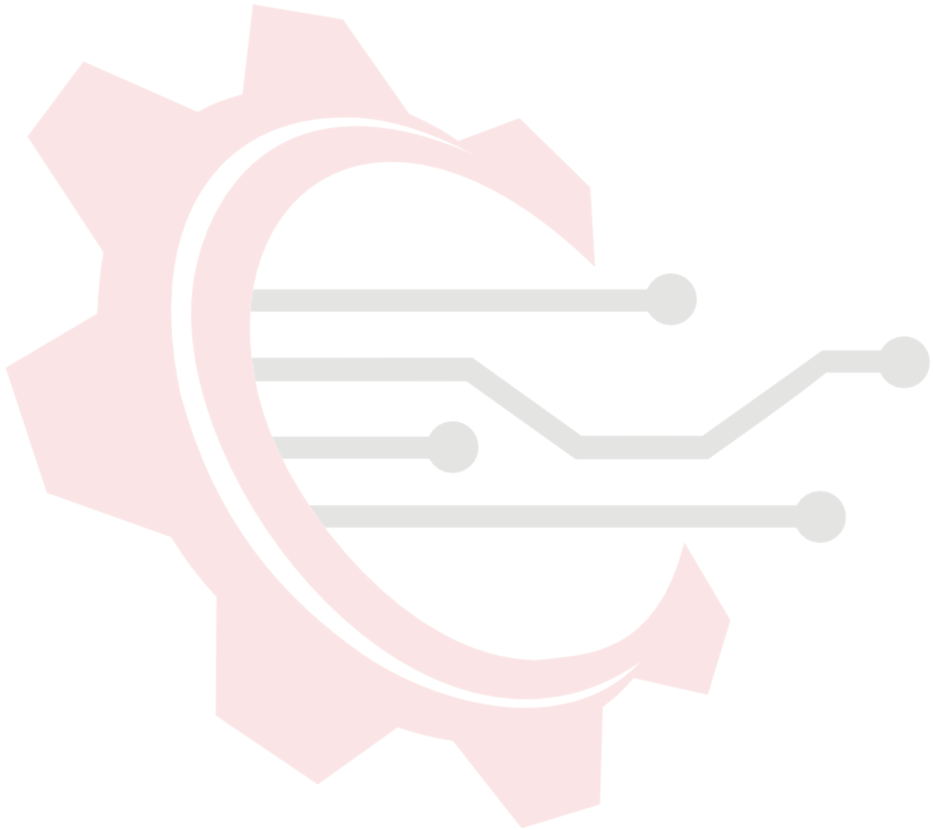
(2) : 2 wire PTC/PT100/PT1000/KTY

(3) : Optional, in case of +24 External Supply usage

PT100, PT1000 Thermal Probe 3 Wires :



(4) : 3 wire PT100/PT1000

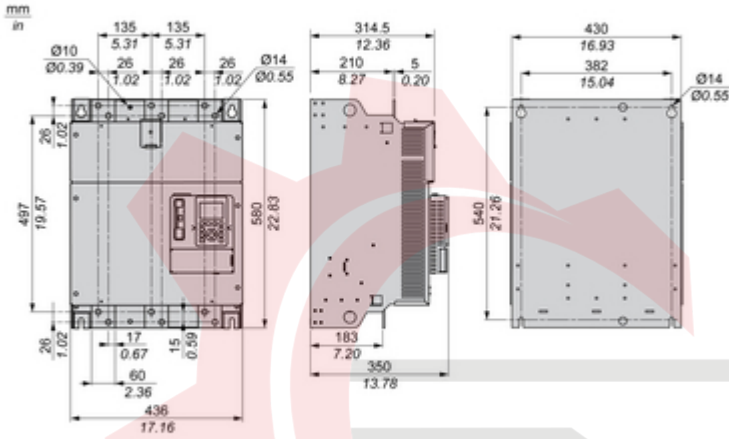


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Technical Illustration

Dimensions

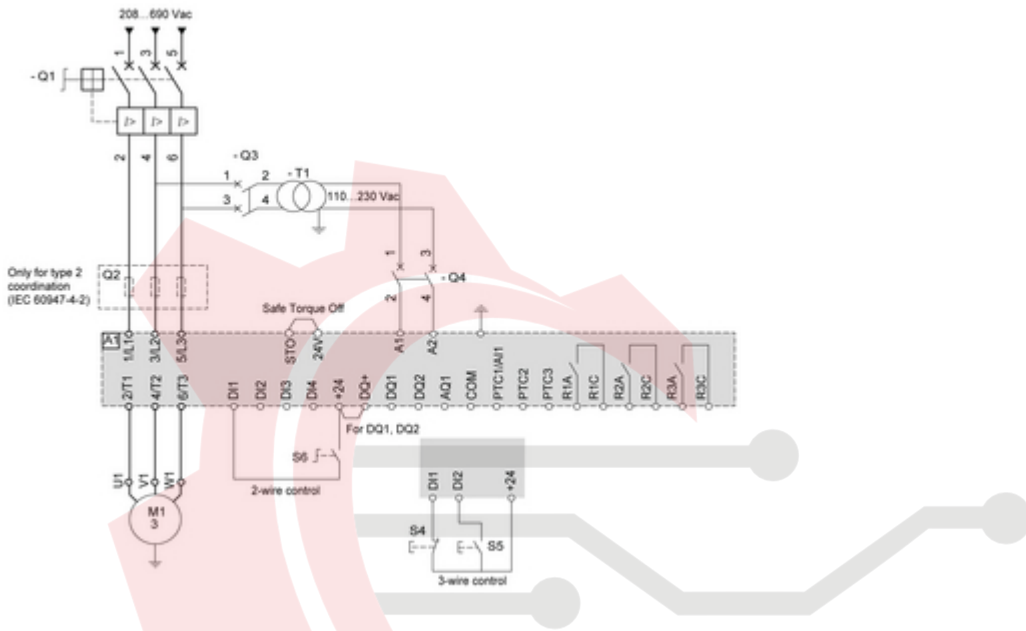
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Technical Illustration

Wiring diagram



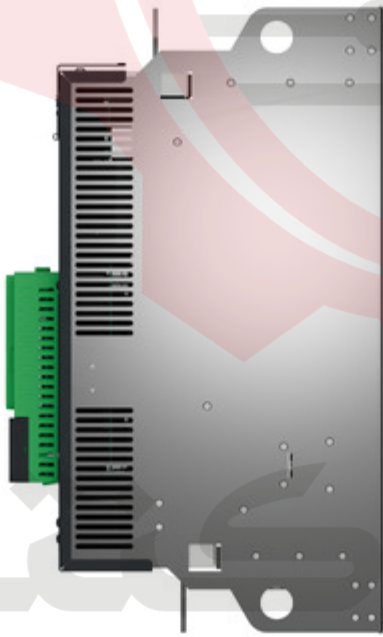
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Image of product / Alternate images

Alternative

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