

Soft Starter with reversing function
VersiStart II g PS
Assembly- and Commissioning Instructions



as per 01/26 1S610.10001

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These commissioning instructions were prepared with great care. Nevertheless, PETER electronic GmbH & Co. KG does not assume liability for damage resulting from mistakes possibly contained in this manual. Technical changes that serve to improve the product are subject to change without notice.



Disposal Instructions

Equipment containing electrical components may not be disposed of together with domestic waste. It must be collected separately as electrical and electronic waste according to local and currently valid legislation.

Notes and symbols used in these instructions

Note: Notes explain the advantages of certain adjustments or settings and help you to make use of the device in the best possible way.



Warning notices: Read them carefully and follow them strictly!

Warning notices are indicated in order to protect you against danger or to help you to prevent the device from being damaged.



Caution: Danger to life through electric shock!

When you see this sign, always make sure that the device is de-energized and secured against unintentional energizing.

1. Safety notes



The described devices are electrical equipment for use in industrial electrical power installations. An impermissible removal of the covers during operation can cause serious damage to your health, since these devices contain live parts with high voltages.

Adjustment work may only be performed by trained staff observing the safety regulations. Assembly and mounting work may only be carried out with the equipment deenergized.

Make sure that all drive components are properly earthed.

Please read these commissioning instructions carefully before putting the device into operation.

Besides, the user must ensure that the devices and associated components are fitted and connected in accordance with the applicable local, legal and technical regulations. The VDE-regulations VDE 0100, VDE 0110 (EN 60664), VDE 0160 (EN 50178) , VDE 0113 (EN 60204, EN 61310), VDE 0660 (EN 50274) plus the appropriate regulations of the TÜV (Technical Control Association) and the trade associations apply in Germany.

The user must ensure that the drive turns into a safe operating state following a device failure, in the event of maloperation, or if the control unit has failed etc..

Caution: Even if the motor is at rest, it is **not** physically separated from the mains.

2. Conformity

In industrial linguistic usage the drive controllers of the type series VersiStart II 9 PS are called "devices", however, in the sense of the "law on the safety of equipment", the "EMC-law" or the "EC-machinery directive" they are not devices or machines ready for use or connection but they are components. It is only possible to define their final function, when these components are integrated into the design and construction of the user.

To be able to use the devices to their intended purpose, it requires power supply networks according to DIN EN 50160 (IEC38).

The user takes the responsibility that the user's design and construction comply with the applicable legal provision.

The commissioning is strictly forbidden as long as the conformity of the final product with the guidelines 2006/42/EC (Machinery directive) and 2006/95/EC (Low voltage directive) is not proved.

3. General description

The smart motorstarter function is a softstart, reversal and protection of 3-phase asynchronous motors. Overcurrent is detected when the set current is exceeded longer than 2 sec. Direction reversal takes place via relay switching. The relays are de-energised at this. This ensures a long service life.

Soft starter

Two motor phases are impacted through thyristor phase-fired control to allow a steady increase of the currents. The motor torque behaves in the same manner when ramping up. This ensures that the drive can start without jerking and the drive elements are not damaged. Starting time and starting torque can be adjusted via rotary switch.

Softstop

The softstop function shall extend the natural running down time of the drive to also prevent jerky stopping.

The deceleration time is set with rotary switch t_{on} , the running-down torque with rotary switch M_{off} .

Motor protection

The thermal load of the motor is calculated using a thermal model. Thenominal motor current can be adjusted via potentiometer I_e . To calculate the thermal load the current is measured in phase T3.

A symmetric current load of all 3 phases of the motor is assumed for flawless functioning. When the trigger value – stored in the trigger characteristics-, is reached, the motor is switched off and the device switches to fault 8. The fault can be acknowledged via the reset button or reset input.



Attention:

The data of the thermal model is cleared through reset or voltage failure. In this case, the user must provide adequate cooling time of the motor.

Phase failure

To make sure the motor is not loaded with asymmetric currents, a check takes place during motor start whether phases L1, L2 and L3 are present. If one or several phases are absent, the device switches to fault 4. The fault can be acknowledged via the reset button or reset input

Motor current protection

To ensure blocking protection is in place, the motor current is monitored in T3. The switching threshold can be adjusted via potentiometer I_{max} . In the event of overcurrent, the power semiconductors deactivate and the signal relay for normal operation is reset. The red "ERR" LED flashes code 5. This status is stored. The fault can be acknowledged by switching the auxiliary voltage off / on, operating the reset button or selecting the reset control input.

Motor connection

In off state or fault condition the motor terminals are isolated from the mains voltage by a 4 pole. forcibly guided contact relay. The contact opening is min. 0.5 mm.

Control inputs

Clockwise rotation and anticlockwise rotation can be selected via two control inputs. The input signal detected first is executed if both inputs are selected simultaneously. After the detected signal is cancelled, the rotational direction is reversed via the soft start function.

The control inputs have a common isolated ground connection NE.

Signalling output “Ready”

Contact 11/14 is closed if no device fault is present.

4. Usage to the intended purpose

The devices of the VersiStart II 9 PS are electrical equipment that is used in industrial electrical power installations. They are designed for the application in machines, in order to reduce the starting torque or the inrush peaks and the soft stop torque of drives with three-phase motors.. Furthermore, the VersiStart II 9 PS offers the possibility of a turning function.

Typical Applications

reversing drive for door and gate control, bridge drives and
hoisting gear with blocking protection
conveying systems with blocking protection
actuators in process technology with blocking protection
points drives

5. EC Declaration of Conformity



EC Declaration of Conformity

The manufacturer / company placing the product on the market
(authorized representatives of the manufacturer / companies placing the product on the market
that are established within the Community)

Name / Address: PETER electronic GmbH & Co. KG
Bruckäcker 9
92348 Berg

hereby declares that the following product (device, component, unit) in the version as supplied

Product designation: Softstart-Reverse Starter
Series / type designation: VersiStart II .. PS
Article number: 2S6...
Year of manufacture: 2013

complies with the provisions of the following EU-directives:

2014/30/EU Electromagnetic compatibility
2014/35/EU Electrical equipment designed for use within certain voltage limits

The following harmonized standards have been applied:

Tested according to **EN 60947-4-2 :2012**
EN 61000-6-4 :2007 + A1:2011
EN 61000-6-2 :2005

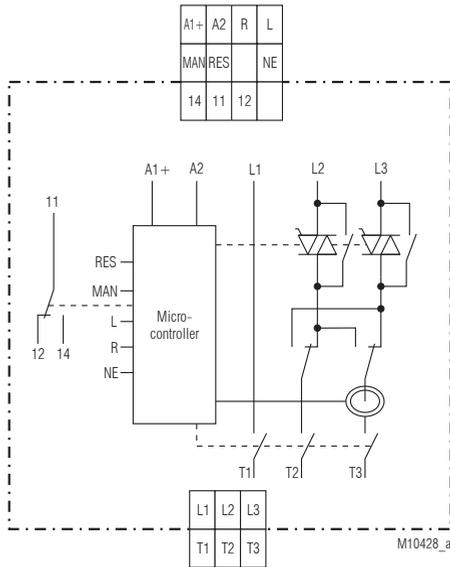
This EC Declaration of Conformity is no longer valid, if the product is modified or changed
without our agreement.

This declaration is issued under the sole responsibility of the signatory.

Berg, 29.01.2026 Bernhard Tischner, Managing director
(place, date) (signatory and function of the signatory)


(signature)

6. Block diagram

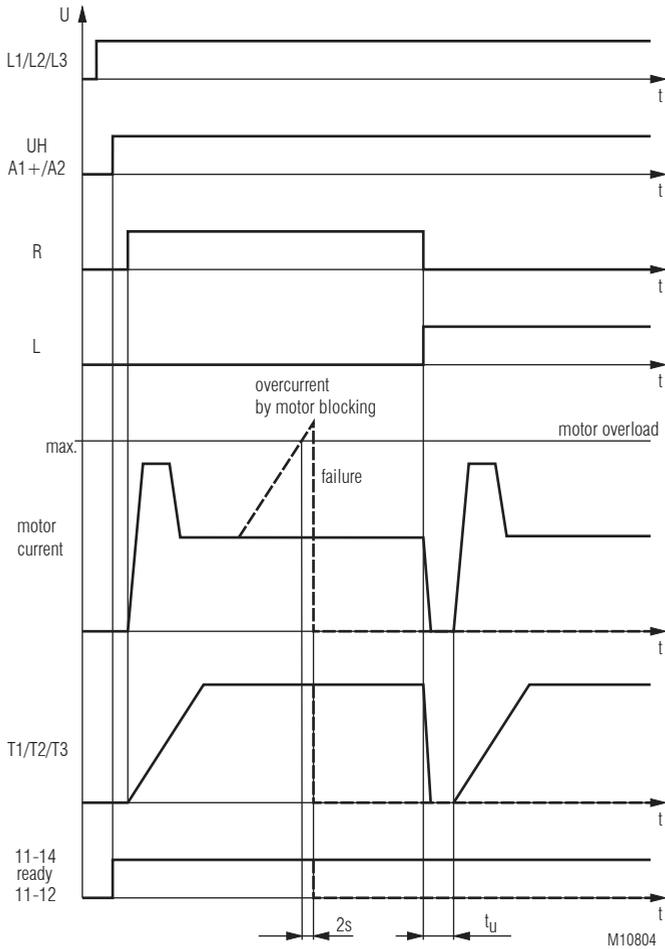


6.1 Indication

green LED "ON":	permanent on -	auxiliary supply connected
yellow LED "R":	permanent on -	clockwise, power semiconductors bridged
	flashing -	clockwise, ramp operation
yellow LED "L":	permanent on -	anticlockwise, power semiconductors bridged
	flashing -	anticlockwise, ramp operation
red LED "ERROR":	flashing -	Error
	1*)-	Overtemperature on semiconductors
	2*)-	Wrong mains frequency
	3*)-	Phase reversal detected
	4*)-	min. 1 phase is missing
	5*)-	Motor overcurrent detected
	6*)-	Mains isolating relay not disconnected
	7*)-	Incorrect temperature measurement circuit
	8*)-	Motor protection has responded

1*) - 8*) = Number of flashing pulses in sequence

7. Function Diagram



t_u = switchover delay time

t_p = overload response time according to characteristic class 10A or 5 (variants /XX1)

8. Technical Data

Nominal voltage L1/L2/L3:	3 AC 200 ... 480 V \pm 10%	
Nominal frequency:	50 / 60 Hz , automatic detection	
Auxiliary voltage:	DC 24 V \pm 10%	
Motor power:	4 kW bei AC 400 V	
Min. motor power:	25 W	
Operating mode:		
9,0 A:	AC 51	
9,0 A:	AC 53a: 6-2: 100-30	IEC/EN 60947-4-2
Surge current:	200 A (t_p = 20 ms)	
Load limit integral:	200 A ² s (t_p = 10 ms)	
Peak reverse voltage:	1500 V	
Overvoltage limiting:	AC 550 V	
Leakage current in off state:	< 3 x 0.5 mA	
Starting voltage:	30 ... 80 %	
Start / deceleration ramp:	1 ... 10 s (Special time SO1: 0 ... 1 s)	
Consumption:	2 W	
Switchover delay time:	250 ms	
Start up delay		
for master tick:	min. 100 ms	
Release delay		
for master tick	min. 50 ms	
Overcurrent measuring device:	AC 5 ... 50 A	
Measuring accuracy:	\pm 5% of end of scale value	
Measured value update time		
at 50 Hz:	100 ms	
at 60 Hz:	83 ms	
Motor protection		
I_e 1,5 A bis 6,9 A:	Class 10 A	
I_e 6,9 A bis 9,0 A:	Class 5	
Short circuit strength:		
max. fuse rating:	25 A gG / gL	IEC/EN 60 947-5-1
Assignment type:	1	IEC/EN 60 947-4-1
Electrical life:	> 10 x 10 ⁶ Schaltspiele	

8.1 Inputs

Control input right, left:	DC 24V
Rated current:	4 mA
Response value ON:	DC 10 V ... 30 V
Response value OFF:	DC 0 V ... 8 V
Connection:	polarity protected diode
Manuel:	DC 24 V
	(connect button on terminals "MAN" and "RES")

8.2 Indicator Outputs

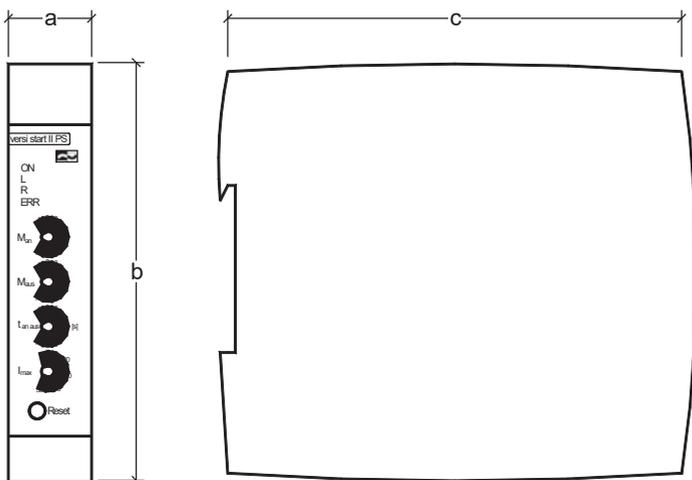
RES:	DC 24 V, semiconductor, short circuit proof, rated continuous current 0.2 A programmable at customers specification (on request)	
Ready:	Changeover contact 250 V / 5 A	
Contact:	1 changeover contact	
Switching capacity to AC 15		
NO contact:	3 A / AC 230 V	IEC/EN 60 947-5-1
NC contact:	1 A / AC 230 V	IEC/EN 60 947-5-1
Thermal current I_{th}:	5 A	
Electrical life to AC 15 at 3 A, AC 230 V:	2 x 10 ⁵ switch. cycles IEC/EN 60 947-5-1	
Mechanical life:	30 x 10 ⁶ switching cycles	
Permissible switching frequency:	1800 switching cycles/h	
Short circuit strength max. fuse rating:	4 A gL	IEC/EN 60 947-5-1

8.3 General Data

Operating mode:	Continuous operation	
Temperature range:		
Operation:	0 ... + 60°C (see derating curve)	
Storage:	- 25 ... + 75°C	
Relative air humidity:	93% at 40°C	
Altitude:	< 1.000m	
Clearance and creepage distances overvoltage category / contamination level between control input- , auxiliary voltage and Motor voltage respectively		
indicator contact:	4 kV / 2	IEC/EN 60 664-1
Overvoltage category:	III	
EMC		
Interference resistance		
Electrostatic discharge (ESD):	8 kV (air)	IEC/EN 61 000-4-2
HF-irradiation		
80 MHz ... 1.0 GHz:	10V / m	IEC/EN 61 000-4-3
1.0 GHz ... 2.5 GHz:	3V / m	IEC/EN 61 000-4-3
2.5 GHz ... 2.7 GHz:	1V / m	IEC/EN 61 000-4-3
Fast transients:	2 kV	IEC/EN 61 000-4-4
Surge voltage between wires for power supply:	1 kV	IEC/EN 61 000-4-5
between wire and ground:	2 kV	IEC/EN 61 000-4-5
HF-wire guided	10 V	IEC/EN 61 000-4-6

Voltage dips:	IEC/EN 61 000-4-11
Interference emission	
Wire guided:	Limit value class B IEC/EN 60 947-4-2
Radio irradiation:	Limit value class B IEC/EN 60 947-4-2
Degree of protection:	
Housing:	IP 40 IEC/EN 60 529
Terminals:	IP 20 IEC/EN 60 529
Vibration resistance:	Amplitude 0.35 mm frequency 10...55 Hz, IEC/EN 60 068-2-6 0 / 060 / 04 IEC/EN 60 068-1
Climate resistance:	
Wire connection:	DIN 46 228-1/-2/-3/-4
Screw terminal (fixed):	
Control terminals	
Cross section:	1 x 0.14 ... 2.5 mm ² solid or stranded wire with sleeve
Power terminals	
Cross section	1 x 0.25 ... 2.5 mm ² solid or stranded wire with sleeve
Insulation of wires or sleeve length::	8 mm
Fixing torque:	0.5Nm
Wire fixing:	captive slotted screw
Mounting:	DIN rail IEC/EN 60 715
Weight:	220 g
Standard Type	
VersiStart II 9 PS:	3AC 400V 4kW 50/60Hz 9,0A
Article number:	2S610.40009
Nominal voltage:	3AC 400V
Nominal motor power	4kW
Control input R, L	
With softstart	
Without mains isolating	
With overcurrent protection	

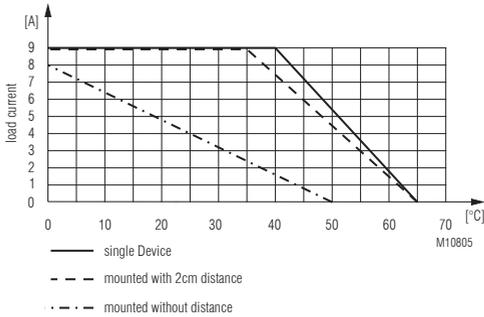
8.4 Dimensions



Mounting dimensions	a	b	c
VersiStart II 9 PS	22,5	105	120,3

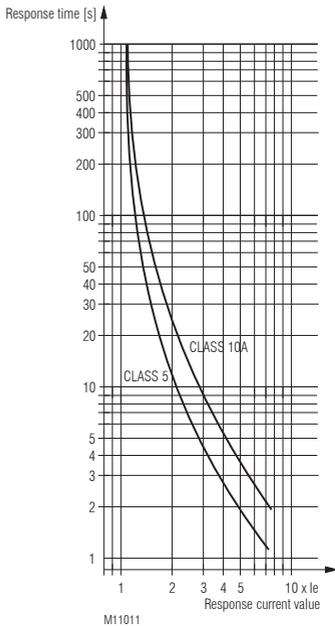
All dimensions indicated in mm.

8.5 Characteristics



Derating curve:

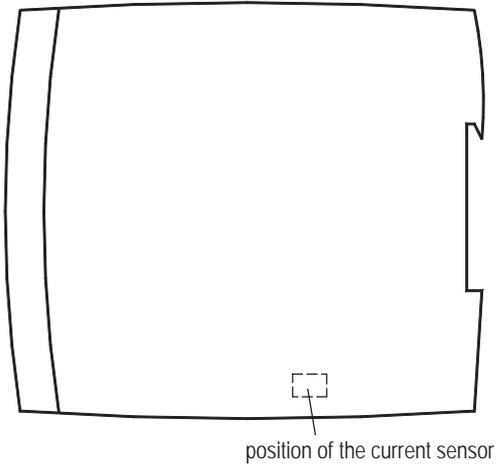
Rated continuous current depending on ambient temperature and distance Enclosure without ventilation slots



Trigger characteristics
Motor overload protection

8.6 Mounting Notes

The phase current in the device is measured with a hall effect sensor. Due to this principle also magnetic fields next to the sensor may have an influence. When designing circuits with this motorstarter components that generate magnetic fields like contactors, transformers, high current wires should not be placed close to the sensor..



9. Set-up Procedure

9.1 Connection Terminals

Terminal designation	Signal designation
A1 (+)	Auxiliary voltage + DC 24 V
A2	Auxiliary voltage 0 V
R+	Control input clockwise
L+	Control input anti-clockwise
NE	Earth connection control input
MAN	Input for remote reset
RES	Output for remote reset
11, 12, 14	Indicator relay for operation
L1	Phase voltage L1
L2	Phase voltage L2
L3	Phase voltage L3
T1	Motor connection T1
T2	Motor connection T2
T3	Motor connection T3

9.2 Set-up Procedure

1. Connect motor and device according to application example.
A clockwise rotating field is assumed for operation. A anti-clockwise rotating field triggers a fault message.
2. Turn rotary switch t_{on} / t_{off} fully clockwise, M_{on} e. g. M_{off} fully anticlockwise and rotary switch I_{max} e. g. I_e of the required current.
3. Connect voltage and starting via input R- or softstop L-.
4. The starting time is set by turning the rotary switch t_{on} anti-clockwise and the starting torque is set by turning the rotary switch M_{on} clockwise to the desired value. If set correctly, the motor shall swiftly accelerate to the nominal speed.

9.3 Reset Function

2 options are available to acknowledge the fault

Manual (reset button):

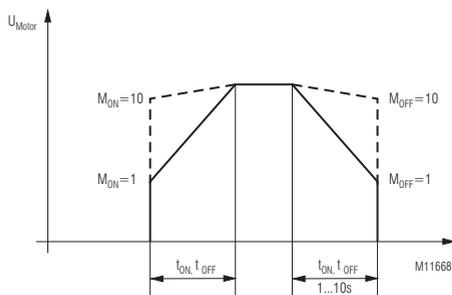
Acknowledgement is performed by operating the reset button at the front of the device. If the button is still actuated after 2 seconds, the device resumes the fault state.

Manual (remote acknowledgement):

Remote acknowledgement can be realised by connecting a button (N/O contact) between the terminals MAN and RES. Acknowledgement is triggered as soon as the contact of the button closes. If the button is still actuated after 2 seconds, the device resumes the fault state since a defect in the acknowledgement circuit cannot be ruled out.

9.4 Setting Facilities

Rotary switch M_{on} :	- Starting torque at softstart 30...80%
Rotary switch M_{off} :	- Deceleration torque at softstop 80...30%
Rotary switch t_{on} / t_{off} :	- Start / deceleration ramp 1 ... 10 s
Rotary switch t_{on} / t_{off} :	- Start / deceleration ramp 0 ... 1 s
Rotary switch I_{max} :	- Motor current monitoring 5 ... 50 A_{eff}
Rotary switch I_e :	- Nom. motor current 1.6 A_{eff} ... 9.0 A_{eff}



Setting of start / deceleration ramp

Attention:



- Never clear a fault when the device is switched on.
- The user must ensure that the device and the necessary component are mounted and connected according to the locally applicable regulations and technical standards (VDE, TÜV, BG)
- Adjustments may only be carried out by qualified specialist staff and the applicable safety rules must be observed.
- After a short circuit the motor starter is defective and has to be replaced (Assignment type 1).
- Group supply:
- If several motor starters are protected together, the sum of the motor currents must not exceed 25 A.

10. Installation guideline

The devices are to be installed into a switchbox or switchgear cabinet according to point 2 and 4. It must be ensured that the switchbox/switchgear cabinet is capable of dissipating the occurring heat loss (see techn. data).

10.1 Connection

The device is to be installed according to the attached connection diagram. Another circuit requires consultation.

11.1.1 Earthing

The electrical earthing provided ensures a low impedance connection between all metallic surfaces. Apart providing a degree of electrical safety and isolation, the earthing also has the beneficial effect that the flow of RF currents can be directed through the structure of the equipment rather than through sensitive circuits, where it could be disruptive. It is for this reason that it is vitally important to provide separate earth conductors for each part of the installation all connected to a common star point.

11.1.2 Cabling

To avoid EMI couplings into the electronics and the disturbances they involve, it must be ensured that the control cables are laid separately in separate cable ducts and as far as possible away from the power cables. If control cables crossing power cables, they have to be laid at an angle of 90° (Figure 1).

When connection shielded cables make sure that the unshielded cable ends are as short as possible. The large-surface shield bonding must not necessarily be located on the end of the shielding but may also be established in a suitable place - at a distance of some centimetres (Figure 2).

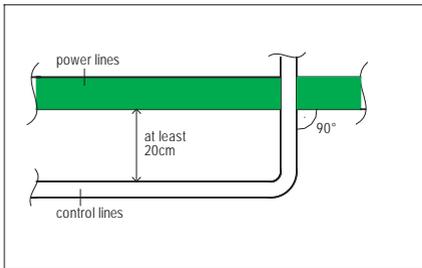


Figure 1

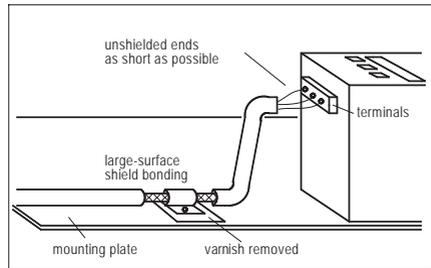


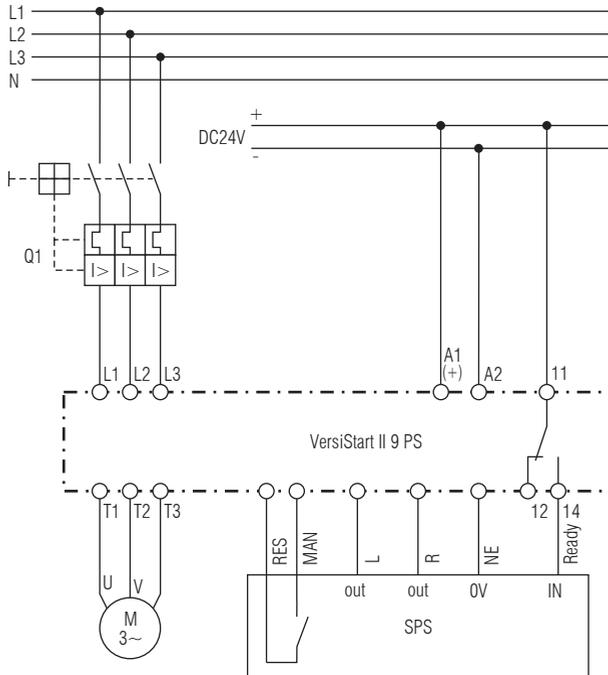
Figure 2



Caution!

The protective conductor connection to the motor must not be laid in shielded motor cables, but is to be separately laid with an appropriate cross-sectional area. The individual earthing systems, power earth, protective earth, digital earth, and analog earth conductors should be laid separately by using a suitable star-point wiring.

10.2 Application Example





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