MOELLER

Hardware and Engineering

SLS – Safety Lockout System

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Warning!
Dangerous electrical voltage!

Before commencing the installation

- Disconnect the power supply of the device.
- Ensure that devices cannot be accidentally restarted.
- Verify isolation from the supply.
- Earth and short circuit the device.
- Cover or enclose any adjacent live components.
- Follow the engineering instructions (AWA) for the device concerned.
- Only suitably qualified personnel in accordance with EN 50110-1/-2 (VDE 0105 Part 100) may work on this device/system.
- Before installation and before touching the device ensure that you are free of electrostatic charge.
- The functional earth (FE) must be connected to the protective earth (PE) or the potential equalisation. The system installer is responsible for implementing this connection.
- Connecting cables and signal lines should be installed so that inductive or capacitive interference does not impair the automation functions.
- Install automation devices and related operating elements in such a way that they are well protected against unintentional operation.
- Suitable safety hardware and software measures should be implemented for the I/O interface so that an open circuit on the signal side does not result in undefined states in the automation devices.
- Ensure a reliable electrical isolation of the extra-low voltage of the 24 V supply. Only use power supply units complying with IEC 60364-4-41 (VDE 0100 Part 410) or HD384.4.41 S2.
- Deviations of the mains voltage from the rated value must not exceed the tolerance limits given in the specifications, otherwise this may cause malfunction and dangerous operation.
- Emergency stop devices complying with IEC/EN 60204-1 must be effective in all operating modes of the automation devices. Unlatching the emergency-stop devices must not cause a restart.
- Devices that are designed for mounting in housings or control cabinets must only be operated and controlled after they have been installed and with the housing closed. Desktop or portable units must only be operated and controlled in enclosed housings.
- Measures should be taken to ensure the proper restart of programs interrupted after a voltage dip or failure. This should not cause dangerous operating states even for a short time. If necessary, emergency-stop devices should be implemented.
- Wherever faults in the automation system may cause injury or material damage, external measures must be implemented to ensure a safe operating state in the event of a fault or malfunction (for example, by means of separate limit switches, mechanical interlocks etc.).
- Depending on their degree of protection, frequency inverters may contain live bright metal parts, moving or rotating components or hot surfaces during and immediately after operation.
- Removal of the required covers, improper installation or incorrect operation of motor or frequency inverter may cause the failure of the device and may lead to serious injury or damage.
- The applicable national accident prevention and safety regulations apply to all work carried on live frequency inverters.
- The electrical installation must be carried out in accordance with the relevant regulations (e. g. with regard to cable cross sections, fuses, PE).
- Transport, installation, commissioning and maintenance work must be carried out only by qualified personnel (IEC 60364, HD384 and national occupational safety regulations).
- Installations containing frequency inverters must be provided with additional monitoring and protective devices in accordance with the applicable safety regulations. Modifications to the frequency inverters using the operating software are permitted.

- All covers and doors must be kept closed during operation.
- To reduce the hazards for people or equipment, the user must include in the machine design measures that restrict the consequences of a malfunction or failure of the drive (increased motor speed or sudden standstill of motor). These measures include:
  - Other independent devices for monitoring safety-related variables (speed, travel, end positions etc.).
  - Electrical or non-electrical system-wide measures (electrical or mechanical interlocks).
  - Never touch live parts or cable connections of the frequency inverter after it has been disconnected from the power supply. Due to the charge in the capacitors, these parts may still be live after disconnection. Fit appropriate warning signs.

Contents

About this manual

This manual describes the installation, operation and function of the components required for the Moeller Safety Lockout System (**SLS**). It provides a detailed description of the function and the practical usage.

Read this manual thoroughly before installing and commissioning the SLS system and its components.

Abbreviations and symbols

Abbreviations and symbols with the following meanings are described in this manual:

SLS	**S**afety **L**ockout **S**ystem
CB	**C**ontrol **B**ox
CB2	**C**ontrol **B**ox with **2** inputs
CB4	**C**ontrol **B**ox with **4** inputs
CB8	**C**ontrol **B**ox with **8** inputs
MB	**M**arshalling **B**ox
MB8	**M**arshalling **B**ox – **8** inputs
MB16	**M**arshalling **B**ox – **16** inputs
PB	**P**ower **B**ox
DS	**D**isconnection **S**witch
DS2	**D**isconnection **S**witch **2** for guard switch connection
GS	**G**uard **s**witch
ES	**E**mergency-stop **S**witch
NO	**N**ormally **o**pen contact (make contact)
NC	**N**ormally **c**losed contact (break contact)

→ Makes you aware of interesting tips and additional information

⚠ **Attention!**
warns about the possibility of major material damage and minor injury.

⚠ **Warning!**
warns about the possibility of major material damage and severe injury or death.

In order to improve the readability, the title of the chapter is indicated on the top of the left-hand page and the current section is indicated on the top of the right-hand page. Pages where chapters commence and blank pages at the end of the chapter are an exception.

1 SLS General Information

The Safety Lockout System (hereinafter SLS) is a safety component according to the definition of the Machinery Directive 98/37/EC.

If the system is installed and connected as specified in this user manual, and conform to the installation standards (IEC 463..., NEC NFPA70 and other national standards where stipulated), it fulfils the requirements of **category 4** according to EN 954-1.

The Safety Lockout System is a "System" for "Prevention of unexpected start-up of the Machinery to which it is connected", with visual confirmation of the zero-energy status of the SLS output.

The power is disconnected using several safety principles including redundancy, positively driven contacts, dual channel command, etc. for optimum safety. The voltage supply of the machinery is controlled and the status indicated visually.

The system disconnects the voltage to the machinery in three stages:

- Initially, the signals from the disconnect switches are actuated in a safety circuit with two channels. Delayed closing or opening of one of the 2 channels which result in the non-operation of the **PB** before the problem is resolved or both channels are reset. The system indicates a failure.
- The main contactors are switched off resulting from the disconnect command. A voltage monitor controls the status of voltage supply behind the main contactors on the machinery supply side. If a voltage of more than 10 V remains on the output of the **PB** (machinery side), there will be no visual confirmation of the zero-energy state of the SLS output.
- The safe status of power interruption is confirmed by a green light on DS, DS2, which can only light up if the voltage monitor indicates no voltage supply for the machinery.

Note that the most important rule to be observed by the machinery operators is:

NO LIGHT ⟷ NO ENTRY

The system is designed to be flexible, in order to assure use with various machinery types and sizes, and to ensure world-wide installation. Therefore, all technical and safety aspects as well as national and local regulations which may apply have to be considered.

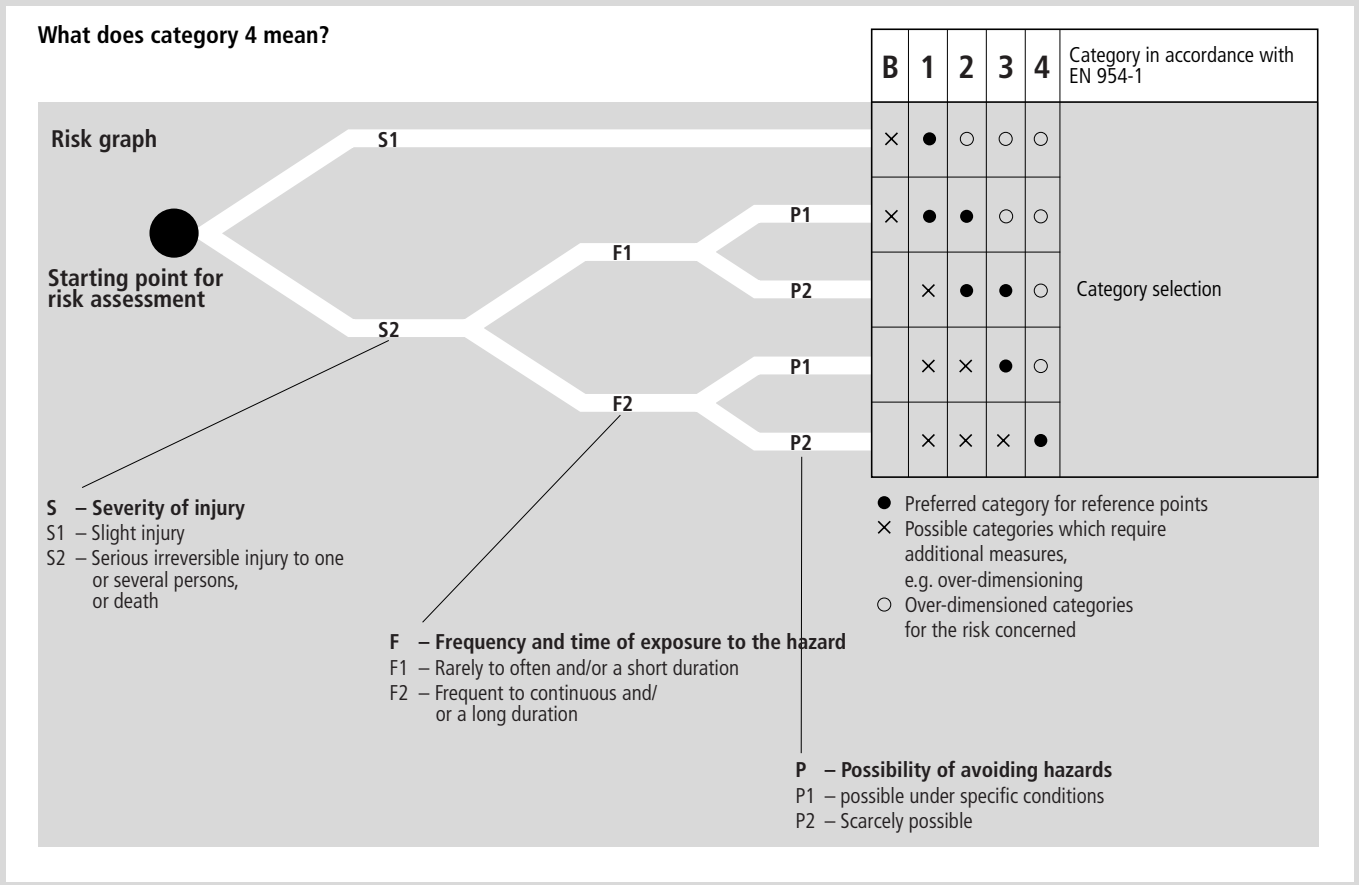


Figure 1: Risk assessment graph

Category	Requirements
B	Protective/control systems and components taking into account the operating and ambient temperatures.
1	Additional to "B": Well-tried components and principles that meet the safety requirements
2	Additional to "B": Checking of the safety function by the control system at suitable intervals
3	Additional to "B": Single fault safety and fault detection whenever practicable in accordance with the state of technology
4	Additional to "B": Single fault safety and fault detection or no hazard due to accumulation of faults

General safety instructions

Warning!
Moeller cannot be held liable for any injury, damage or consequential damages as a result of incorrect connection, fitting or installation. All connection, fitting and maintenance work may only be performed by suitably qualified personnel.

Never carry out electrical work on the devices while the power supply is switched on.

Always follow the safety rules:

- Switch off and ground.
- Secure against restart.
- Verify isolation from the supply.
- Cover adjacent live parts.
- Only suitably qualified personnel may transport, install, test, operate, repair and maintain the Safety Lockout System.

Electrical protection of the SLS

The SLS must also be protected against

- Overvoltage caused by mains voltage spikes (caused for example by lightning strikes).
- Harmonics (Contact Moeller for relevant values).
- Input voltage deviations exceeding +/– 10 %.

The PB must be additionally protected in accordance to the local installation standards and codes which apply.

Intended usage and limitations of the SLS

Warning!
- The SLS is not intended for use to
  – Start up machinery.
  – Stop machinery by using a disconnect switch.
  – Replace a device for disconnecting electrical equipment according to IEC/EN 60204-1 clause 5.3 and 5.5.
- The machinery must have their own start/stop commands, and may not start automatically when the SLS connects the power supply to the machinery.
- Safety-related interruption in accordance with EN 954-1 Category 4, refers exclusively to the Safety Lockout System, consisting of the Power Box, Control Box, Marshalling Box and Disconnect Switch modules. External commands such as "Disconnect" effect only a single, not-safety-related interruption. For safe interruptions, disconnect switches must be used. The PLC-signals of the SLS modules are exclusively for the provision of status signals and **not intended for additional safe interrupt commands.**
- The power output circuit of the SLS is intended to interrupt the power supply to the machinery. The user (or the machine manufacturer) has to make sure, that the power supply output which has been interrupted will not cause risk to life or limb, or any damage.

System overview

The graphic shown below is a typical example of a Safety Lockout System.

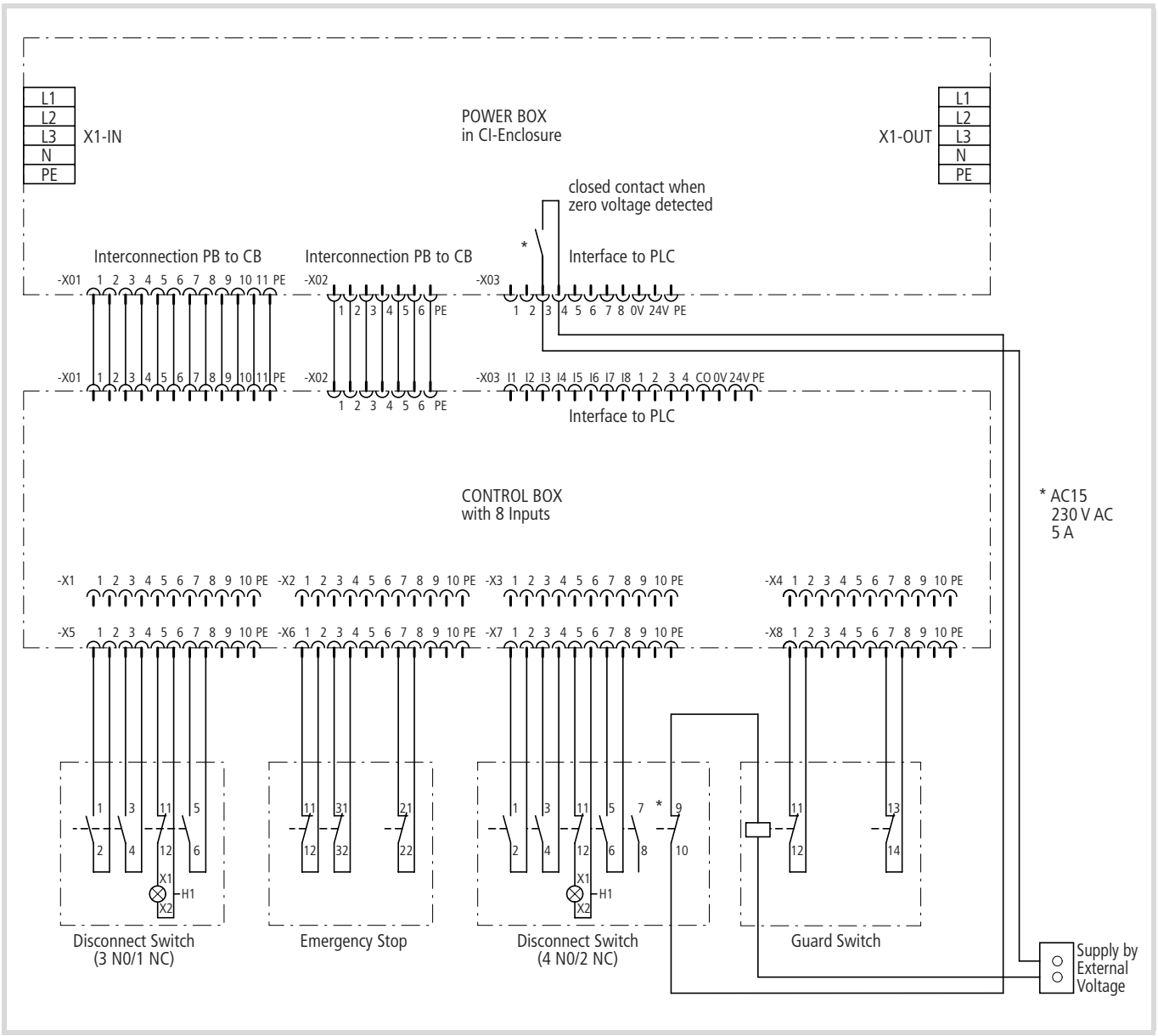


Figure 2: SLS overview

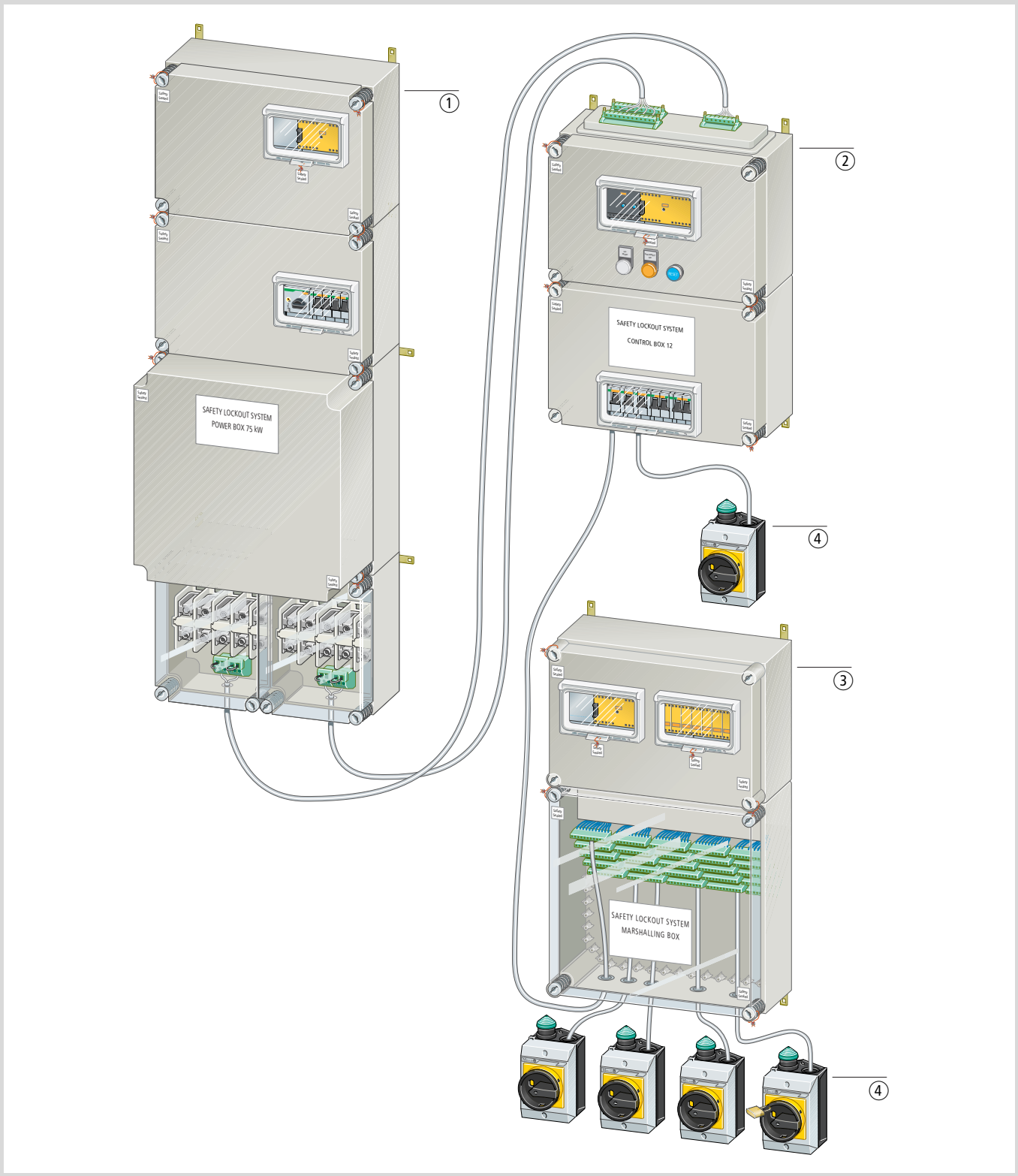


Figure 3: System overview

① Power box
② Control box
③ Marshalling box
④ Disconnect switches

General module description

The basis SLS consists of following different module types:

Power box (PB)

This module executes the transfer or interruption of the power supply voltage to the machinery. It receives the disconnection command from the disconnect switches via Control Box, and enables its power contactor's accordingly.

Confirmation of the zero-energy status is signalled to the disconnect switches also via Control Box.

The operating voltage for the SLS is generated in the Power Box.

Figure 4: Power box

Control box (CB)

This module is an interface and concentrator between the Power Box and the inputs of the disconnect switches and/or the Marshalling Boxes. The Control Box is fed from the Power Box and feeds the relays of the Marshalling Boxes as well as the disconnect switches lamps.

Figure 5: Control Box

Disconnect switches (DS, DS2, ES, GS)

These switches are used by the machinery operators to disconnect the machinery power supplies to the machinery, before entering an exposed area. There are three types of switches which can be considered as disconnect switches. These are the Disconnect Switch **(DS, DS2)**, the Guard Switch **(GS)** and the Emergency Switch **(ES)**. The switches which are located directly in the vicinity of the dangerous area, send a disconnect command to the Power Box and receive a feedback signal confirming the zero-energy status. The zero-energy status is indicated by a green lamp which is mounted on upper section of each switch.

These modules are interconnected in such a way, as to ensure that the machinery operators can safely disconnect the machinery power supply from their locations, and receive confirmation of the zero-energy electrical state of the machinery, via an indication light on the **DS** and **DS2**.

Figure 6: Disconnect switch

Optional modules

Marshalling box(es) (MB)

This module is a concentrator of inputs (disconnect switches and/or Marshalling Boxes) and transfers the zero-energy status of the Power Box output to the switches DS and DS2.

Time delay module

The machinery shut-down can be delayed by 0.5 to 30 seconds with the time delay module.

The use of this option must be carefully considered with the risk assessment analysis. The SLS fulfills category 3 when used in conjunction with this option.

→
- The modules are considered as components of the SLS system. They must be installed according to the relevant user manual.
- The seals applied by Moeller GmbH are **not to be removed**. Breaking or removing the seals releases Moeller GmbH from any warranty claims. Should the seals be broken or removed, **safety is no longer guaranteed and the corresponding module(s) has(have) to be replaced. Moeller will not be held responsible for damage or injury which result when the seals are broken or removed**.
- If the SLS is not installed according to the relevant instructions, it may be possible that the SLS no longer fulfills the requirements of category 4 according to EN 954-1.

→ The modules of SLS (PB, CB, MB's, DS's, etc.) have to be connected by the user (or his representative) according to the installation instructions. The user is responsible to ensure that the system is correctly connected.

It is particularly important to use the correct cable type and to verify the maximum length permitted, as well as the use of suitable conductor cross-sections (→ Page 13).

2 Engineering Information

Please ensure that the load which your system presents to the SLS does not exceed the power box specifications.

SLS system component requirement

The SLS configuration consists of:

- **PB:** one module is required
- **CB:** one module is required
- **DS, DS2, GS, ES:** quantity depending on the application (minimum 1)

Site of installation of the SLS

- PB must be installed in the direct vicinity of the machinery electrical switch-cabinet. The input side of PB has to be connected directly after the main supply disconnect switch and machinery protection; the machinery (load) is connected to the output side of PB.
- The disconnect switches have to be placed at all locations as defined by the machinery manufacturer, in order to ensure that the operators can easily switch off the machinery supply voltage before entering into an exposed/dangerous area.
- MB's as connection points for signals coming from a lower level, must be fitted at locations to optimise the total cable length between the disconnect switches and PB.

SLS control voltage

The control voltage for SLS is generated internally by a 400 V or 480/230 V control transformer. The primary voltage for the transformer has to be selected by taps on the terminal block X_T, and must correspond to the rated mains voltage of the system.

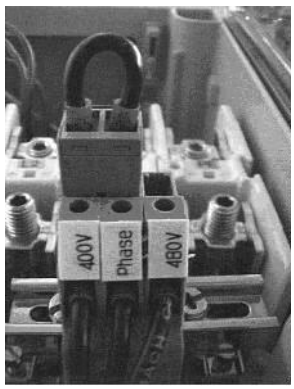


Figure 7: Terminal block X_T

Cables and wiring for SLS interconnection

All connections between PB, CB and MB's should be made with 1.5 mm^2 (AWG 16) to 2.5 mm^2 (AWG 13) wires.

The connections to the disconnect switches have to be made with 0.75 mm^2 (AWG 18) to 1.5 mm^2 (AWG 16) wires.

Shielded cables are not necessary for correct operation of the Safety Lockout System.

If you have distances of more than 1000 m or more than 8 disconnect switches, please contact Moeller for further possibilities.

Allowed maximum cable lengths

The lengths of the cables which can be used can be taken from the following table:

From	To	Maximum distance [m]
Power Box	Control Box	approx. 200
Control Box (max. 8 i/ps)	Switches **(DS/ES/GS)**	approx. 800
Total		approx. 1000
Combined Power/Control Box		
Power/Control Box	Switches **(DS/ES/GS)**	approx. 800

Configuration requirements

If your design includes the optional MB, the max. cable length from CB to each disconnect switch may not exceed 300 m (as opposed to 800 m as stated in the table). If you require longer distances, please contact Moeller.

3 System Components

Power Box

The Power Box must be selected in accordance to the projected load for the application, i.e. the expected power and/or current requirement. PB is available as a single unit or as a combined Power/Control Box unit. A withdrawable PB unit for exclusive use in a Moeller MODAN6000 distribution board is also available.

The Power Box consists of:

- Enclosure, totally insulated CI, sheet steel or withdrawable unit
- Two main contactor's for interruption of the power line
- Voltage monitoring relay
- Control transformer generating the control voltage for the SLS
- Terminal blocks to the CB
- Terminal block for status indication to a PLC

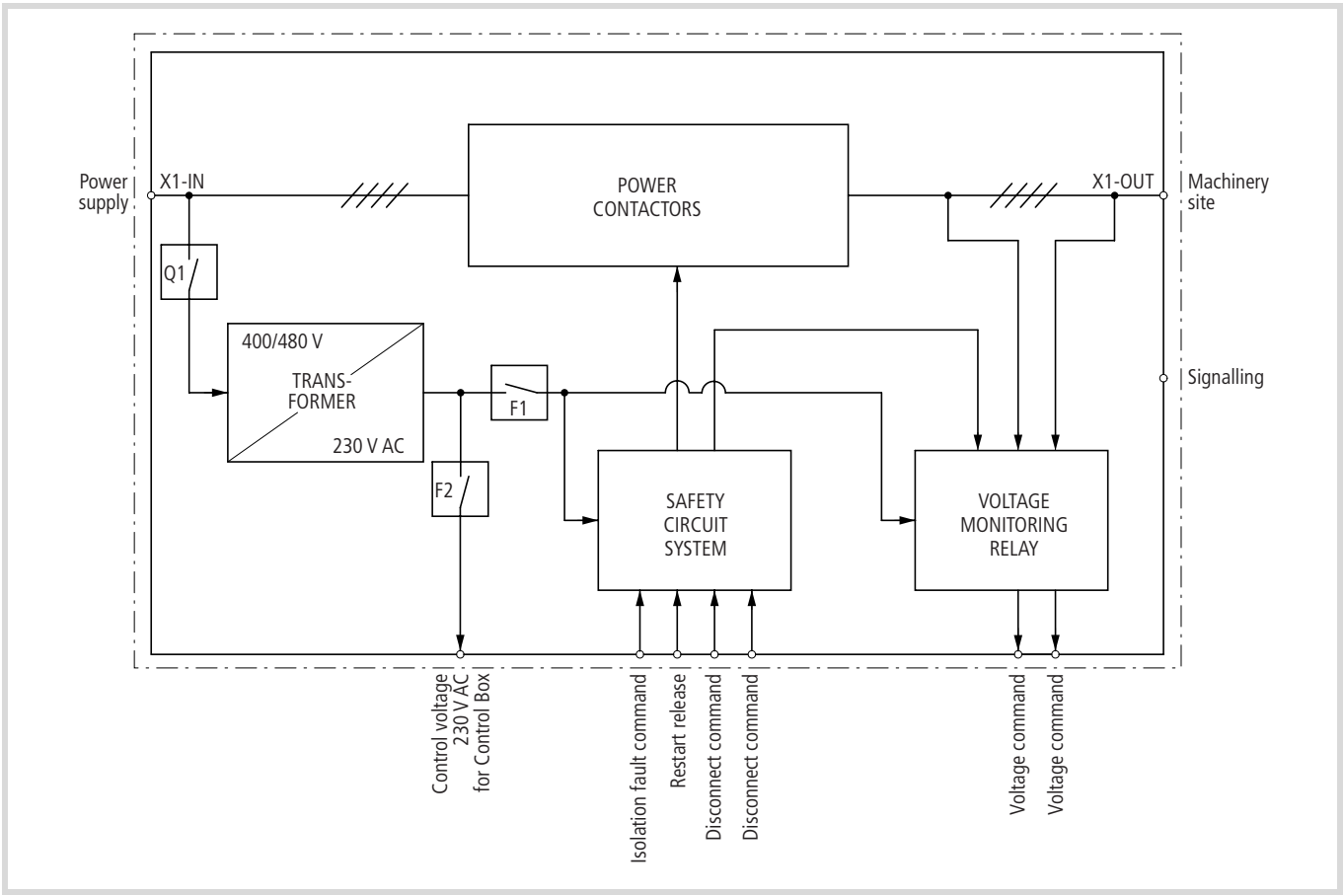


Figure 8: "Power Box" block diagram

Each PB should be protected according to the information supplied in our catalogue. Local installation standards and codes must be observed.

Table 1: Description of interconnections for PB

Block/Terminal	Meaning	Technical Details
X1-IN	"Main Power Supply Input"	L1/L2/L3/N/PE (TN-S-system) Protection: Moeller Type "NZM" Circuit Breaker conform to IEC 947-4-1 (→ HPL0211-2002GB, "Industrial Switchgear")
X1-OUT	"Main Power Supply to Machinery"	L1/L2/L3/N/PE (TN-S-system)[1)]
XT	Selection of operating voltage	Operating voltage 400 V: Link "Phase" to "400 V" Operating voltage 480 V: Link "Phase" to "480 V"
X01	Interconnection with Power Box	1:1 Wiring to Control Box X01
X02	Interconnection with Power Box	1:1 Wiring to Control Box X02
X03		
1, 2	Status "Main Contactors" Signalization of main contactors status	NO, potential free Operating characteristics: AC15: 230 V/6 A DC13: 24 V/10 A Protection: Fuse 6.3 A quick-blow or 4 A slow-blow or MCB Moeller type "FAZ-C4-NA" (IEC/UL)
3, 4	Status "No Voltage Hazard" Signalization of voltage status at X1-OUT via voltage monitor PU3Z	NO, potential free Operating characteristics: AC1: 400 V/0.1 to 5 A/200 VA DC1: 24 V/0.1 to 5 A/120 W AC15: 230 V/5 A DC13: 24 V/5 A Protection: Fuse 6.3 A quick-blow or 4 A slow-blow or MCB Moeller type "FAZ-C4-NA" (IEC/UL)
5	Status "Voltage Fault" Signalization, that voltage monitor detects an incorrect voltage state at X1-OUT	Semiconductor output Operating characteristics: 24 V/DC 50 mA/PNP Protection: Fuse 6.3 A quick-blow or 4 A slow-blow or MCB Moeller type "FAZ-C4-NA" (IEC/UL)
24 V, 0 V	Supply of semiconductor outputs	External 24 V DC supply Protection: Customer side

1) In case of TN-C-system make links between "N" and "PE" terminals at X1-IN **and** X1-OUT

Control Box

The Control Box must be selected in accordance to the number of necessary disconnect switches. It serves as an interface between disconnect switches and PB. CB is available as single unit in CI-enclosure or combined with PB.

The Control Box consists of:

- Enclosure, totally insulated CI
- Power supplies 24 V DC
- Isolation monitoring relay
- Dual channel safety relay
- Multi-input safety relay
- Terminal blocks to the PB
- Terminal blocks for inputs
- Terminal block for status indication to a PLC

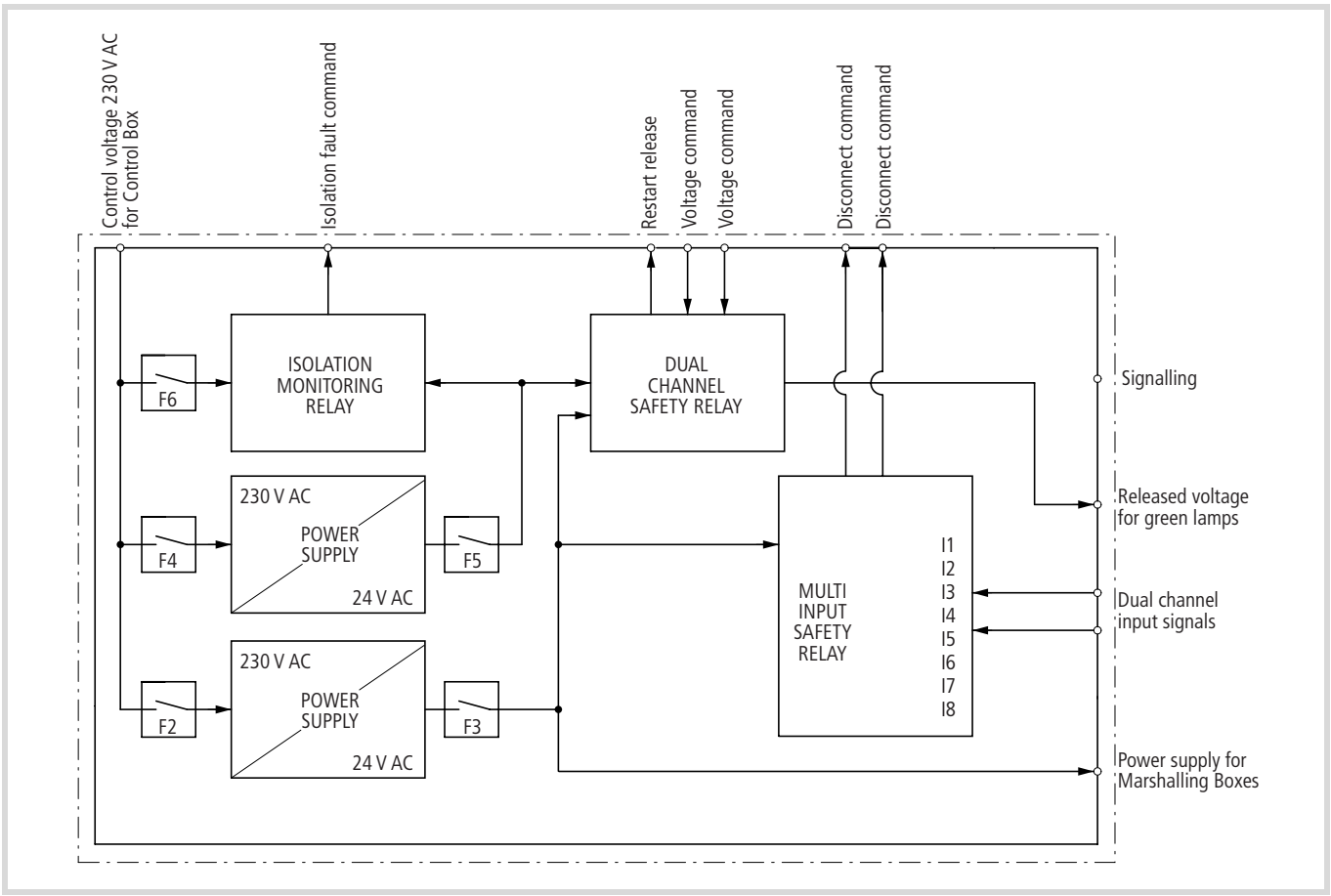


Figure 9: "Control Box" block diagram

Table 2: Description of interconnections for CB

Block/Terminal	Meaning	Technical Details
X1 to X8	Input Connectors	Dual channel safety input (DS/ES/GS)
1, 2 3 4		Safety channel 1 NO for PLC-signalization (→ X03: I1 to I8) External voltage for PLC-signalization (→ X03: CO)
5, 6 7, 8 9, 10 PE		Voltage supply 24 V DC for green lamps Safety Channel 2 Voltage supply 24 V DC for additional MB's PE
X01	Interconnection with Power Box	1:1 Wiring to Power Box X01
X02	Interconnection with Power Box	1:1 Wiring to Power Box X02
X03		
CO	Common Voltage Terminal of common voltage for all potential free information in CB	Common voltage point for all potential free contacts used for signalization to the PLC
I1 to I8	"Disconnect Command Confirmation" I1 to I8: Contact from inputs X1 to X8: 3 Signalization of position from switch of corresponding inputs I1 to I8: Analog to terminal 3 of inputs X1 to X8	CO, potential free to X03: CO Operating characteristics: AC15: 230 V/6 A DC13: 24 V/10 A Protection: Fuse 6.3 A quick-blow or 4 A slow-blow or MCB Moeller type "FAZ-C4-NA" (IEC/UL)
1	"Isolation Monitoring Status" Signalization of isolation fault in interconnection cables to switches	NO, potential free to X03: CO Operating characteristics: AC1: 240 V/0.1 to 8 A/1 100 VA DC1: 24 V/0.1 to 5 A/120 W Protection: Fuse 6.3 A quick-blow or 4 A slow-blow or MCB Moeller type "FAZ-C4-NA" (IEC/UL)
2	"Status Control Box" Signalization of connect command given from CB to PB	NO, potential free to X03: CO Operating characteristics: AC1: 240 V/0.1 to 8 A/2 000 VA DC1: 24 V/0.1 to 8 A/200 W AC15: 230 V/3 A DC13: 24 V/7 A (6 cycles/min.) Protection: Fuse 6.3 A quick-blow or 4 A slow-blow or MCB Moeller type "FAZ-C4-NA" (IEC/UL)
3	"Control Box Status" Signalization of connect command to Power Box	Semiconductor output
4	"Fault of Control Box" Signalization of faulty device in Control Box	Semiconductor output Operating characteristics: Short circuit proof, 24 V DC/20 mA, PNP Protection: Fuse 6.3 A quick-blow or 4 A slow-blow or MCB Moeller type "FAZ-C4-NA" (IEC/UL)
24 V, 0 V	Supply of semiconductor outputs	External 24 V DC supply Protection: Customer side

Marshalling box

The Marshalling Box must be integrated if the maximum available number of inputs of CB is not sufficient for your application. It is a concentrator of inputs and is connected direct to one of the inputs of CB instead of a disconnect switch. The MB is available as a single unit in a CI-enclosure.

The Marshalling Box consists of:

- Enclosure, totally insulated CI
- Multi-input safety relay
- Terminal blocks to the CB
- Terminal blocks for inputs
- Terminal block for status indication to a PLC

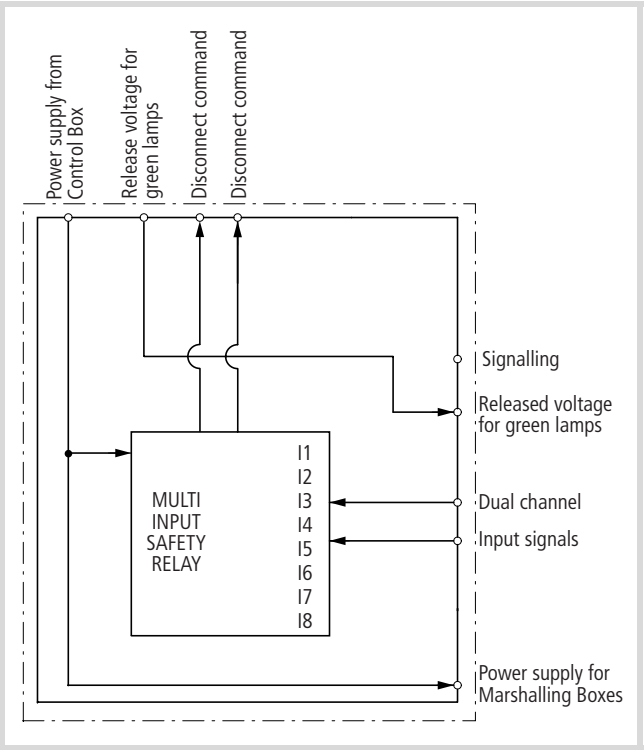


Figure 10: "Marshalling Box" block diagram

Table 3: Description of interconnections for MB

Block/Termina	Meaning	Technical Details
X1 to X16	Input Connectors	Dual channel safety input (DS/ES/GS)
1, 2 3 4		Safety channel 1 NO for PLC-signalization (→ X03: I1 to I16) External voltage for PLC-signalization (→ X03: CO)
5, 6 7, 8 9, 10 PE		Voltage supply 24 V DC for green lamps Safety channel 2 Voltage supply 24 V DC for add. MB's PE
X01	Interconnection with Control Box	1:1 Wiring to Input X1 to X8
X03		
CO	Common Voltage Terminal of common voltage for all potential free information in CB	Common voltage point for all potential free contacts used for signalization to the PLC
I1 to I16	"Disconnect Command Confirmation" I1 to I16: Contact from inputs X1 to X16: 3 Signalization of position from switch of corresponding inputs I1 to I8: Analog to terminal 3 of inputs X1 to X8	NO, potential free to X03: CO Operating characteristics: AC15: 230 V/6 A DC13: 24 V/10 A Protection: Fuse 6.3 A quick-blow or 4 A slow-blow or MCB Moeller type "FAZ-C4-NA" (IEC/UL)
2	"Status Marshalling Box" Signalization of connect command given from CB to PB	NO, potential free to X03: CO Operating characteristics: AC1: 240 V/0.1 to 8 A/2000 VA DC1: 24 V/0.1 to 8 A/200 W AC15: 230 V/3 A DC13: 24 V/7 A (6 cycles/min.) Protection: Fuse 6.3 A quick-blow or 4 A slow-blow or MCB Moeller type "FAZ-C4-NA" (IEC/UL)
3	"Marshalling Box Status" Signalization of connect command to Power Box	Semiconductor output
4	"Fault of Marshalling Box" Signalization of faulty device in Marshalling Box	Semiconductor output Operating characteristics: Short circuit proof, 24 V DC/20 mA, PNP Protection: Fuse 6.3 A quick-blow or 4 A slow-blow or MCB Moeller type "FAZ-C4-NA" (IEC/UL)
24 V, 0 V	Supply of semiconductor outputs	External 24 V DC supply Protection: Customer side

4 Commissioning Instructions

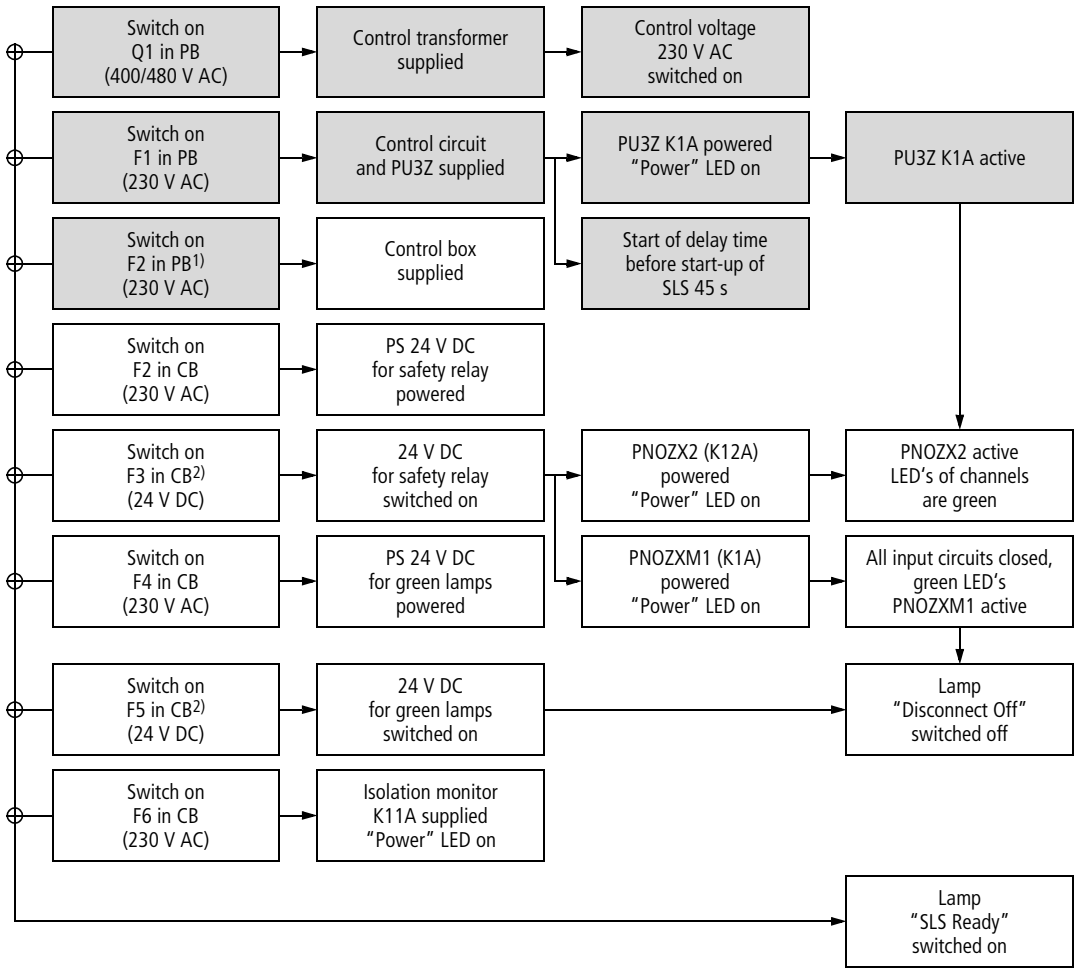
Start up of SLS

Warning!
Before you power up the system, ensure that the wiring and cabling are connected according to the instructions in this manual.

- The main supply disconnect switch must be in the "OFF" position.
- Select the operating voltage by using the link of terminal block X_T in PB. If theoperating voltage on site is 400 V plug link in position "Phase" – "400 V". If operating voltage on site is 480 V plug link in position "Phase" – "480 V".
- Make current adjustment at PKZM0 (Q1) in PB according to selection of operating voltage (→ label close to X_T).
- Turn at least one of the disconnect switches to the "OFF" position (disconnect switches are padlockable in the "OFF" position).
- All MCB's and protection circuit breakers in PB and CB must be switched "ON".
- Close the main supply disconnect switch. This causes the SLS to be energized, and the green verification light of all DS, DS2 which are in the "OFF" position will light up.
- Close all disconnect switches. Every time a DS or DS2 is closed, its verification light turns off.
- If all disconnect switches are in the "ON" position:
  – All the green verification lights are de-energized.
  – PB main contactors are energized and the input voltage of PB is transferred to the output side.

→ During start-up or after voltage interruption, the SLS will self-check the function of its internal systems. This self-test requires approximately 45 s for completion; the system cannot be started during this time.

If all disconnect switches are in the "ON" position during start-up, the SLS will not turn on before at least one of the disconnect switches has been turned "OFF" and then turned back "ON".



1) F2 in PB does not apply in combined Power/Control Box
2) F3 and F5 in CB does not apply in upgraded CB's

Figure 11: "Start-up" flow diagram

Normal operation

How to stop and restart the SLS

The following sequence applies if the SLS has to interrupt the power supply voltage to the machine:

- The machinery must be stopped using its stop command.
- The operator who needs to work in an exposed area has to turn off and padlock the corresponding disconnect switch. The SLS goes into the "Disconnected Status".
- If (and only if) the zero-energy status is verified, the verification light comes "ON" and the operator is allowed to enter the corresponding exposed area. **No Light => No Entry**.
- When work has been completed, the padlock can be removed and the disconnect switch can be turned to the "ON" position. Then the verification light turns "OFF".
- When all disconnect switches are in the "ON" position, PB transfers the main voltage to its output and the machinery can be started again.

Manual restart of SLS and machinery

- If the SLS is turned "OFF", the machinery can no longer be supplied.
- The SLS can be turned "ON", switching back all switches in "ON" position.
- If the SLS is turned "ON" again, the machinery may not start without a manual command from the machinery operator. These functions are to be provided by the machinery manufacturer.

Function of internal components

Control circuit protection devices

All protection devices are visible on the cover and can be operated.

Legend	Description	Name	Explanation
Power Box			
Q1/Q2[1)]	Primary transformer protection	PKZM0-2.5	Control power to the SLS system
F1/F2[1)]	Secondary transformer protection – 230 V	FAZ-2-S6	Supplies "K1A" relay
F2/F3[1) 2)]	Secondary transformer protection – 230 V	FAZ-2-S6	Supplies 230 V power to the Control Box
Control Box			
F2	Primary protection for 24 V DC "G1" power supply	FAZ-S1	230 V power for the 24 V DC power supply for the safety relays
F3[3)]	Secondary protection for 24 V DC "G1" power supply	FAZ-2-C6	24 V DC power for the safety relay circuits
F4	Primary protection for 24 V DC "G2" power supply	FAZ-S1	230 V power for the 24 V DC power supply for the verification lamps
F5[3)]	Secondary protection for 24 V DC "G2" power supply	FAZ-2-C6	24 V DC power for the **"DS"** lamps
F6	Primary protection for K11A Relay	FAZ-S2	230 V power for the isolation monitor

1) Power Boxes with integrated MCCB as protection for the power line have different device names
_/_ means: Name of device in PB without integrated MCCB/with integrated MCCB

2) F2/F3 in PB does not apply in combined Power/Control Box

3) F3 and F5 in CB does not apply in upgraded CB's

Voltage monitor PU3Z (K1A) in power box

Attention!
The voltage monitor checks the status of voltage when main contactors are switched off. If voltage is present, it will not enabel the green light on the switches and will also not re-start the SLS.

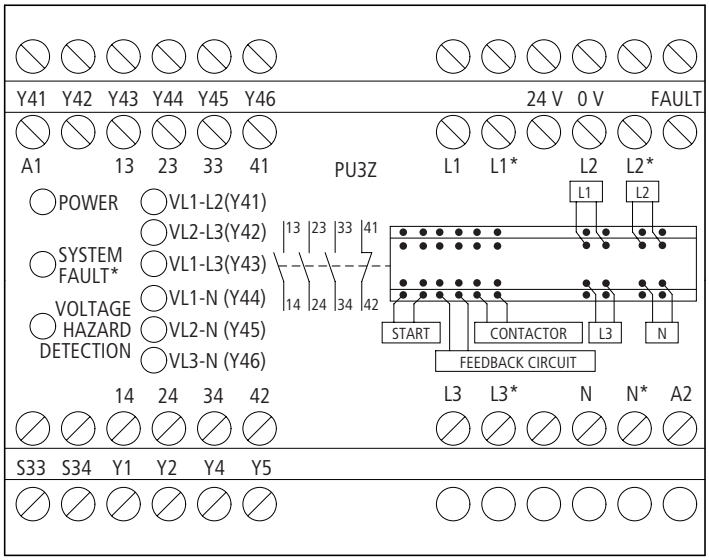


Figure 12: PU3Z (K1A)

Meaning of the LED indications

LED	
Power	Power supply voltage status
Voltage Hazard Detection	Faulty voltage status at PB output
System Fault	Internal fault status
VL1-L2 (Y41)	Voltage status L1-L2 at PB output
VL2-L3 (Y42)	Voltage status L2-L3 at PB output
VL1-L3 (Y43)	Voltage status L1-L3 at PB output
VL1-N (Y44)	Voltage status L1-N at PB output
VL2-N (Y45)	Voltage status L2-N at PB output
VL3-N (Y46)	Voltage status L3-N at PB output

Concentrator of inputs (Relays K1A to K4A) in Control Box

The modular safety relay reduces the possibility of failure in safety circuits. It is a concentrator of all inputs. If only one input is disconnected on the relays it will signal a disconnect command to the PB. After all inputs are closed, the disconnect command is removed and the PB is released to switch on the main contactors.

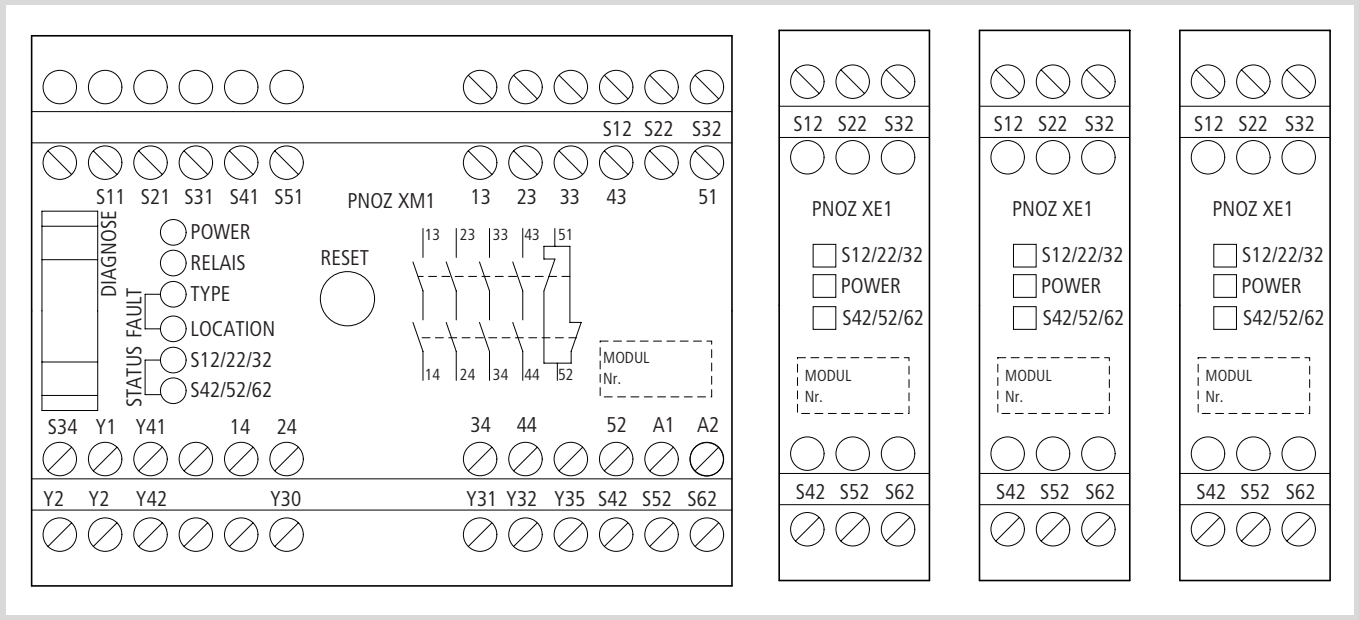


Figure 13: PNOZ XM1 (K1A), 3 × PNOZ XE1 (K2A to K4A)

Meaning of the LED indications

LED	
Power	Power supply voltage status of K1A to K4A
RELAIS/RELAY	Modular safety relay is energized
TYPE	Internal fault
LOCATION	A module of the safety relay is defective
S12/22/32	Status indication of 1st input of each module
S42/52/62	Status indication of 2nd input of each module

The modular safety relays indicate the status of each individual two channel input of the CB. For each input the LED can light up in three different colours (flashing or not) depending on the situation:

- Green — Input is "ON"
- Flashing green — Input is "ON" during cycle test of safety relay
- Flashing yellow — Input is "OFF"
- Red (fixed or flashing) — Faulty input

The command output from the corresponding module will be "ON" only if all input LEDs are green. This means that as soon as one of the switches is open, the CB is in the "OFF" position.

The relationship between the LED's of the modular relay and the corresponding input connector is indicated in the table below:

Monitoring Relay	LED	Input Connector
PNOZ XM1 (K1A)	S12/22/32	X1
	S42/52/62	X2
PNOZ XE1 (K2A)	S12/22/32	X3
	S42/52/62	X4
PNOZ XE1 (K3A)	S12/22/32	X5
	S42/52/62	X6
PNOZ XE1 (K4A)	S12/22/32	X7
	S42/52/62	X8

Isolation monitoring (Relay K11A) in the control box

The isolation monitor monitors incorrect connection between both internal power supplies and isolation faults in connection cables to the switches.

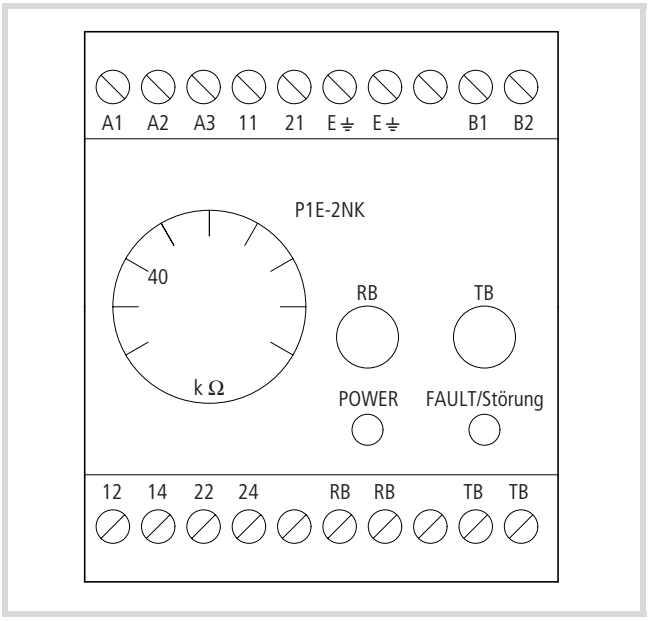


Figure 14: P1E-2NK

Meaning of the LED and button indications

LED	
Power	Power supply voltage status
Fault: red	Isolation fault in one of the connection cables to switches
Button	
TB	Test-button for simulating isolation fault
RB	Reset button for resetting of an isolation fault **Attention!** The function of this button is wired to the blue reset button in the front of the CB.

Confirmation relay (K12A) in control box

This safety relay is a confirmation relay for the PU3Z voltage monitor located in the PB. If voltage indicates no voltage present on the switched off main contactors, it closes the safety circuits of this confirmation relay. The safety relay will then supply the green lights of the activated switches with power.

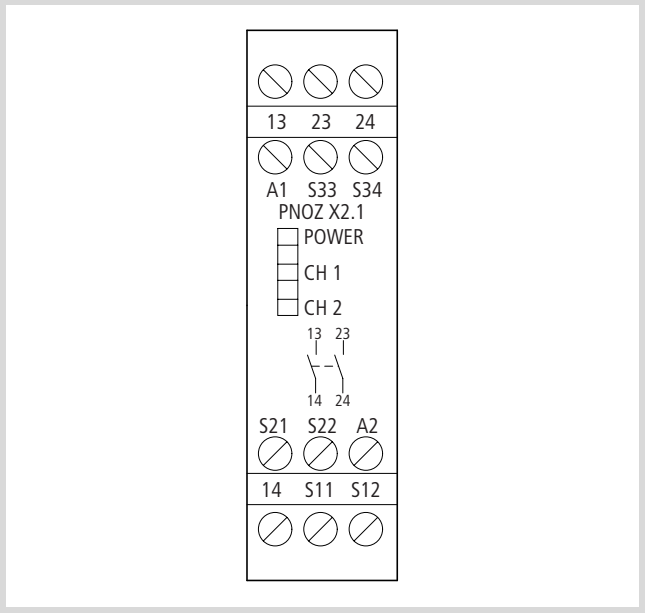


Figure 15: PNOZ X2.1

Meaning of the LED indications

LED	
Power	Power supply voltage status
CH1	Channel 1 closed
CH2	Channel 2 closed

Status of internal relays and indication lamps under normal working conditions

The following table explains the indications of each internal relay in both normal SLS working states ("ON" and "OFF" position):

Relay	Description	Colour	SLS Status	
			OFF	ON
Disconnect Switch				
H1	Verification lamp of DS is in			
	"OFF" position	green	ON	OFF
	"ON" position	green	OFF	
Power Box				
K1A	Power	green	ON	ON
	System fault	red	OFF	OFF
	Voltage hazard detection	red	OFF	OFF
	Y41 to Y46	yellow	OFF	ON
Control Box				
K1A to K4A	Power	green	ON	ON
	Relay	green	OFF	ON
	Fault type	red	OFF	OFF
	Fault location	red	OFF	OFF
	S12/22/32 Input			
	"OFF"	yellow	flashing	OFF
	"ON"	green	ON	ON
	S42/52/62 Input			
	"OFF"	yellow	flashing	OFF
	"ON"	green	ON	ON
K11A	Power	green	ON	ON
	Fault	red	OFF	OFF
K12A	Power	green	ON	ON
	Channel 1	green	ON	OFF
	Channel 2	green	ON	OFF
H2	"SLS Ready"	white	ON	ON
H1	"Disconnect OFF"	yellow	ON	OFF

The next three block diagrams illustrate the status of each SLS-module and internal relays in both normal working states ("ON" and "OFF" position of SLS) as well as de-energized state:

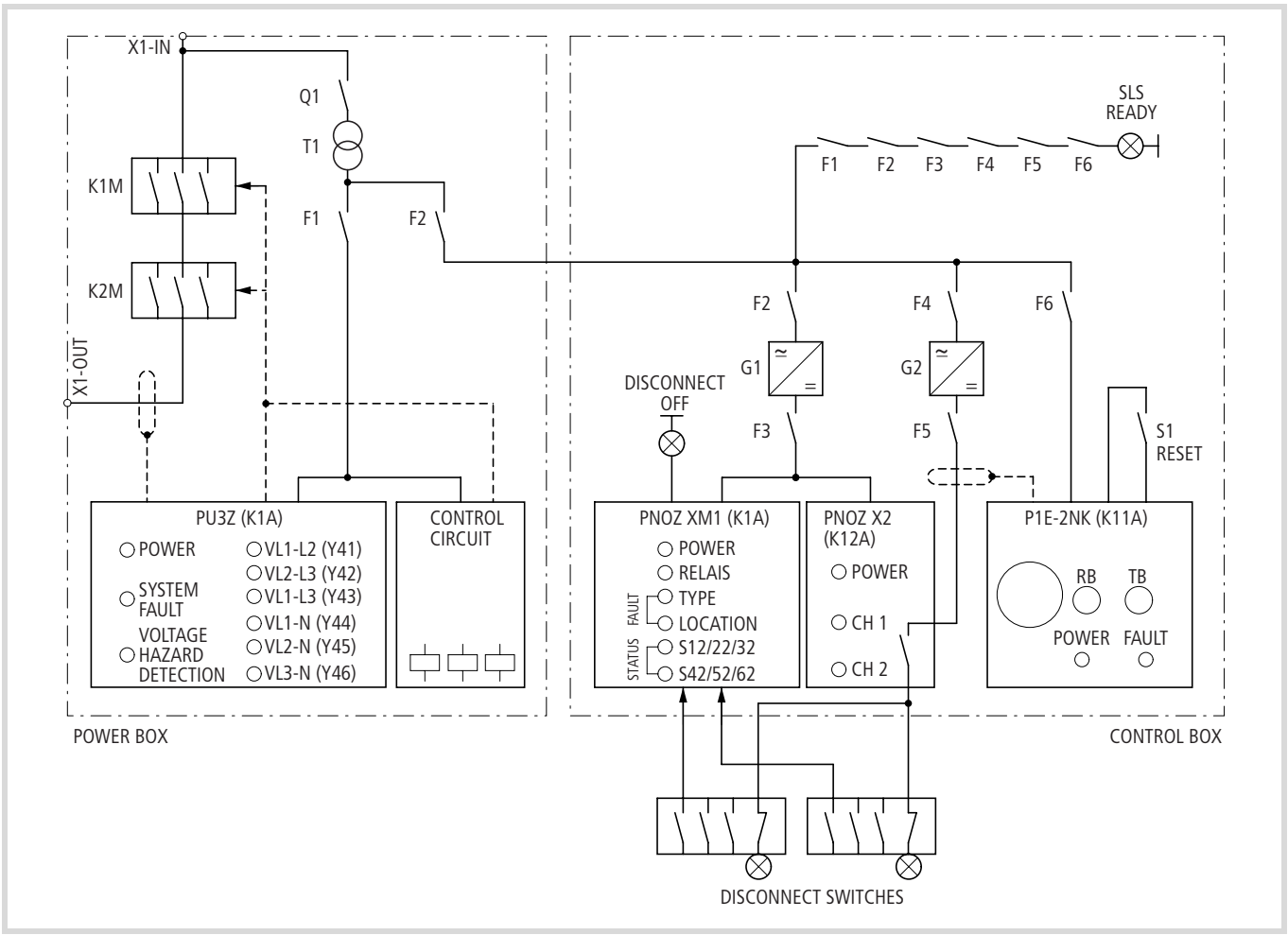


Figure 16: SLS not-energized

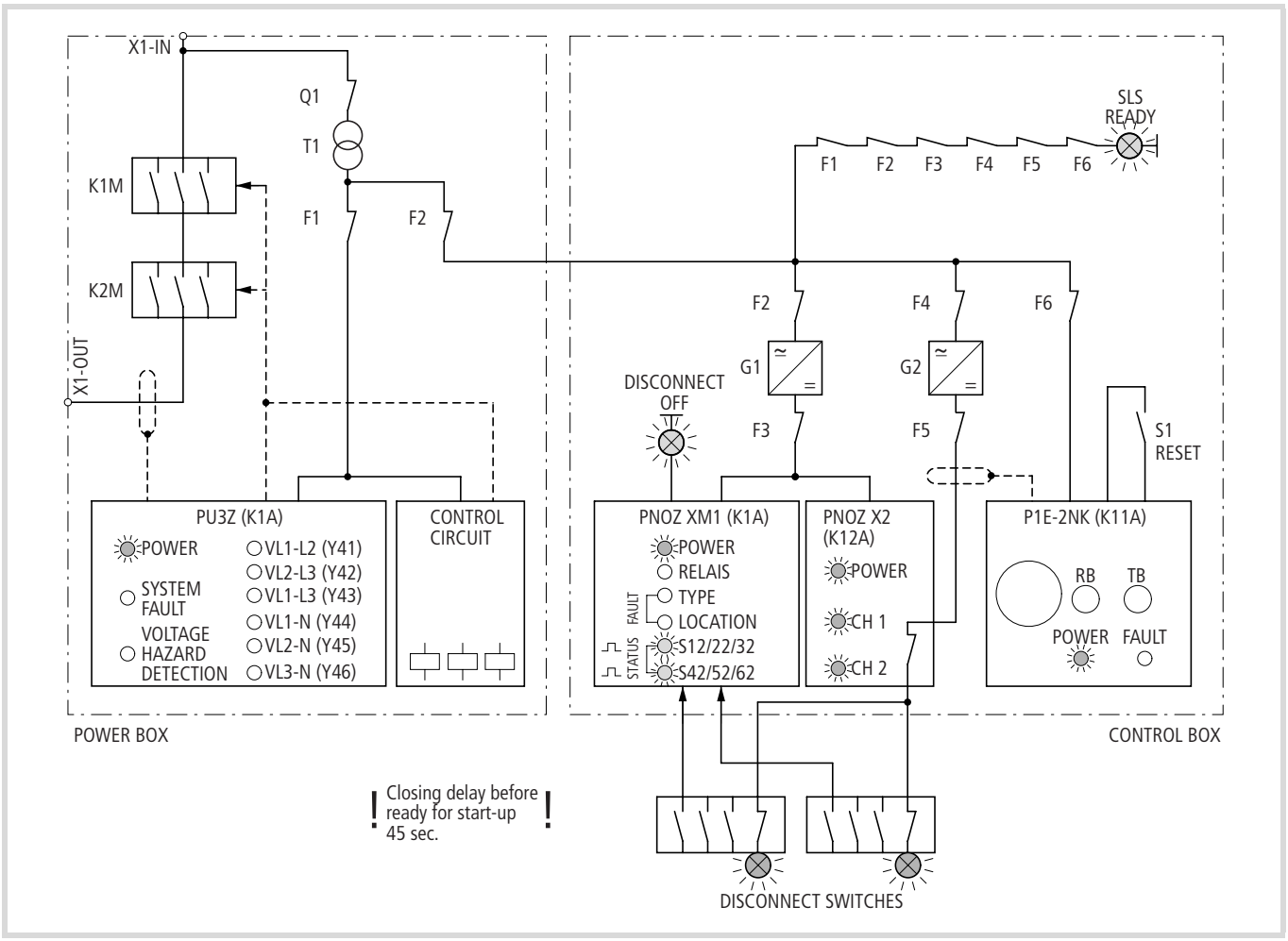


Figure 17: SLS energized in "OFF" position

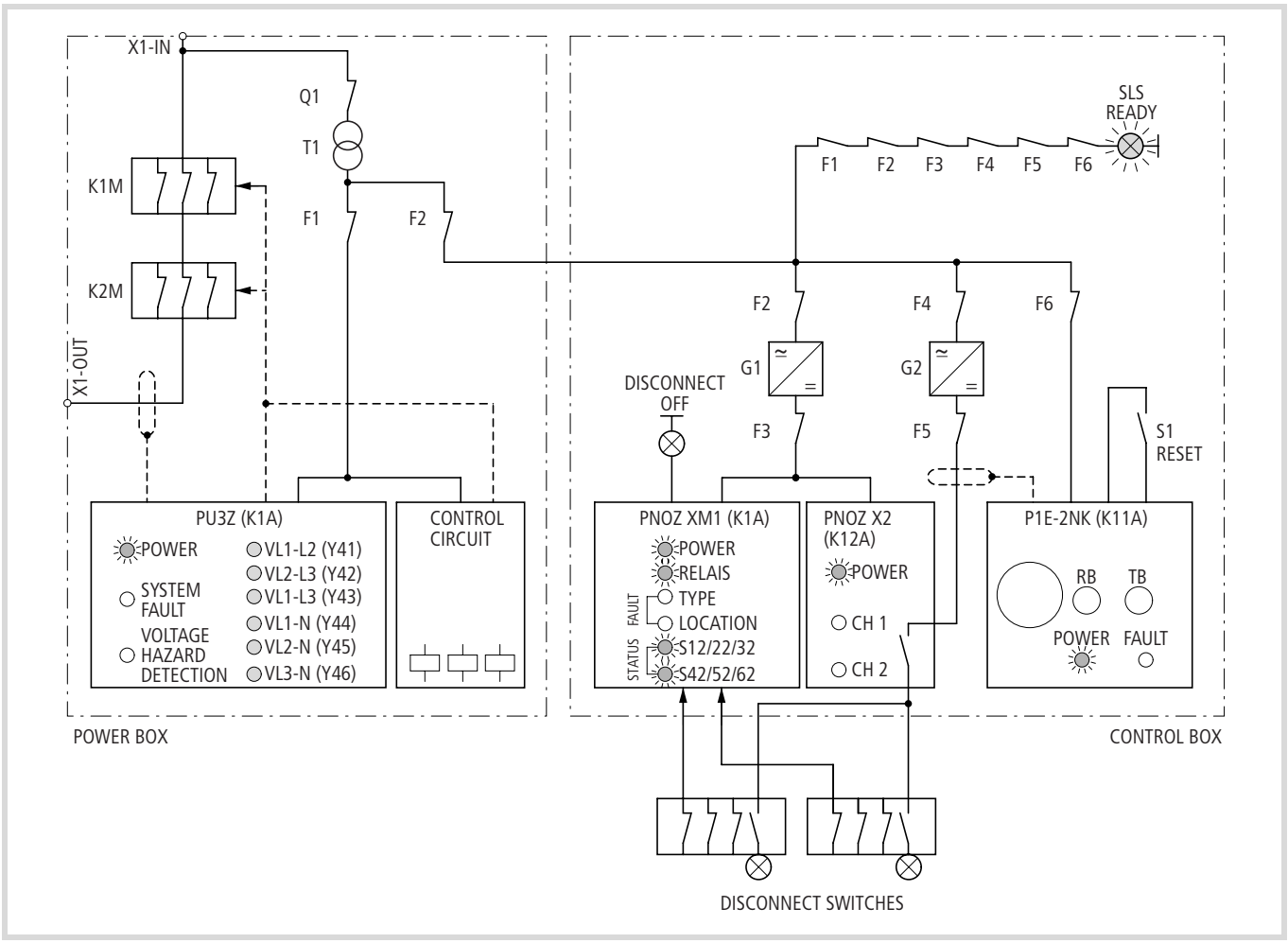


Figure 18: SLS energized in "ON" position

5 Trouble Shooting

Protection devices

→ All SLS protection devices in the Power Box as well as in the Control Box have to be switched in the "ON" position before the system can be used ("SLS Ready" lamp indicates this state).

All protection devices are visible behind the cover and can be operated.

In case of tripping of one of these protection devices, please undertake the following steps.

CB "Q1" in the Power Box

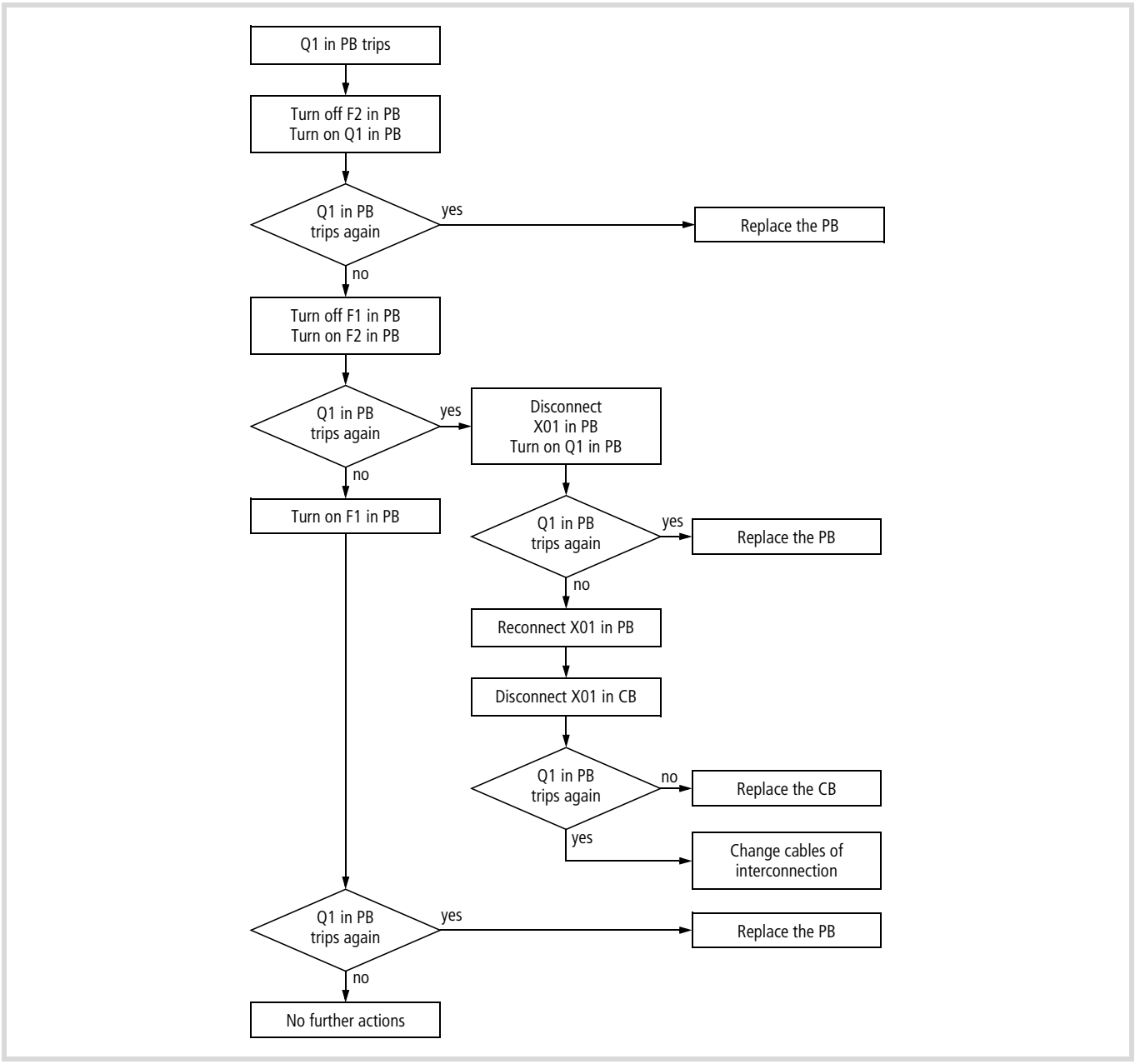


Figure 19: Tripping of "Q1" in PB

MCB "F1" in Power Box

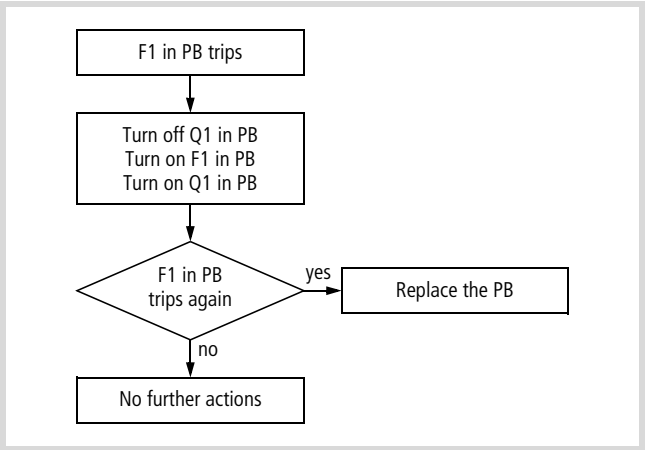


Figure 20: Tripping of "F1" in PB

MCB "F2" in Power Box

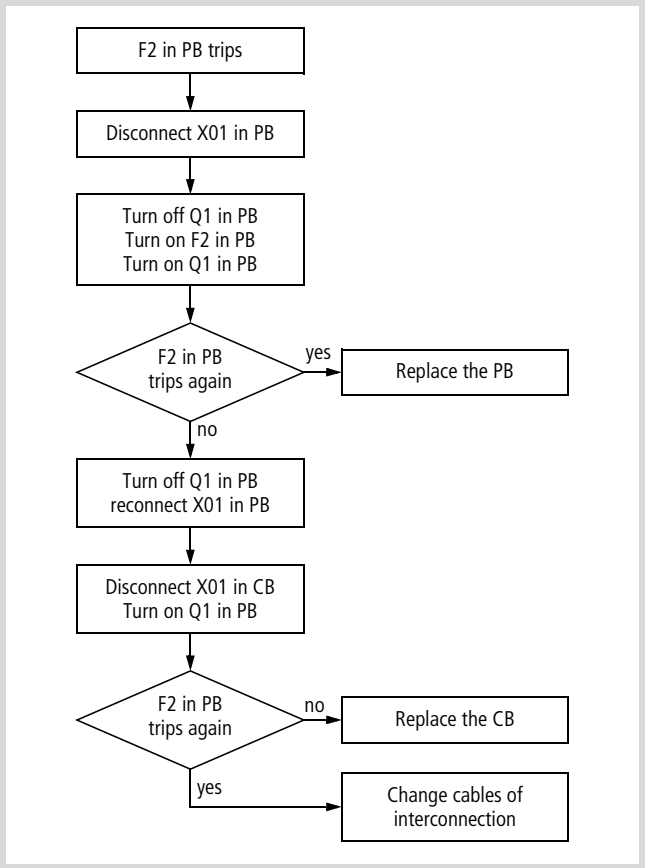


Figure 21: Tripping of "F2" in PB

MCB "F3" or "F5" in Control Box

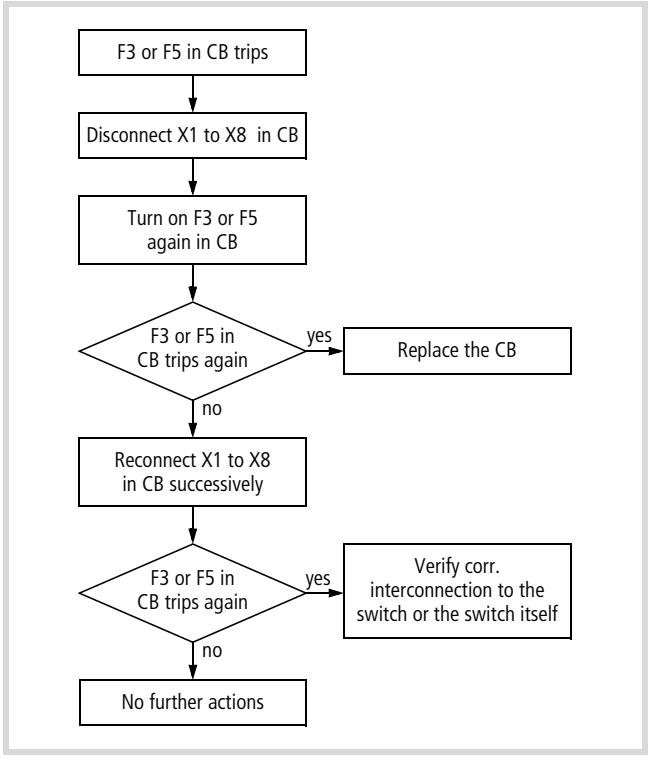


Figure 22: Tripping of "F3" or "F5" in CB

MCB "F2", "F4" or "F6" in Control Box

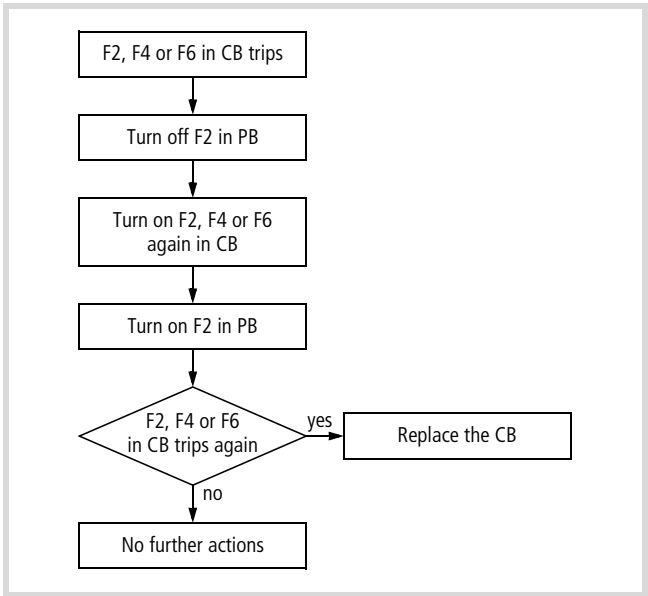


Figure 23: Tripping of "F2", "F4" or "F6" in CB

Voltage monitor in power box

"Power"-State

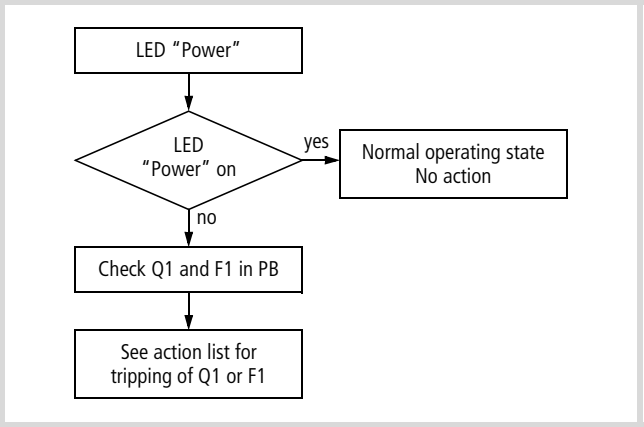
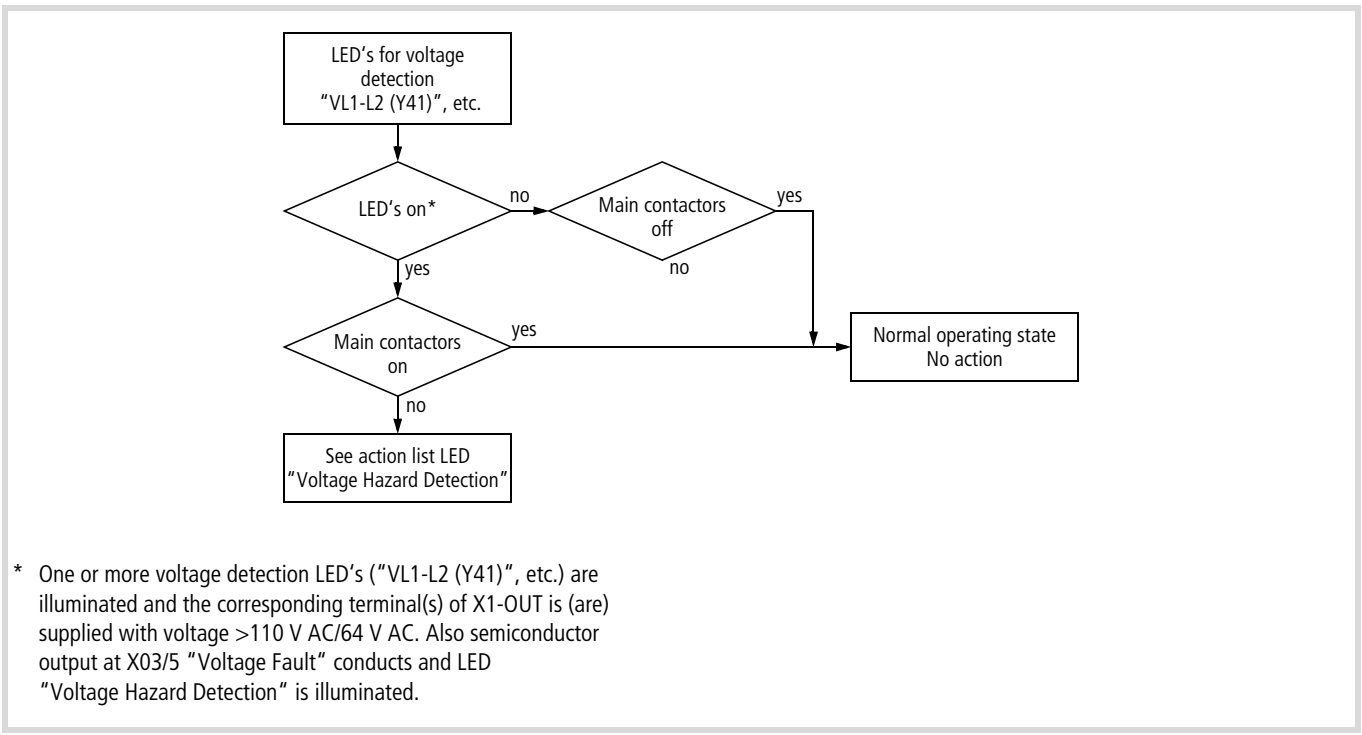


Figure 24: "Power" LED

Voltage monitor in voltage hazard states

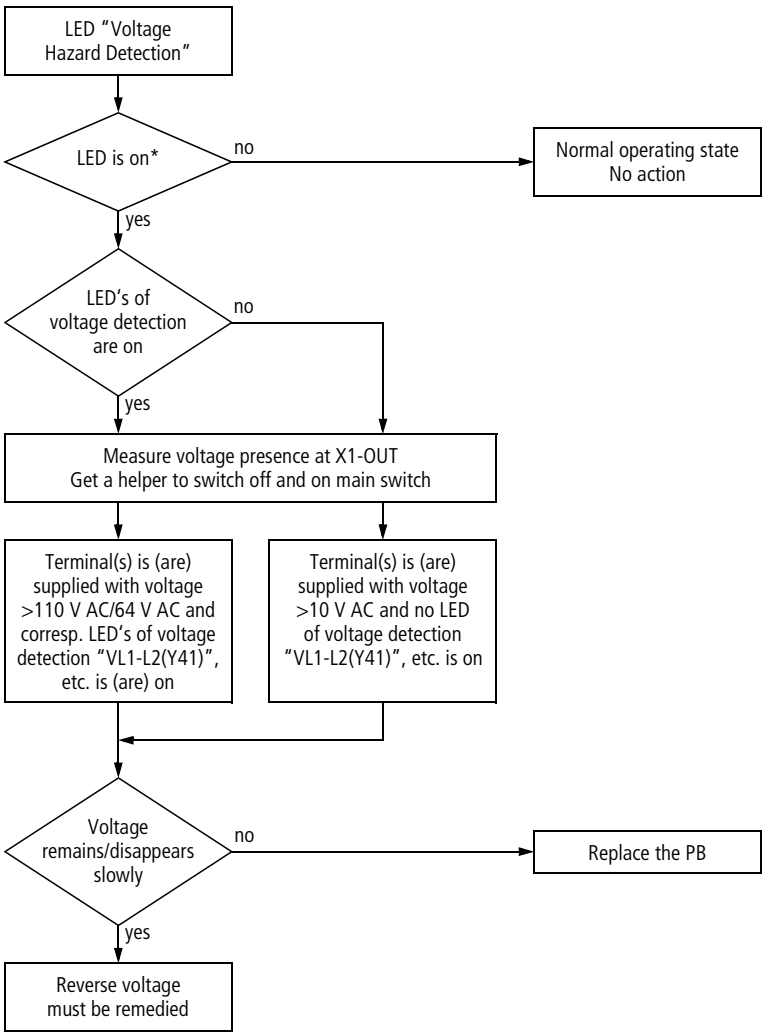
The voltage state as well as a voltage hazard will be detected by two types of LED's.

The first LED types are the six off voltage detecting LED's named "VL1-L2 (Y41)", etc., which indicate voltage states >110/64 V AC in both voltage cases (normal working state or hazard) on the SLS output.. The second type of LED is the "Voltage Hazard Detection" LED, which indicates each voltage hazard >10 V AC. Parallel to this LED, the semiconductor output to PB-X03/5 "Voltage Fault" also issues a signal.



* One or more voltage detection LED's ("VL1-L2 (Y41)", etc.) are illuminated and the corresponding terminal(s) of X1-OUT is (are) supplied with voltage >110 V AC/64 V AC. Also semiconductor output at X03/5 "Voltage Fault" conducts and LED "Voltage Hazard Detection" is illuminated.

Figure 25: Voltage Hazard >10 V AC



* Additionally, semiconductor output at X03/5 "Voltage Fault" signals also.

Figure 26: Voltage hazard

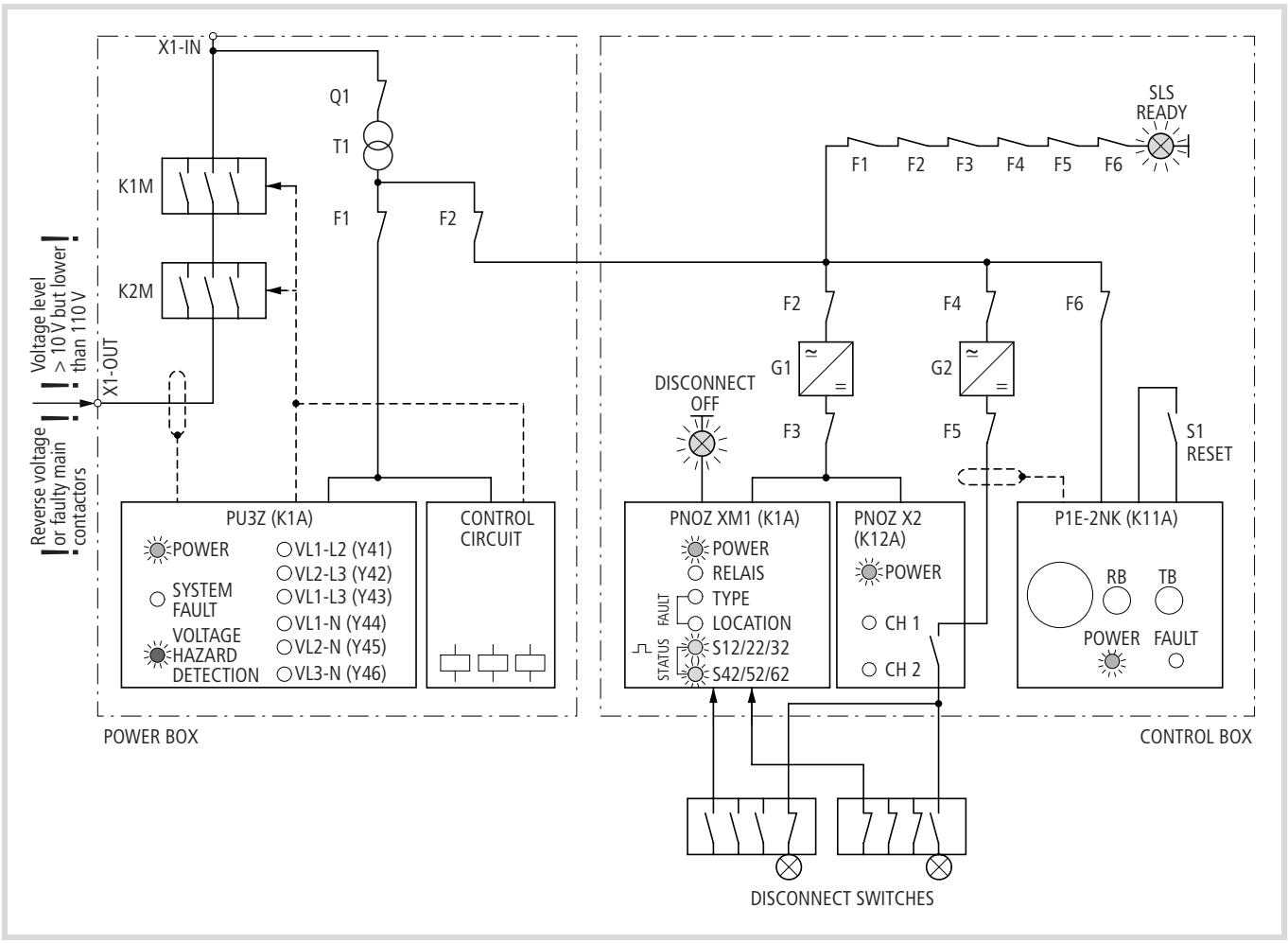


Figure 27: SLS "Voltage hazard detection" of PU3Z (>10 V AC, but <110 V AC)

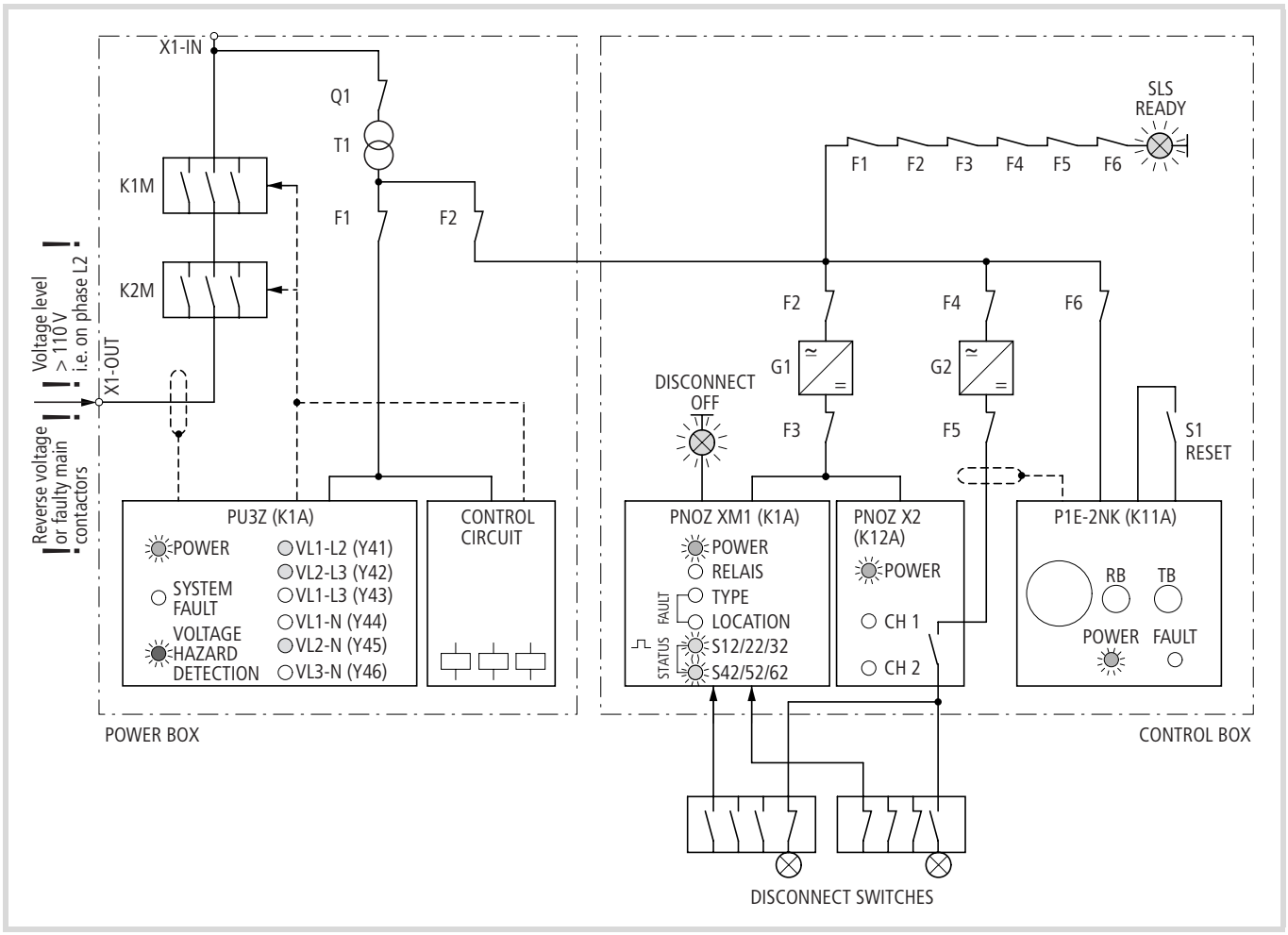


Figure 28: SLS "Voltage Hazard Detection" of PU3Z (>110 V AC/64 V AC)

State of System Fault

In the case of a defective voltage monitor, the "System Fault" LED detects this state.

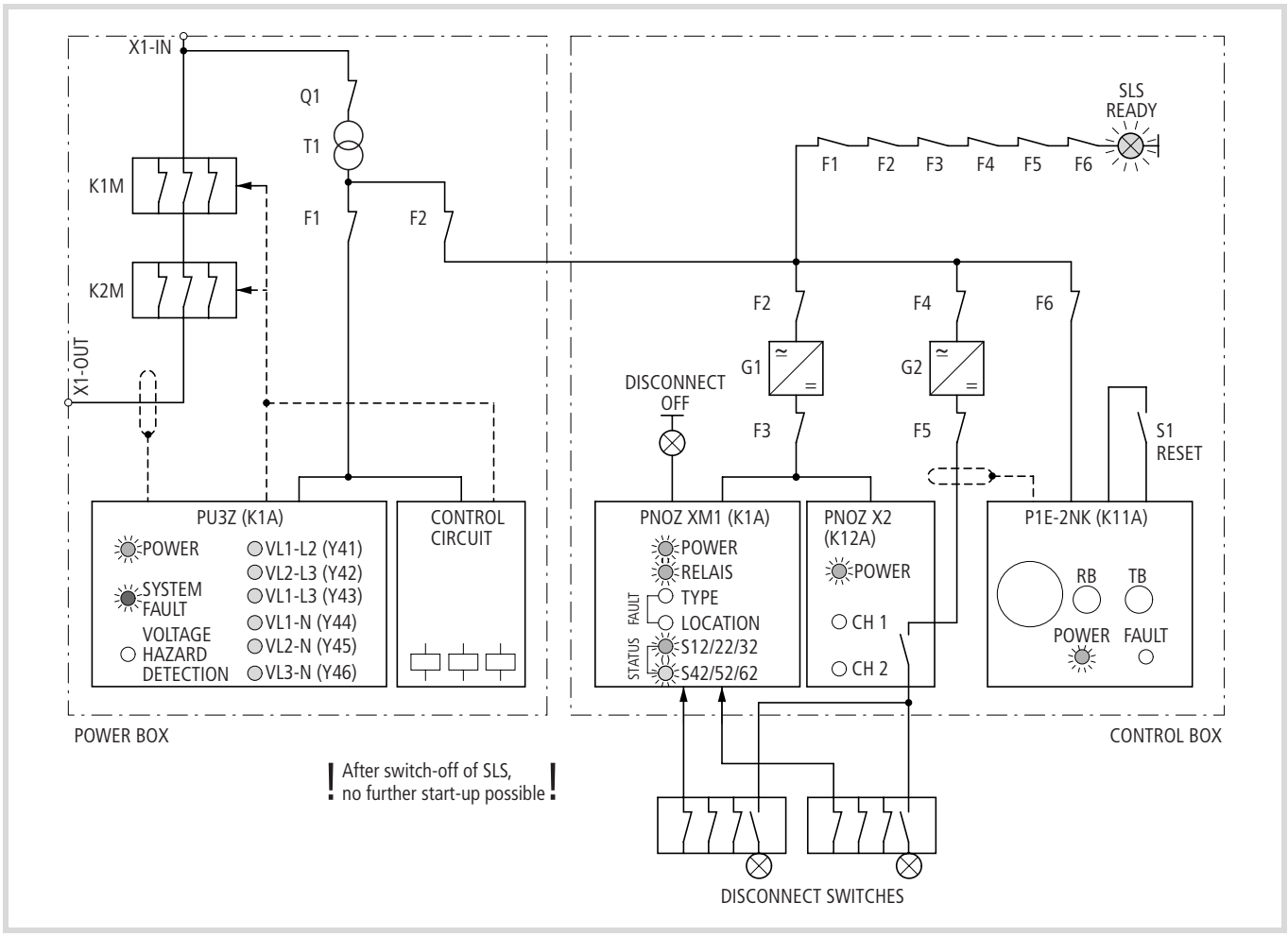


Figure 29: SLS "system fault" of the PU3Z in the "ON" position

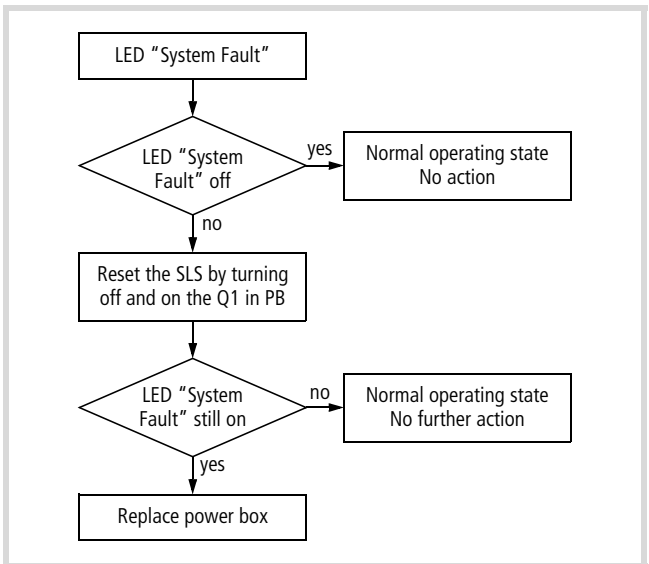


Figure 30: System fault

Concentrated Relay (K1A to K4A) in Control Box

"Power" state

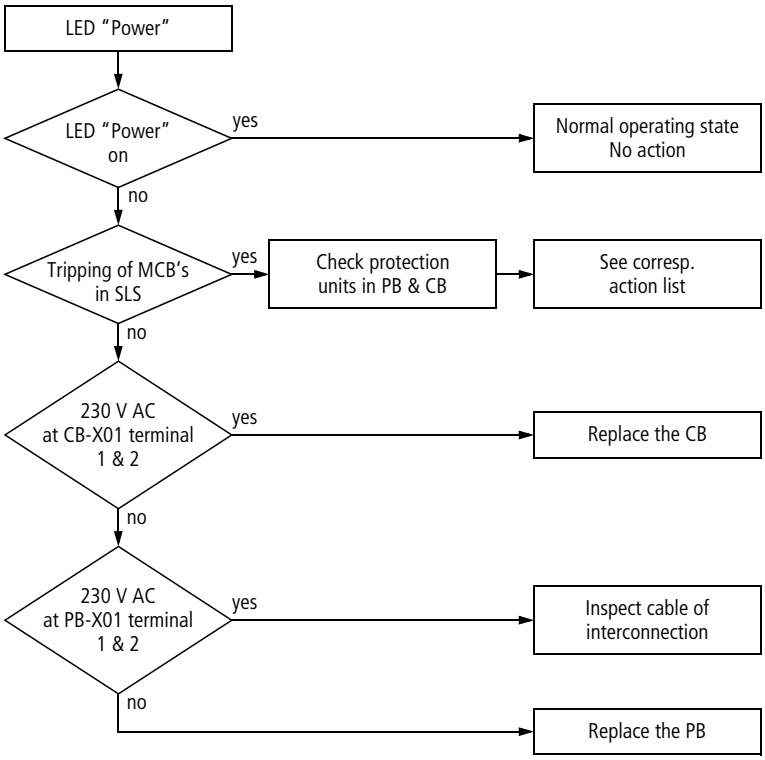


Figure 31: "Power" LED

Operational state

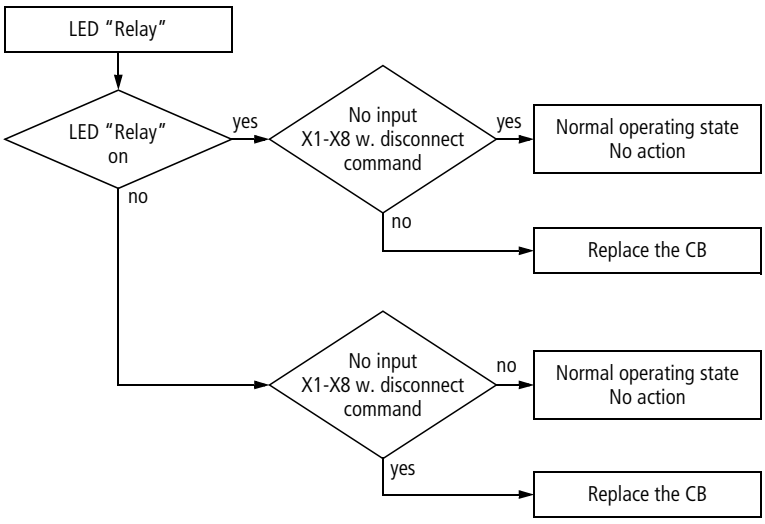


Figure 32: "Relay" LED

State of input indications

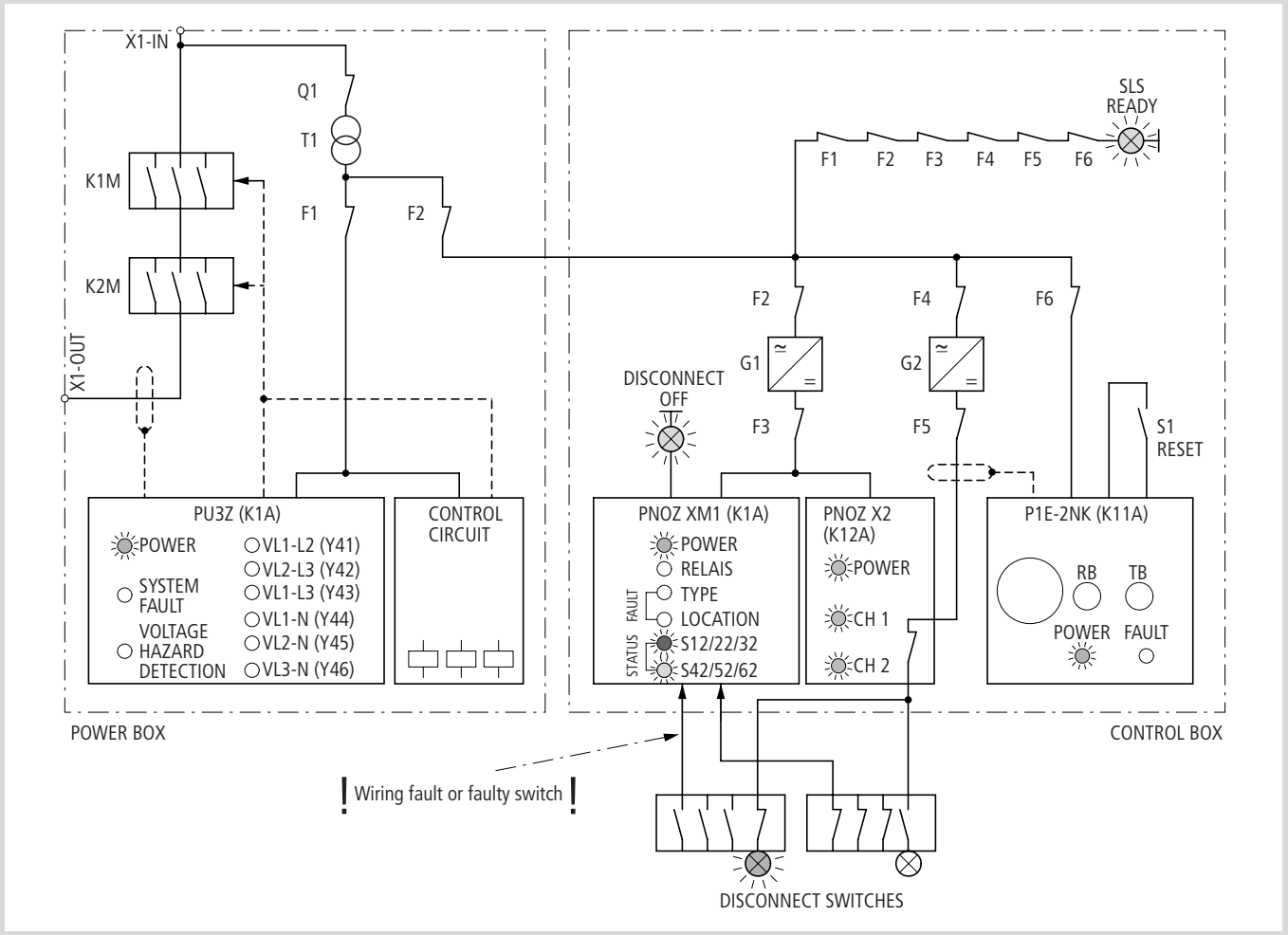


Figure 33: SLS "S12/22/32" and/or "S42/52/62" of PNOZ XM1

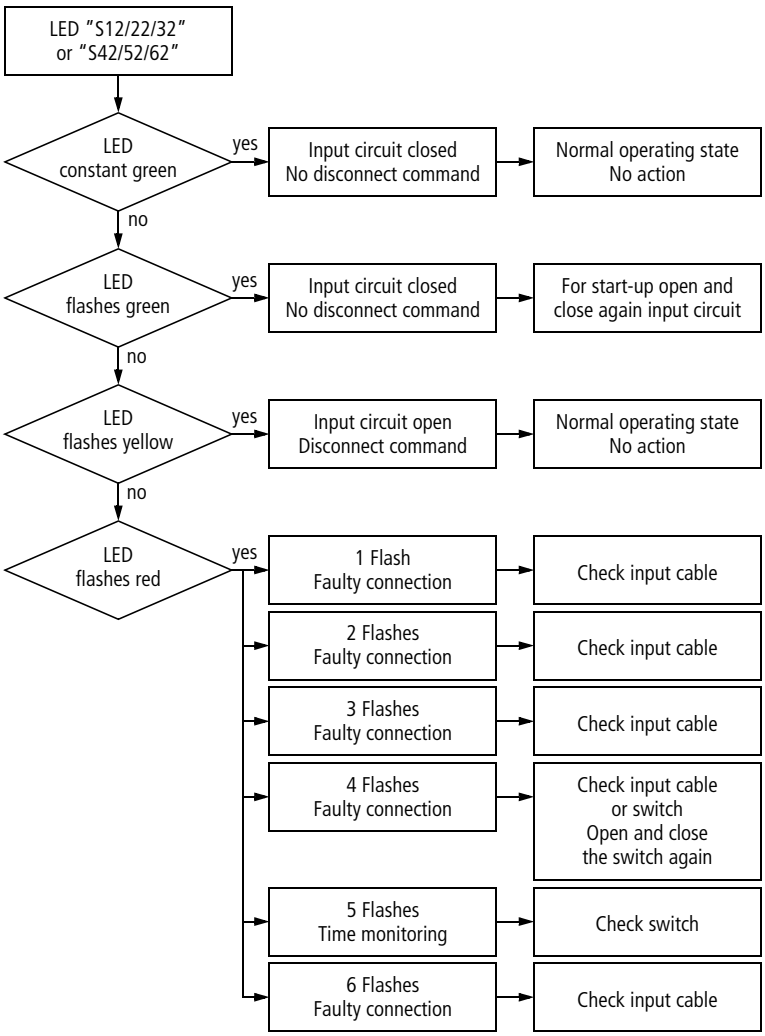


Figure 34: Input LED's

Fault state

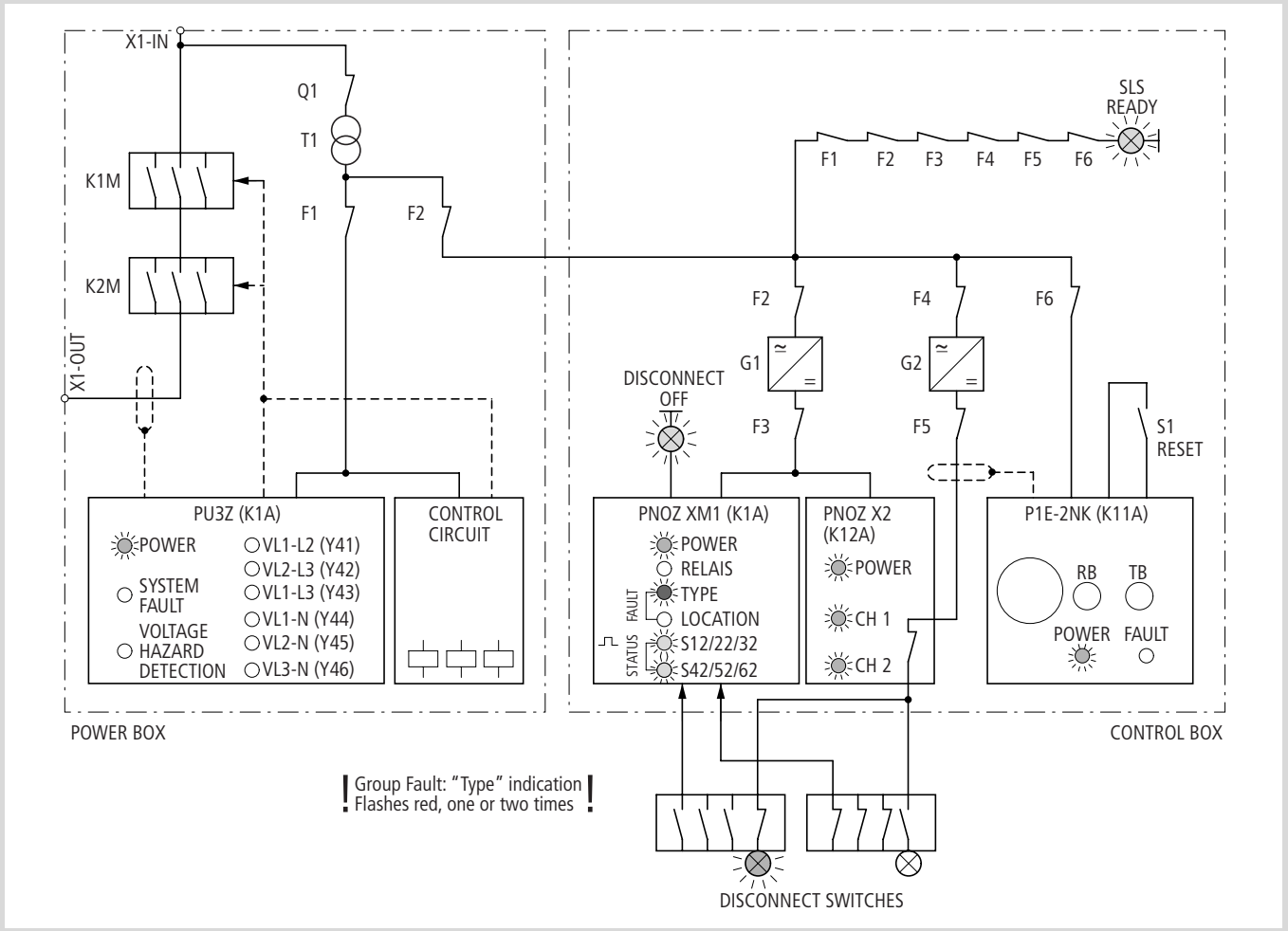


Figure 35: "Type" fault of PNOZ XM1

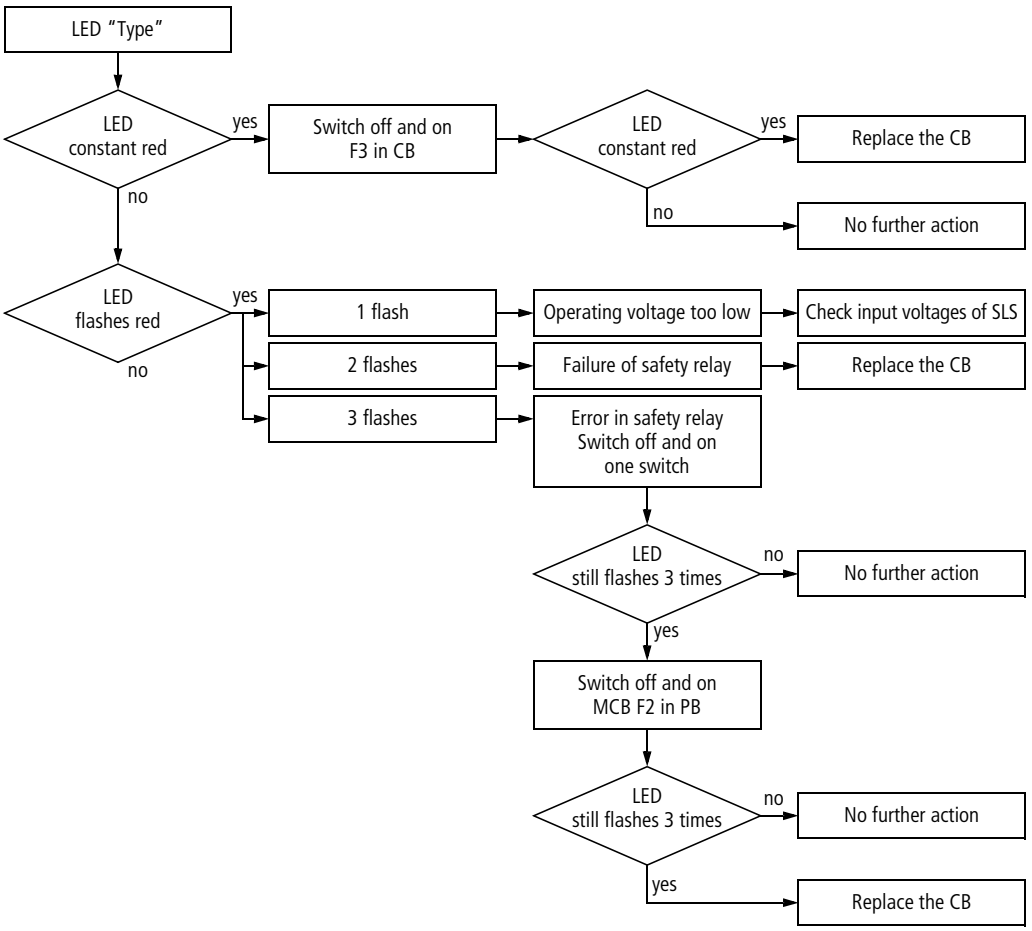


Figure 36: "Type" fault

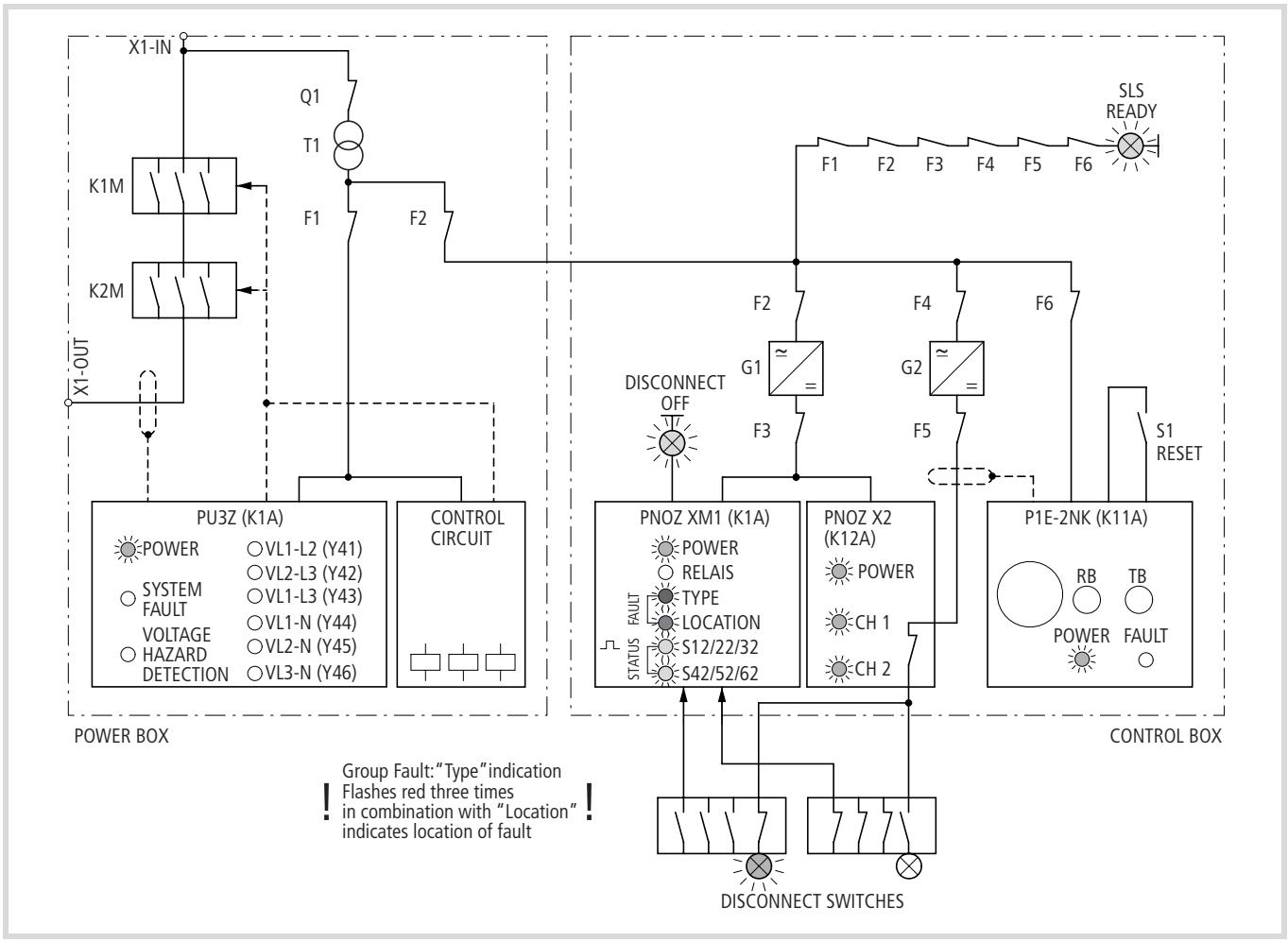


Figure 37: "Type" and "Location" fault of PNOZ XM1

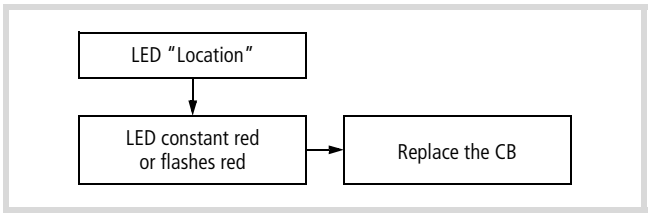


Figure 38: "Location" fault

Isolation monitoring relay K11A

"Power" state

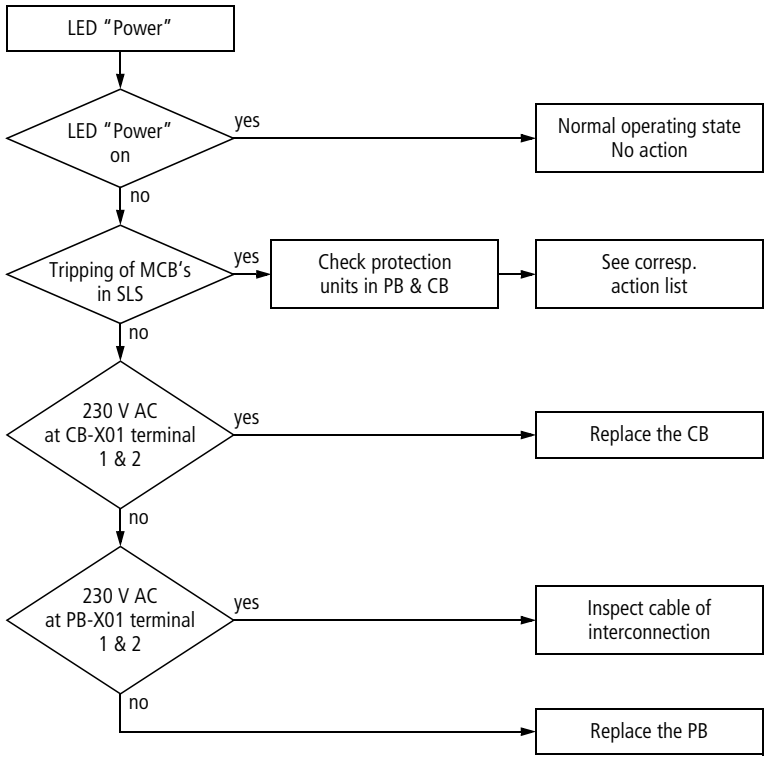


Figure 39: "Power" LED

Isolation "Fault" indication

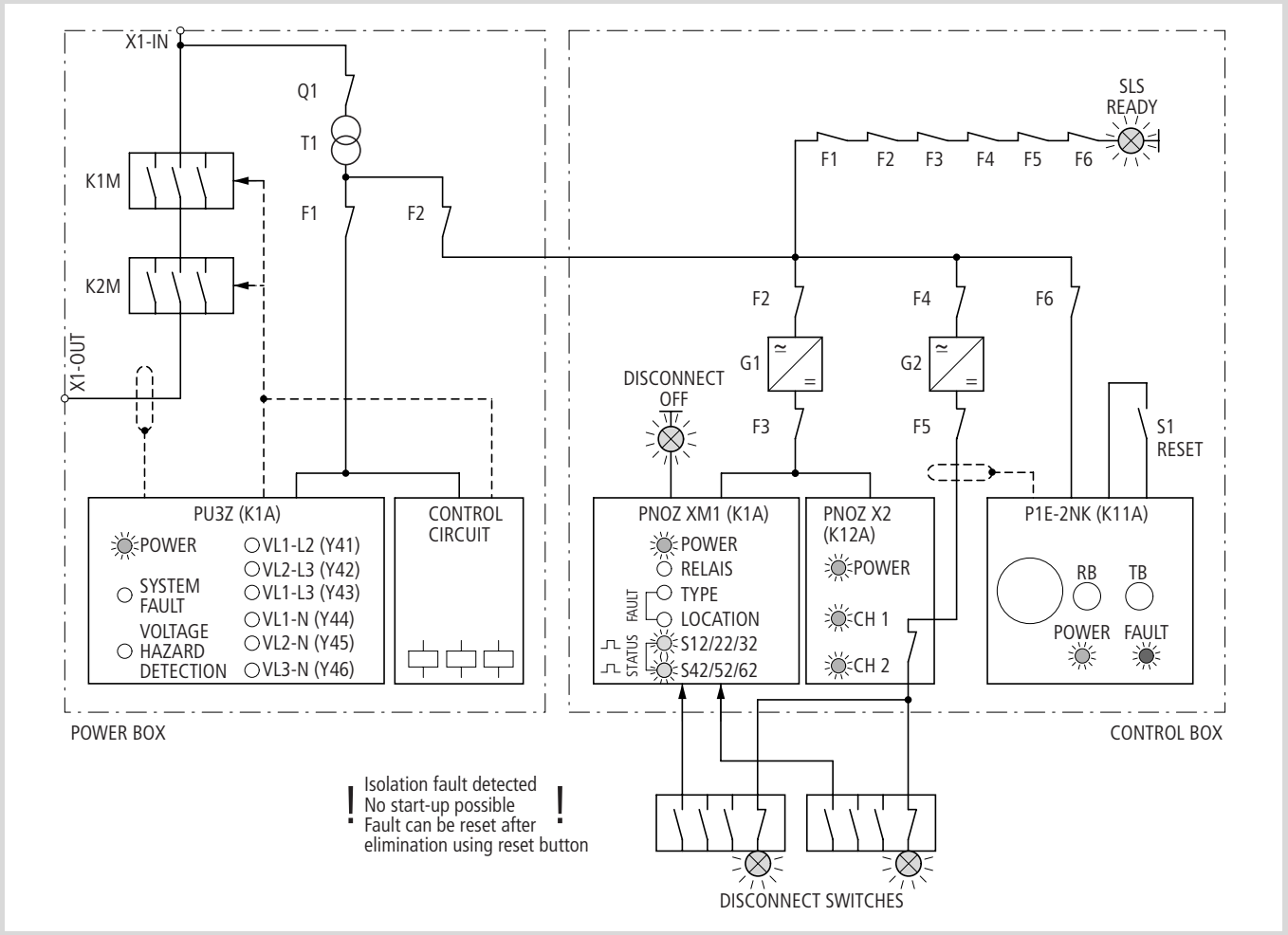


Figure 40: "Fault" of P1E-2NK

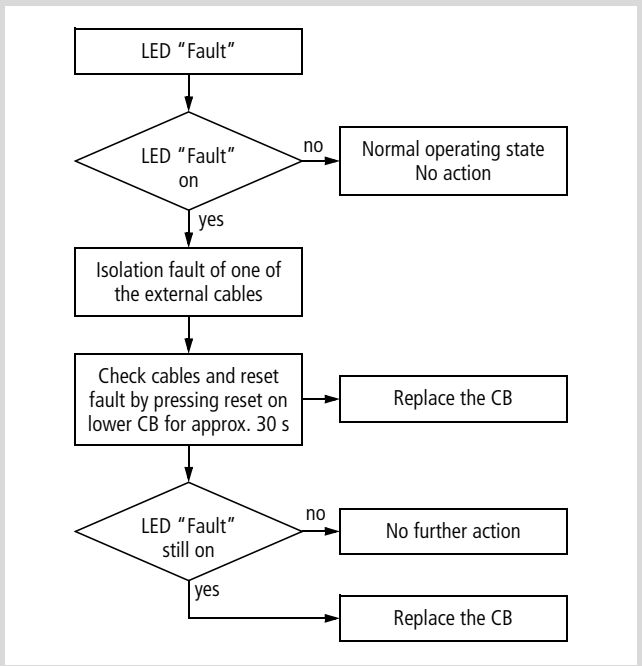


Figure 41: Isolation fault

Confirmation relay K12A of voltage monitor PU3Z

"Power" state

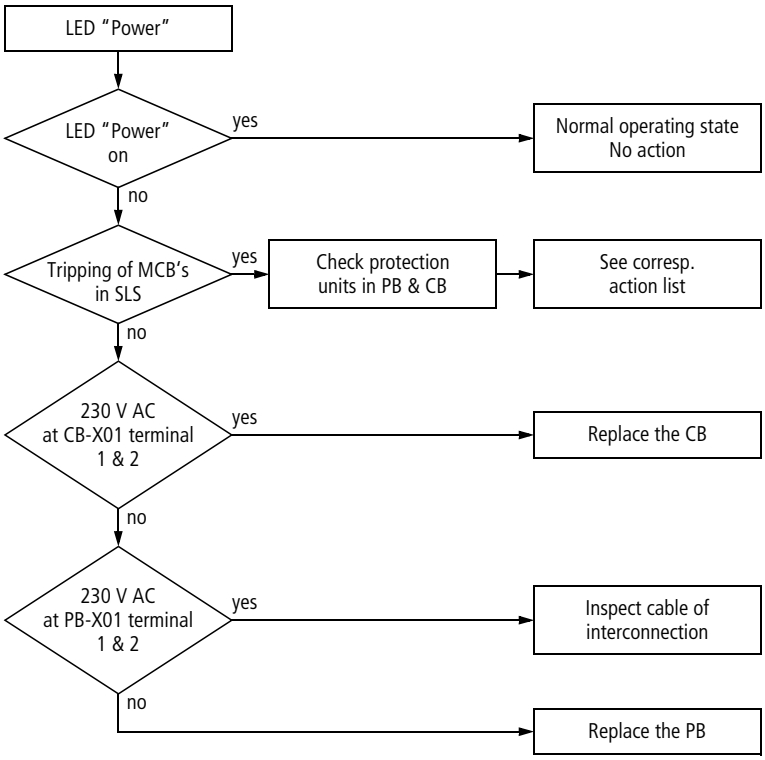


Figure 42: "Power" LED

Channel state indication

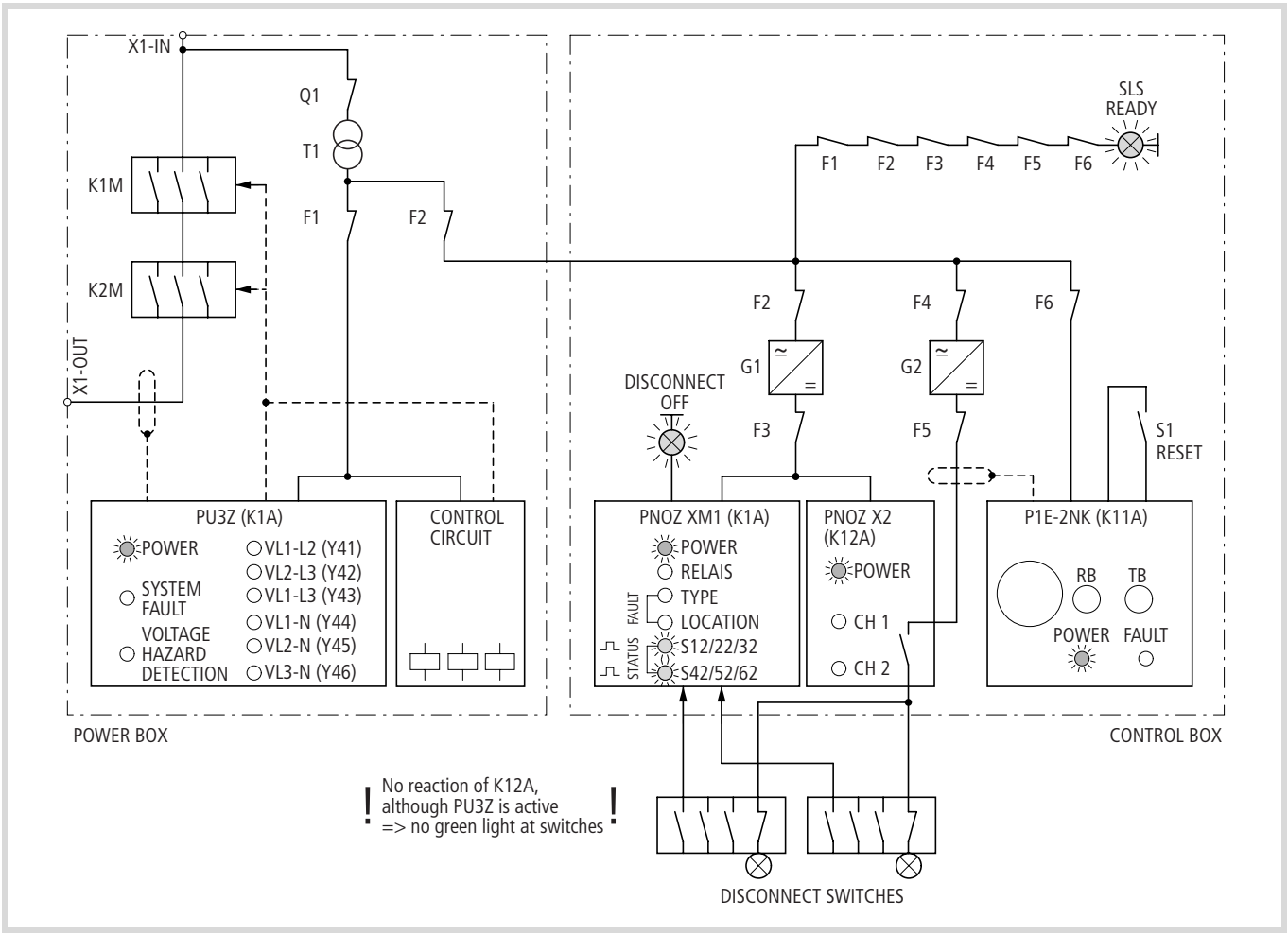
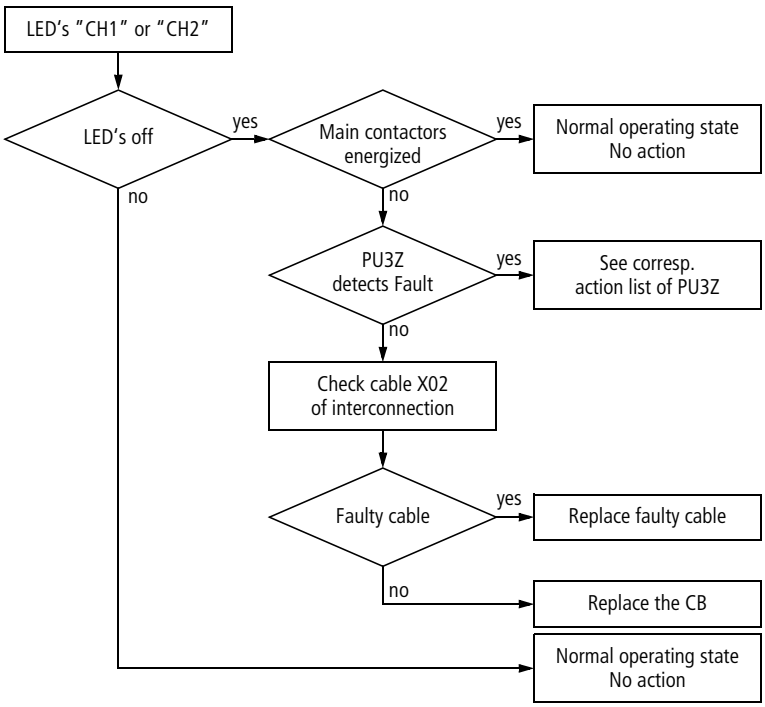


Figure 43: SLS "CH1" and/or "CH2" of PNOZ X2.1



Main contactors energized means SLS on
Main contactors de-energized means SLS off

Figure 44: Channel state

Indication lamps on the control box

On the front of the CB there are two lamps for indication of the status of the SLS.

SLS ready

This white lamp signals that the system is powered up for operation. It lights up only if all protection devices in the PB and the CB are turned on and the interconnection cables are o.k.

Disconnect off

This yellow lamp signals the "Disconnect Status" of the system. The "SLS Ready" lamp should also be "ON". If now one of the switches is switched to the "OFF" position, the lamp lights up and indicates the "Disconnect" state.

→ If the indication lamps are not illuminated during the normal working state as described above, check the bulbs to ensure that they are functional.

Disconnect switch

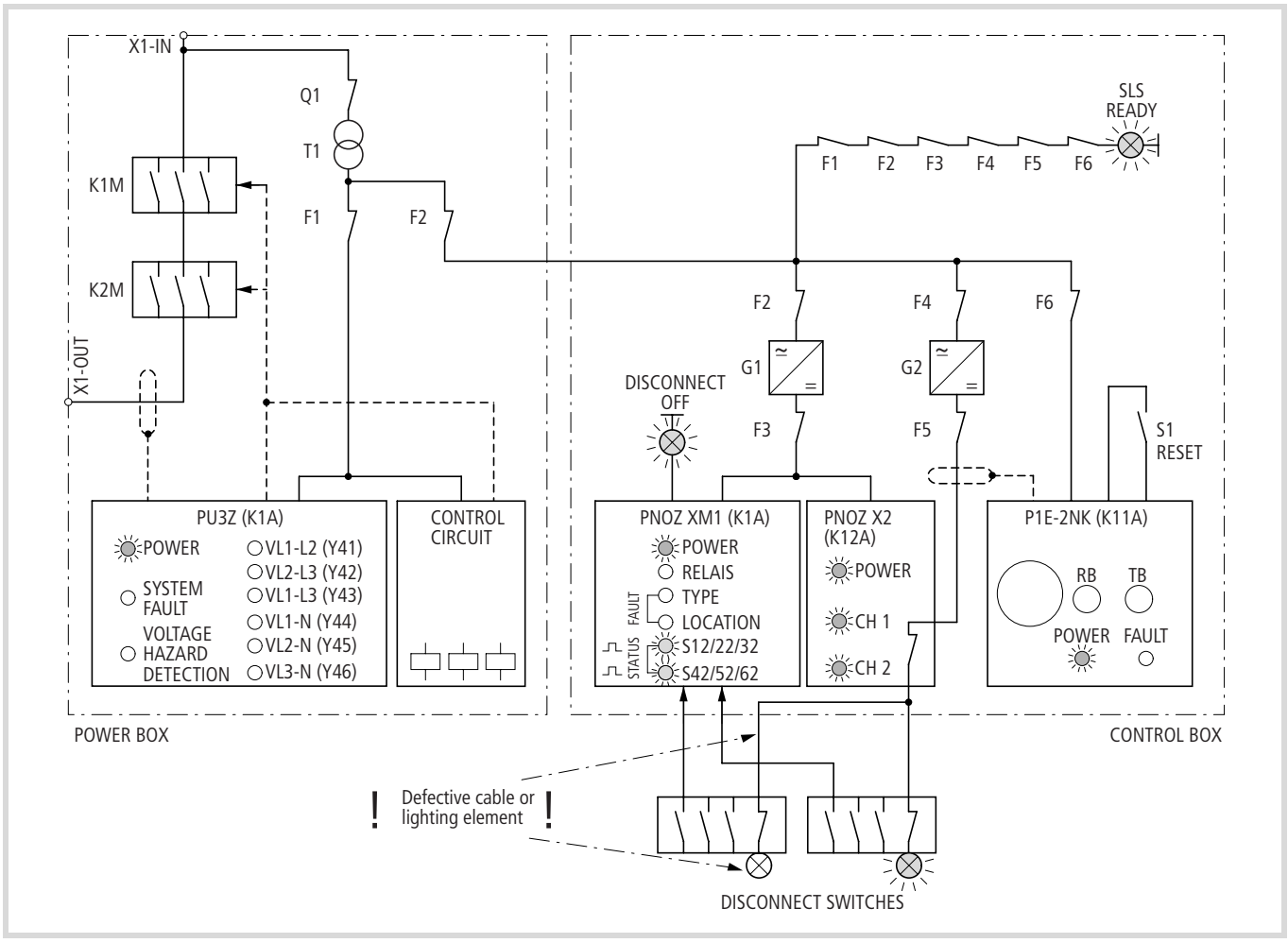


Figure 45: Fault on green lamp

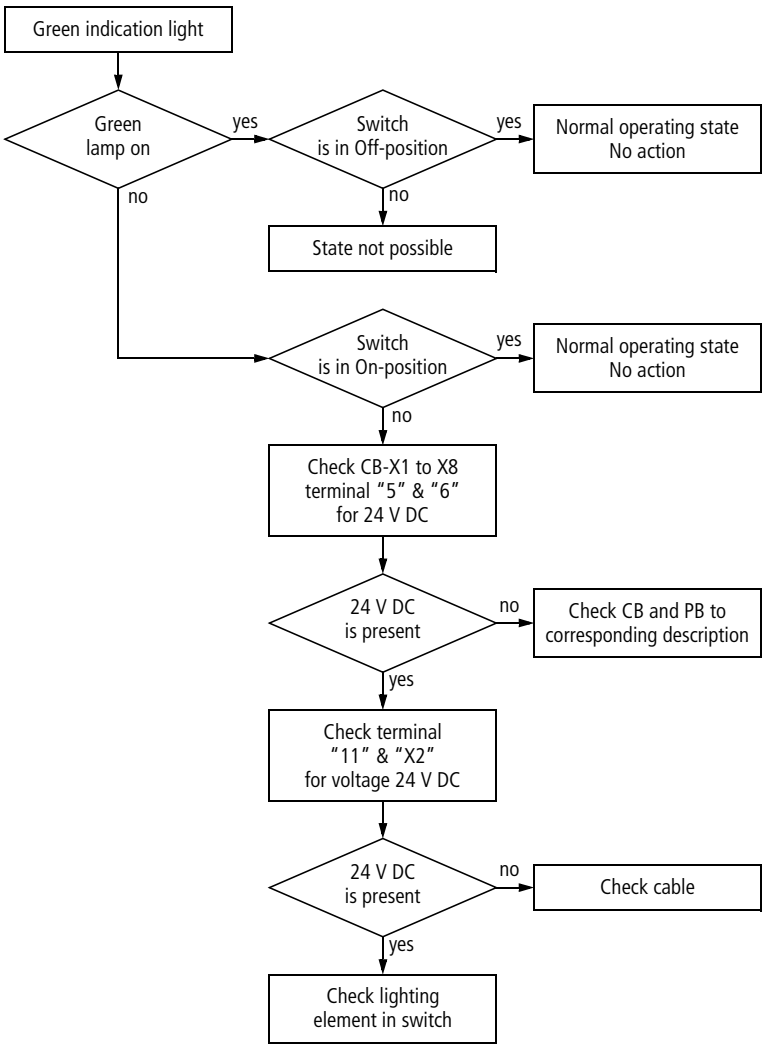


Figure 46: Fault on green lamp

6 General Information for the Replacement of Sealed Units

Each SLS module is sealed with Moeller seals, when it is delivered. The interfaces for customer connection as well as the enclosures of the disconnect switches are assembled in an unsealed unit. Moeller recommends, that authorized persons should seal all enclosures after installation and start-up of the SLS. This ensures the integrity of the total SLS.

The following interfaces are however accessible to the customer and not sealed by Moeller:

- Main power terminals of PB
- Interconnection connectors between PB and CB (X01, X02)
- Input connectors of CB (X1 to X8)
- PLC-Interface terminals of PB and CB (X03)

Warning!
Do not open the sealed units of the SLS-modules. Opening and working on any of the sealed devices will free Moeller from any accident liability or warranty claims.

After delivery, a visual inspection of the modules for external damage has to be carried out by the customer. Moeller must be informed immediately if visible damage to enclosure, devices, housings or a damaged/broken seal is found. Moeller will exchange damaged modules as soon as possible. Only modules in perfect condition may be installed and used in an SLS.

Please do not open the sealed units for the SLS-modules, because Moeller cannot provide a guarantee or warranty once these modules have been opened.

If the system develops a fault in a module, Moeller cannot provide a warranty for this module if the seals have been broken. The warranty expires at the end of the warranty period, or immediately if the seals are broken by unauthorized personnel.

The disconnect switches should be sealed by persons authorized by the customer as soon as the cables have been connected.

Module types in CI-enclosure or sheet steel enclosures

If the SLS-Unit malfunctions, the entire faulty module must be replaced as follows:

- Turn off and padlock the mains supply switch to the SLS System.
- Open the seals only on the customer connection enclosures and disconnect the power cables (PB only) and all control cable connectors (X01, X02, X1 to X16 and X03).
- Remove the defective SLS-module and exchange it with an SLS-module of the same type.
- Reconnect all power and control cables to the correct terminals.
- During the warranty period, send faulty SLS-modules to Moeller, where they will be tested and repaired. They will be returned free of charge. The repair will be subject to a charge after the warranty period or if the seal is broken.

Module types as fully withdrawable units of the MODAN6000MCC

These SLS-modules (PB types only) are supplied integrated into an MCC-panel type MODAN6000, or separately as a spare part for this MCC-panel. In any case this unit is also sealed.

- If the SLS-module in a withdrawable unit is integrated in an MCC, the unit is sealed so that it cannot be removed from the MCC without breaking the wire seal.
- If the SLS-module in a withdrawable unit is supplied as a spare part, the packing is sealed in such a way that the unit cannot be taken out of the packing without breaking the wire seal.

Faulty SLS-modules in withdrawable units may only be exchanged by authorized persons. The exchange procedure is described in the following steps:

- Turn off the mains supply switch of the SLS system. It can be integrated directly into the same withdrawable unit or next to the PB in a second unit.
- The seal wire has to be broken and the faulty SLS-module has to be withdrawn from the MCC-panel.
- The spare part module received has to be checked for shipping damage. If the packing is not damaged, the seal-wire of the packing can be broken and the spare part module can be unpacked.
- The spare unit can now be installed in the MCC-panel. Exchange the faulty SLS-module only with the same SLS-module type or better.
- After the SLS is operational with this exchanged unit, the new SLS-module has to be sealed with two seal wires in the installed position by an authorized person.
- A protocol with the following data is required for:
  – internal documentation on-site
  – documentation which is to be sent to Moeller during the warranty period.

  The following details are required:
  – Name of project
  – Factory number of unit(s)
  – Module type of faulty SLS-module
  – Module type of exchanged spare part unit
  – Date
  – Signature of maintenance personnel on-site.
- During the warranty period, please return the faulty SLS-unit packed in the packing of the spare part unit to Moeller, where it will be repaired and tested. It will then be returned after repair. Repairs after the warranty period has expired and/or the seals have been broken, will be subject to a charge.
- If support is required, please contact your local Moeller representative.

Appendix

Technical Data

SLS, Cables/Interconnection

General	
Standards and regulations considered for the SLS design with CI enclosure	IEC/EN 60204-1 IEC/EN 60439-1 EN 954-1 EN 1037 UL 508A 73/23/EC Low Voltage Directive 89/336/EC EMC Directive 98/37/EC Machinery Directive
Electrical Characteristics	
Grid type	TN-S-Network
Rated operation voltage	400 V, 3-ph or 480 V, 3-ph[1)]
Voltage fluctuations	+/– 10 %
Frequency	50/60 Hz
Current I_c	→ Power Box specification
Motor rating for SLS	
in CI enclosure	5.5 to 75 kW, AC3, 380/440 V 7.5 to 100 HP; 480 V
in sheet steel enclosure	75 to 250 kW, AC3, 380/440 V 100 to 300 HP; 480 V
Mechanical Characteristics	
Expected life of the SLS	10^6 cycles (ON-OFF)
Cables/Interconnections	
	All connections between Power-, Control- and Marshalling Box should be made with min. 1.5 mm^2 (AWG 16) wires, max. 2.5 mm^2 (AWG 13) wires possible.
	The connections to the Disconnect Switches have to be made with 0.75 mm^2 (AWG 18) to max. 1.5 mm^2 (AWG 14) wires.
	Shielded cables are not necessary for the correct operation of the Safety Lockout System.

1) Control Voltage 400 or 480 V has to be chosen via link on terminal block X_T.

SLS in Totally Insulated CI Enclosure

General	
Standards	IEC/EN 60204-1 IEC/EN 60439-1 UL 508A 73/23/EC Low Voltage Directive
Climatic test	Damp heat, constant, to IEC 60068 Part 2 – 3. Damp heat, cyclic, to IEC 60068 Part 2 – 30.
Chemical environment	According to paragraph 6.1.2. of the IEC/EN 60439-1 standard.
EMC	According to EN 50081-2 and EN 55011. Interference class "A".
Ambient temperature min./max.	According to IEC/EN 60439-1 standard.
	Average over a period of 24 h +35 °C Maximum: +40 °C Minimum: –5 °C
Altitude	Max. 2000 m above sea level
Relative humidity	According to paragraph 6.1.2.1. of the IEC/EN 60439-1 standard.
Installation conditions	Indoor installation acc. IEC 60439-1. Protected outdoor installation acc. IEC 60364.
Degree of protection	IP55 to IEC 60529
Clearances and creepage distances	IEC 60664
Overvoltage category	III
Pollution degree	3
Material	Thermoplastic
Base	Glass-fibre reinforced polycarbonate
Cover	Polycarbonate not reinforced
Flammability characteristics	
Glow wire test to IEC 60695-1-2A	960 °C
UL: Base	UL 94 V1
Cover	UK 94 V2
Halogen free	Yes (enclosure base and cover)

SLS in Sheet Steel Enclosure

General	
Standards	IEC 60439-1 UL 508A DIN VDE 0660 Part 500/1994
Climatic test	Damp heat, constant, to IEC 60068 Part 2 – 3. Damp heat, cyclic, to IEC 60068 Part 2 – 30.
Ambient temperature min./max.	According to IEC/EN 60439-1 standard.
	Average over a period of 24 h +35 °C Maximum: +40 °C Minimum: –5 °C
Degree of protection	IP54 to IEC 60529
Installation conditions	Indoor installation to IEC 60439-1.
Internal arc test	To ZVEI Guidelines to testing performance in the event of internal faults in low-voltage switchgear and control-gear assemblies up to 65 kA_{rms}, 0.1 s.
Vibration test	Germanischer Lloyd, Characteristic 1
Transportation simulation test	IEC 60068 Part 2 – 6
Material/steel thickness	Sheet steel: 1.5 mm cladding, 2 mm door
Surface treatment	Hot-galvanized or structured powder spray paint on epoxide polyester base.
Colour of painted surface	Pebble grey (RAL 7032) to DIN 43656/light texture, paint thickness ≧ 40 µm, Finish: gloss.
Resistance to chemicals/decontaminability	Resistance to paraffin and petrol, in accordance with MCW (maximum concentration at workplace), diluted acids 10 % in accordance with MCW/decontaminable.
Internal separation	Form 1 – 4 IEC 60439-1 (4b to draft IEC 17D [sec.] 142).
Dimensions	
Height	1800 mm[1)]
Width	400/600/800 mm[1)]
Depth	500 mm[1)]

1) Other dimensions on request.

SLS in Fully Withdrawable MODAN6000 Unit

In addition to "General" data of SLS System in sheet steel enclosure please find below the "Electrical Data" of Motor Control Centre MODAN6000. In this case the Power Box is built into a fully withdrawable unit of the Moeller system MODAN6000.

Electrical Data	
Rated insulation voltage U_i	1000 V AC/1200 V DC to DIN VDE 600 V DC to UL and BS
Insulation group	III/3 to DIN VDE 0110/1.89 BS 162 Table 4 and UL 508 Table 18.1
Rated operational voltage U_e	690 V to IEC 60038
Rated frequency	40 to 60 Hz
Motor rating for SLS System	5.5 to 200 kW, AC3, 380/440 V 7.5 to 250 HP; 480 V

MDM Motor Control Centre and Power Distribution Section

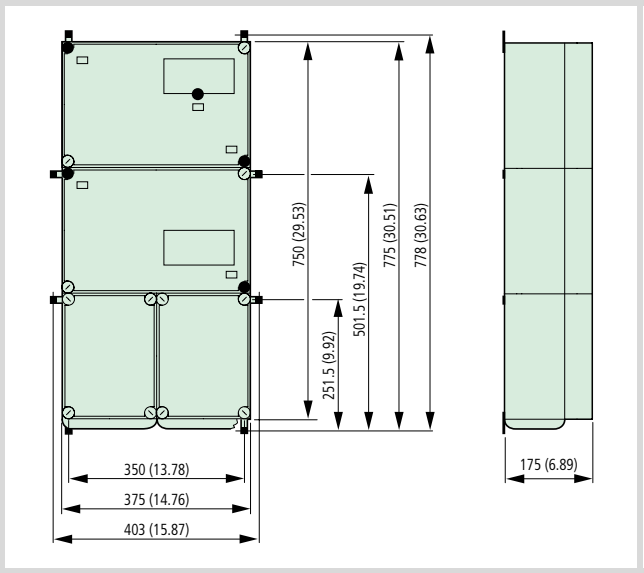
Technical data identical to those listed under "Electrical Data" MODAN6000; the following table shows only the discrepancies.

General	
Degree of protection	IP30 to IP32; IP40 to IP42, IP54
Dimensions	
Height	2200 mm
Width	1000/1200 mm
Depth	600/800/1000 mm
Electrical characteristics for standard installed equipment	
Rated currents	
Power outgoers I_e	Up to 630 A (IEC 439)
Motor starters 400 V, AC-23	
Direct-on-line starters	Up to 250 kW
Motor starters 480 V, in HP	Up to 300 HP
Electrical characteristics for distribution busbars	
Rated currents I_e	1 × 1000 A
Rated prospective short-circuit withstand current I_{sc}"	65 kA_{rms} 100 ms
Rated short-time withstand current I_{cw}	65 kA 1 s
Rated peak withstand current I_{pk}	143 kA

Dimensions

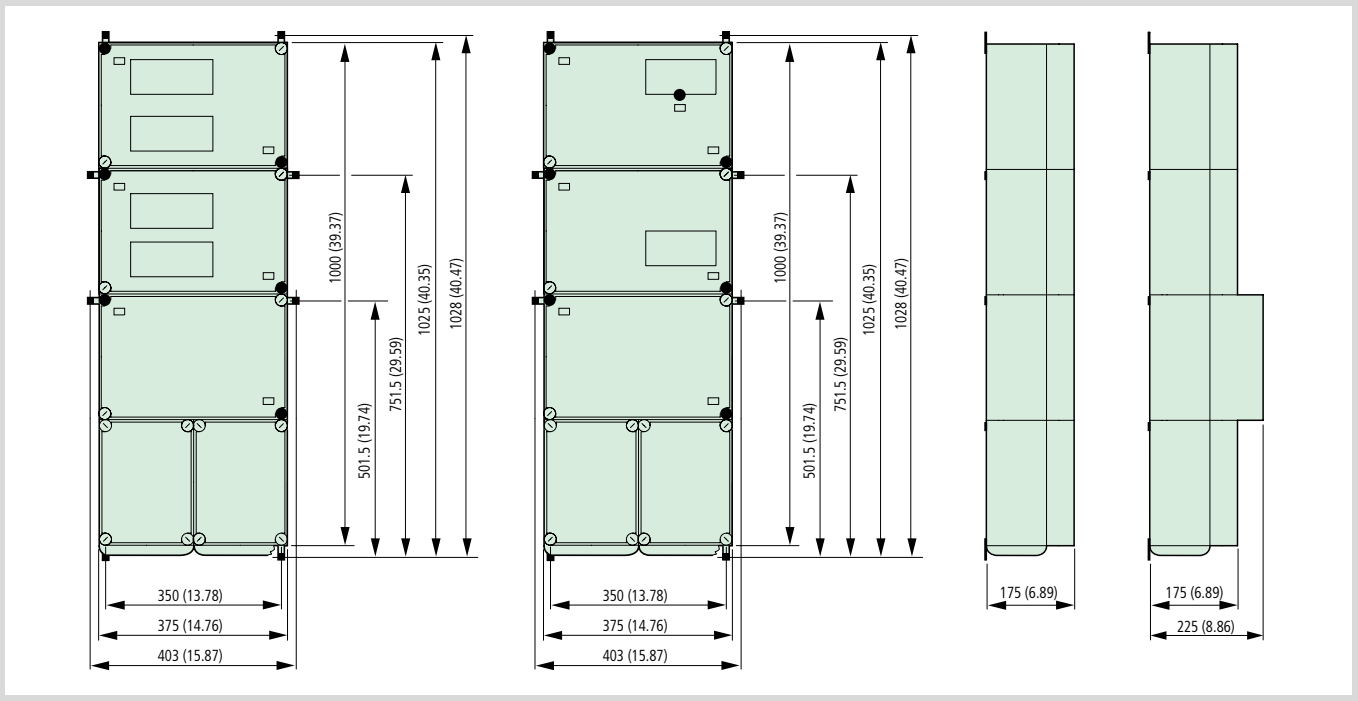
Power Box, Power/Control Box

Power Box
#SLSPB6C3CCP2, 5.5 kW
#SLSPB6C3CDP2, 7.5 kW

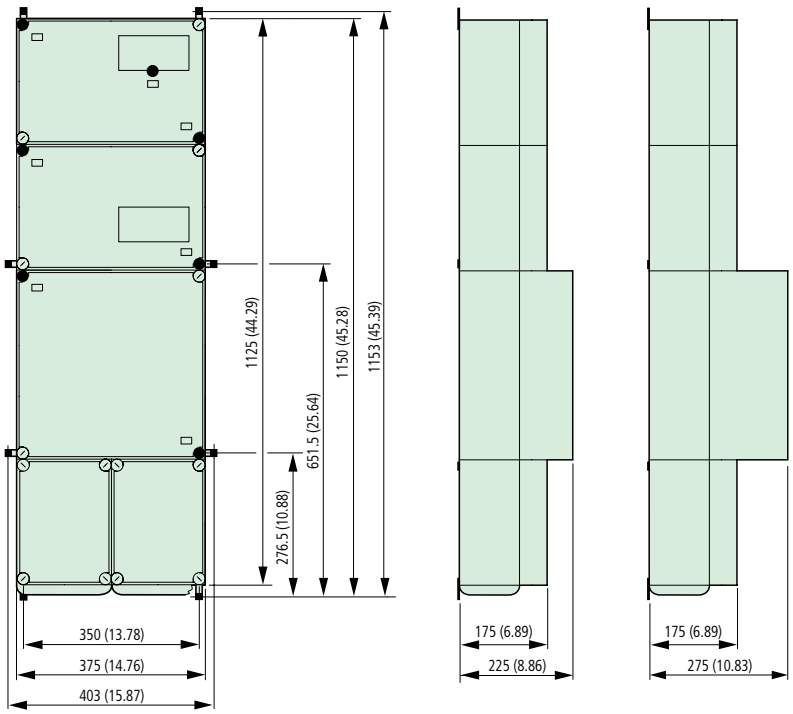


Power & Control Box
#SLSPC6C3CCP2, 5.5 kW

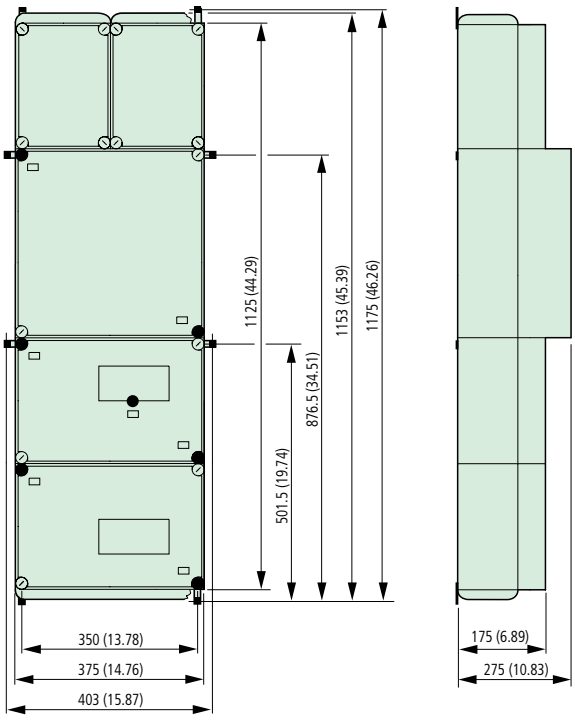
Power Box
#SLSPB6C3CEP2, 11 kW
#SLSPB6C3CFP2, 15 kW
#SLSPB6C3CGP2, 18.5 kW
#SLSPB6C3CHP2, 22 kW
#SLSPB6C3CJP2, 30 kW
#SLSPB6C3CKP2, 37 kW
#SLSPB6C3CL2, 45 kW



Power Box
#SLSPB6C3CMP2, 55 kW
#SLSPB6C3CNP2, 75 kW

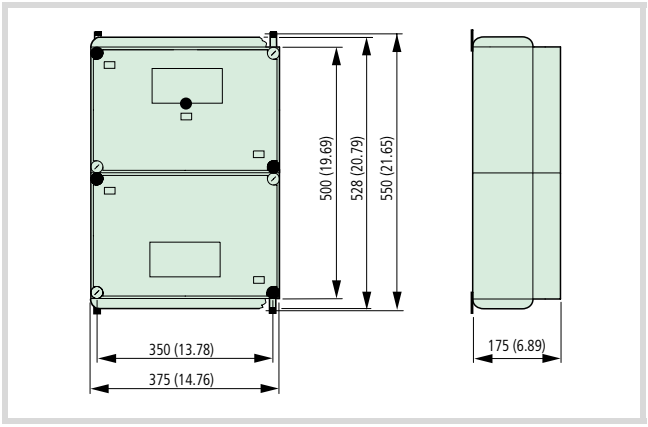


Power Box
#SLSPB6C3CNS1, 75 kW

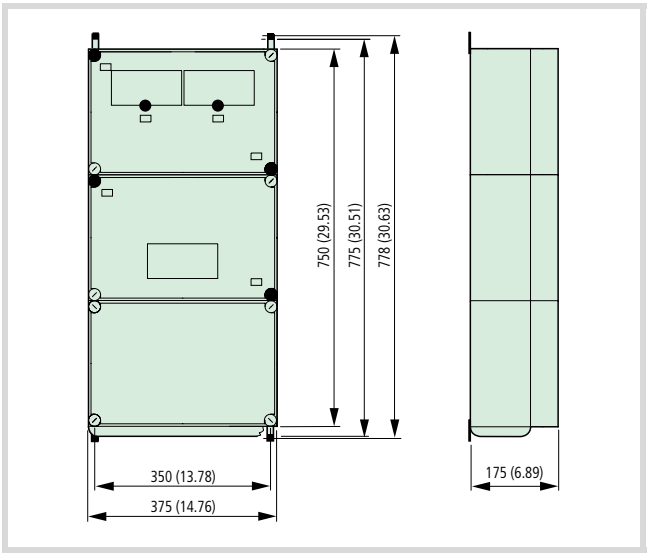


Control Box, Marshalling Box

Control Box I2
#SLSCB6C0SAP2

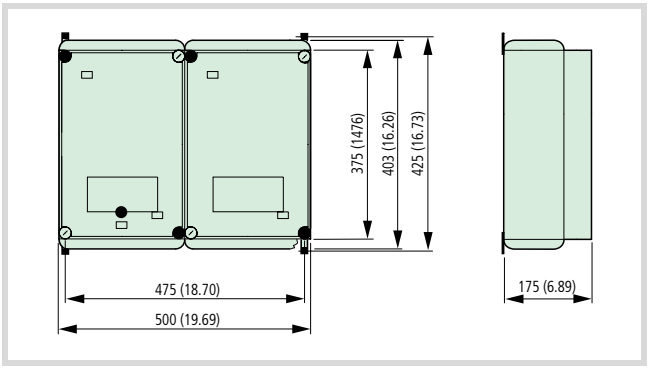


Control Box I8
#SLSCB6C0SDP2

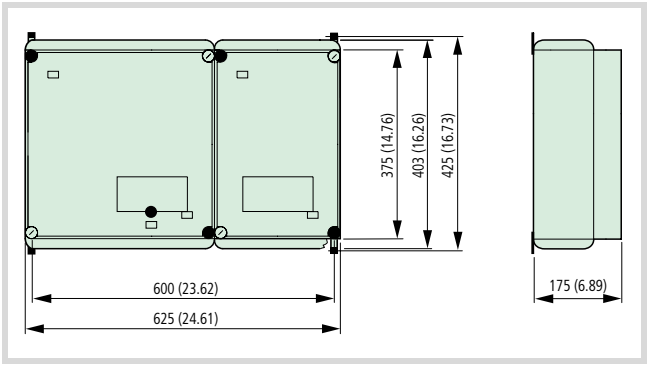


Control Box I2M-P1
#SLSCB6M0SAP1

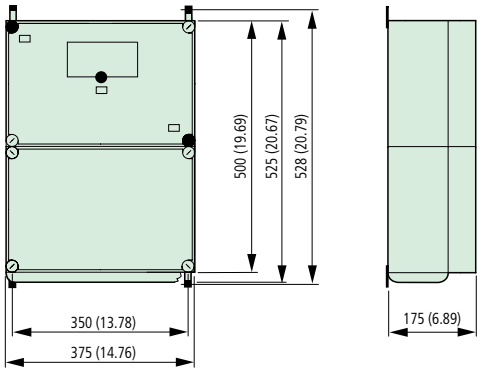
Control Box I2M-P2
#SLSCB6M0SAP2



Control Box I4M
#SLSCB6M0SBP2

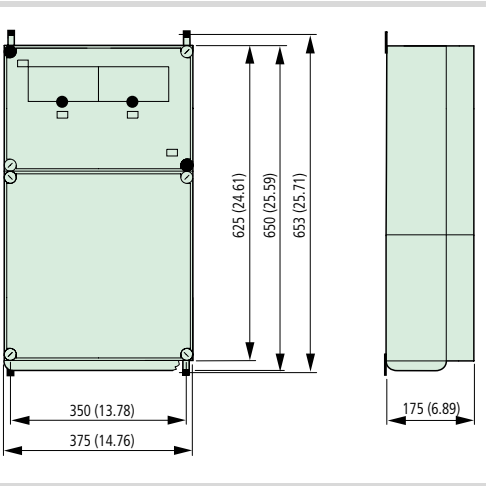


Marshalling Box I8
#SLSMB6C0SDP2



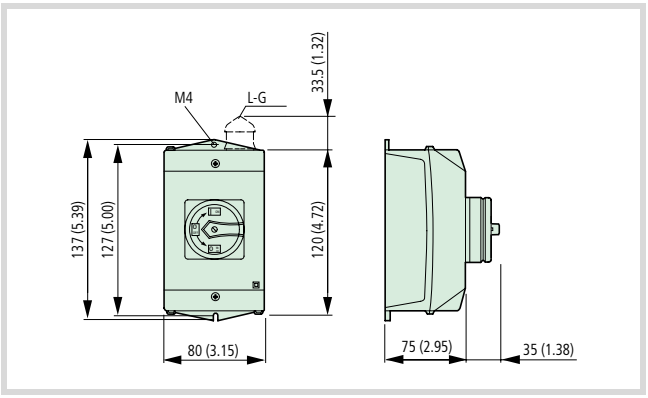
Marshalling Box I16
#SLSMB6C0SHP2

Marshalling Box I16M
#SLSMB6M0SHP2

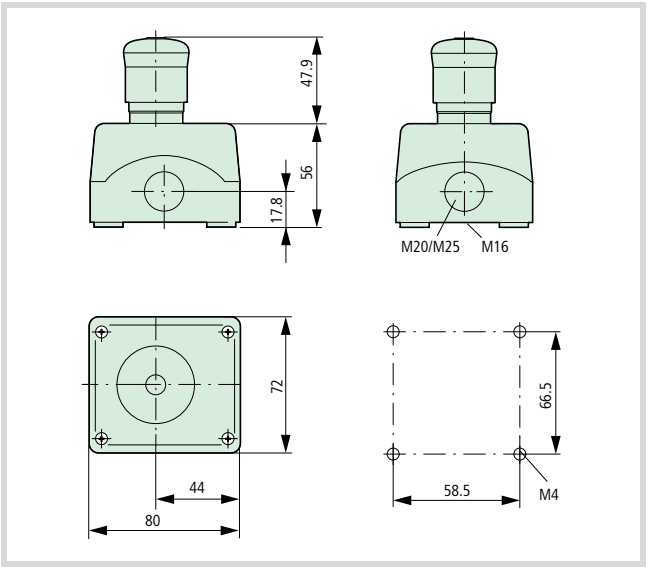


Disconnect Switch, Emergency-Stop Button

Disconnect Switch
#SLSDS00000P1
#SLSDS00001P2



Emergency-Stop Button, complete
for surface mounting
M22-PV/KC02/IY



Cable entries: 2 × M16, 3 × M20, 2 × M25

Declaration of Conformity

MOELLER

Erklärung der EG-Konformität
Declaration of EC-Conformity

Nr. A 003500
No.

für ein Sicherheitsbauteil zur Bestätigung der Übereinstimmung mit der Maschinenrichtlinie 98/37/EG und mit den zu ihrer Umsetzung erlassenen Rechtsvorschriften.
for a Safety Component, certifying compliance with the Machinery Directive 98/37/EC and associated regulations.

Das einzeln in Verkehr gebrachte Sicherheitsbauteil,
The Safety Component placed on the market individually,

Typbezeichnung: Type Reference	**Safety-Lockout-System (SLS)**
Anbieter: Supplier	**Moeller GmbH** **D- 53105 Bonn**
Beschreibung: Description	**Einrichtung zur Verhinderung des unerwarteten Anlaufs von Maschinen; das System erfüllt die Anforderungen der Kategorie 4 gemäß EN 954-1** Device for the prevention of unexpected start of machines; the system fulfills the requirements of category 4 to EN 954-1

auf das sich diese Erklärung bezieht, stimmt mit folgenden Normen oder normativen Dokumenten überein
to which this declaration relates is in conformity with the following standard(s) or normative document(s)

Norm, Dokument: Standard, Document	**EN 954-1; EN 1037** **IEC 60204-1; EN 60204-1** **IEC 60439-1 ; EN 60439-1 ; DIN VDE 0660 Teil 500** **IEC 60439-1/A11; EN 60439-1/A11; DIN VDE 0660 Teil500/A11** **EN 50081-2; EN 50082-2 und EN 55011 Grenzwertklasse A** **(CLass A limit)**

und entspricht den Bestimmungen der folgenden Richtlinie(n).
and complies with the provisions of the following directive(s).

Norm, Dokument: Standard, Document	**98/37/EG**	**Maschinenrichtlinie** Machinery Directive
	73/23/EWG	**Niederspannungsrichtlinie** Low-voltage Directive
	89/336/EWG	**EMV-Richtlinie** EMC Directive

Jahr der Anbringung der CE-Kennzeichnung[1]: 2000
Year of affixing CE-marking[1]

1) **nur für Niederspannungsrichtlinie**
for Low-voltage Directive only

Ausstellungsdatum
Date of Issue

08.02.2000

Moeller GmbH

i.V. Ender

(U. Ender)
Leiter Qualitätsmanagement
Director Quality Management

ma. Fenk

(A. Fenk)
Leiter Key Account Industrie
Manager Director Key Account Industry

Moeller GmbH, D-53105 Bonn

MOELLER

Anlage zur Erklärung der EG-Konformität

Nr. A 003500

Annexe to the Declaration of EC-Conformity

Diese Erklärung der EG-Konformität bezieht sich auf das Dokument Ref. :22816/500/H098 der notifizierenden Stelle **AIB-VINCOTTE Inter .**

This Declaration of EC-Conformity relates to the document Ref. :22816/500/H098 of the notification body **AIB-VINCOTTE Inter .**

Verantwortlich für die Ausführungsqualität ist die bauende Einheit.
The assembling unit is responsible for the product quality.

Ausstellungsdatum
Date of Issue

08.02.2000

Moeller GmbH

i.V. Ender

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Director Quality Management

ppa.

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