

SPRINT **ELECTRIC**



PL/X

Quick
Start
Guide

Kurz-
anleitung

Guía de
inicio
rápido

Guide de
démarrage
rapide

Guida
rapida



WORLD CLASS DESIGN

www.sprint-electric.com

ENGLISH	02
DEUTSCHE	15
ESPAÑOL	28
FRANÇAIS	41
ITALIANO	55

1 Introduction

This Quick Start Guide is intended as a supplement to the PL/X Product Manual, to allow you to quickly get your PL/X Drive up and running as a basic speed controller in a safe and efficient manner.

For any other application, please refer to the PL/X Product Manual.

2 Important safety notes

Drives and process control systems are a very important part of creating better quality and value in products, but they must be designed, installed and used with great care to ensure everyone's safety. Pay particular attention to all the safety warnings in this section.



Electric shock risk! Electrical devices constitute a safety hazard. It is the responsibility of the user to ensure compliance with any acts or bylaws in force.



Do not attempt to commission the PL/X unless you:

- are qualified, and have the knowledge and skills to use it safely.
- thoroughly understand the operation of the machine on which the PL/X is installed,
- have read and understood this document, and
- are familiar with electrical wiring and safety standards.



Only use qualified personnel to design, construct, operate and maintain your systems.



Make sure that all personnel who use or maintain the equipment are aware of all the hazards that are involved in your equipment and processes.

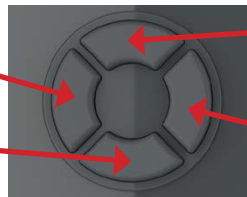


If you have any doubts about the safety of your system or process, do not proceed without first consulting an expert.

3 Navigating the menus

Left button - L

Down button - D



Up button - U

Right button - R

Figure 3-1: Navigation button

Use the buttons on the front of the PL/X to navigate through the setup menus. In this Quick Start Guide, the button sequences are listed next to the display that will be shown when the buttons are pressed correctly.

Button abbreviations:

- L** Press the **Left** button once
- U** Press the **Up** button once
- U/D** Press the **Up** button to increase the value.
Press the **Down** button to decrease the value.
- Nx** Press the relevant button N times. This applies to all buttons. N specifies the number of times to press the button e.g. for **5xL**, press the **Left** button 5 times.
- R** Press the **Right** button once
- D** Press the **Down** button once

3.1.1 Diagnostic Summary Screens

The Diagnostic Summary Screens are displayed at power up.

SPD%	Iarm	Ifld	RJSC		SRef	Ilim	-Ilim	Mode
0	0	0	0000		0	150	-150	STOP

Note: When the display is at the top level, it toggles between the Diagnostic Summaries approximately every 5 seconds.

Press the Left key at least 5 times (**5xL**) to return to these screens from any menu level.

3.1.2 Save parameters

To save the settings at any time, go first to the Diagnostic Screens (section 3.1.1), then press the **Right (R)** button, **Up (U)** button and **Right (R)** button to display the Parameter Save screen. This sequence is shown as **R-U-R**:

R-U-R

PARAMETER SAVE 2 UP KEY TO CONTINUE
--

Press the **Up (U)** button to continue.

When the save is finished, press the Left button twice (**2xL**).

4 Installation

4.1.2 Connect the drive

- Before starting to connect the drive, make sure that all power is OFF.
- Make sure that power and control wiring are routed in separate conduit / cable trays and that wiring meets all applicable national and local electrical regulations.
- Make sure that the voltages on the EL1/EL2/EL3 terminals are in-phase with the voltages on L1/L2/L3.
- For reliable operation, the PL/X must control the main contactor through its CON1 and CON2 terminals.
- Drive ratings of 185kW and higher (frame sizes 3, 4 & 5) require an external power connection for the heatsink cooling fan.

Use the following diagrams to connect your drive.

4.1.1 Frame 1

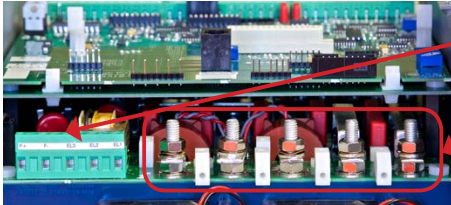


Figure 4-1: Top connections - Frame 1

Field (F+ and F-) and EL1, EL2, EL3 supply terminals

Busbar connections for input ac power (L1, L2, L3) and armature (A+ and A-)

Note: These terminals are common for all PL/X models.

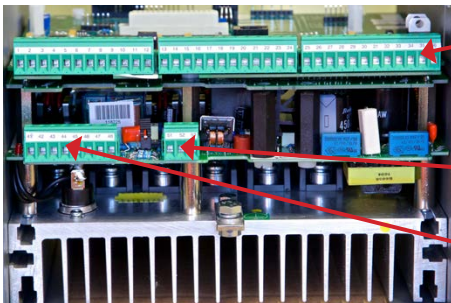


Figure 4-2: Bottom connections - Frame 1

Control terminals 1 - 36

Note: These terminals are common for all PL/X models.

Control power supply (L, N, E):
Terminals 51 (E), 52 (N) and 53 (L)

Terminals 41 - 48 for contactor control and remote armature sensing

4.1.2 Frame 2

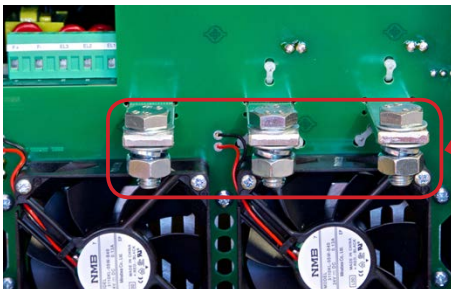
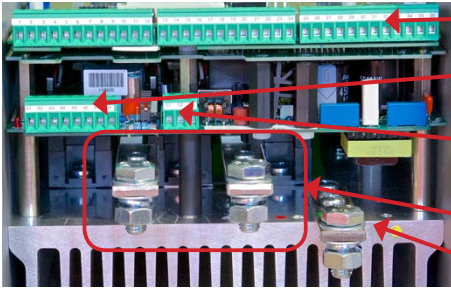


Figure 4-3: Top connections - Frame 2

Note: Field (F+ and F-) and EL1, EL2, EL3 supply terminals are as Frame 1

Input ac busbars (L1, L2, L3)

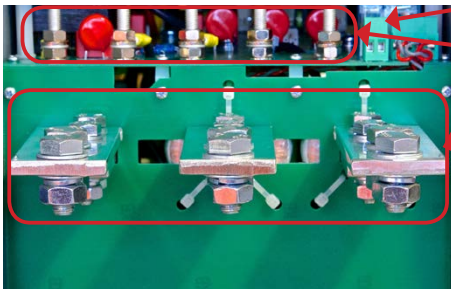
Note: The motor armature connections (A+, A-) are located at the bottom of the unit (Figure 4.4).



- Control terminals 1 - 36
- Terminals 41 - 48 for contactor control and remote armature sensing
- Control power supply (L, N, E): Terminals 51 (E), 52 (N) and 53 (L)
- Armature (A+ and A-) terminals
- Earth/Ground

Figure 4-4: Bottom connections - Frame 2

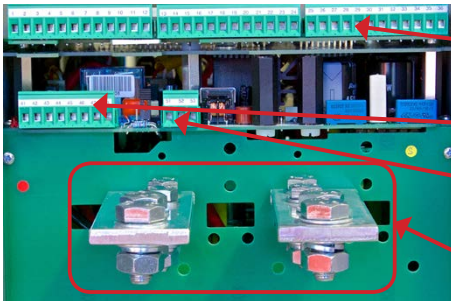
4.1.3 Frame 3



- 110Vac external fan supply (B1, B2)
- Field (F+ and F-) and EL1, EL2, EL3 supply terminals
- Input ac busbars (L1, L2, L3)

Note: The motor armature connections (A+, A-) are located at the bottom of the unit (Figure 4 6).

Figure 4-5: Top connections - Frame 3



- Control terminals 1 - 36
- Terminals 41 - 48 for contactor control and remote armature sensing
- Control power supply (L, N, E): Terminals 51 (E), 52 (N) and 53 (L)
- Armature (A+ and A-) terminals

Figure 4-6: Bottom connections - Frame 3

4.1.4 Frame 4

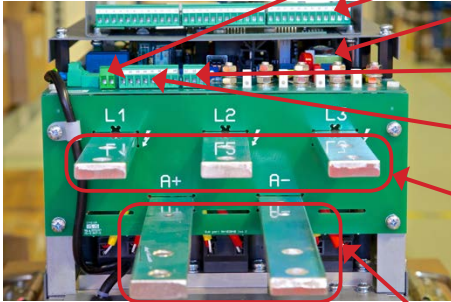


Figure 4-7:
Bottom connections - Frame 4

- 240Vac external fan supply (B1, B2)
- Control terminals 1 - 36
- EL1, EL2, EL3 and Field (F+ and F-) supply terminals
- Control power supply (L, N, E): terminals 51 (E), 52 (N) and 53 (L)
- Terminals 41 - 48 for contactor control and remote armature sensing
- Busbar connections for input ac power (L1, L2, L3)

Note: L1, L2, L3 can be located at either top or bottom of the unit, depending on your original purchase requirements.

Armature (A+ and A-) terminals

4.1.5 Frame 5

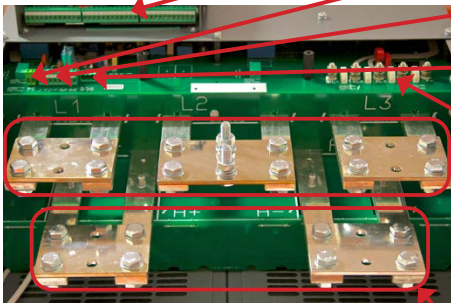


Figure 4-8:
Bottom connections - Frame 5

- Control terminals 1 - 36
- 240Vac external fan supply (B1, B2)
- Terminals 41 - 48 for contactor control and remote armature sensing
- Control power supply (L, N, E): terminals 51 (E), 52 (N) and 53 (L)
- EL1, EL2, EL3 and Field (F+ and F-) supply terminals
- Busbar connections for input ac power (L1, L2, L3)

Note: L1, L2, L3 can be located at either top or bottom of the unit, depending on your original purchase requirements.

Armature (A+ and A-) terminals

4.1.6 Wiring diagrams

Power

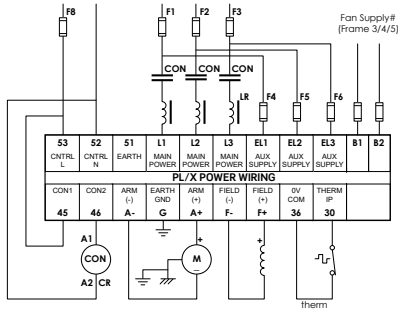


Figure 4-9: Power wiring diagram

Control

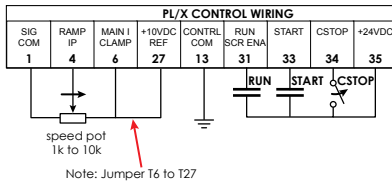


Figure 4-10: Control wiring diagram

Note: See Product Manual for fuse specifications.

The power input terminals are located at the top of the PL/X*, with the power output terminals at the bottom of the PL/X (except for Frame 1 model).

Note: If a thermistor is not fitted to the motor, short together terminals 30 and 36.

* Power input terminals located at top or bottom for frame 4 & 5.

Frame 3 models require a 110Vac fan supply. Frame 4 & 5 models require a 240Vac fan supply.

The control terminals are located at the bottom of the PL/X.

4.1.7 Control terminal functions

Note: All contacts are maintained type.

CSTOP Coast Stop

This must be closed before all other control signals for correct sequencing. When opened, the drive immediately stops generating armature current and the contactor drops out. The motor coasts to a stop.

RUN Run

Electronic inhibit for all operation modes. May be connected to terminal T35 with a jumper in most applications or preferably an auxiliary normally open contact on the main contactor. When closed, the drive may generate current. If open, no armature current will be generated.

START Start

When closed the drive's contactor comes in and the motor runs at potentiometer speed setting. When opened, the drive ramps to zero and the contactor opens after a delay (default 2 secs).

Note: As programmed from the factory, after removal of the START input, the motor field current is present until the field quench delay is completed (default 10 seconds).

4.1.8 Optional feedback devices

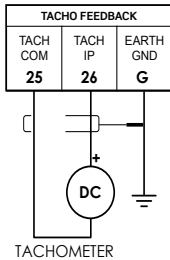


Figure 4-11: DC tachometer

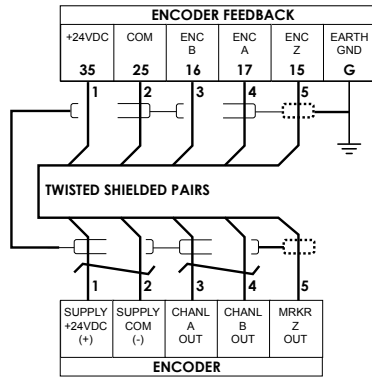


Figure 4-12: Encoder

4.2 Note the supply and motor data

Measure the supply voltage and enter it below.

Make a note of all the other parameters from the motor and feedback device nameplates.

Description	Typical value	Actual value	Units
Supply voltage	480		Vac
Armature volts	500		Vdc
Armature current	35		Adc
Base speed	1750		rpm
Maximum speed	2300		rpm
Field volts	300		Vdc
Field current @ BS	1.35		Adc
Field current @ MS	0.8		Adc
Feedback device:			
DC tachometer	60		V/1000
Encoder	1024		PPR
Encoder volts	5 – 24		Vdc

4.3 Final checks BEFORE applying power

- Recheck all wiring, especially the drive's chassis ground.
- Use a multimeter to check the L1, L2, L3, F+, F-, A+ and A- terminals for short circuits to ground. All readings should be greater than 1MΩ.

If any resistances are lower than 1MΩ, correct them before you apply power.

4.4 Final checks BEFORE applying power



It is essential that the following steps are performed as written and in the correct sequence.

Apply 110 - 240 Vac control power to terminal T53 (Line) and T52 (Neutral).

4.4.1 Calibrate the drive to the motor

Press the buttons in the specified sequence to set the values recorded in section 4.2:

Note: When U/D is shown, use the Up and Down buttons to change the values.

1.	Rated Armature Current	R-R-U-R-R-U/D	2) RATED ARM AMPS 35.0 AMPS
2.	Rated Field Current	L-D-D-R-U/D	4) RATED FIELD AMPS 1.35 AMPS
3.	Rated Base Speed	L-D-R-U/D	5) BASE RATED RPM 1750 RPM
4.	Required Maximum Speed	L-D-R-U/D	6) DESIRED MAX RPM 1750 RPM

Note: The base speed is the same as maximum speed unless field weakening is used to extend the speed range (section 4.11).



Always commission the drive with armature voltage as the speed feedback source even if the motor is fitted with a dc tacho or encoder as this allows the polarity of the feedback to be verified. This ensures that the motor will not run out of control

5.	Rated Armature Volts	L-9xD-R-U/D	18) RATED ARM VOLTS 500 VOLTS
6.	Supply Voltage	L-D-R-U/D	19) EL1/2/3 RATED AC 460.0 VOLTS

Check the following have not been modified from their factory default settings. If necessary correct the selections to those shown below:

7. Motor 1/2 Select

L-D-R-U/D

20) MOTOR 1/2 SELECT
MOTOR 1

8. Speed Feedback Type

L-8xU-R-U/D

Then **4xL**

9) SPEED FBK TYPE
ARMATURE VOLTS

4.4.2 Feedback calibration

If you do not have a DC tachometer or encoder, skip this section. Save the parameters (section 3.1.2).

1. DC tachometer

For a DC Tachometer, first calibrate the drive to the expected DC voltage for base speed

Base Tacho Voltage = (Base Speed/1000) x Tacho Volts per 1000 RPM



The tacho voltage must not exceed 200 Vdc

R-R-U-R-6xD-R-U/D

Then **4xL**

8) MAX TACHO VOLTS
87.50 VOLTS

2. Encoder
PPR

If the encoder is a quadrature type then enable parameter 10 as below. For a pulse and direction type encoder disable the parameter. In both cases set the number of lines.

Note: On PL models only, it is also possible to operate with a pulse-only encoder (no direction signal).

R-R-U-R-8xD-R-R-U/D

10) QUADRATURE ENABLE
ENABLED

L-D-R-U/D

Then **4xL**

11) ENCODER LINES
1024

Tastenkürzel:

- L** Einmal auf die **Links**-Taste drücken
- O** Einmal auf die **Nach-oben**-Taste drücken
- O/U** **Oben**-Taste drücken, um den Wert zu erhöhen.
Unten-Taste drücken, um den Wert zu verringern.
- Nx** Die entsprechende Taste N Mal drücken. Dies gilt für alle Tasten. N gibt an, wie oft die Taste gedrückt werden muss. Zum Beispiel drücken Sie bei **5xL** 5 Mal auf die **Links**-Taste.

3.1.1 Diagnoseberichte

Beim Einschalten wird auf dem Display eine Zusammenfassung der Diagnoseberichte angezeigt.

SPD%	Iarm	Ifld	RJSC	↔	SRef	Ilim	-Ilim	Mode
0	0	0	0000		0	150	-150	STOP

Hinweis: In der obersten Menüebene wechselt das Display ca. alle 5 Sekunden zwischen den verschiedenen Diagnoseberichten.

Drücken Sie mindestens 5 Mal auf die Links-Taste (**5xL**), um aus einer beliebigen Menüebene zu diesen Anzeigen zurückzukehren.

3.1.2 Parameter speichern

Die Einstellungen können jederzeit gespeichert werden. Dazu öffnen Sie die Diagnosebildschirme (Abschnitt 3.1.1) und drücken Sie auf die Tasten **Rechts (R)**, **Oben (O)** und **Rechts (R)**, um den Bildschirm „Parameter Save“ (Parameter speichern) zu öffnen. Diese Abfolge wird als **R-O-R** angegeben:

R-O-R

PARAMETER SAVE	2
UP KEY TO CONTINUE	

Drücken Sie zum Fortfahren die Taste **Oben (O)**.
Nach dem Speichern drücken Sie zwei Mal auf die Links-Taste (**2xL**).

4 Installation

4.1 Anschließen des Antriebs



Vor dem Anschließen des Antriebs muss die Stromversorgung vollständig ausgeschaltet sein.



Stellen Sie sicher, dass die Strom- und Steuerkabel in unterschiedlichen Kabelkanälen verlegt sind und dass die Verkabelung gemäß den geltenden nationalen und örtlichen elektrotechnischen Vorschriften ausgelegt ist.



Stellen Sie sicher, dass die Spannungen an den Anschlüssen EL1/EL2/EL3 phasengleich zu den Spannungen auf L1/L2/L3 sind.



Damit ein zuverlässiger Betrieb sichergestellt ist, muss der PL/X den Hauptschutz über die Anschlüsse CON1 und CON2 ansteuern.



Antriebe ab 185kW (Baugrößen 3, 4 und 5) benötigen eine separate Spannungsversorgung für den Lüfter

Schließen Sie den Antrieb gemäß den folgenden Diagrammen an.

4.1.1 Rahmen 1

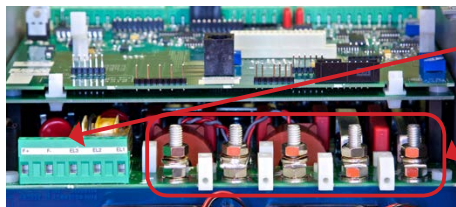


Abbildung 4-1: Obere Anschlüsse - Rahmen 1

Anschlussklemmen Feld (F+ und F-) und EL1, EL2, EL3

Sammelschienenanschlüsse für AC-Netzeingänge (L1, L2, L3) und Anker (A+ und A-)

Hinweis: Diese Anschlüsse sind bei allen PL/X-Modellen gleich.

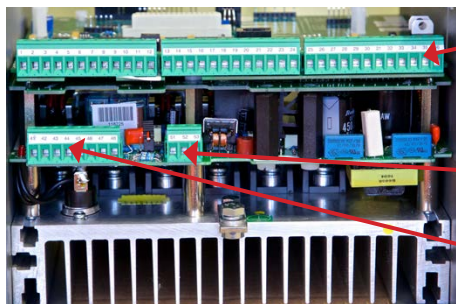


Abbildung 4-2: Untere Anschlüsse - Rahmen 1

Steueranschlüsse 1-36

Hinweis: Diese Anschlüsse sind bei allen PL/X-Modellen gleich.

Stromversorgung Steuerung (L, N, E):
Anschlüsse 51 (E), 52 (N) und 53 (L)

Anschlüsse 41-48 für Schützsteuerung
und Remote-Abstastung Anker

4.1.2 Rahmen 2

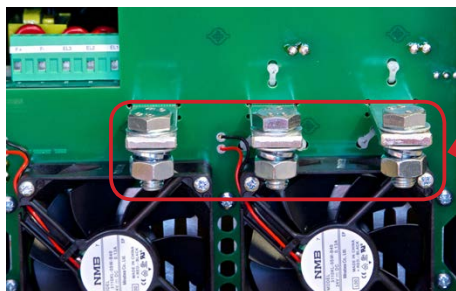
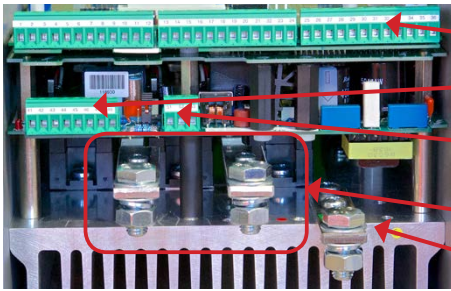


Abbildung 4-3: Obere Anschlüsse - Rahmen 2

Hinweis: Anschlussklemmen Feld (F+ und F-) und EL1, EL2, EL3 wie bei Rahmen 1

Sammelschiene Wechselstromeingang (L1, L2, L3)

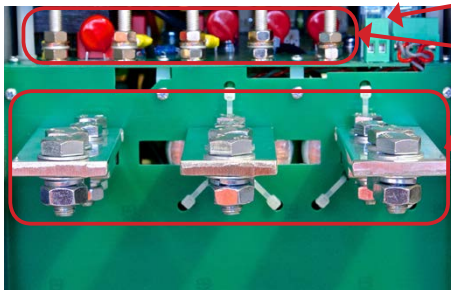
Hinweis: Die Motorankeranschlüsse (A+, A-) befinden sich an der Geräteunterseite (Abbildung 4-4).



- Steueranschlüsse 1-36
- Anschlüsse 41-48 für Schützsteuerung und Remote-Abtastung Anker
- Stromversorgung Steuerung (L, N, E):
Anschlüsse 51 (E), 52 (N) und 53 (L)
- Anschlüsse Anker (A+ und A-)
- Erdung/Masse

Abbildung 4-4: Untere Anschlüsse - Rahmen 2

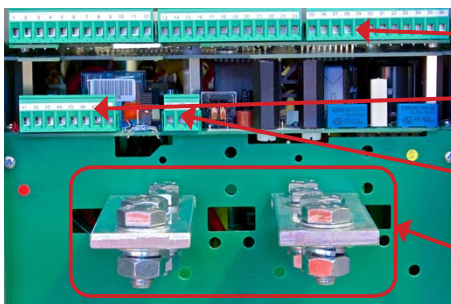
4.1.3 Rahmen 3



- 110Vac Lüfterversorgung (B1, B2)
- Anschlussklemmen Feld (F+ und F-) und
EL1, EL2, EL3
- Sammelschiene Wechselstromeingang
(L1, L2, L3)

Hinweis: Die Motorankeranschlüsse (A+, A-) befinden sich an der Geräteunterseite (Abbildung 4-6).

Abbildung 4-5: Obere Anschlüsse - Rahmen 3



- Steueranschlüsse 1-36
- Anschlüsse 41-48 für Schützsteuerung und Remote-Abtastung Anker
- Stromversorgung Steuerung (L, N, E):
Anschlüsse 51 (E), 52 (N) und 53 (L)
- Anschlüsse Anker (A+ und A-)

Abbildung 4-6: Untere Anschlüsse - Rahmen 3

4.1.4 Rahmen 4

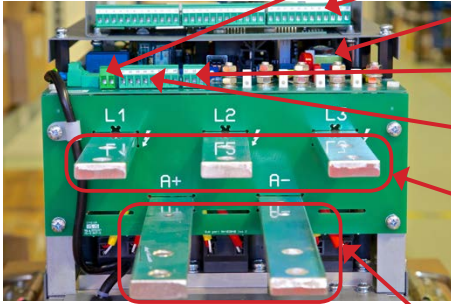


Abbildung 4-7:
Untere Anschlüsse - Rahmen 4

240Vac Lüfterversorgung (B1, B2)

Steueranschlüsse 1-36

Anschlussklemmen EL1, EL2, EL3 und Feld (F+ und F-)

Stromversorgung Steuerung (L, N, E):
Anschlüsse 51 (E), 52 (N) und 53 (L)

Anschlüsse 41-48 für Schützsteuerung
und Remote-Abtastung Anker

Sammelschienenanschlüsse für AC-
Netzeingänge (L1, L2, L3)

*Hinweis: L1, L2 und L3 können je nach
Ihren Anforderungen entweder
oben oder unten am Gerät
angeordnet sein.*

Anschlüsse Anker (A+ und A-)

4.1.5 Rahmen 5

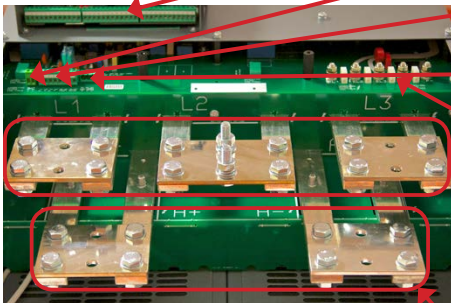


Abbildung 4-8:
Untere Anschlüsse - Rahmen 5

Steueranschlüsse 1-36

240Vac Lüfterversorgung (B1, B2)

Anschlüsse 41-48 für Schützsteuerung
und Remote-Abtastung Anker

Stromversorgung Steuerung (L, N, E):
Anschlüsse 51 (E), 52 (N) und 53 (L)

Anschlussklemmen EL1, EL2, EL3 und
Feld (F+ und F-)

Sammelschienenanschlüsse für AC-
Netzeingänge (L1, L2, L3)

*Hinweis: L1, L2 und L3 können je nach
Ihren Anforderungen entweder
oben oder unten am Gerät
angeordnet sein.*

Anschlüsse Anker (A+ und A-)

DE