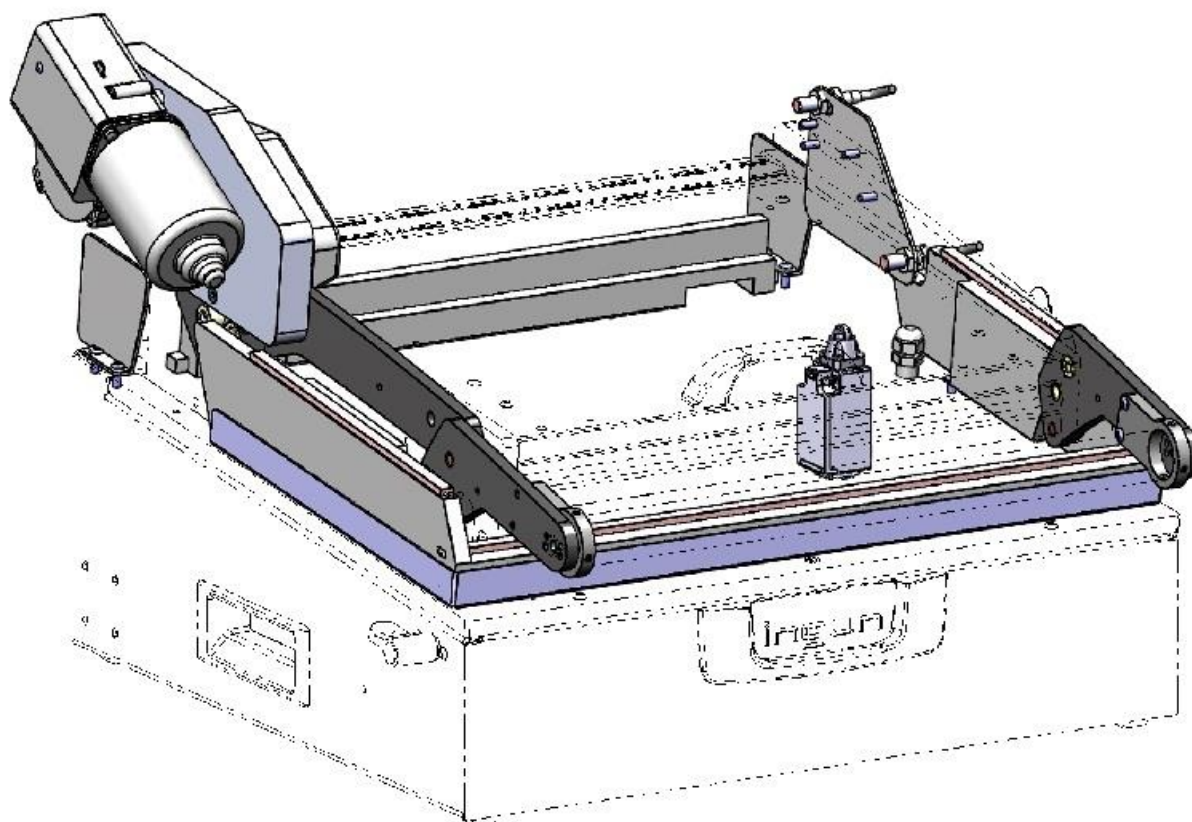


## Reference design

For control unit for functional units

- Opener-closer automatic - FB-OSA-E-MAXxxx
- Safety edge - FB-SIS-SOA-MAXxxx

**INFO 4594**



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## Beschreibung / *Description*

Die Öffner-Schließer-Automatik FB-OSA-E-MAxxxx ergänzt manuelle Prüfadapter der Baureihe MA xxxx um eine elektrische Antriebseinheit, die das selbsttätige Öffnen und Schließen des Prüfadapters ermöglicht. Durch diese Erweiterung ergeben sich zusätzliche potenzielle Risiken für den Bediener, die durch entsprechende Schutzeinrichtungen für einen sicheren Betrieb zu minimieren sind.

Je nach Einsatzfall sind dafür vom Anwender spezifische Anpassungen und Risikobewertungen vorzunehmen, um beispielsweise den Anforderungen der Maschinenrichtlinie 2006/42/EG gerecht zu werden und eine CE-Konformität zu gewährleisten.

Die Funktionsbaugruppen können mit unterschiedlichen Steuerungsarten betrieben werden. Je nach dem in welcher Umgebung der Prüfadapter mit den Funktionsbaugruppen integriert werden soll, kann eine ideale Lösung der Steuerung zu unterschiedlichsten Ergebnissen führen. Aus diesem Grund ist die Steuerung nicht im Lieferumfang von INGUN enthalten und wird mit dem hier vorliegenden Referenzdesign dem Kunden zur Verfügung gestellt.

INGUN hat eine Konfiguration erarbeitet, die als Referenz für die Integration und Ansteuerung der Öffner-Schließer-Automatik sowie einer Sicherheits-Kontaktleiste dienen kann. Diese Referenz ist ein Vorschlag zur Ansteuerung der Funktionsbaugruppen, wodurch alle Grundfunktionen vorhanden sind.

Damit wird der Kunde über die Anforderung der Steuerung informiert und kann nach seinen

*The FB-OSA-E-MAxxxx automatic opener/closer complements the series' manual test fixtures*

*MA xxxx an electrical drive unit that enables automatic opening and closing of the test fixture. This upgrade results in additional potential risks for the operator, which must be minimised by appropriate protective devices to ensure safe operation.*

*Depending on the application, specific adaptations and risk assessments must be carried out by the user, for example to meet the requirements of the Machinery Directive 2006/42/EC and to ensure CE conformity.*

*The function units can be operated using different control methods. Depending on the environment in which the test fixture is to be integrated with the function units, an ideal solution of the control unit can lead to varying results. For this reason, the control unit is not included in the INGUN scope of delivery and is made available to the customer with this reference design.*

*INGUN has developed a configuration that can be used as a reference for the integration and control of the NC/NO automatic and a safety strip. This reference is a proposal for the control of the function units, whereby all basic functions are available.*

*This informs customers about the requirements of the control system and allows him to create the ideal control system for their needs.*

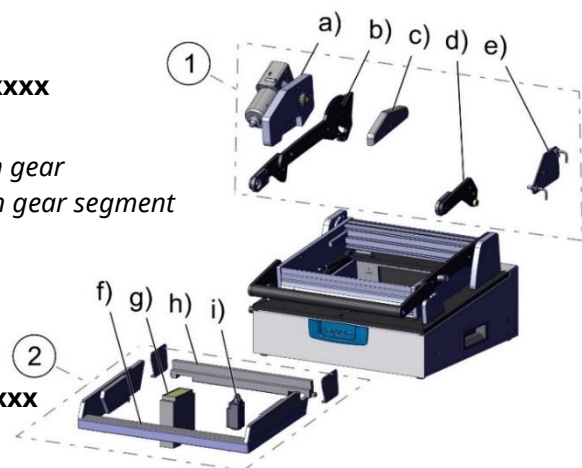
Gegebenheiten die für ihn ideale Steuerung erstellen.

① **Öffner-Schließer-Automatik - FB-OSA-E-MAXxxx**  
**Opener-closer automatic - FB-OSA-E-MAXxxx**

- a) Antriebsmotor mit Zahnrad / *Drive unit with gear*
- b) Koppel mit Zahnsegment / *Side coupler with gear segment*
- c) Abdeckung / *Cover*
- d) Griffbaugruppe / *Latch*
- e) Offen- und Geschlossen-Sensor / *Open/closed sensor*

② **Sicherheits-Kontaktleiste - FB-SIS-SOA-MAXxxx**  
**Safety switch - FB-SIS-SOA-MAXxxx**

- f) Sicherheits-Schaltleiste / *Safety strip*
- g) Schaltgerät für Sicherheits-Schaltleisten / *Safety switch*
- h) Berührschutz / *Shock-proof protection*
- i) Schalter für Montageplatte / *Switch for mounting plate*



**Öffner-Schließer-Automatik (FB-OSA-E-MAXxxx) / Automatic opener/closer (FB-OSA-E-MAXxxx)**

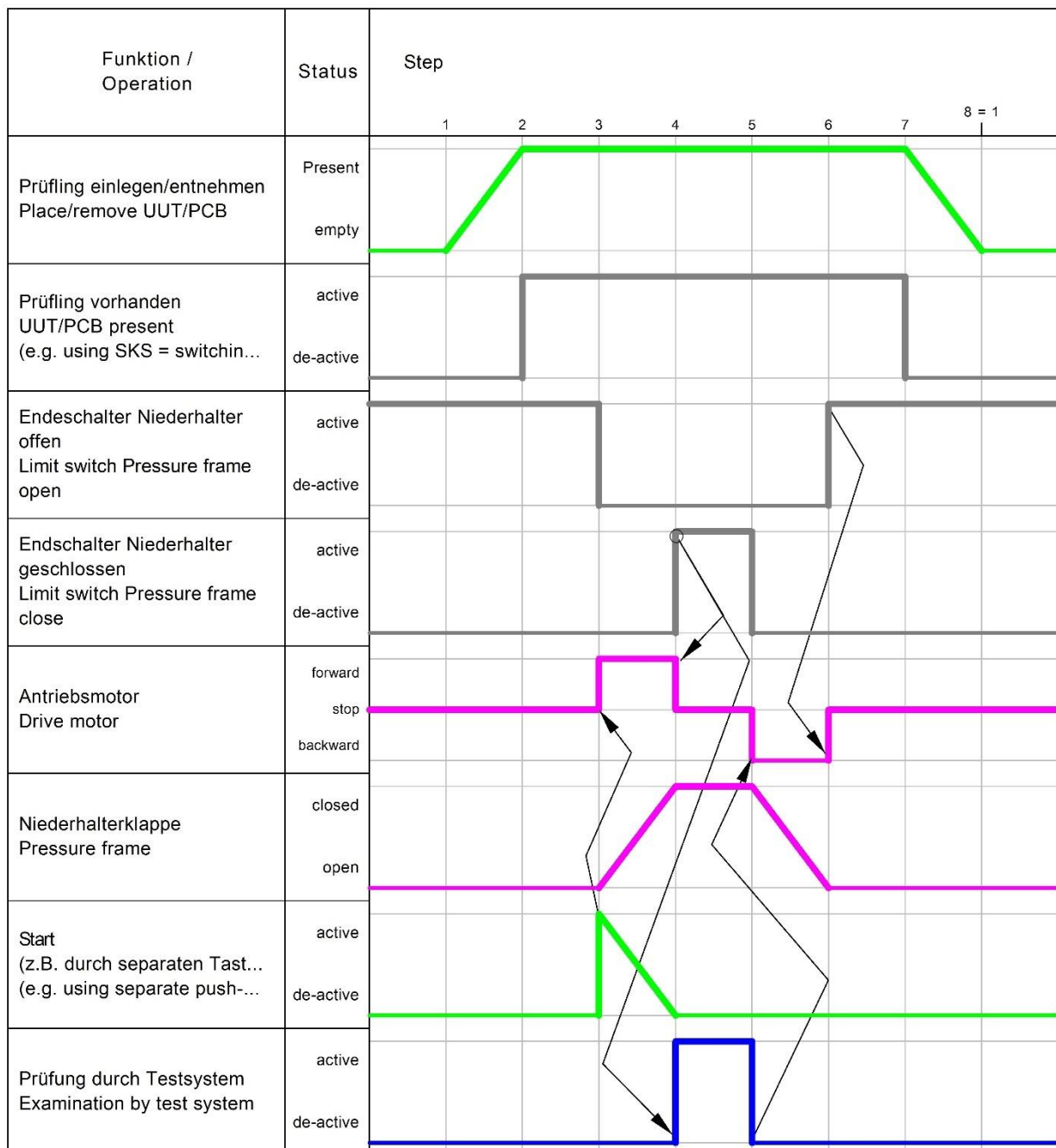
- Der Antrieb der Öffner-Schließer-Automatik erfolgt durch einen Gleichstrom-Getriebemotor über ein Zahnrad auf das Zahnsegment der Koppel der Antriebseinheit des MAXxxx.
- The automatic opener/closer is driven by a DC geared motor via a gear wheel on the gear of the side coupler on the MAXxxx drive unit.
- Der Motor wird mit einer Spannung von 12 Volt direkt von einem 10 Ampere-Netzteil versorgt.
- The motor is supplied with a voltage of 12 volts directly from a 10 Ampere power pack.
- Der Antriebsmotor wird durch einen Startimpuls gestartet und läuft durch eine Selbsthaltung bis zum Erreichen des Endschalters in die jeweilige Endlage.
- The drive motor is started by a start impulse and runs until the limit switch is reached in the respective end position.
- Die Drehrichtung zum Öffnen und Schließen erfolgt durch eine Polwechsel-Schaltung.
- The direction of rotation for opening and closing is affected by a pole-changing circuit.

**Betriebssicherheit (FB-SIS-SOA-MAXxxx) / Operational safety (FB-SIS-SOA-MAXxxx)**

- Die Sicherheits-Schaltleisten im Einlegebereich (links, vorn und rechts) werden von einem Schaltgerät, das als eine einfehlersichere Elektronik zweikanalig aufgebaut ist, ausgewertet. (Erfüllung der ISO 13849-1:2015 Kategorie 3 PL e.)
- The safety strips in the loading area (left, front, and right) are evaluated by a switching device that is designed as single-fault-proof electronics with two channels. (Fulfillment of ISO 13849-1:2015 Category 3 PL e.)
- Ein schneller Stopp zur Vermeidung von Verletzungen durch Quetschen oder Scheren wird durch die Kurzschluss-Bremse sichergestellt.
- A quick stop to avoid injuries from crushing or shearing is ensured by the short-circuit brake.

- Der NOT-Aus-Taster unterbricht durch ein Sicherheitsschaltgerät den Motorstrom.
- Deaktivierung des Öffner-Schließer-Antriebs beim Öffnen der Montageplatte der Antriebseinheit (Debugging) durch einen Schalter.
- The EMERGENCY stop button interrupts the motor current via a safety switching device.
- Deactivation of the NC-NO drive when the drive unit mounting plate is opened (debugging) by a switch.

## Ablaufdiagramm der Prüfung / *Test flowchart*



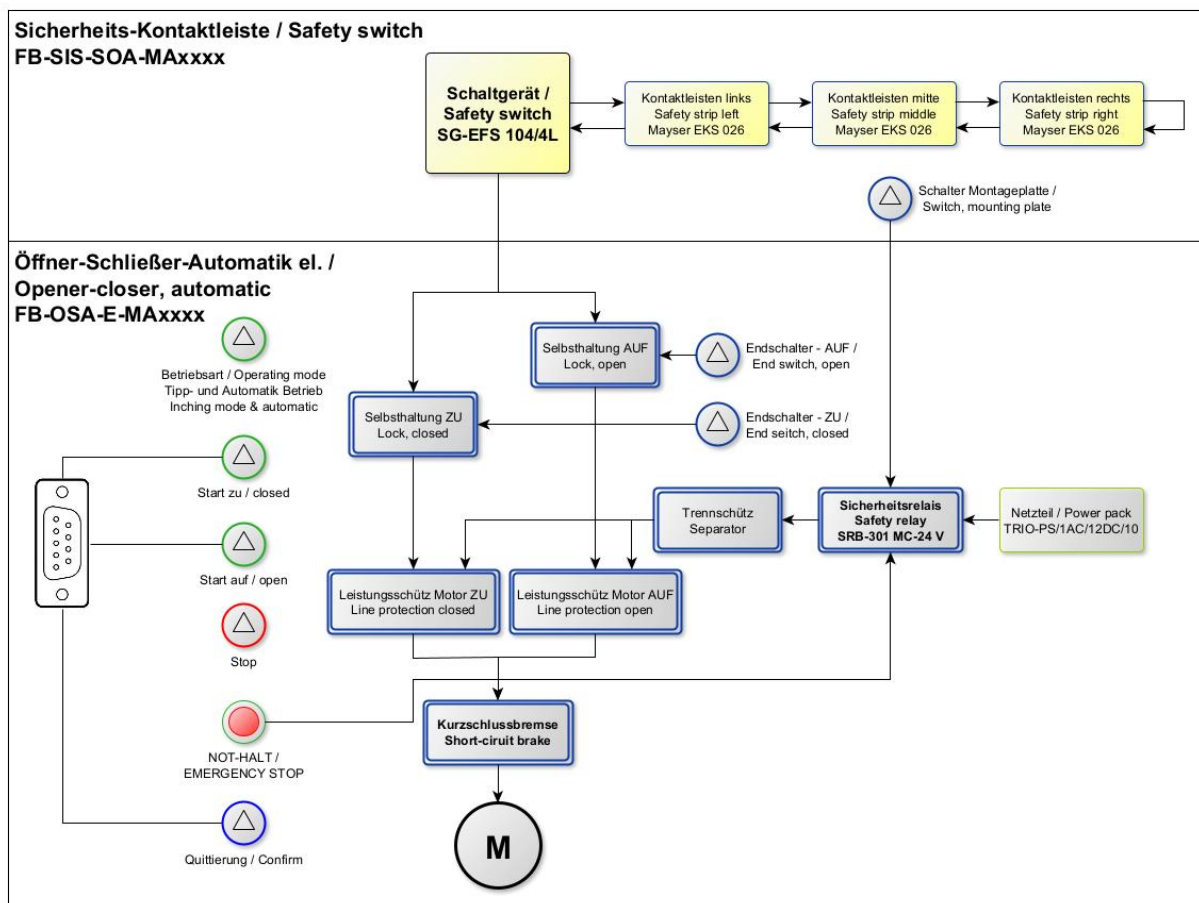
## Steuerung / *Control unit*

Im Folgenden wird eine Steuerung beschrieben, die INGUN für die internen Funktionsprüfungen erstellt hat und die bei Bedarf nachgebaut werden kann.

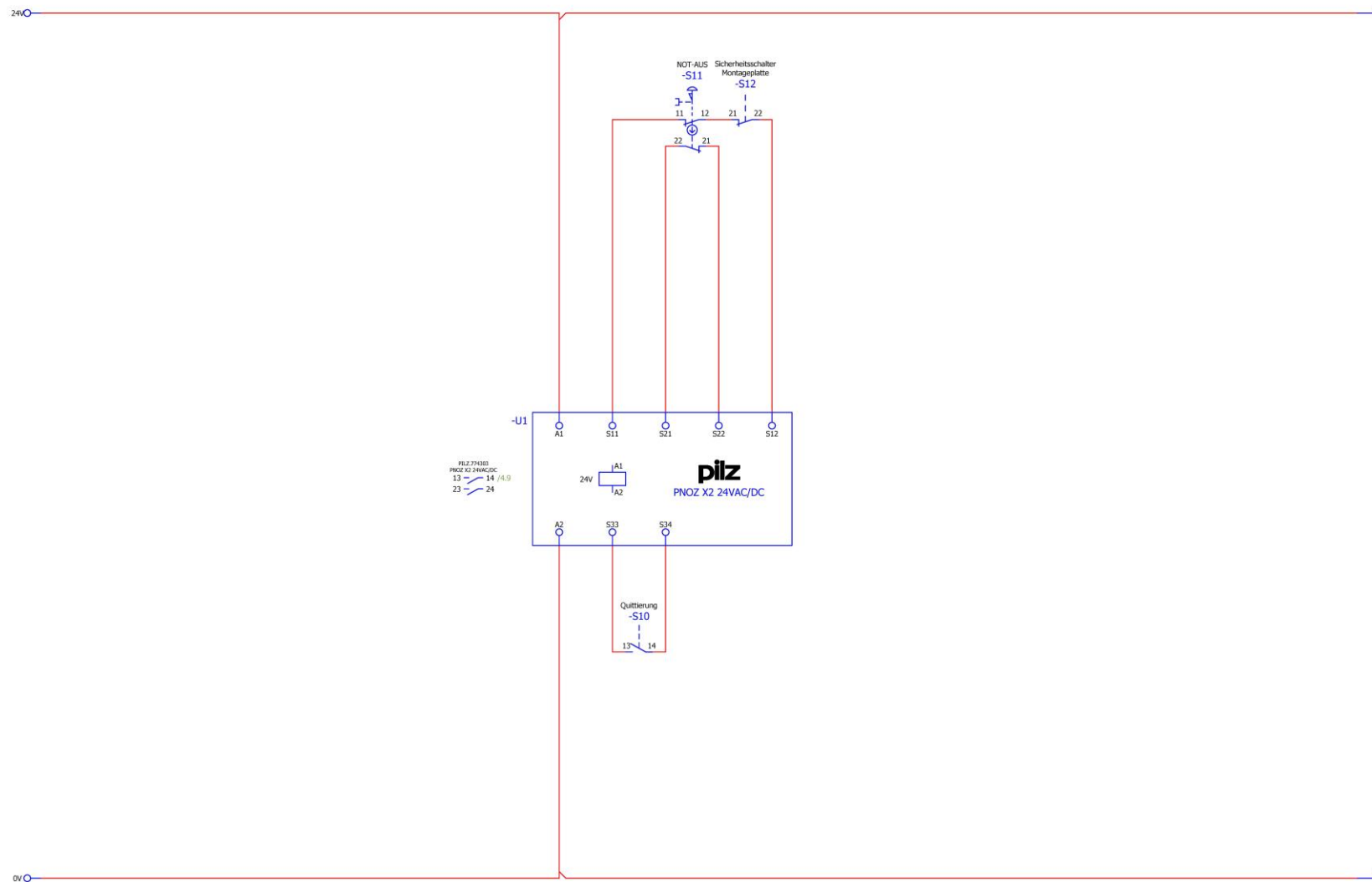
In the following, a controller is described that INGUN created for the internal function tests and that can be replicated if necessary.

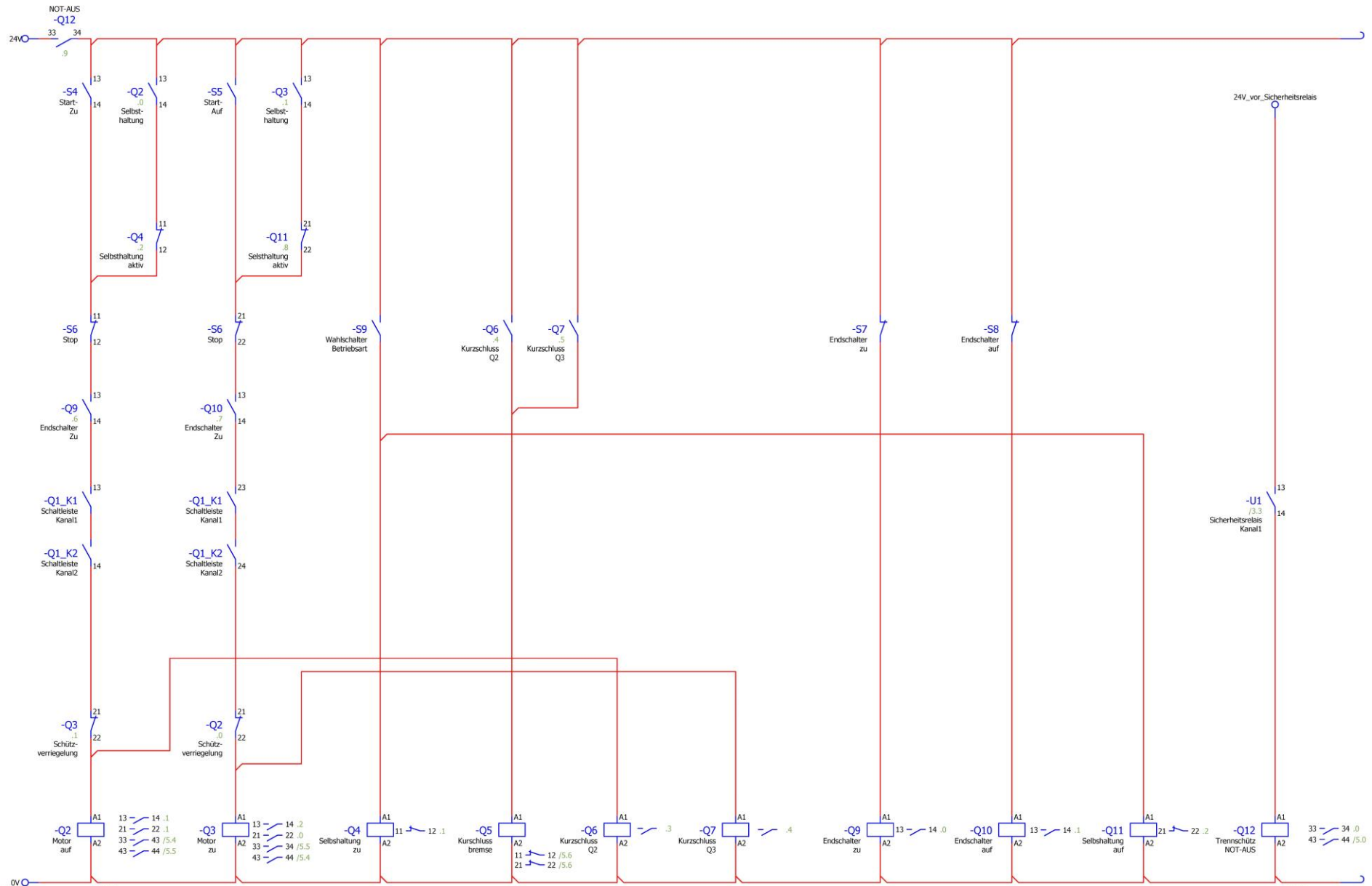


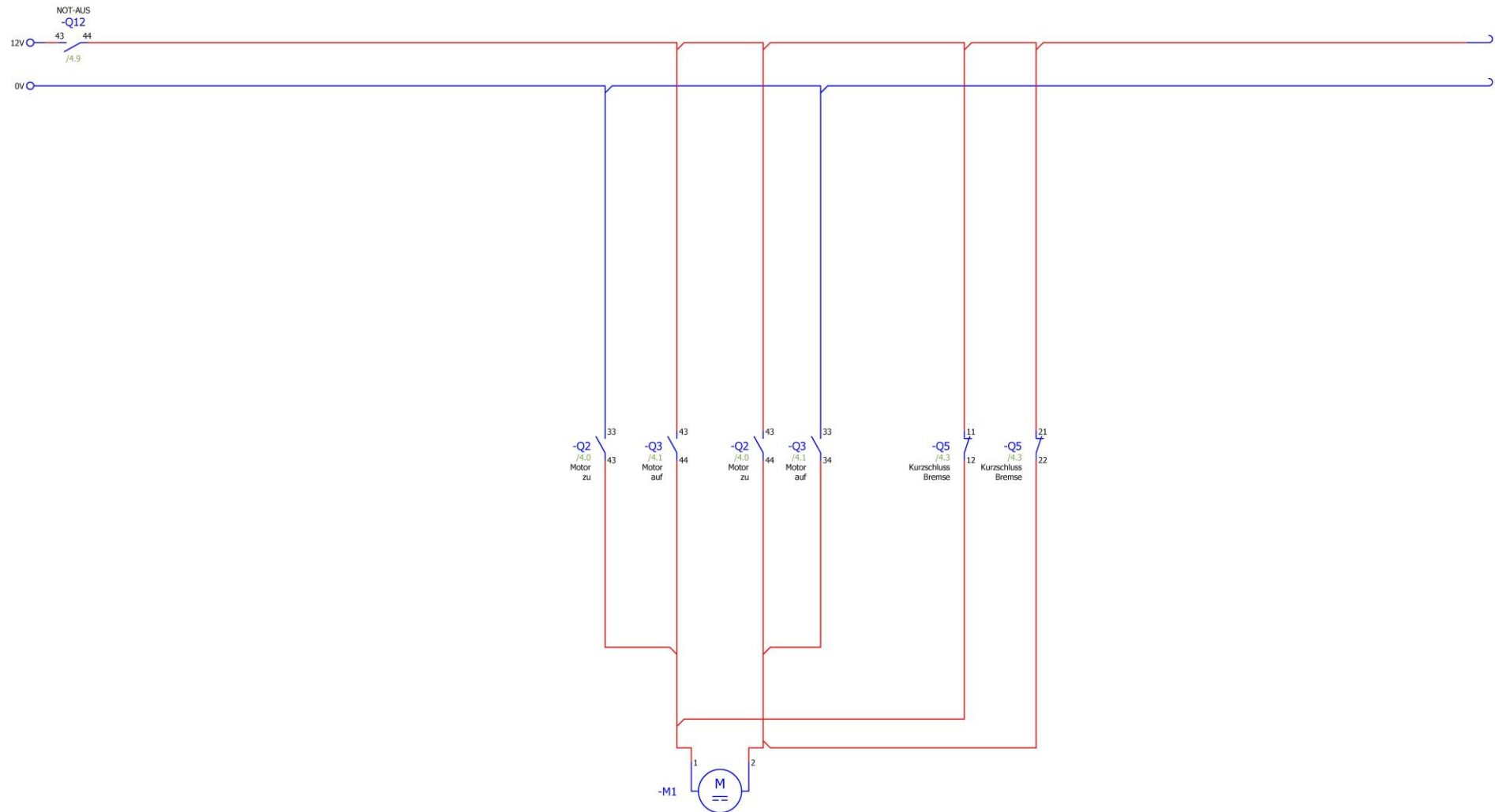
## Blockschaltbild / *Block wiring diagram*



## Funktionsplan / *Function chart*







## E-Plan



Ingun Prüfmittelbau GmbH

Max-Stromeyer-Straße 162

D-78467 Konstanz

|                     |                                     |  |  |
|---------------------|-------------------------------------|--|--|
| Project description | FB-OSA-E-MAxxxx, FB-SIS-SOA-MAxxxx  |  |  |
| Job number          | ID_13.592                           |  |  |
| Commission          | 1.0                                 |  |  |
| Path                | Manufacturing Equipment Development |  |  |
| Created on          | 10.11.2021                          |  |  |
| Edit date           | 04.01.2024                          |  |  |

<





Parts list

F01\_002

| Device tag                                                                  | Quantity   | Designation                                                                                 | Type number                          | Manufacturer | Part number                                  | Pos |
|-----------------------------------------------------------------------------|------------|---------------------------------------------------------------------------------------------|--------------------------------------|--------------|----------------------------------------------|-----|
| Placement                                                                   | QU         |                                                                                             | Order number                         | Supplier     | Function text                                |     |
| =Energy_supply+ESK-XD2<br>=Energy_supply+MAxxx&/2.1                         | 1<br>Piece | D-SUB contact insert                                                                        | VS-15-ST-DSUB/16-MPT-0,5<br>1688078  | PXC          | PXC.1688078<br>Buchse                        |     |
| =Energy_supply+ESK-XD4<br>=Energy_supply+MAxxx&/1.4                         | 1          | REAN XLR Buchse 3. POL.                                                                     | RC3F                                 | REAN<br>REAN | REAN.RC3F                                    |     |
| =Energy_supply+Electric_cabinet-F1<br>=Energy_supply+Electric_cabinet&/1.3  | 1          | RES.CURRENT OP.CIRCUIT BREAKER TYPE A PSE/SSF<br>25A 1+N-POL IFN 300MA 230V 2MW             | 5SM3612-6<br>5SM3612-6               | SIE<br>SIE   | SIE.5SM3612-6                                |     |
| =Energy_supply+Electric_cabinet-F2<br>=Energy_supply+Electric_cabinet&/3.4  | 1<br>Piece | Thermomagnetic device circuit breaker                                                       | UT 6-TMC M 4A<br>0916606             | PXC          | PXC.0916606                                  |     |
| =Energy_supply+Electric_cabinet-G1<br>=Energy_supply+Electric_cabinet&/3.4  | 1<br>Piece | Power supply unit                                                                           | TRIO-PS/1AC/12DC/10<br>2866488       | PXC          | PXC.2866488                                  |     |
| =Energy_supply+Electric_cabinet-G2<br>=Energy_supply+Electric_cabinet&/2.4  | 1<br>Piece | Power supply unit                                                                           | TRIO-PS/1AC/24DC/ 5<br>2866310       | PXC          | PXC.2866310                                  |     |
| =Energy_supply+Electric_cabinet-Q1<br>=Energy_supply+Electric_cabinet&/5.1  | 1          | Schaltgerät<br>SG-EFS 104/2W included in the delivery INGUN FB-SIS-SOA-MAxxxx!              | 1005196<br>1005196                   | MAYS<br>MAYS | MAYS.1005196                                 |     |
| =Energy_supply+Electric_cabinet-Q2<br>=Energy_supply+Electric_cabinet&/6.1  | 1          | Contactory relay, 3N/O+1N/C, DC current<br>3 Schließer + 1 Öffner, DC-betätigt              | DILER-31-G(24VDC)<br>010157          | ETN<br>ETN   | ETN.DILER-31-G(24VDC)<br>Motor Zu            |     |
| =Energy_supply+Electric_cabinet-Q3<br>=Energy_supply+Electric_cabinet&/6.3  | 1          | Contactory relay, 3N/O+1N/C, DC current<br>3 Schließer + 1 Öffner, DC-betätigt              | DILER-31-G(24VDC)<br>010157          | ETN<br>ETN   | ETN.DILER-31-G(24VDC)<br>Motor Auf           |     |
| =Energy_supply+Electric_cabinet-Q4<br>=Energy_supply+Electric_cabinet&/8.0  | 1<br>piece | Modular monostable relays<br>Modular relay, 2 pole, 20 A - DC - 24 V - AgSnO2 - 1 NO + 1 NC | 22.23.9.024.4000<br>22.23.9.024.4000 | FIN          | FIN.22.23.9.024.4000<br>Selbsthaltung Zu     |     |
| =Energy_supply+Electric_cabinet-Q5<br>=Energy_supply+Electric_cabinet&/8.4  | 1<br>piece | Contactory<br>Modular contactory, 2 pole, 25 A - AC (50/60Hz)/DC - 24 V - AgSnO2 - 2 NC     | 22.32.0.024.4420<br>22.32.0.024.4420 | FIN          | FIN.22.32.0.024.4420<br>Kurzschlussbremse    |     |
| =Energy_supply+Electric_cabinet-Q6<br>=Energy_supply+Electric_cabinet&/8.5  | 1<br>piece | Modular monostable relays<br>Modular relay, 2 pole, 20 A - DC - 24 V - AgSnO2 - 1 NO + 1 NC | 22.23.9.024.4000<br>22.23.9.024.4000 | FIN          | FIN.22.23.9.024.4000<br>Kurzschluss Q2       |     |
| =Energy_supply+Electric_cabinet-Q7<br>=Energy_supply+Electric_cabinet&/8.6  | 1<br>piece | Modular monostable relays<br>Modular relay, 2 pole, 20 A - DC - 24 V - AgSnO2 - 1 NO + 1 NC | 22.23.9.024.4000<br>22.23.9.024.4000 | FIN          | FIN.22.23.9.024.4000<br>Kurzschluss Q3       |     |
| =Energy_supply+Electric_cabinet-Q9<br>=Energy_supply+Electric_cabinet&/8.7  | 1<br>piece | Modular monostable relays<br>Modular relay, 2 pole, 20 A - DC - 24 V - AgSnO2 - 1 NO + 1 NC | 22.23.9.024.4000<br>22.23.9.024.4000 | FIN          | FIN.22.23.9.024.4000<br>Endschalter Zu       |     |
| =Energy_supply+Electric_cabinet-Q10<br>=Energy_supply+Electric_cabinet&/8.8 | 1<br>Piece | Contactory relay<br>MIRO 12.4 24V-2U OUTPUT RELAY (IN: 24 VAC/DC - OUT: 250 VAC/DC / 6 A)   | 52103<br>52103                       | MURR         | MURR.52103<br>Endschalter Auf                |     |
| =Energy_supply+Electric_cabinet-Q11<br>=Energy_supply+Electric_cabinet&/8.2 | 1<br>piece | Modular monostable relays<br>Modular relay, 2 pole, 20 A - DC - 24 V - AgSnO2 - 1 NO + 1 NC | 22.23.9.024.4000<br>22.23.9.024.4000 | FIN          | FIN.22.23.9.024.4000<br>Selbsthaltung Auf    |     |
| =Energy_supply+Electric_cabinet-Q12<br>=Energy_supply+Electric_cabinet&/6.6 | 1          | Contactory relay, 3N/O+1N/C, DC current<br>3 Schließer + 1 Öffner, DC-betätigt              | DILER-31-G(24VDC)<br>010157          | ETN<br>ETN   | ETN.DILER-31-G(24VDC)<br>Trennschütz Not-Aus |     |
| =Energy_supply+Electric_cabinet-Q13<br>=Energy_supply+Electric_cabinet&/5.7 | 1<br>piece | Contactory<br>Modular contactory, 2 pole, 25 A - AC (50/60Hz)/DC - 24 V - AgSnO2 - 2 NC     | 22.32.0.024.4420<br>22.32.0.024.4420 | FIN          | FIN.22.32.0.024.4420<br>Sicherheitsöffnung   |     |

Parts list

F01\_002

| Device tag                                                                  | Quantity        | Designation                                                       | Type number                        | Manufacturer | Part number                                        | Pos |
|-----------------------------------------------------------------------------|-----------------|-------------------------------------------------------------------|------------------------------------|--------------|----------------------------------------------------|-----|
| Placement                                                                   | QU              |                                                                   | Order number                       | Supplier     | Function text                                      |     |
| =Energy_supply+Electric_cabinet-S4<br>=Energy_supply+Electric_cabinet&/7.1  | 1               | Contact element, 1N/O, base fixing, 6. contact, screw connection  | M22-KC10<br>216380                 | ETN<br>ETN   | ETN.M22-KC10<br>Start Zu                           |     |
| =Energy_supply+Electric_cabinet-S5<br>=Energy_supply+Electric_cabinet&/7.2  | 1               | Contact element, 1N/O, base fixing, 6. contact, screw connection  | M22-KC10<br>216380                 | ETN<br>ETN   | ETN.M22-KC10<br>Start auf                          |     |
| =Energy_supply+Electric_cabinet-S6<br>=Energy_supply+Electric_cabinet&/7.3  | 2               | Contact element, 1 N/C, base fixing, 6. contact, screw connection | M22-KC01<br>216382                 | ETN<br>ETN   | ETN.M22-KC01<br>Stop                               |     |
| =Energy_supply+Electric_cabinet-S9<br>=Energy_supply+Electric_cabinet&/7.4  | 1               | Contact element, 1N/O, base fixing, 6. contact, screw connection  | M22-KC10<br>216380                 | ETN<br>ETN   | ETN.M22-KC10<br>Wahlschater Betriebsart            |     |
| =Energy_supply+Electric_cabinet-S10<br>=Energy_supply+Electric_cabinet&/7.8 | 2               | Contact element, 1N/O, base fixing, 6. contact, screw connection  | M22-KC10<br>216380                 | ETN<br>ETN   | ETN.M22-KC10<br>Quittieren Not-Aus u. Schaltleiste |     |
| =Energy_supply+Electric_cabinet-S11<br>=Energy_supply+Electric_cabinet&/7.7 | 1               | Not-Aus 2x Öffner                                                 | M22-PVT/K01/K01<br>M22-PVT/K01/K01 | ETN          | ETN.M22-PVT-K12<br>NOT-AUS                         |     |
| =Energy_supply+Electric_cabinet-U1<br>=Energy_supply+Electric_cabinet&/9.3  | 1<br>part/piece | Emergency stop relay 24V AC/DC 2n/o<br>22,5mm S-95-housing        | PNOZ X2 24VAC/DC<br>774303         | PILZ         | PILZ.774303                                        |     |
| =Energy_supply+Electric_cabinet-X1<br>=Energy_supply+Electric_cabinet&/1.5  | 3<br>Stück      | Feed-through terminal block                                       | PT 4<br>3211757                    | PXC<br>PXC   | PXC.3211757<br>230V                                |     |
| =Energy_supply+Electric_cabinet-X1<br>=Energy_supply+Electric_cabinet&/1.5  | 3<br>Stück      | Feed-through terminal block                                       | PT 4 BU<br>3211760                 | PXC<br>PXC   | PXC.3211760<br>=                                   |     |
| =Energy_supply+Electric_cabinet-X1<br>=Energy_supply+Electric_cabinet&/1.5  | 3<br>Stück      | Ground modular terminal block                                     | PT 4-PE<br>3211766                 | PXC<br>PXC   | PXC.3211766<br>=                                   |     |
| =Energy_supply+Electric_cabinet-X1<br>=Energy_supply+Electric_cabinet&/1.5  | 1<br>Stück      | Terminal strip marker carrier                                     | KLM 3<br>0811969                   | PXC<br>PXC   | PXC.0811969<br>=                                   |     |
| =Energy_supply+Electric_cabinet-X1<br>=Energy_supply+Electric_cabinet&/1.5  | 2<br>piece      | End bracket for terminal block<br>End clamp                       | CLIPFIX 35-5<br>3022276            | PXC<br>PXC   | PXC.3022276<br>=                                   |     |
| =Energy_supply+Electric_cabinet-X1<br>=Energy_supply+Electric_cabinet&/1.5  | 2<br>Stück      | Plug-in bridge                                                    | FBS 2-6<br>3030336                 | PXC<br>PXC   | PXC.3030336<br>=                                   |     |
| =Energy_supply+Electric_cabinet-X1<br>=Energy_supply+Electric_cabinet&/1.5  | 3<br>Stück      | End cover                                                         | D-ST 4<br>3030420                  | PXC<br>PXC   | PXC.3030420<br>=                                   |     |
| =Energy_supply+Electric_cabinet-X2<br>=Energy_supply+Electric_cabinet&/4.0  | 10<br>Piece     | Feed-through terminal block                                       | PT 1,5/S-QUATTRO<br>3208197        | PXC<br>PXC   | PXC.3208197<br>24V                                 |     |
| =Energy_supply+Electric_cabinet-X2<br>=Energy_supply+Electric_cabinet&/4.0  | 2<br>Stück      | End cover                                                         | D-PT 1,5/S-QUATTRO<br>3208375      | PXC<br>PXC   | PXC.3208375<br>=                                   |     |
| =Energy_supply+Electric_cabinet-X2<br>=Energy_supply+Electric_cabinet&/4.0  | 2<br>Piece      | Cross-connector for terminal block<br>Plug-in bridge              | FBS 5-3,5<br>3213043               | PXC<br>PXC   | PXC.3213043<br>=                                   |     |
| =Energy_supply+Electric_cabinet-X2<br>=Energy_supply+Electric_cabinet&/4.0  | 1<br>Piece      | Cross-connector for terminal block<br>Plug-in bridge              | FBS 5-3,5 BU<br>3213112            | PXC<br>PXC   | PXC.3213112<br>=                                   |     |

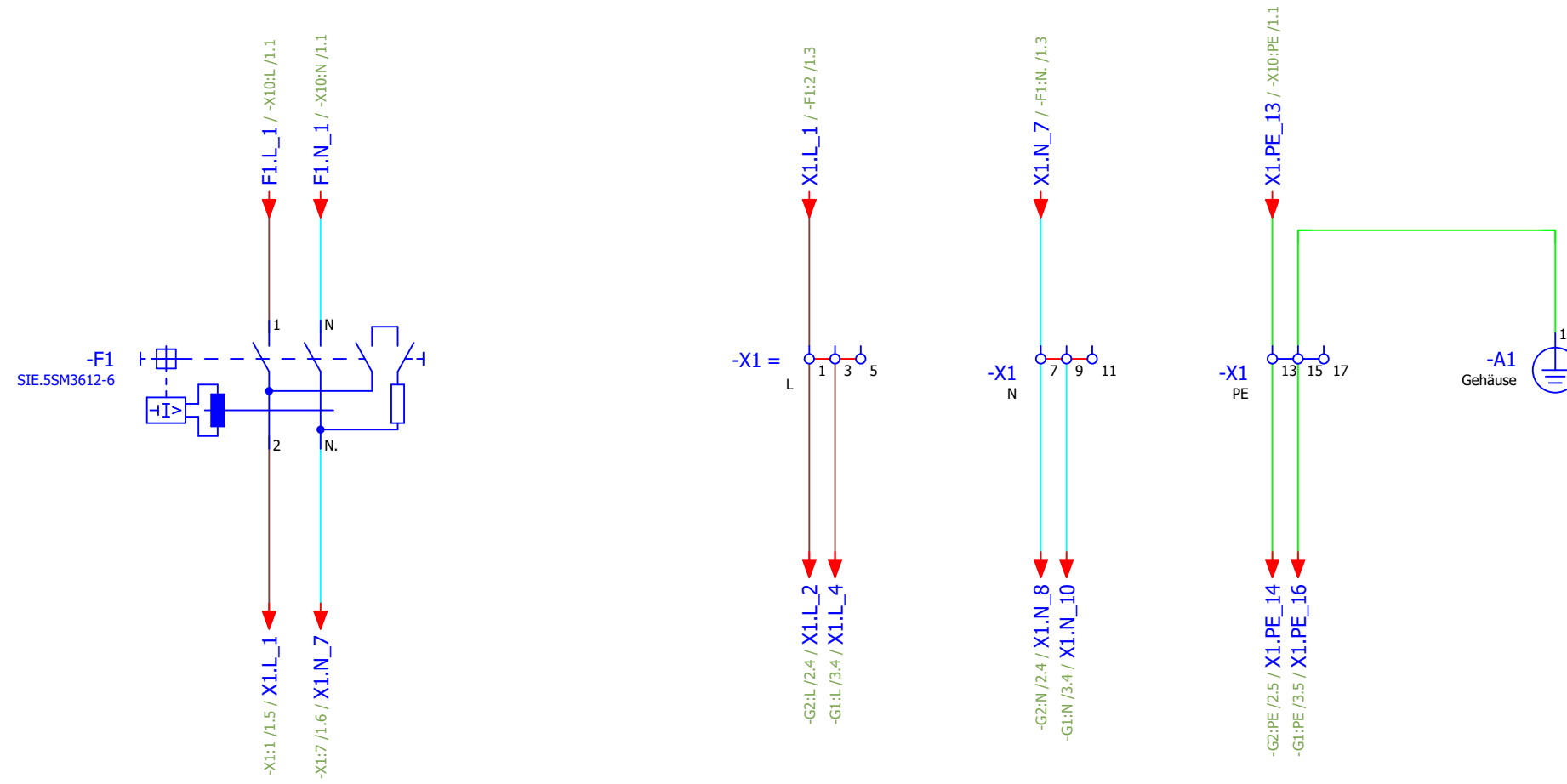
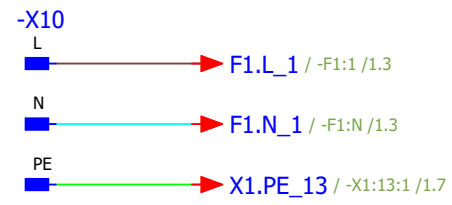


Parts list

F01\_002

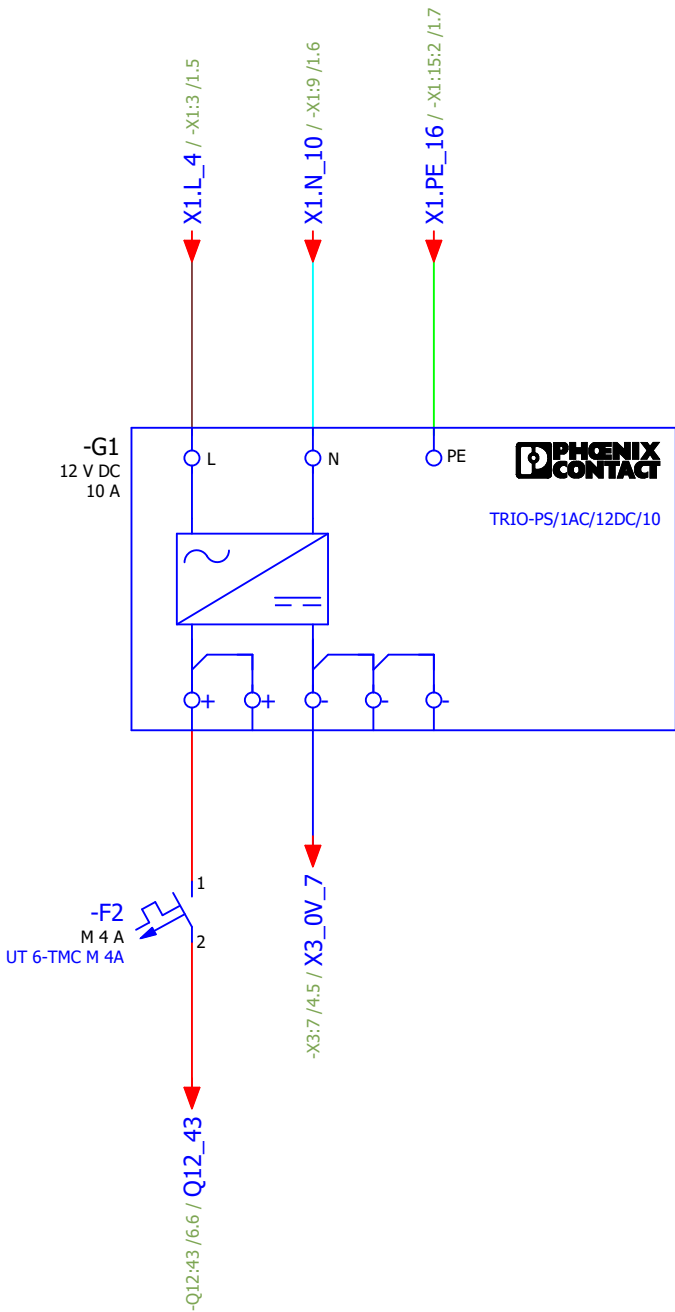
| Device tag                                                                    | Quantity   | Designation                                         | Type number                   | Manufacturer | Part number     | Pos |
|-------------------------------------------------------------------------------|------------|-----------------------------------------------------|-------------------------------|--------------|-----------------|-----|
| Placement                                                                     | QU         |                                                     | Order number                  | Supplier     | Function text   |     |
| =Energy_supply+Electric_cabinet-X6<br>=Energy_supply+Electric_cabinet&/7.2.1  | 1<br>Stück | Terminal strip marker carrier                       | KLM 3<br>0811969              | PXC<br>PXC   | PXC.0811969     |     |
| =Energy_supply+Electric_cabinet-X6<br>=Energy_supply+Electric_cabinet&/7.2.1  | 1<br>piece | End bracket for terminal block<br>End clamp         | CLIPFIX 35-5<br>3022276       | PXC<br>PXC   | PXC.3022276     |     |
| =Energy_supply+Electric_cabinet-X7<br>=Energy_supply+Electric_cabinet&/7.2.6  | 3<br>Stück | Double-level terminal block                         | PTTB 1,5/S<br>3208511         | PXC<br>PXC   | PXC.3208511     |     |
| =Energy_supply+Electric_cabinet-X7<br>=Energy_supply+Electric_cabinet&/7.2.6  | 1<br>Stück | End cover                                           | D-PTTB 1,5/S<br>3208579       | PXC<br>PXC   | PXC.3208579     |     |
| =Energy_supply+Electric_cabinet-X7<br>=Energy_supply+Electric_cabinet&/7.2.6  | 1<br>Stück | Terminal strip marker carrier                       | KLM 3<br>0811969              | PXC<br>PXC   | PXC.0811969     |     |
| =Energy_supply+Electric_cabinet-X7<br>=Energy_supply+Electric_cabinet&/7.2.6  | 2<br>piece | End bracket for terminal block<br>End clamp         | CLIPFIX 35-5<br>3022276       | PXC<br>PXC   | PXC.3022276     |     |
| =Energy_supply+Electric_cabinet-XD1<br>=Energy_supply+Electric_cabinet&/7.3.4 | 1          | D-SUB Buchsenleiste 180 ° Polzahl (num): 9 Lötkelch | 09670005470<br>09 67 209 4704 | HAR<br>HAR   | HAR.09672094704 |     |

## Distribution 230V

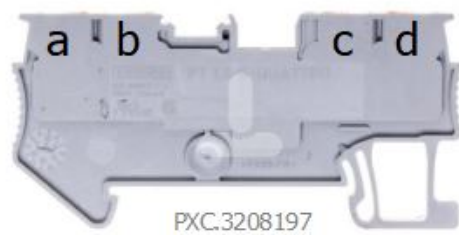
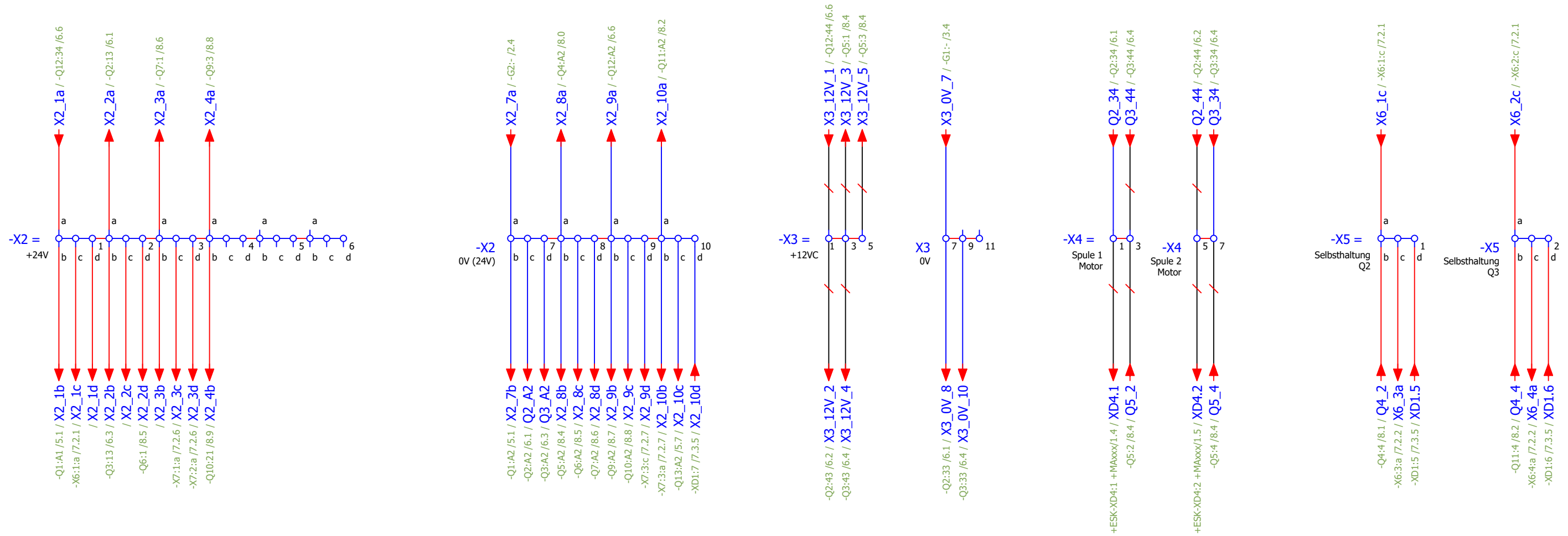




Supply 12V

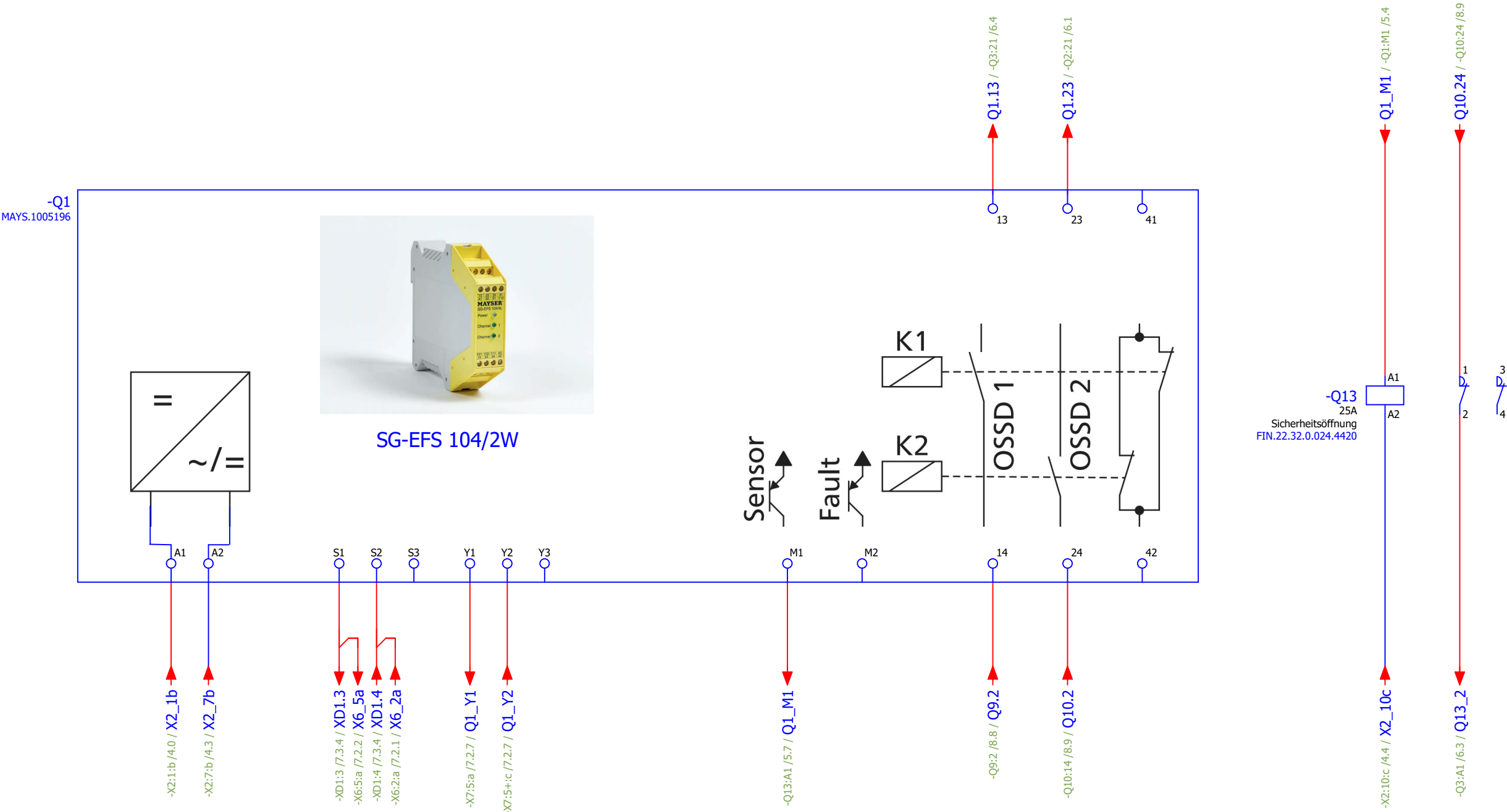


The entire 12V-wiring has to be performed with 1,5mm²



Mayser analyse unit

included in the delivery INGUN FB-SIS-SOA-MAxxxx!

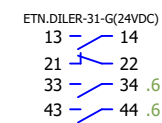
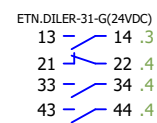
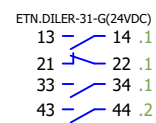
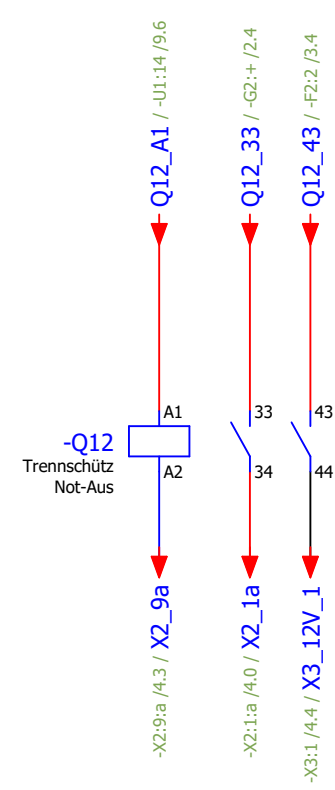
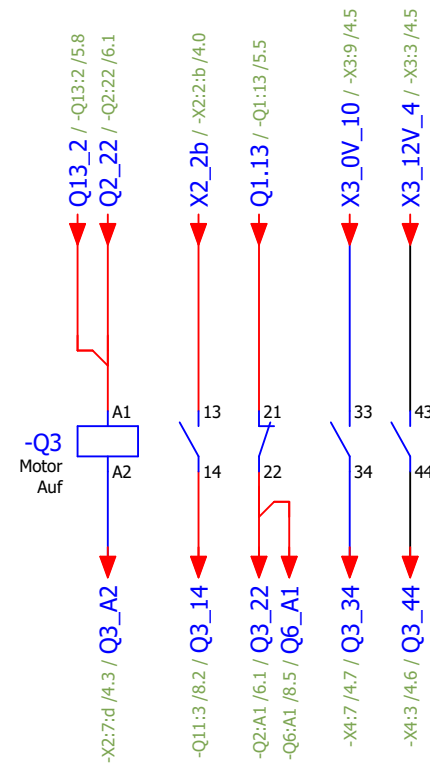
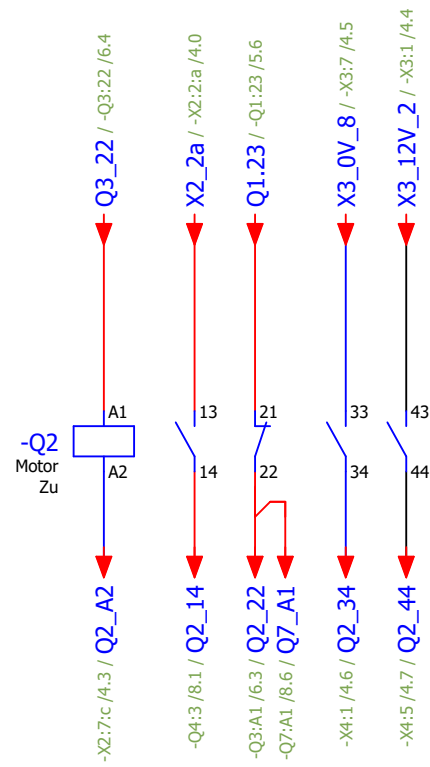


-Q13 25A  
Sicherheitsöffnung  
FIN.22.32.0.024.4420

FIN.22.32.0.024.4420  
1 2 .8  
3 4 .8

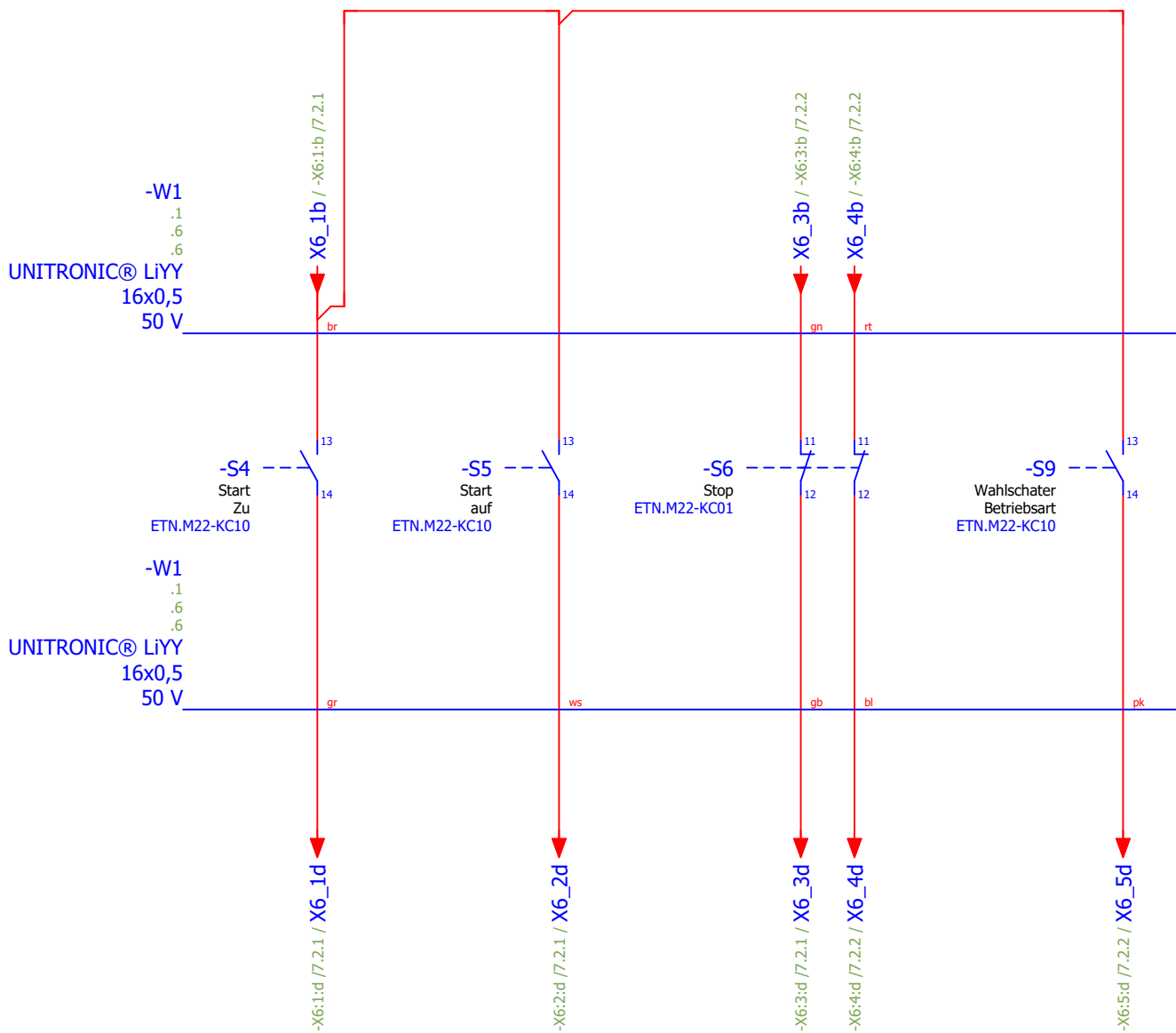
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|--------------|------|------|----------|------|------------|----------------|--------------------------|------------------------------------|-----------------------------------|-----------|--------------|
|              |      |      |          | Date | 10.11.2021 | 1.0            | Ingun Prüfmittelbau GmbH | FB-OSA-E-MAxxxx, FB-SIS-SOA-MAxxxx | =Energy_supply+Electric_cabinet/5 |           | Seite: 5     |
|              |      |      |          | Ed.  |            |                |                          |                                    | Schaltplan allpolig               |           |              |
|              |      |      |          | Appr |            |                |                          |                                    | &                                 |           |              |
| Modification | Date | Name | Original |      |            | Replacement of | Replacement of           |                                    | Page                              | ID_13.592 | Page 13 / 23 |

## power contactors

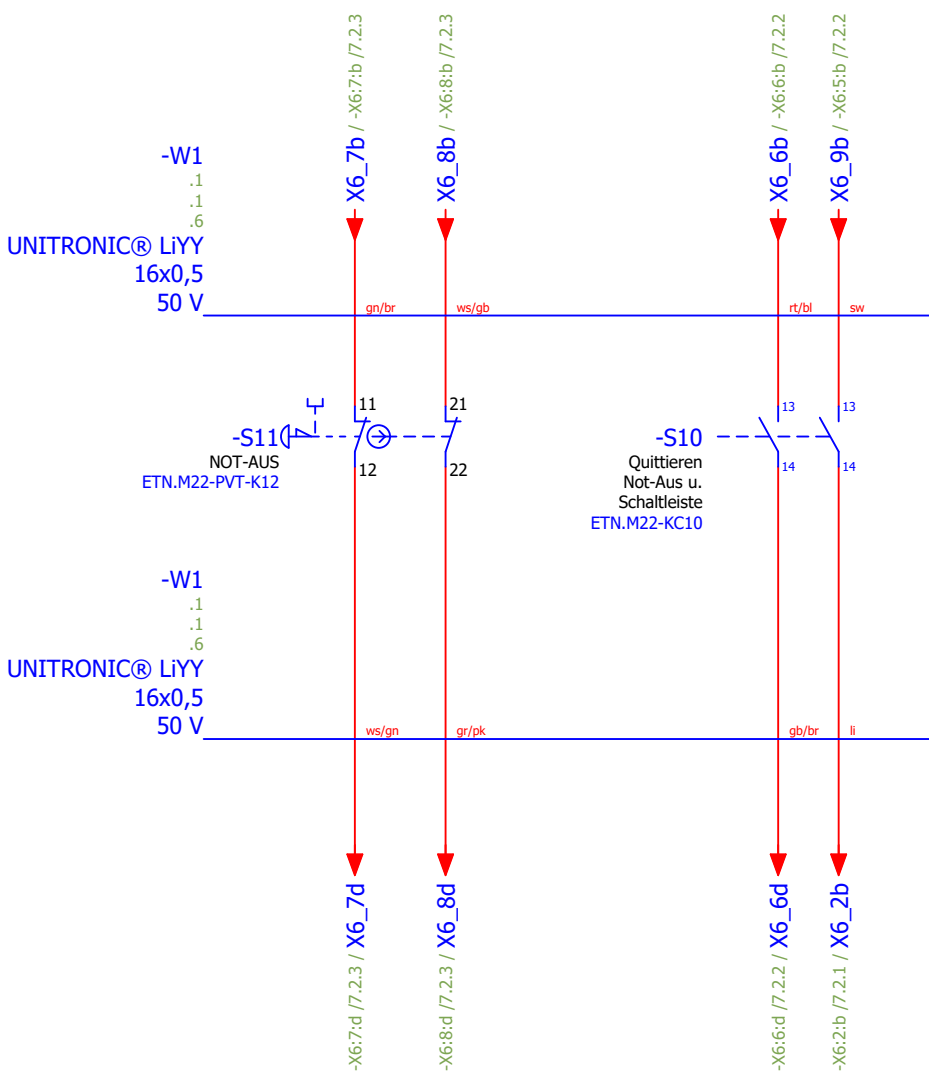


|              |  |      |      |            |                |                          |                                    |                                   |                |          |
|--------------|--|------|------|------------|----------------|--------------------------|------------------------------------|-----------------------------------|----------------|----------|
|              |  |      | Date | 10.11.2021 | 1.0            | Ingun Prüfmittelbau GmbH | FB-OSA-E-MAxxxx, FB-SIS-SOA-MAxxxx | =Energy_supply+Electric_cabinet/6 |                | Seite: 6 |
|              |  |      | Ed.  |            |                |                          |                                    | Schaltplan allpolig               |                |          |
|              |  |      | Appr |            |                |                          |                                    | &                                 |                |          |
| Modification |  | Date | Name | Original   | Replacement of |                          |                                    | Replacement of                    | Page ID_13.592 | Page     |

Start/Stop/Inching

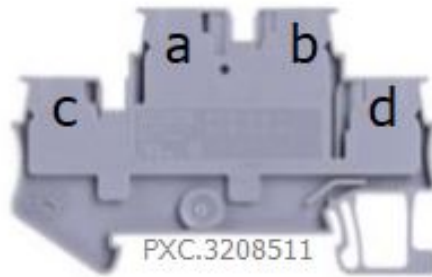
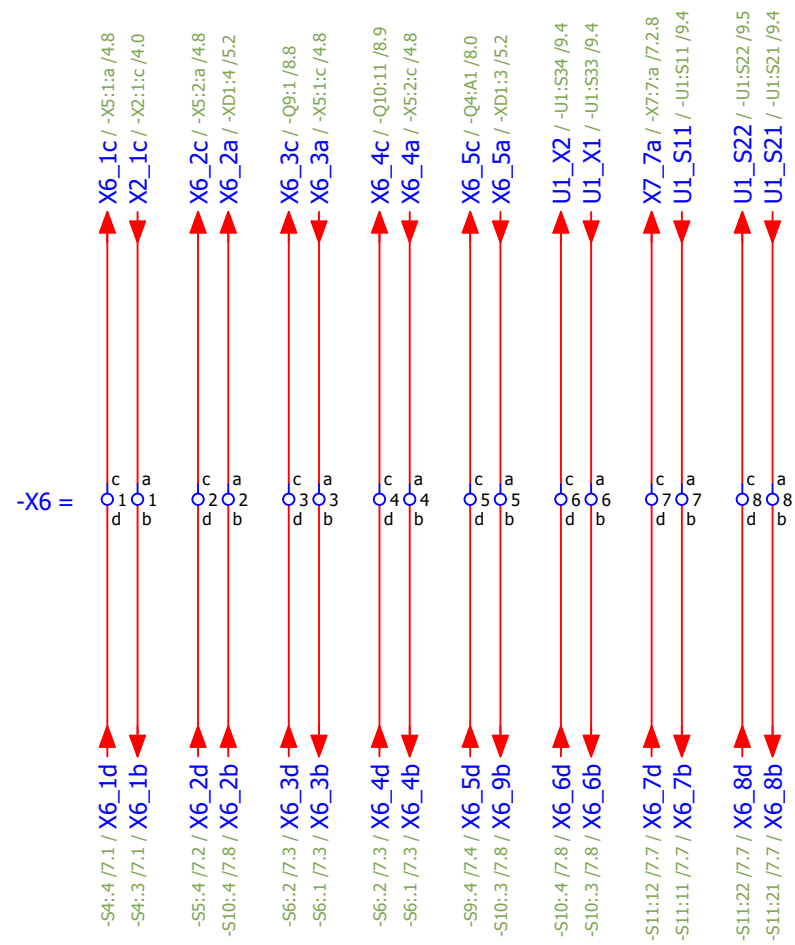


Emergency-Stop / Acknowledge

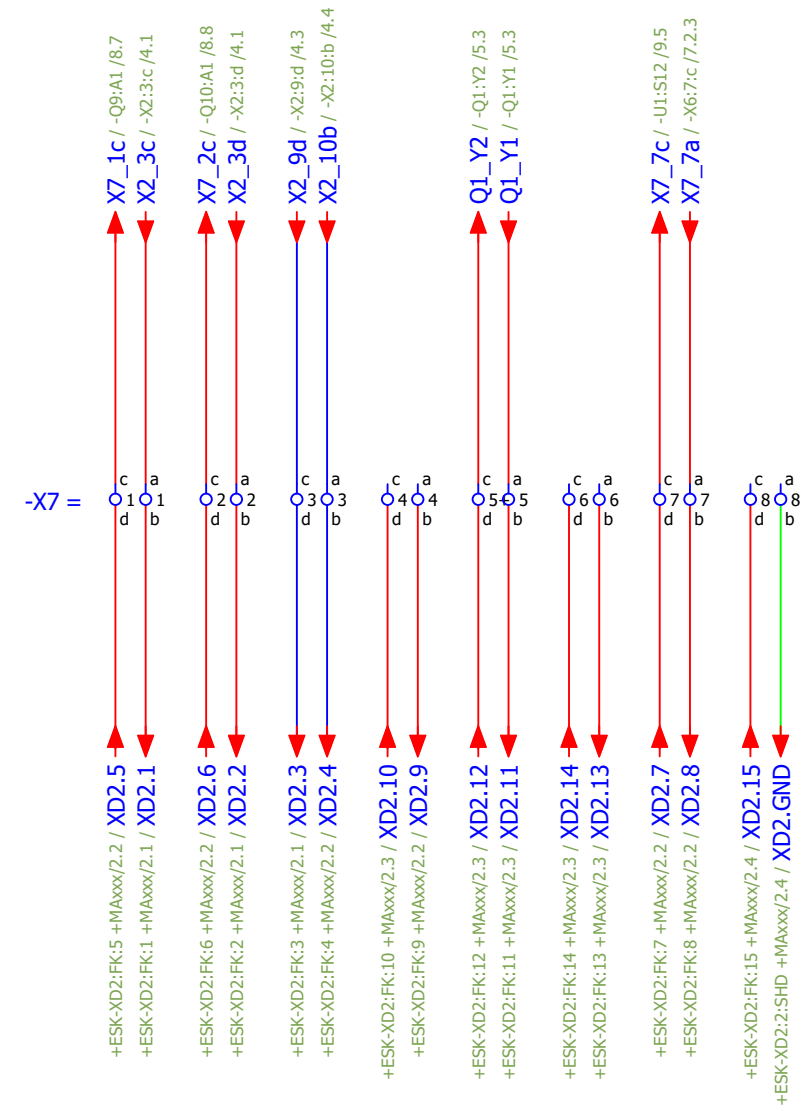


## Terminal limit switch/Button

## Limit switch



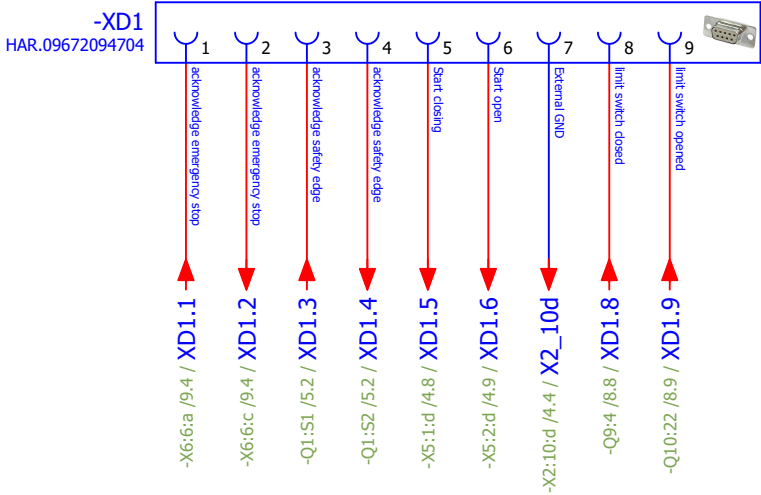
## Button



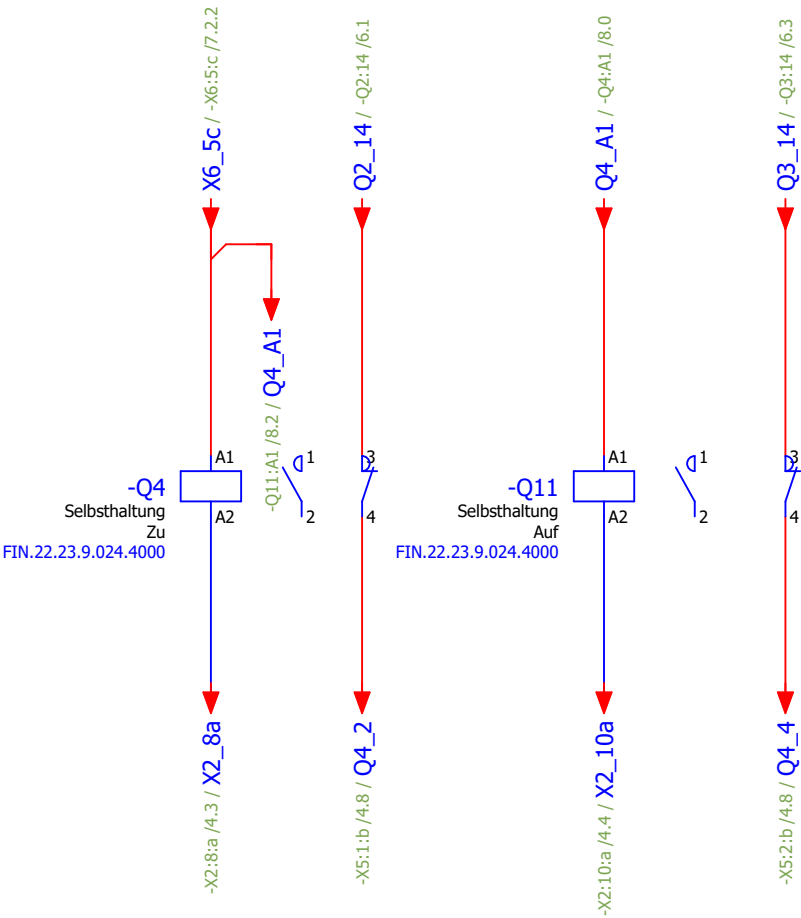
Sub-D for external control unit

external configuration for Sub-D connector

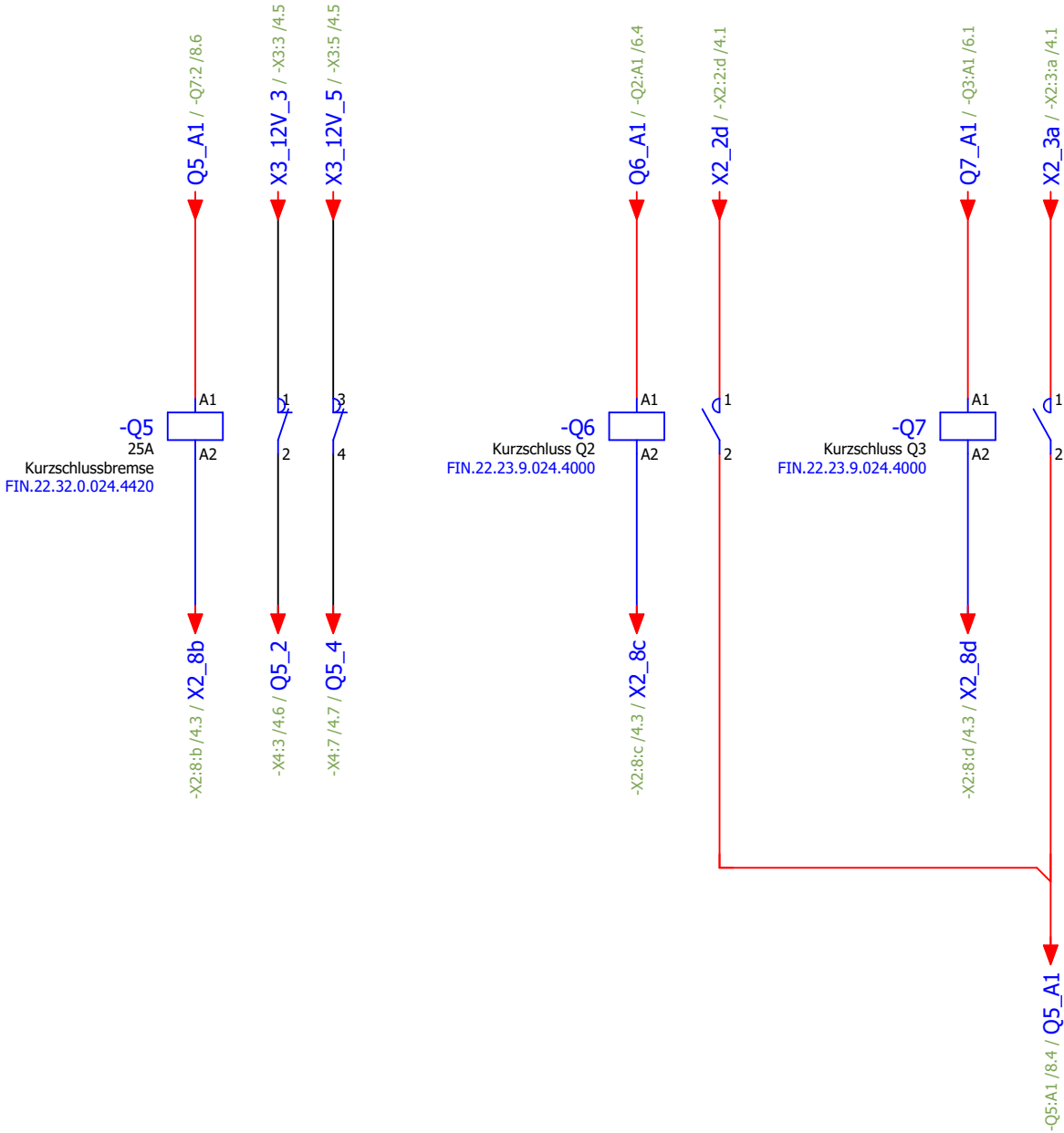
- Pin 1-2: NO potenzial-free
- Pin 3-4: NO potenzial-free
- Pin 5: DO
- Pin 6: DO
- Pin 7: External GND/0V
- Pin 8: DI
- Pin 9: DI



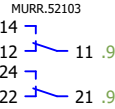
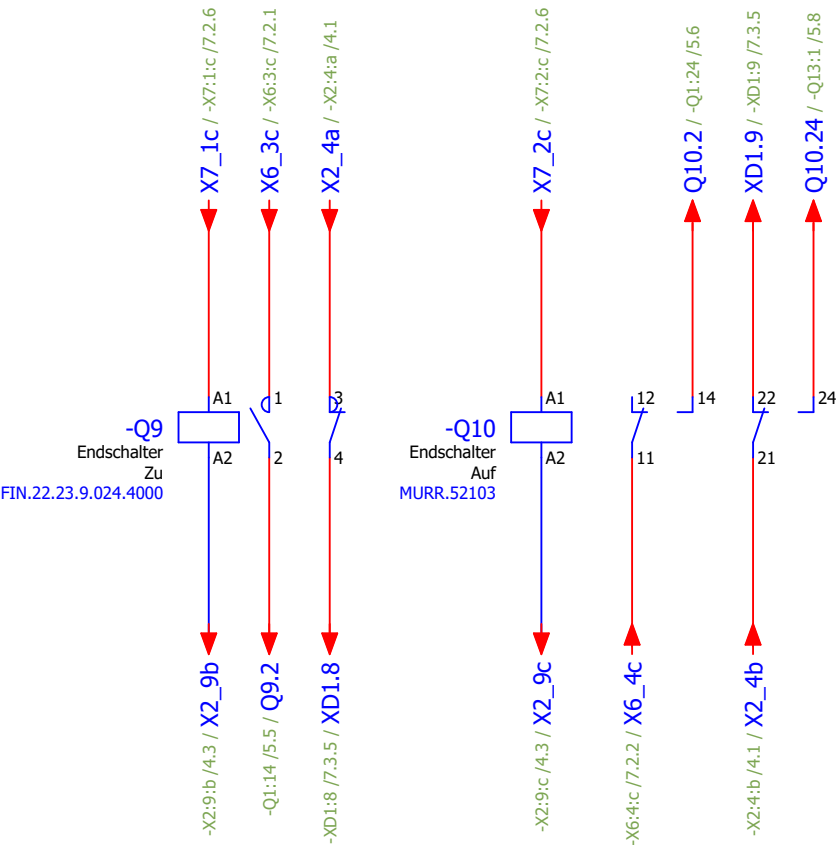
self holding circuit/  
inching mode



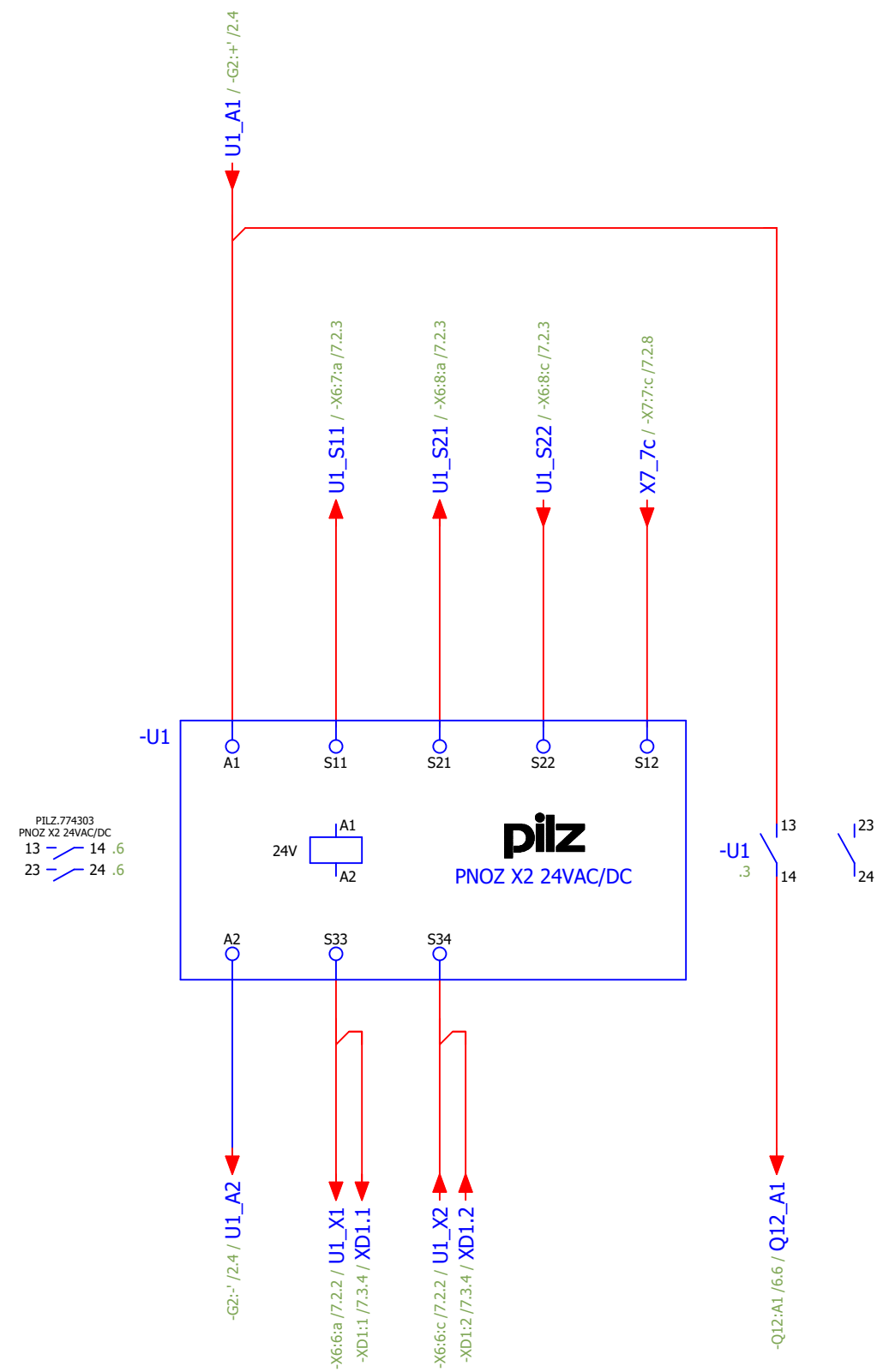
Electrical short brake



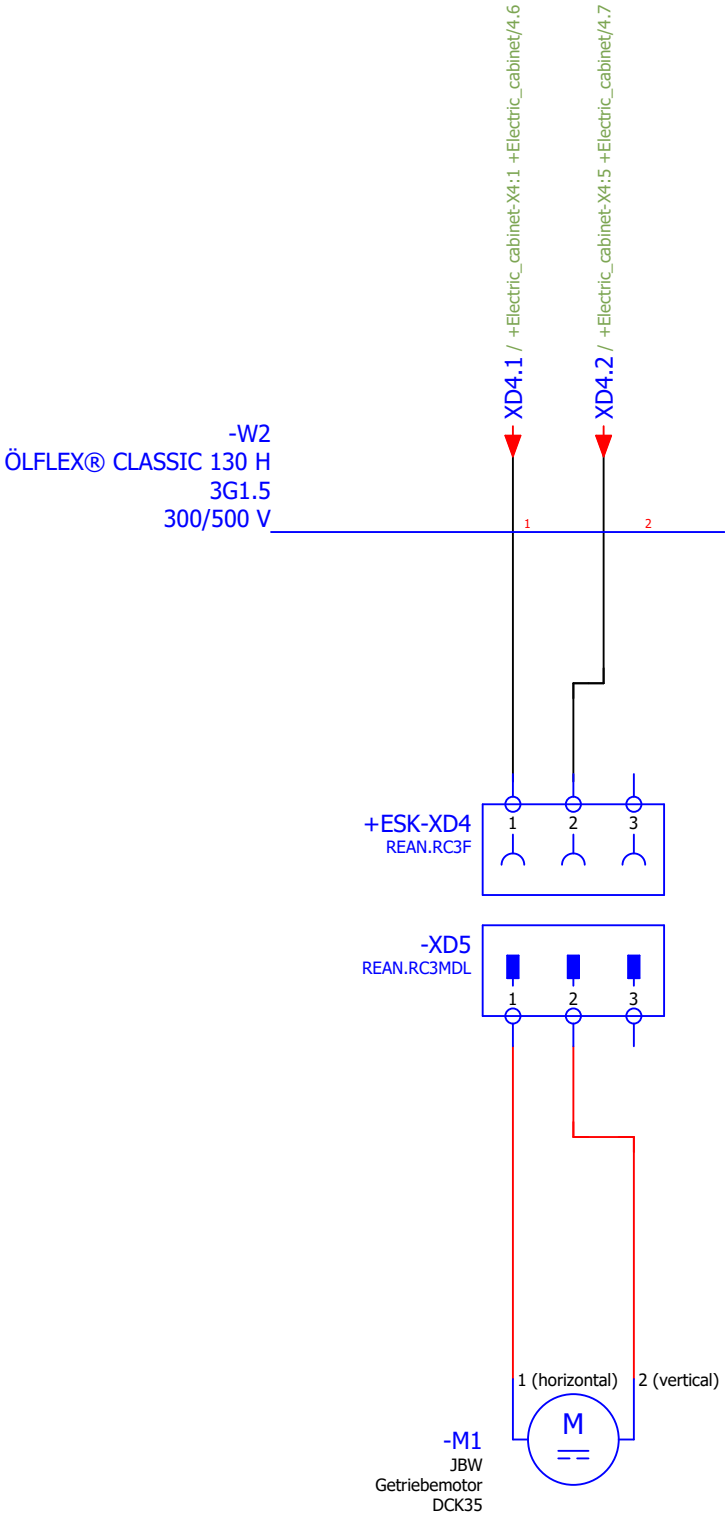
Limit Switch



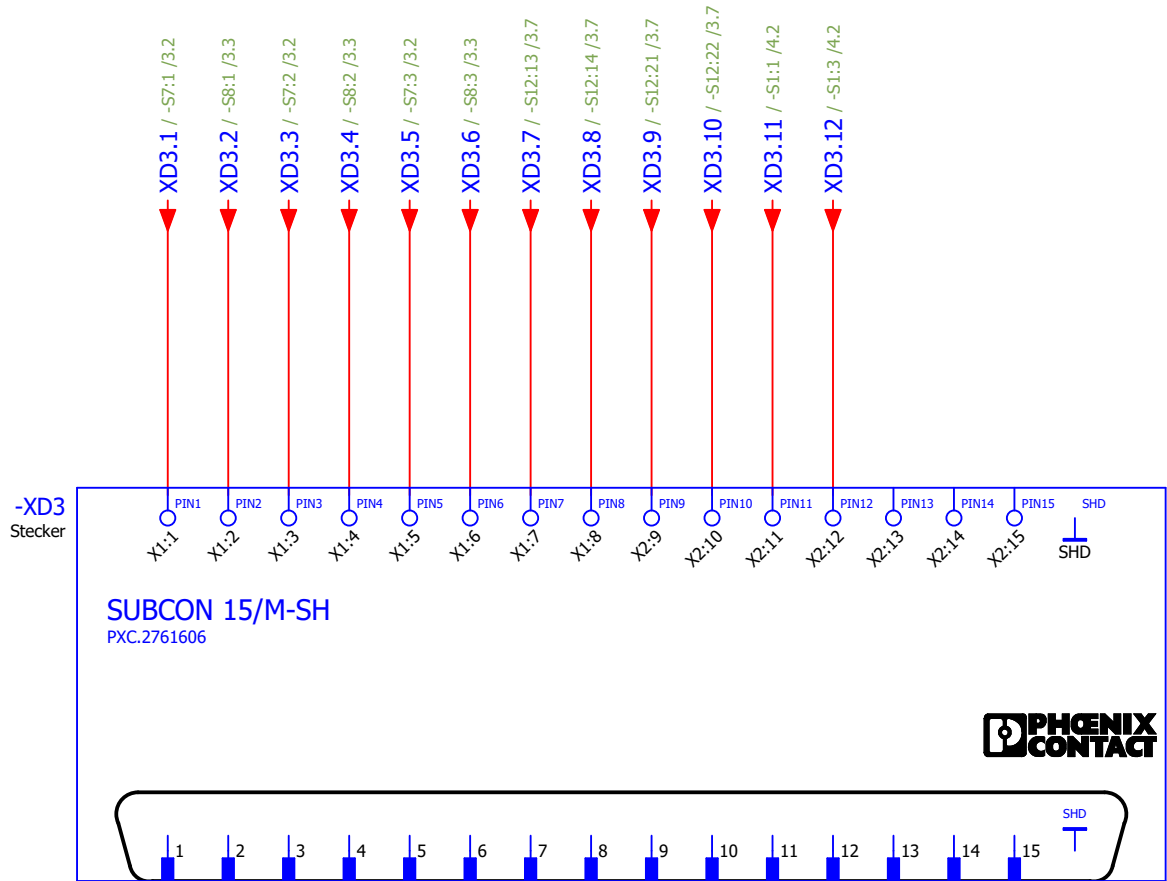
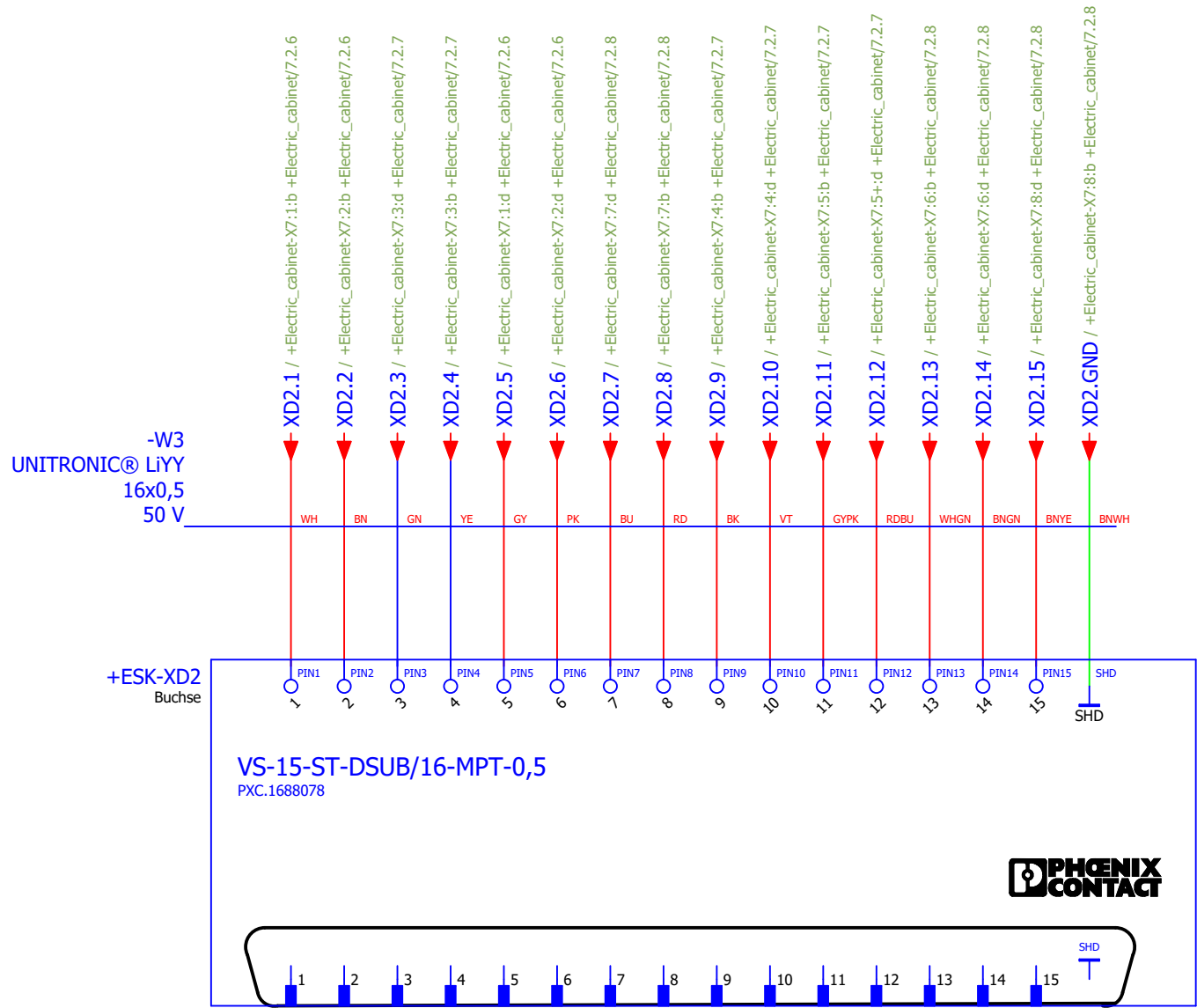
Pilz safety relay



Motor

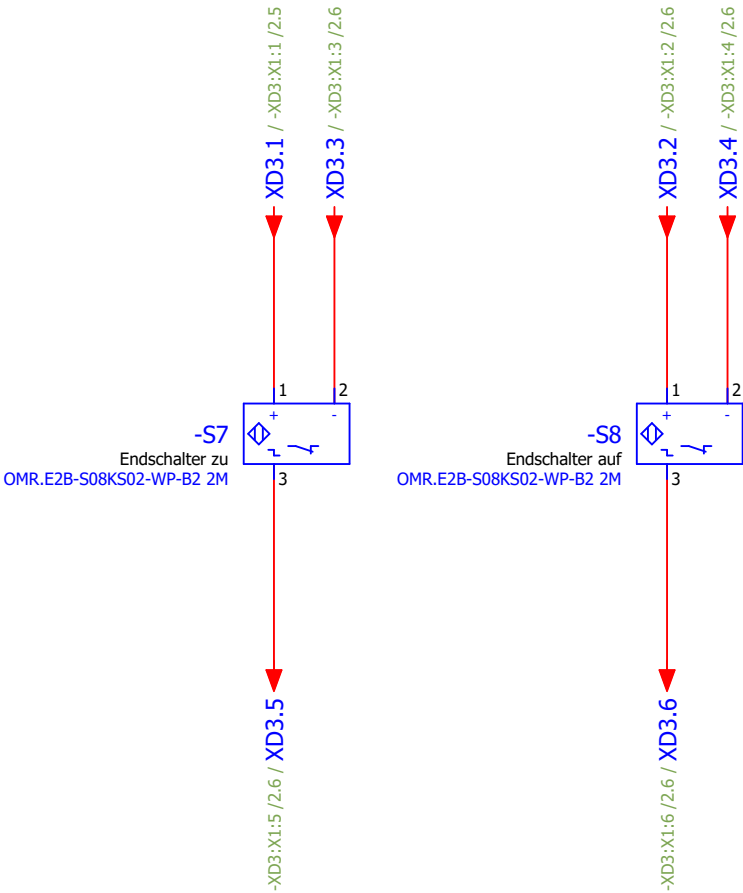


Sub-D for signal cable

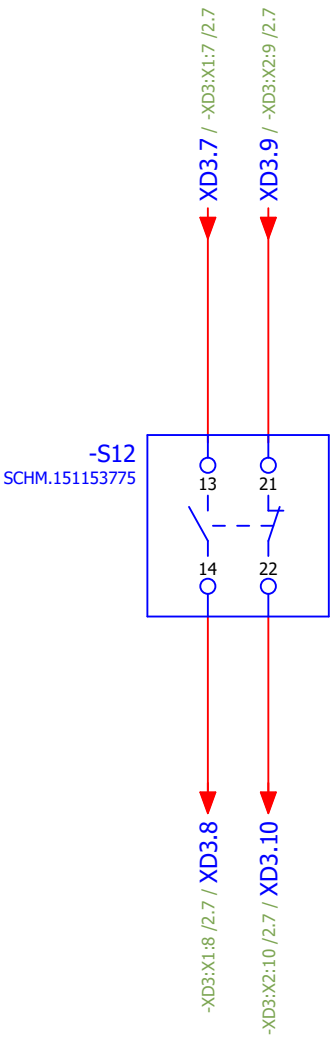


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|--------------|------|------|----------|------------|-------------------------------|
|              |      |      | Date     | 10.11.2021 | 1.0                           |
|              |      |      | Ed.      |            |                               |
|              |      |      | Appr     |            |                               |
| Modification | Date | Name | Original |            | Replacement of Replacement of |

Limit switch



Safety switch  
mounting plate

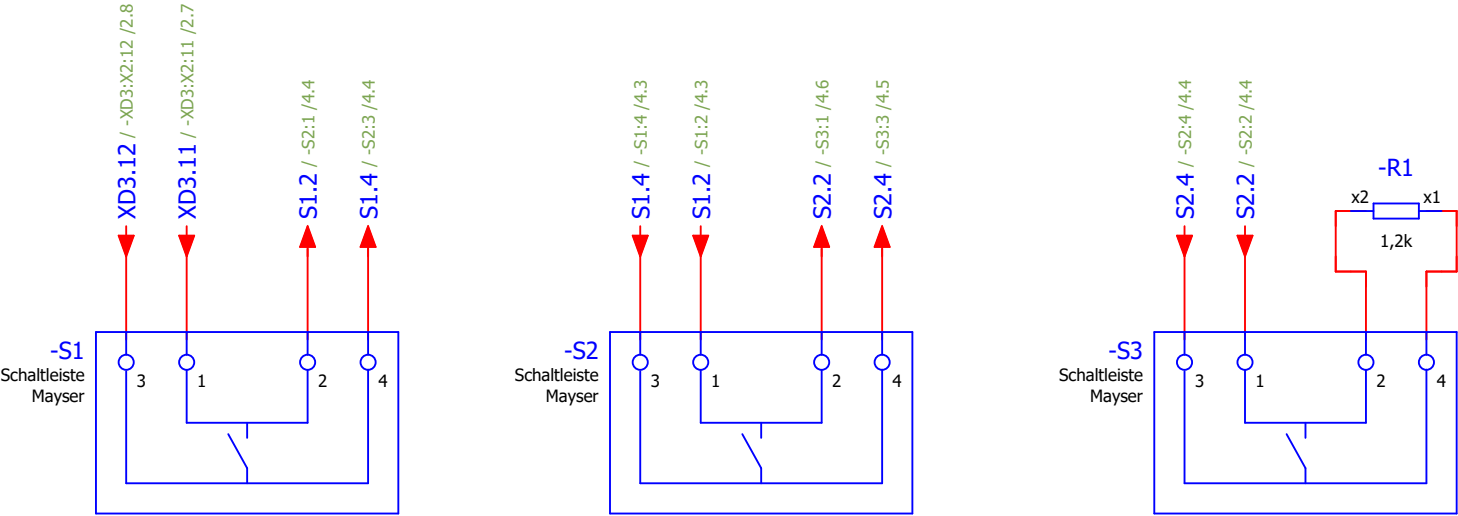


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|              |      |      |          | Date | 10.11.2021 | 1.0                           |
|              |      |      |          | Ed.  |            |                               |
|              |      |      |          | Appr |            |                               |
| Modification | Date | Name | Original |      |            | Replacement of Replacement of |

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| =Energy_supply+MAxxx/3 |      |
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|---------------------|
| Seite: 3            |
| Schaltplan allpolig |
| &                   |
| Page 22 / 23        |

Safety edge in series



## Stückliste von Teilen außerhalb des E-Plans / *BOM of parts not included in E-Plan*

| <b>Teile, die nicht im EPLAN enthalten sind / <i>Parts that are not included in the EPLAN</i></b> |                                        |                                           |                                             |                                |
|---------------------------------------------------------------------------------------------------|----------------------------------------|-------------------------------------------|---------------------------------------------|--------------------------------|
| <b>Bauteil<br/><i>Component</i></b>                                                               | <b>INGUN<br/>Art-Nr. Part-<br/>No.</b> | <b>Hersteller<br/><i>Manufacturer</i></b> | <b>Artikelnummer<br/><i>Part number</i></b> | <b>Menge<br/><i>Number</i></b> |
| Quittiertaster Blau / <i>Acknowledgment button blue</i>                                           | 201968                                 | Eaton                                     | 216931 M22-DL-B                             | 1 Stk                          |
| Starttaster / <i>Start button</i>                                                                 | 37377                                  | Eaton                                     | 216927 M22-DL-G                             | 2 Stk                          |
| Stoptaster / <i>Stop button</i>                                                                   | 36543                                  | Eaton                                     | 216925 M22-DL-R                             | 1 Stk                          |
| Wahlschalter Betriebsart / <i>Operating mode selector switch</i>                                  | 201976                                 | Eaton                                     | 216865 M22-WK                               | 1 Stk                          |
| Netzkabel / <i>Power cord</i>                                                                     | 201979                                 | Kopp                                      | 147705011                                   | 1 Stk                          |
| Schaltschrank / <i>Electrical cabine</i>                                                          | 201991                                 | Rittal                                    | 1039000                                     | 1 Stk                          |
| Flanschplatte / <i>Flange plate</i>                                                               | 201989                                 | Rittal                                    | 2564200                                     | 1 Stk                          |
| PG-Verschraubung / <i>PG-fitting</i>                                                              | 30538                                  | Lapp                                      | 53111010                                    | 5 Stk                          |
| Leergehäuse Steuerstation / <i>Empty housing control station</i>                                  | 201984                                 | Eaton                                     | 216540 M22-I6                               | 1 Stk                          |
| Sub-D Buchse 15 pol / <i>Sub-D socket 15 pin</i>                                                  |                                        | Phoenix Contact                           | 1688078                                     | 1 Stk                          |
| Aderendhülse 0,5 mm / <i>Ferrule 0.5mm</i>                                                        | 52028                                  |                                           |                                             | 200 Stk                        |
| Aderendhülse 1,5 mm / <i>Ferrule 1.5mm</i>                                                        | 32860                                  |                                           |                                             | 100 Stk                        |
| Kabel blau 1,5 mm / <i>Cable blue 1.5mm</i>                                                       | 35462                                  |                                           |                                             | 10 m                           |
| Kabel schwarz 1,5 mm / <i>Cable black 1.5mm</i>                                                   | 14849                                  |                                           |                                             | 20 m                           |
| Kabel grün/gelb 1,5 mm / <i>Cable green/yellow 1.5 mm</i>                                         | 35466                                  |                                           |                                             | 10 m                           |
| Hutschiene / <i>DIN rail</i>                                                                      |                                        |                                           |                                             | 2 m                            |
| 3*1,5 Lappkabel / <i>3x1.5 Lapp cable</i>                                                         |                                        |                                           |                                             | 5 m                            |
| Kanal geriffelt B30 H60 / <i>Channel fluted B30 H60</i>                                           |                                        |                                           |                                             | 2 m                            |
| Schaltlitze H05V-K 0,5 mm / <i>Wire H05V-K 0.5 mm</i>                                             |                                        |                                           |                                             | 100 m                          |

## Haftungsausschluss / *Disclaimer*

INGUN übernimmt keine Garantie, dass dieses Referenzdesign unter allen Bedingungen die Anforderungen an einen sicheren Betrieb erfüllt. Die Verwendung dieses Designs ersetzt nicht die individuelle Risikobewertung durch den Anwender und bietet auch keine Gewähr, dass damit unter allen Umständen die Anforderungen z.B. der Maschinenrichtlinie und an die CE-Konformität erfüllt werden.

INGUN übernimmt darüber hinaus auch keine Haftung für eventuelle Schäden, die durch Änderungen an diesem Referenzdesign beispielsweise an der Steuerung entstehen können.

Eine Überschreitung der 12-Volt-Versorgungsspannung des Gleichstrom-Getriebemotors erhöht die Gefahr von Verletzungen durch Quetschen oder Scheren und reduziert die Lebensdauer des Prüfadapters.

Das Fehlen einer Kurzschluss-Bremse führt zu einem harten Anfahren der Endlagen. Außer-

INGUN does not guarantee that this reference design meets the requirements for safe operation under all conditions. The use of this design does not replace the individual risk assessment by the user and does not guarantee that the requirements of e.g., the Machinery Directive and CE conformity will be met under all circumstances.

Furthermore, INGUN does not accept any liability for possible damage which may result from changes to this reference design, e.g., to the control unit.

Exceeding the 12-volt supply voltage of the DC geared motor increases the risk of injury from crushing or shearing and reduces the service life of the test fixture.

The lack of a short-circuit brake causes the pressure frame to open and close abruptly. Furthermore, in the event of an EMERGENCY stop,

dem wird im Fall eines NOT-Halts der Anhalte-  
weg verlängert und dadurch die Verletzungsge-  
fahr erhöht.

the stopping distance is increased, thereby in-  
creasing the risk of injury.





