Compact manual

Language	**English**
	Translation
Document No.	5.06014.02
Part No.	397361
Status	24.05.2011

be in motion be in motion

BAUMÜLLER

b maXX®

BM4400,

BM4600,

BM4700

POWER CONVERSION EQUIPMENT

LISTED
38WA

E	5.06014.02

Read the manual before starting any work!

Title	Compact manual
Product	**b maXX® BM4400, BM4600, BM4700**
Version	5.06014.02
Article number	397361
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INTRODUCTION

This short instruction serves as an assistance for the mounting of the devices of the series **b maXX® BM4400, BM4600, BM4700** with the type designation BM44XX - XXX - XX2XX[Ryy] in a switching cabinet.

Please, take all information for system configuration with **b maXX® BM4400, BM4600, BM4700** from the manual **b maXX® BM4400, BM4600, BM4700**.

This short instruction does not replace the safety instruction nor the manual, but it rather requires knowledge of the safety instruction (document no. 5.04021) and of the manual **b maXX® BM4400, BM4600, BM4700** (document no. 5.04043) from the user.

In the packing the Safety Instructions are enclosed. The manual is to be found on the enclosed documentation DVD in the packing.

Documents also can be found in the internet under www.baumueller.de in the area Downloads.

1.1 Copyright and trade mark

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1.1 Copyright and trade mark

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FUNDAMENTAL SAFETY INSTRUCTIONS

2.1 Legal information

This manual is addressed to technical qualified personnel, who is specifically skilled and who is thoroughly familiar with all warnings and maintenance procedures.

The user is responsible for the execution of service and commissioning according to the safety notes of the prevailing standards and other relevant national and local instructions concerning conductor dimensioning and protection, grounding, disconnector, overcurrent protection and so on.

For damages, which result from the mounting or from the connection, the one is liable, who has carried out the mounting or the installation.

WARNING

The following **may occur**, if you disregard these safety notes:

- serious personal injury
- death

All persons, who work with this device, must know and regard the safety notes and the safety instructions in this manual.

Apart from this, any and all persons who work on this device must additionally know and regard to all regulations and instructions, that are valid at the location.

WARNING

The following **may occur**, if you disregard these safety notes:

- serious personal injury • death

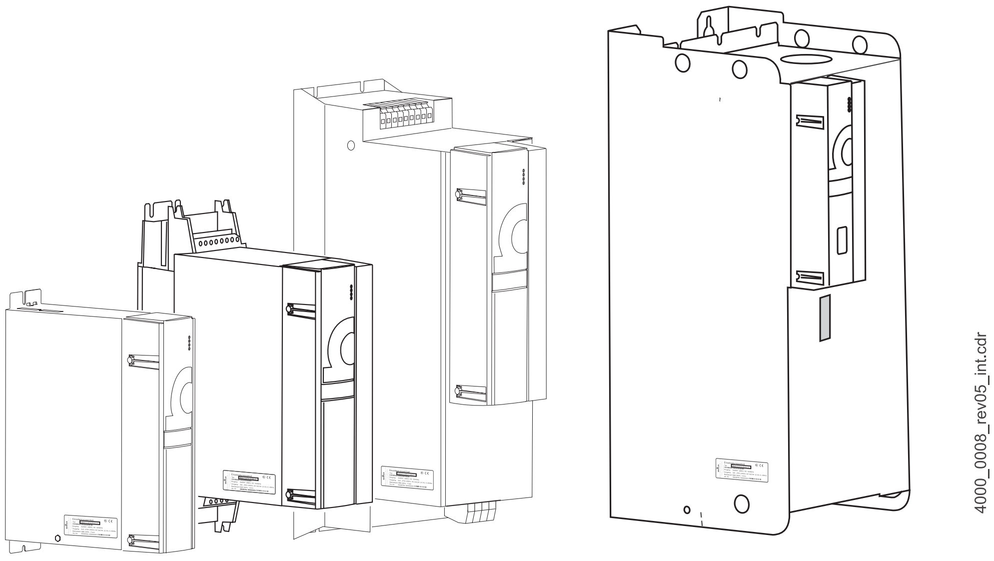
The danger is: ***electricity.***

Knowledge of manual and of safety instructions.

Description of the Devices

3.1 Marking of the device - type key

On the type plate (label) you will find, besides others, the type key of the device.



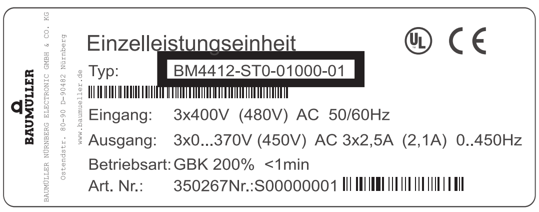


Figure 1: Position of type key label

The type key has the form: BM4XXX - XXX - XXXXX[Ryy] - XX. Directly behind the type key is the design code (-XXXX - X - XXX - XXX). The design code contains information, which only is important to Baumüller Nürnberg GmbH.

That's why in the following table only the type key is explained.

BM4XXX - XXX - XXXXX[Ryy] - [XXX] - XX **Device generation**

BM4XXX - XXX - XXXXX[Ryy] - [XXX] - XX **Type**

4: Vector controller with and without encoder feedback (closed loop / open loop)
5: for M-controller oder V-controller developed devices,
see manual 5.05022
6: Vector controller like 4, but optimzed for max. peak current
7: Vector controller like 4, but optimzed for max. nominal current

BM4XXX - XXX - XXXXX[Ryy] - [XXX] - XX **Size of cabinet**

1 to 7 (from cabinet size 1 there are two different wide versions)

BM4XXX - XXX - XXXXX[Ryy] - [XXX] - XX **Current grading (output rated current)**

0 to 6 (current value is dependent on the cabinet size), see appendix D

BM4XXX - XXX - XXXXX[Ryy] - [XXX] - XX **Cooling type**

S: air-cooled with air supply and with air outlet in the control cabinet
A: air-cooled with air supply and with air outlet outside the control cabinet
Z: water-cooled with water cooler in the control cabinet
F: water-cooled with water cooler outside the control cabinet
C: (cold plate) cooling via mounting wall of the control cabinet

BM4XXX - XXX - XXXXX[Ryy] - [XXX] - XX **Mains type**

T: TN- or TT-mains
I: IT-mains and 'grounded delta'

BM4XXX - XXX - XXXXX[Ryy] - [XXX] - XX **Safety relay**

0: no module
1: Module with one relay and high power current contacts
2: Module with two relays and high power current contacts
3: Module with one relay and low current contacts
4: Module with two relays and low current contacts
5: Module with one relay and all current contacts
6: Module with two relays and all current contacts

BM4XXX - XXX - XXXXX[Ryy] - [XXX] - XX **Hardware type/power unit type**

0: Rectifier and inverter with chopper resistor transistor U_{DC} = 540 V
1: Rectifier and inverter with chopper resistor transistor
U_{Mains} =230 V ± 10 %, U_{DC} =310 V
2: Power module (only output sided inverter). Operation as power module,
U_{DC} = 540 V
3: Rectifier and inverter with chopper resistor transistor U_{DC} = 540 V
short packaging for BM465X, BM466X, BM475X und BM476X

BM4XXX - XXX - XXXXX[Ryy] - [XXX] - XX **Hardware type/controller unit versions**

1: Module in slots A to H pluggable
2: Modules in slots A to M pluggable

BM4XXX - XXX - XXXXX[Ryy] - [XXX] - XX **Hardware type (internal information via Baumüller Nürnberg GmbH.**

0XX: Controller without 7-segment display (RS 485 interface)
1XX: Controller without 7-segment display (RS 485 interface)
2XX :Controller with 7-segment display (RS 485 interface)
3XX :Controller with 7-segment display (Ethernet interface))

BM4XXX - XXX - XXXXX[Ryy] - XX Optional chopper resistor

R16: Chopper resistor with 16 Ω
R10: Chopper resistor with 10 Ω
R05: Chopper resistor with 5 Ω
R03: Chopper resistor with 3 Ω

BM4XXX - XXX - XXXXX[Ryy] - XX State of software controller (firmware)

01: Series version 1.x
03: Series version 3.x

NOTE

This type key is only for the basic device without the plug-in modules. Every plug-in module (except the controller) has its own type key.

4

MOUNTING

The installation instructions, dimensions and drilling plans of the individual device versions for the configuration are to be taken from the manual.

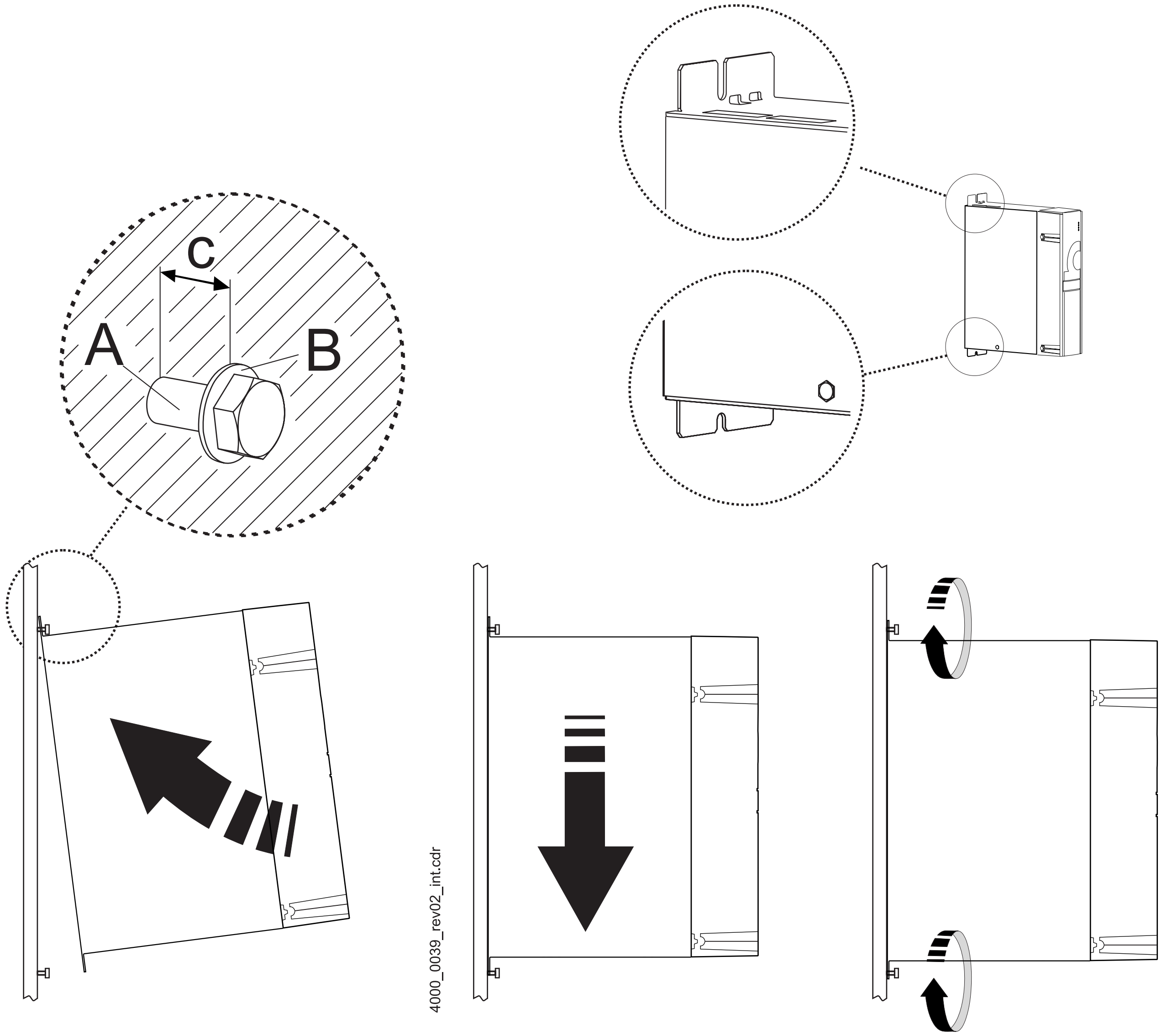


Figure 2: Mounting instruction BM441X, BM442X-S, BM443X-S/Z, BM463X-S/Z, BM444X-S/Z, BM464X-S/Z

Device	**BM441X-XXX -XO -X1**	**BM441X-XXX -X2**	**BM442X-S**	**BM443X-S/Z BM463X-S/Z**	**BM444X-S/Z BM464X-S/Z**
A - screws	2 x M5	4 x M5	4 x M5	4 x M5	4 x M5
B - washers	2 x (5.3 x 10)	4 x (5.3 x 10)	4 x (5.3 x 10)	4 x (5.3 x 10)	4 x (5.3 x 15)
C - mount spacing	c = 5 mm	c = 5 mm	c = 5 mm	c = 5 mm	c = 5 mm

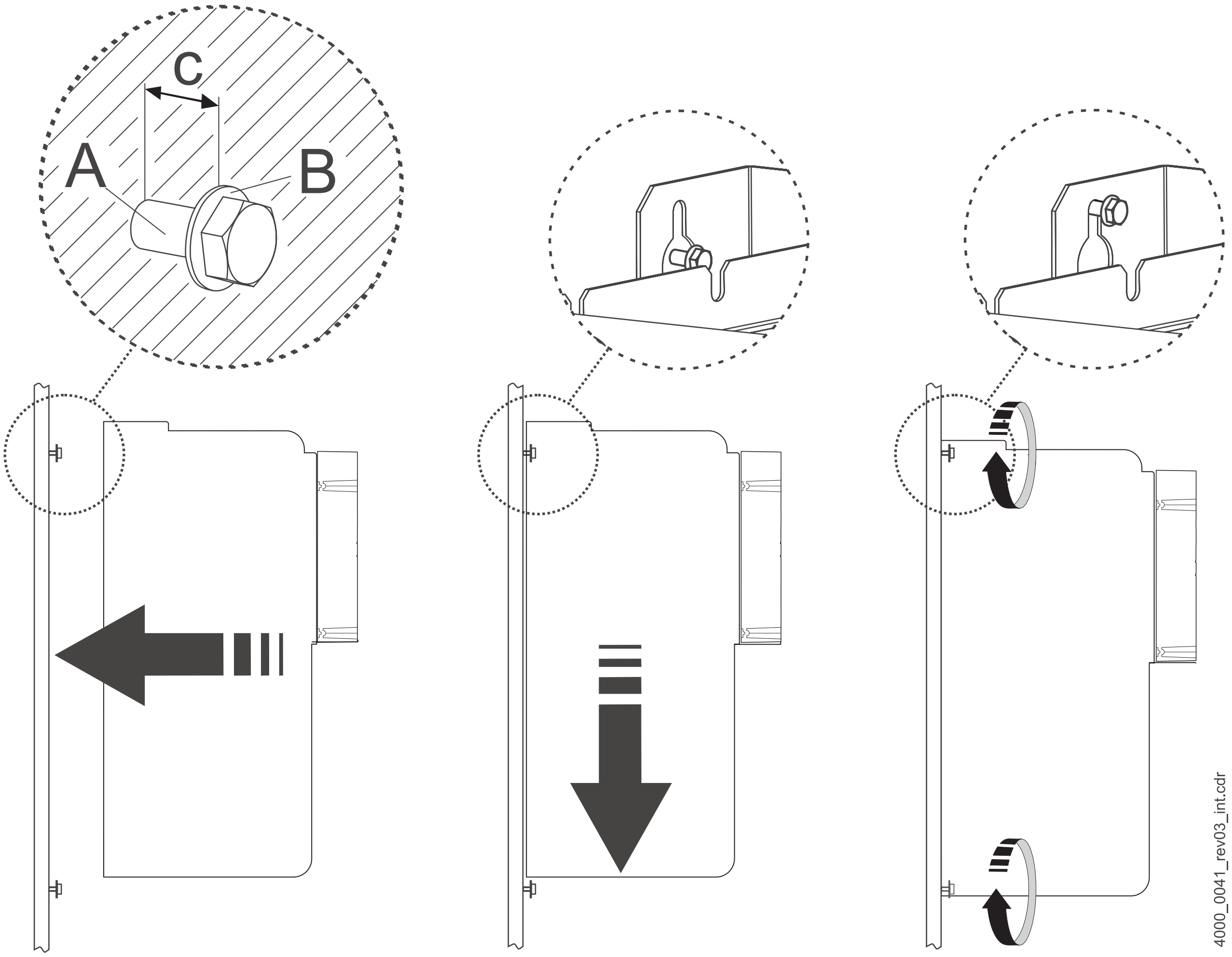


Figure 3: Mounting instruction BM445X-S/Z, BM465X-S/Z, BM446X-S/Z and BM466X-S/Z

Device	**BM445X-S/Z BM465X-S/Z**	**BM446X-S/Z BM466X-S/Z**
A - screws	4 x M8	4 x M8
B - washers	4 x (8.4 x 17)	4 x (8.4 x 17)
C - mount spacing	c = 7 mm	c = 7 mm

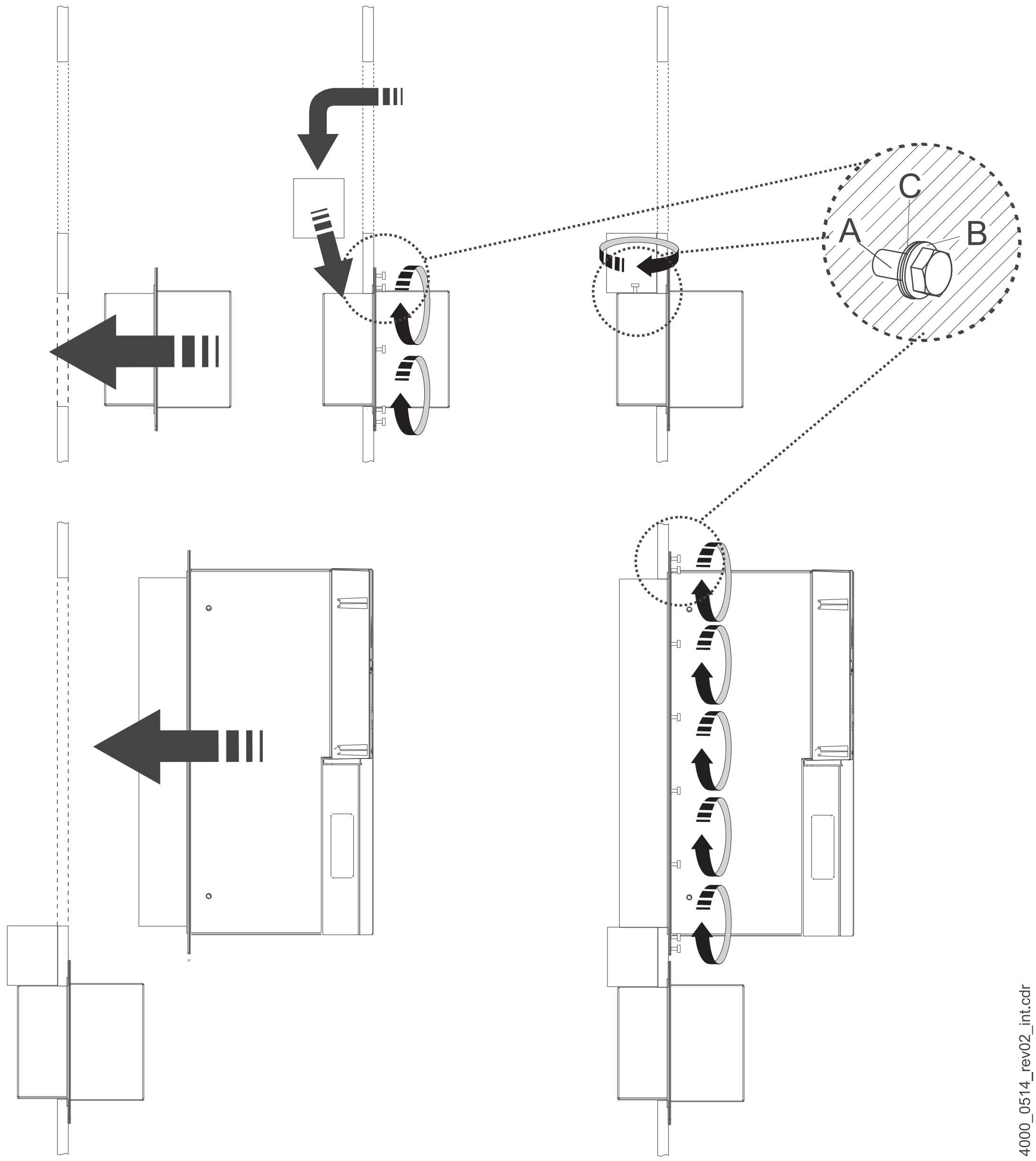


Figure 4: Mounting instruction BM447X-A/F and BM477X-FXX-3XXXX

Device	**BM447X-S/A**	**BM447X-F** **BM477X-FXX-3XXXX**
A - screws	38 x M6	22 x M6
B - conical spring washers	38 x DIN6796-6-FST	22 x DIN6796-6-FST
C - washers	38 x (6.4 x 12.5)	22 x (6.4 x 12.5)

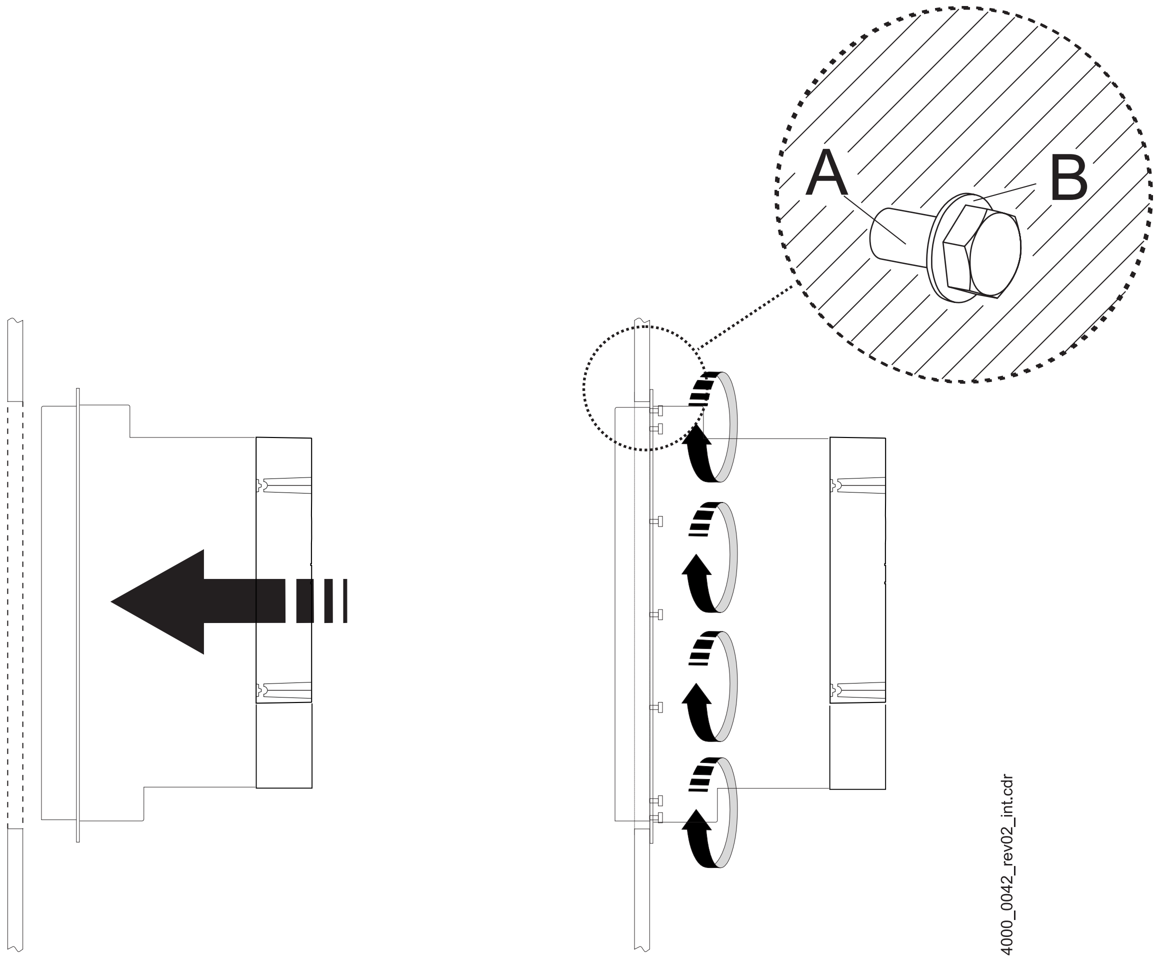


Figure 5: Mounting instruction 'miscellaneous'

Device	**BM454X-A/F/Z/C**	**BM443X-A/F/C BM463X-A/F**	**BM444X-A/F BM464X-A/F**	**BM445X-A/F BM465X-A/F**	**BM446X-A/F BM466X-A/F**
A - screws	4 x M5	14 x M4	16 x M5	16 x M8	20 x M8
B - washers	4 x (5.3 x 10)	14 x (4.3 x 9)	16 x (5.3 x 15)	16 x (8.4 x 17)	20 x (8.4 x 17)

Device	**BM465X-FXX-3XXXX BM475X-FXX-3XXXX**	**BM466X-FXX-3XXXX BM476X-FXX-3XXXX**
A - screws	18x M6	18 x M8
B - washers	18 x (6,4x17)	18 x (8,4x21)

NOTE

At the types BM4XXX-F and BM4XXX-Z, which have got water cooling, do not forget to connect the cooling circuit to the heat sink on the reverse side of the devices.

5

INSTALLATION

The important data for the dimensioning of the electric connections are to be found in the manual.

5.1 Connection diagram

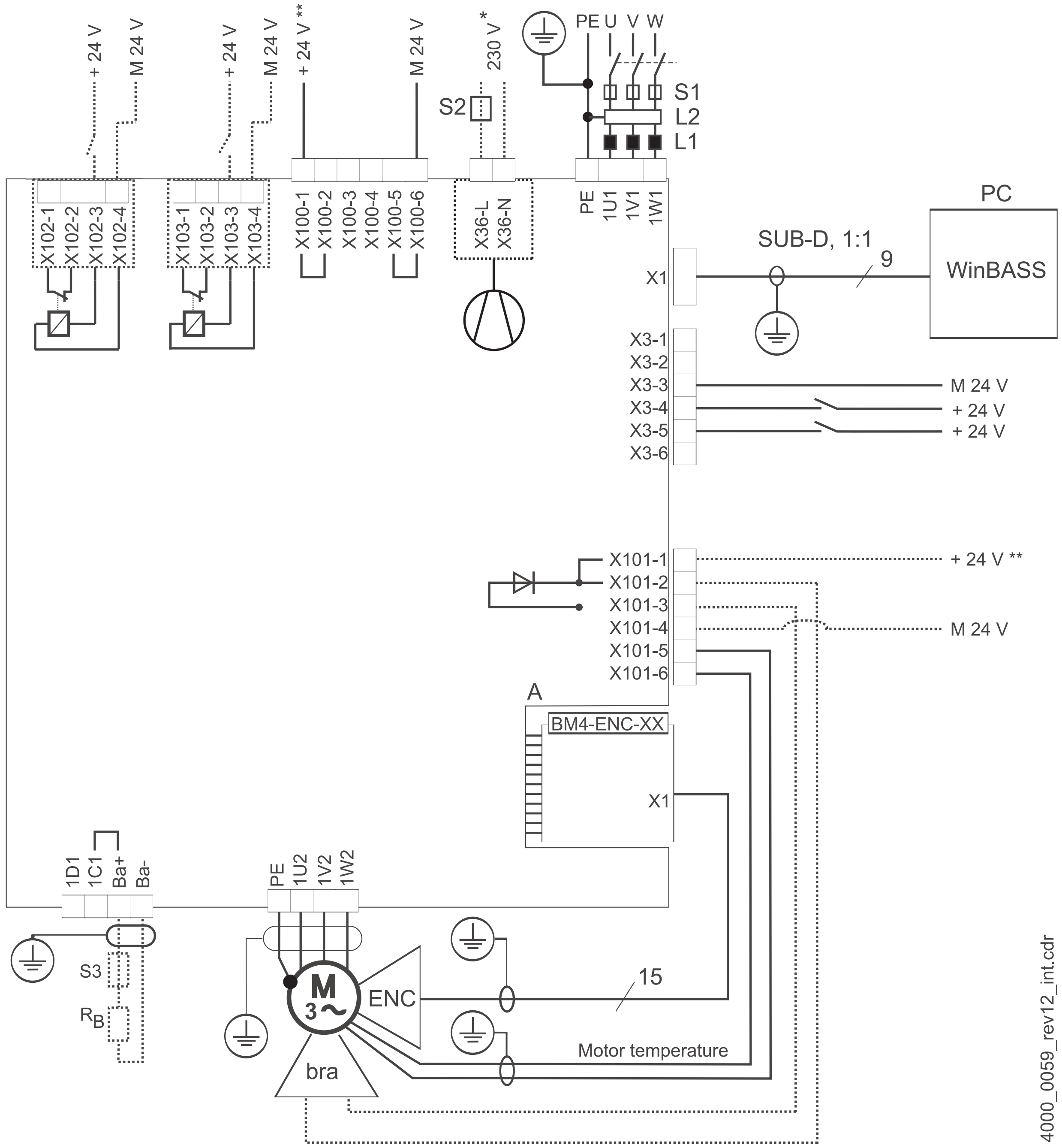


Figure 6: Connection diagram with a directly controlled motor brake

Additional relay is necessary only if the voltage of the brake is ≠24V, if the current of the brake is greater than the switching capacity of X101 or if you consider UL508C and the current of the brake is greater 4 A.
Perhaps consider a limited operating voltage range of the brake because of the internal voltage drop to max. 2.6 V.

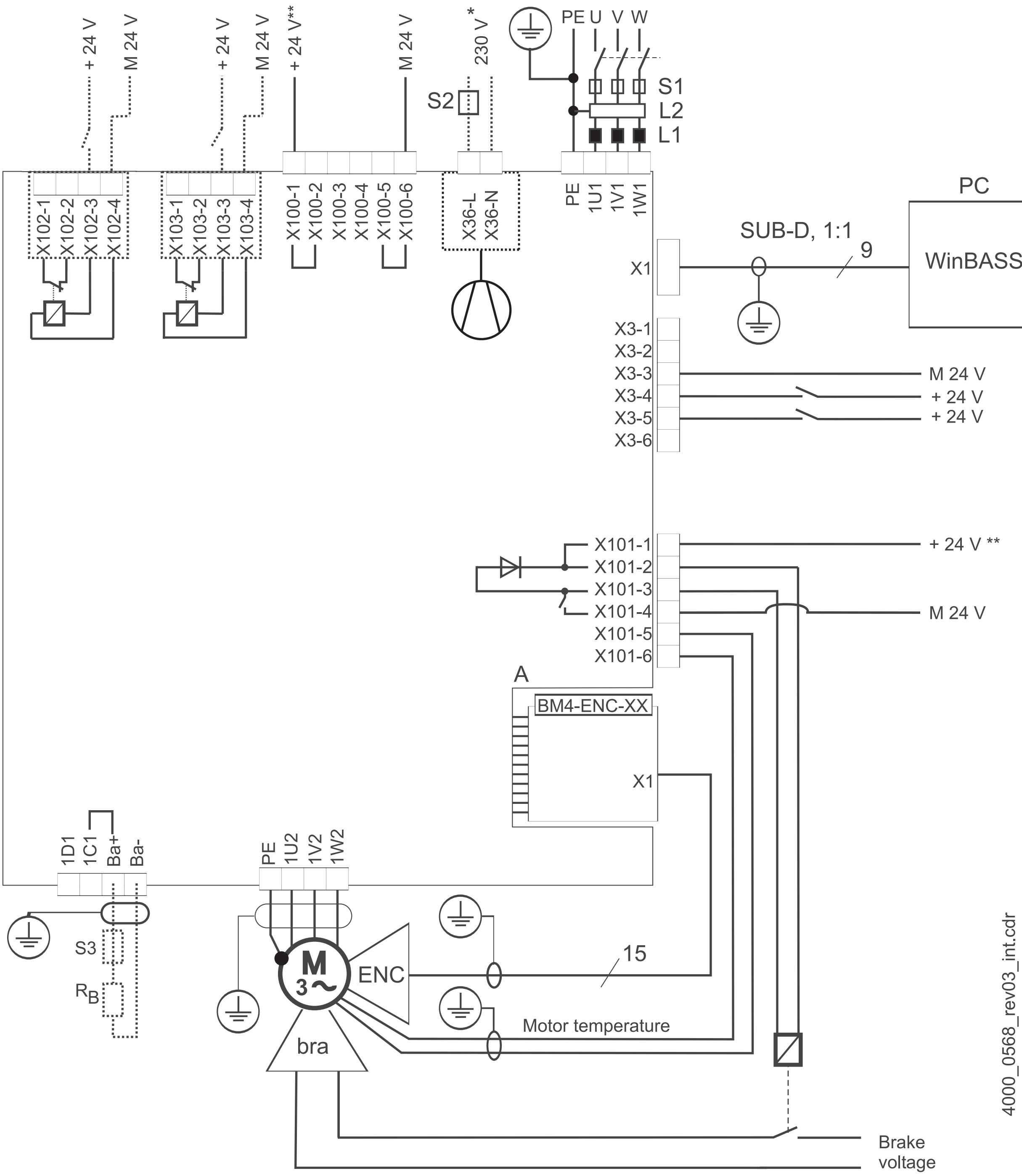


Figure 7: Connection diagram with motor brake controlled via an additional relay.

*	is only valid for BM444X, BM445X and BM446X accordingly the cooling versions S and A. for BM447X cooling type -A:

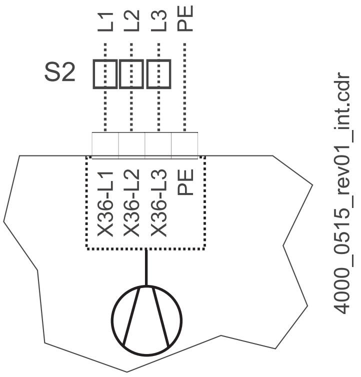


Figure 8: Connection fan BM447X-A

**	The power supply at X100 or X101 must be fused external. At the selection of the fuse you must consider the cross-section of the connecting cable and the maximum allowable load capacity. In case you consider UL 508 C, you must limit the power supply to 100 W or fuse it with a UL-listed 4 A fuse.
Ba- ... 1D1	Connections for chopper resistor and DC link, see ▹Figure 9◃ on page 23 and the following.
R_B	Chopper resistor
PE....1W1	Mains connection, see ▹Figure 9◃ on page 23 ff.
S1	Fuses (circuit cable + device)
S2	Fuse (fan) *)
L1	Mains choke (not necessary for BM441X and BM442X except BM4426)
L2	Mains filter
X1	Serial interface (RS 232), see ▹Figure 18◃ on page 32.
X3	Connections for ready-for-use, quickstop, pulse enable, see ▹Figure 18◃ on page 32.
X36	Connections for fan (only BM444X-S/-A, BM445X-S/-A, BM446X-S/-A, BM447X-A)
X100	Connections for 24 power supply, further information see ▹Figure 18◃ on page 32 (SELV/PELV)
X101	Connections for brake, motor temperature, see ▹Figure 9◃ on page 23 and the following (SELV/PELV)
X102	Connections of the safety relay, see ▹Figure 9◃ on page 23 and the following (SELV/PELV)
X103	Connections of the optional, second safety relay (only BM443X - BM447X)
A:X1	Encoder module, see manual 5.01042 (SELV/PELV)
ENC	Encoder
BRE	Brake
PE....1W2	Connections for motor, see ▹Figure 9◃ on page 23 ff.

5.2 Connection diagrams

NOTE

When having a switched-off safety relay, it is not possible at BM441X and BM442X to use a chopper resistor.

The electrical connections for devices **BM4412** and **BM4413** are shown in the following figure:

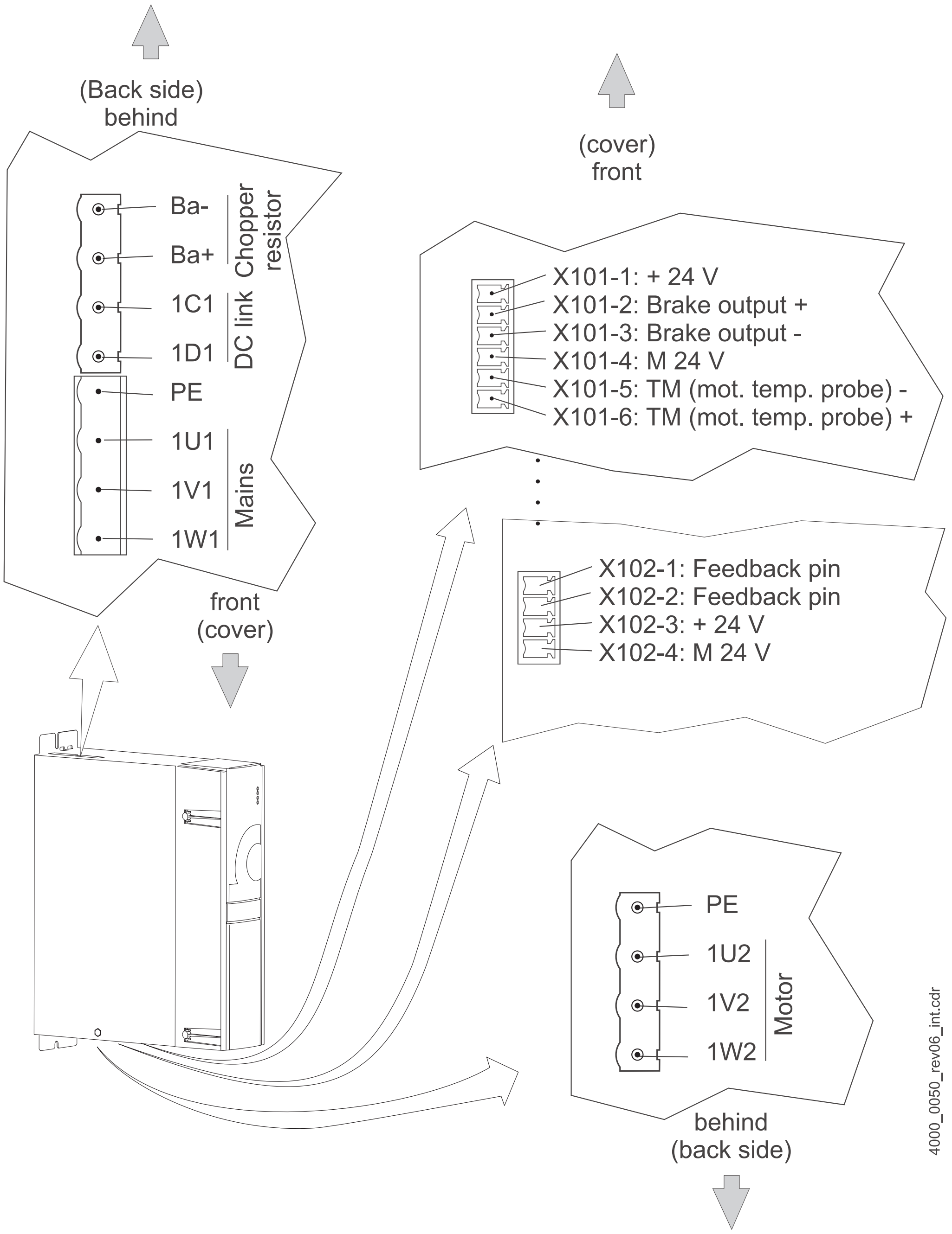


Figure 9: Electrical connections for mains, motor, upon others for BM4412 and BM4413

The electrical connections for device **BM4414** are shown in the following figure:

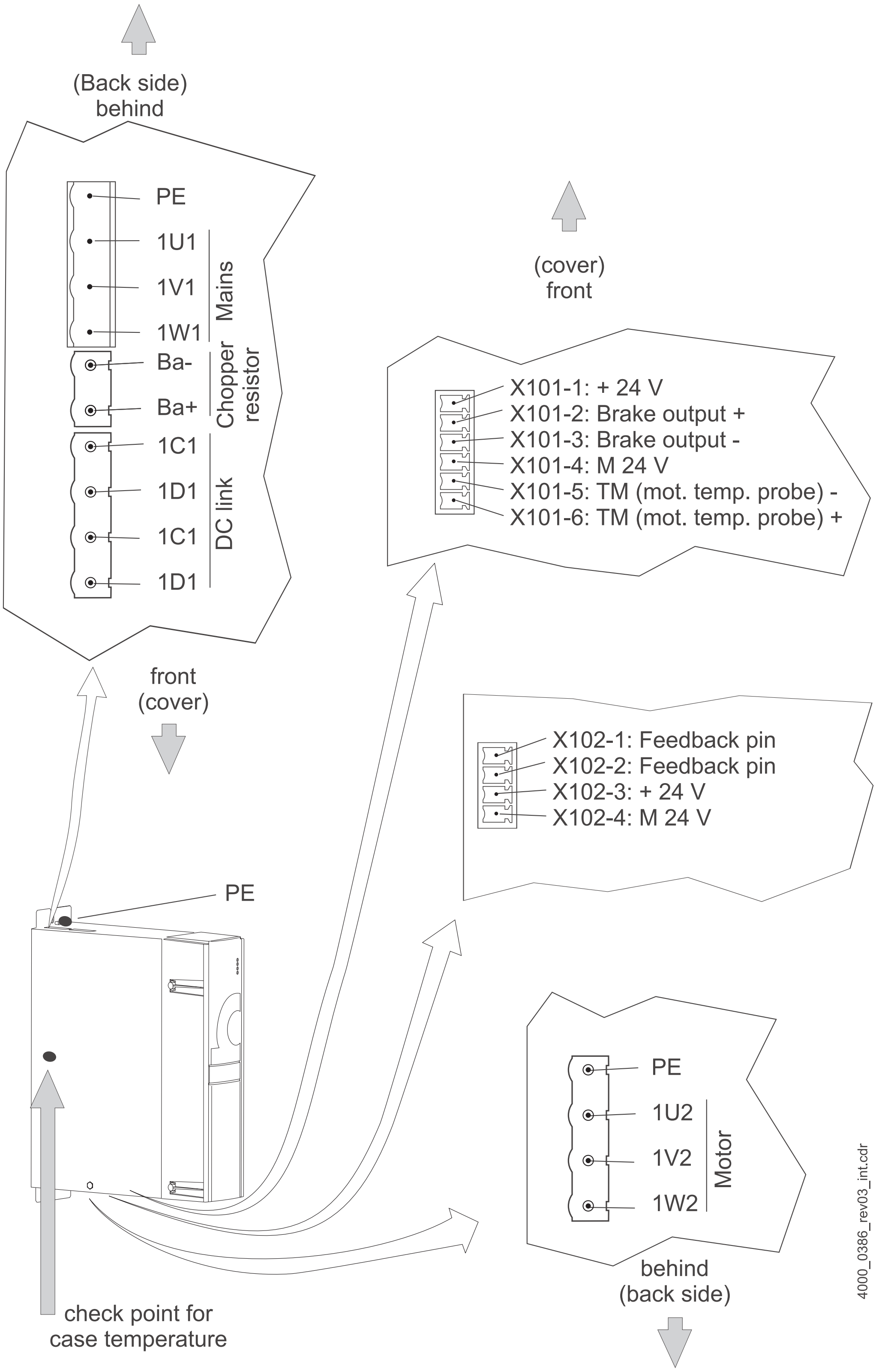


Figure 10: Electrical connections for mains, motor, upon others for BM4414

The electrical connections for device **BM442X** are shown in the following figure:

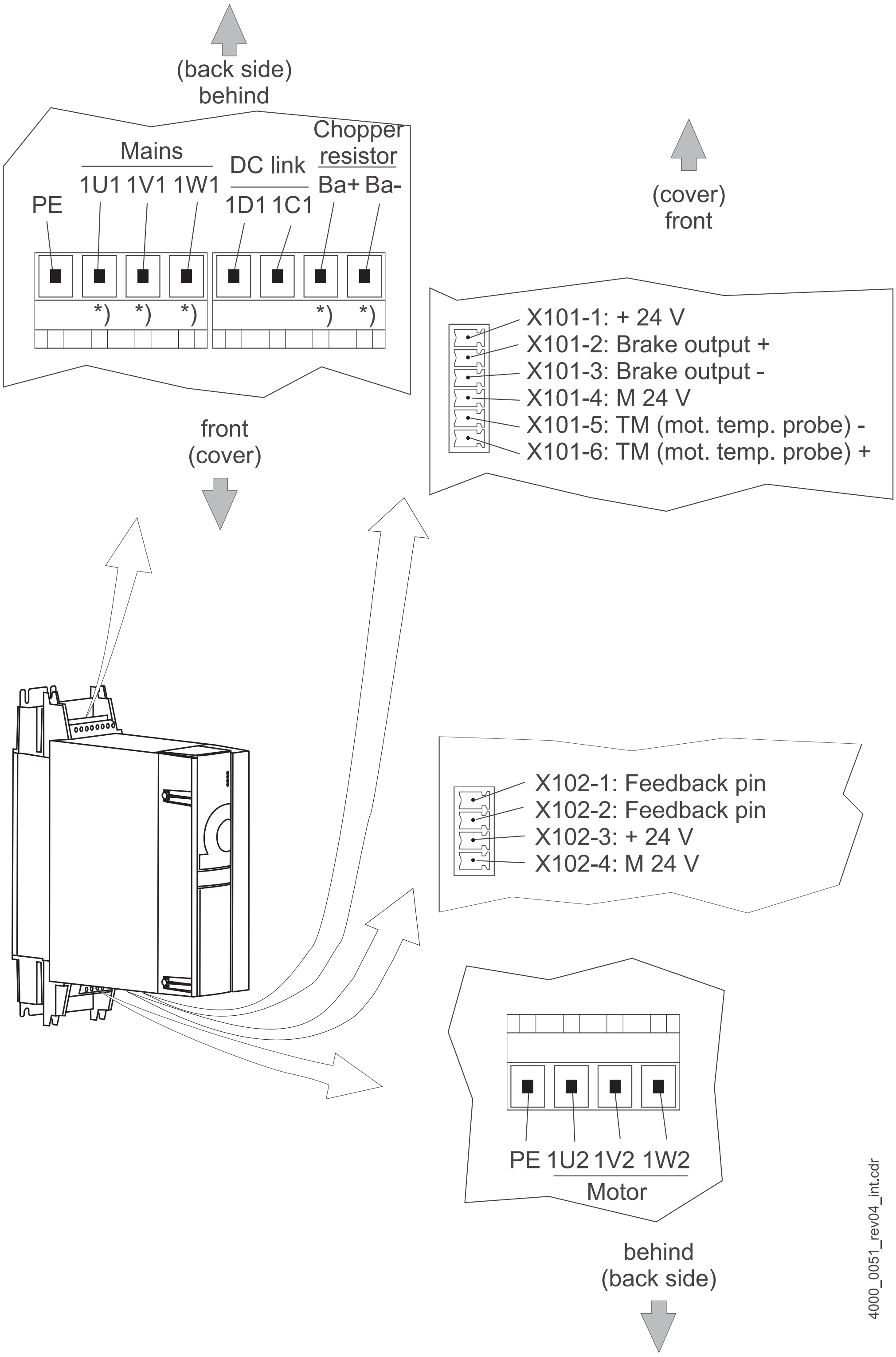


Figure 11: Electrical connections for mains, motor, upon others for BM442X

The electrical connections for device **BM443X** and **BM463X** are shown in the following figure:

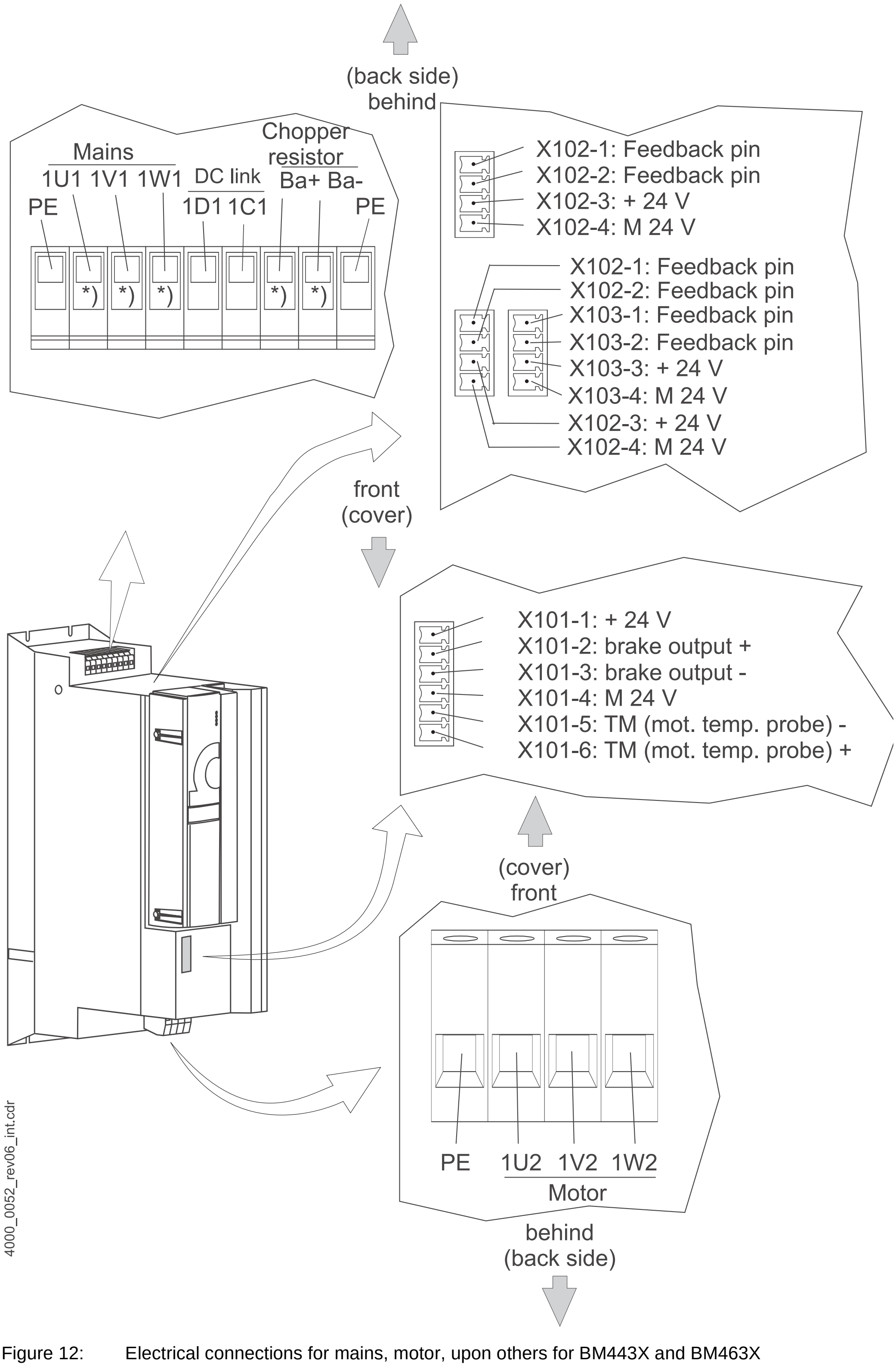


Figure 12: Electrical connections for mains, motor, upon others for BM443X and BM463X

The electrical connections for device **BM444X and BM464X** are shown in the following figure:

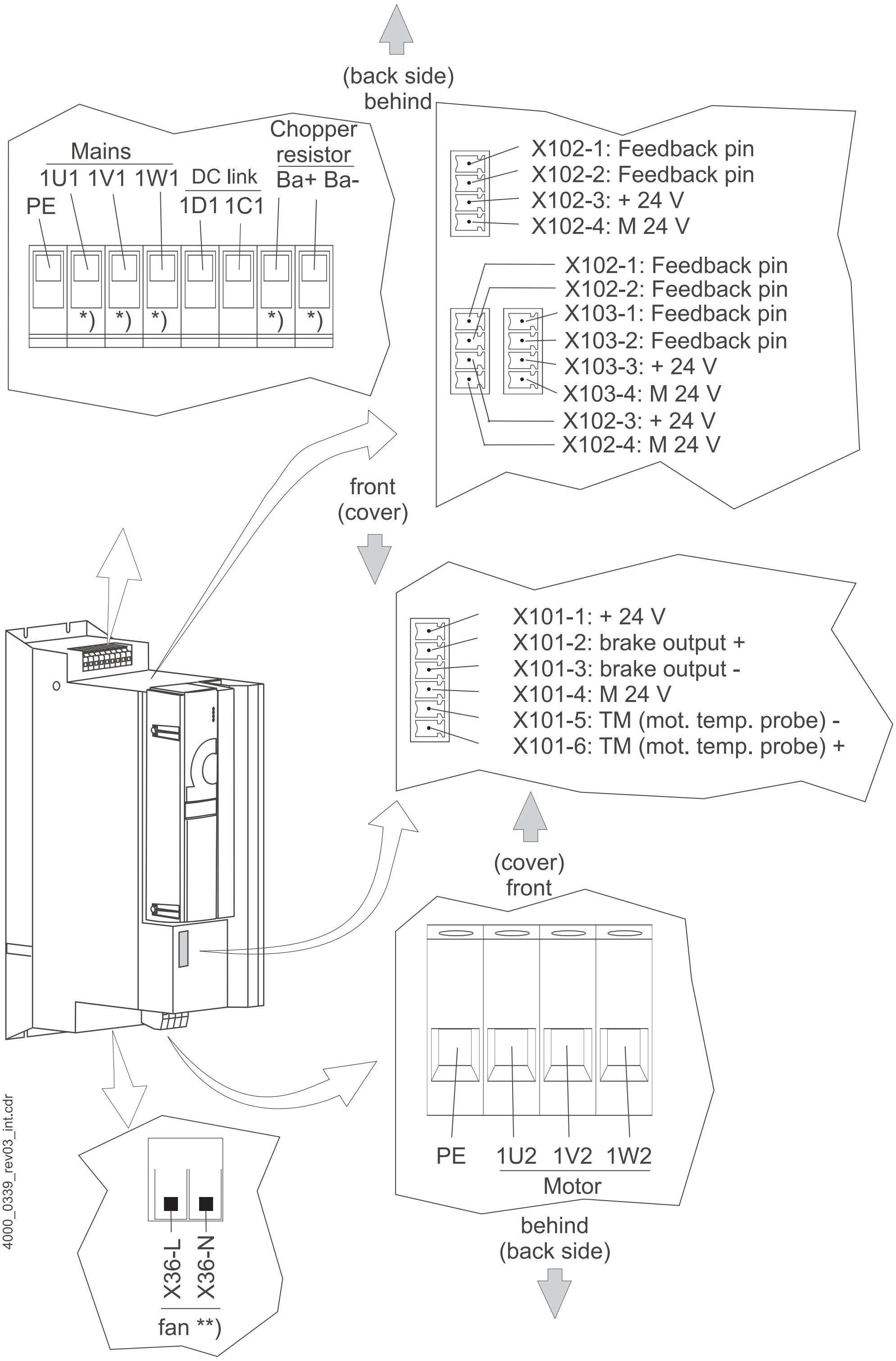


Figure 13: Electrical connections for mains, motor, upon others for BM444X and BM464X
*) only BM444X-S/-A

5.2 Connection diagrams

The electrical connections for the devices **BM445X, BM465X, BM446X** and **BM466X** are shown in the following figure:

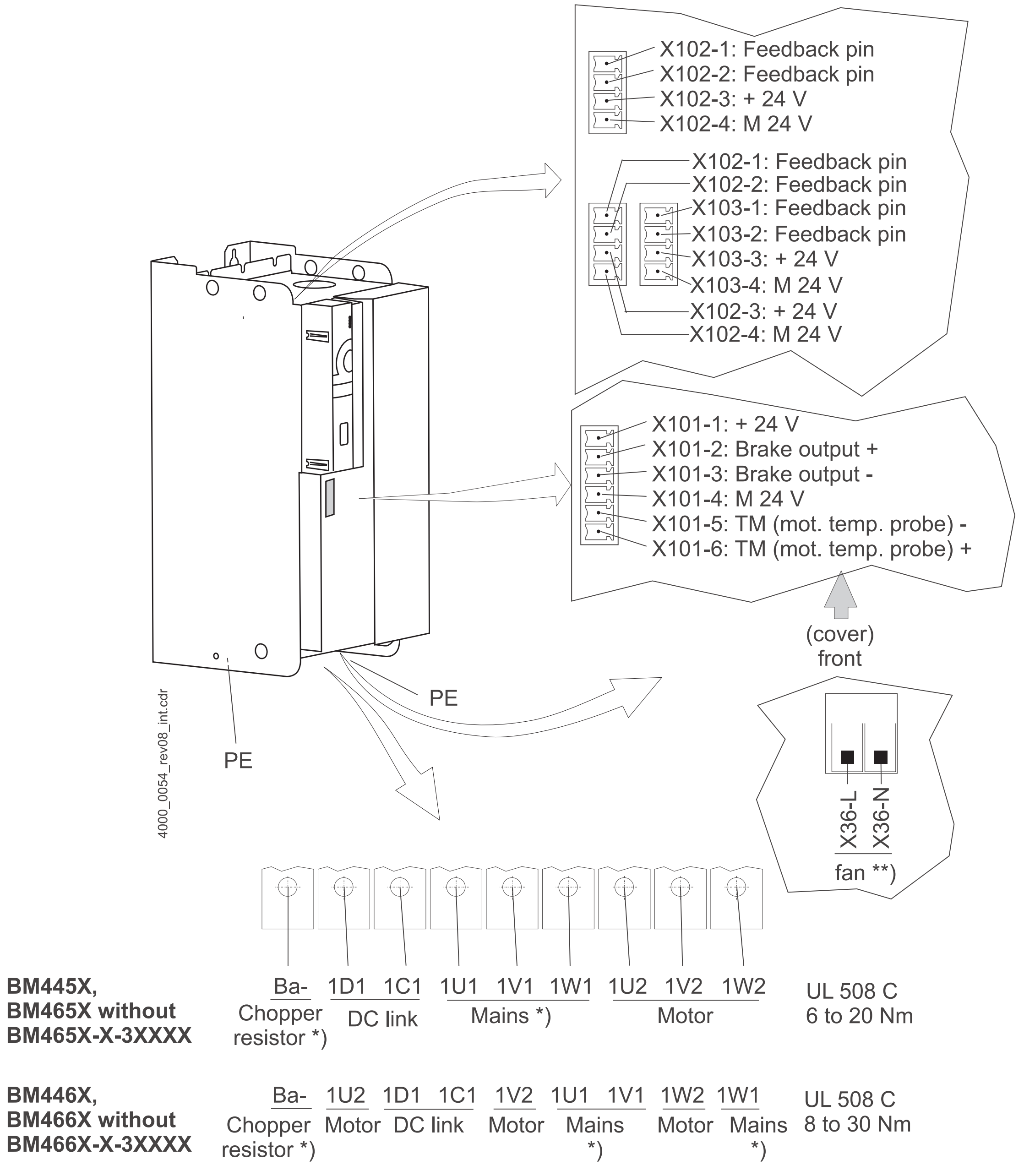


Figure 14: Electrical connections for mains, motor, upon others for BM445X, BM465X,BM446X and BM466X
*) only BM445X-S/-A and BM446X-S/-A

NOTE

The chopper resistor is connected at the devices BM445X and BM446X between Ba- and 1C1.
Also see ▷Figure 6◁ on page 20.

The electrical connections for the device **BM466X** and **BM476X** are shown in the following figure:

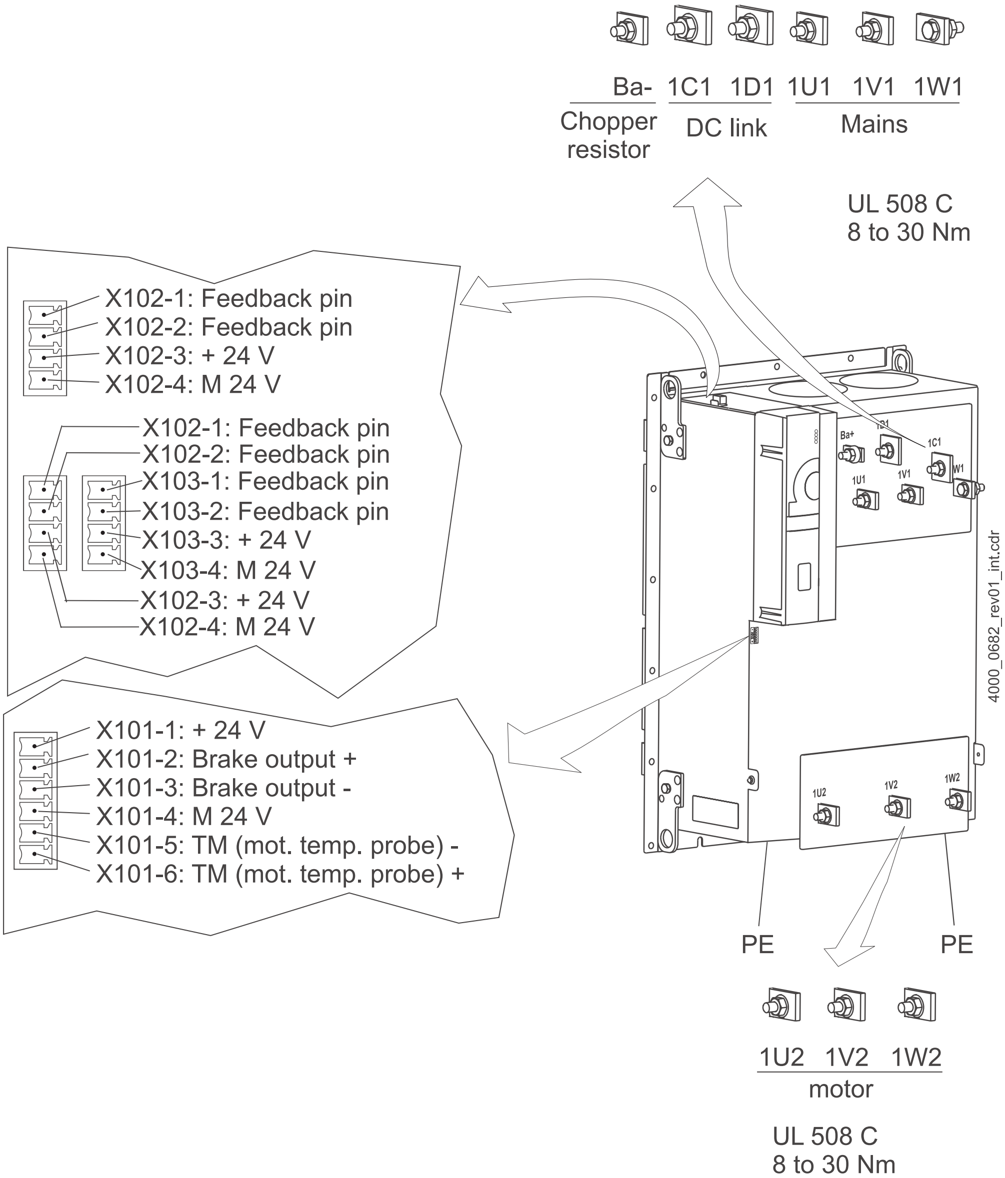


Figure 15: Electrical connections for mains, motor, upon others for BM466X and BM476X

The electrical connections for the device **BM4755** are shown in the following figure:

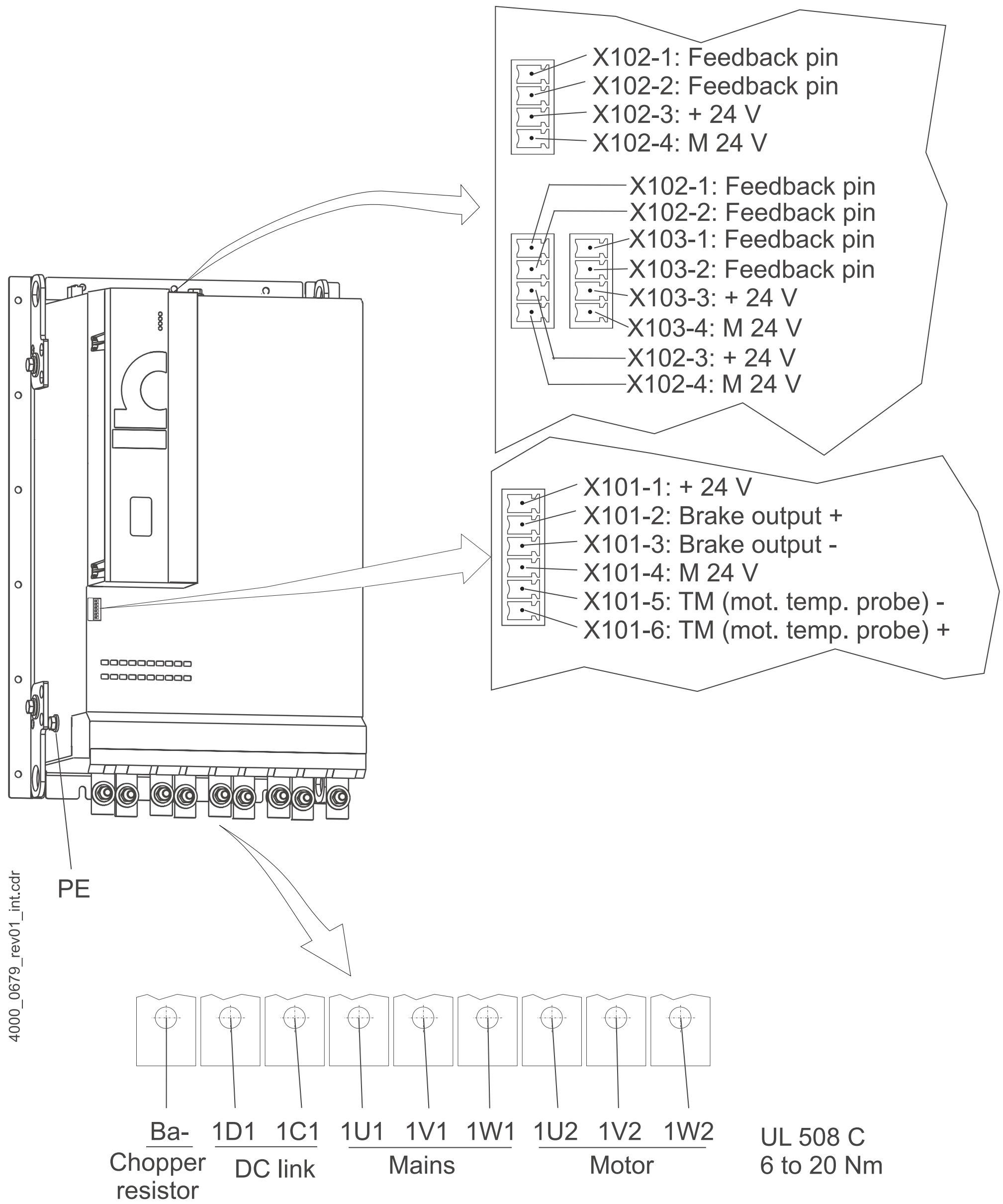


Figure 16: Electrical connections for mains, motor, upon others for BM4755

The electrical connections for the device **BM447X** and **BM4773** are shown in the following figure:

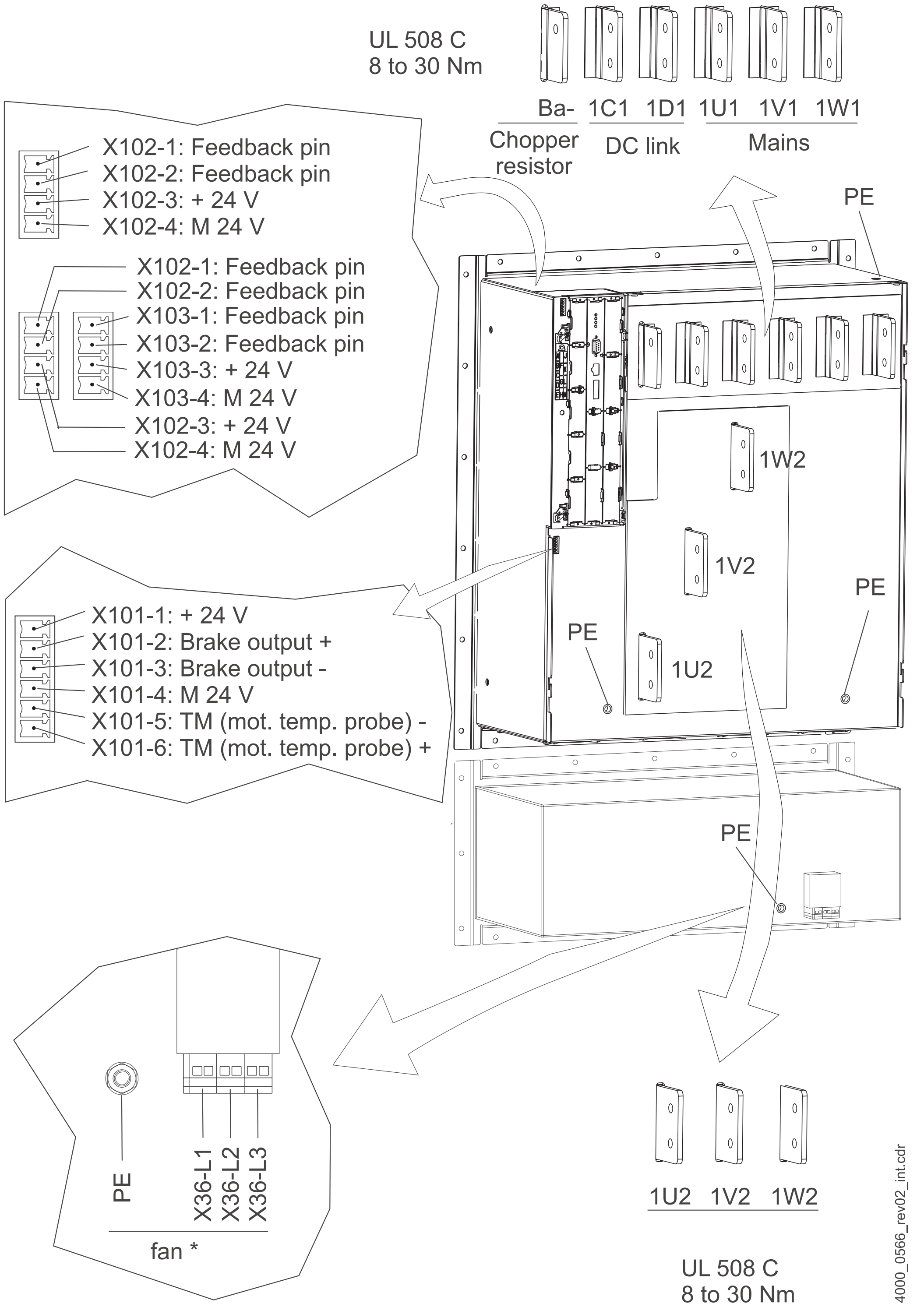


Figure 17: Electrical connections for mains, motor, upon others for BM447X and BM4773
*)only BM447X-/-A

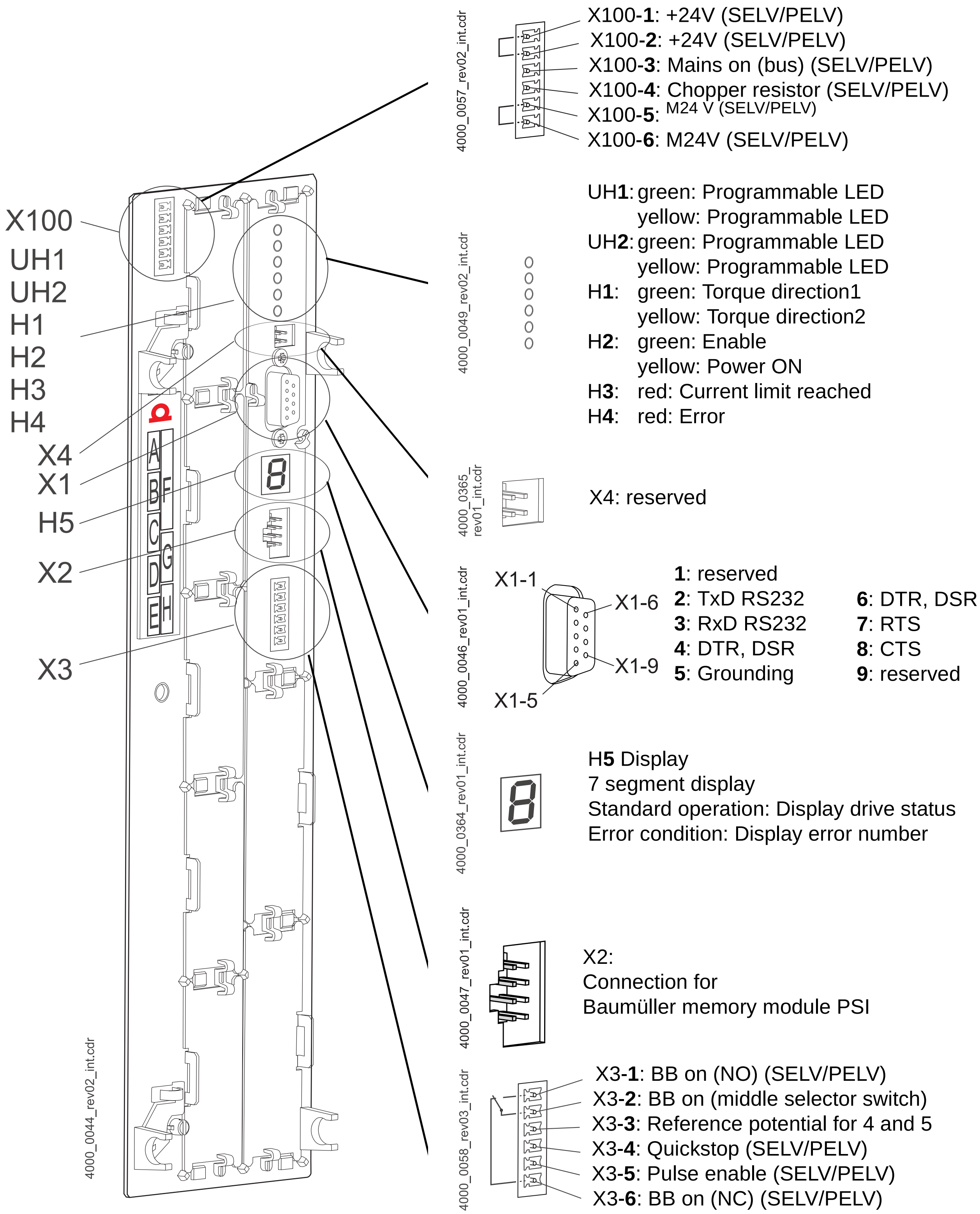


Figure 18: Connection X100 and connections of the controller unit

6

COMMISSIONING

In this chapter we describe an exemplary commissioning of a bmaXX® device with a Baumüller motor DS 56-M with sine-cosine encoder. Carry out the commissioning, to make sure that the delivered devices are in an accordingly condition. This commissioning is **not** for the complete installation of the device for your application.

6.1 Requirements to the executing personnel

The personnel, who is assigned for commissioning, must have enough knowledge about:

- Safety technology
- PC-operation (windows),
  especially in the program WinBASS II (up to FW 3.09) or ProDrive (from FW 3.07).
- Connection and operating method of the device b maXX® 4400.

6.2 Preconditions

The commissioning is an exemplary checking of the functionality of the device. When commissioning, your assure yourself if the device is ready for operation.

Commissioning with Baumüller-motors

The, furthermore described, exemplary commissioning is specified to Baumüller motors. In order to reduce your scope of work, you are provided with a motor database, within the operating software WinBASS II, which provides the most values automatically (reads out), so that you can concentrate on the checking of the values.

If you, however, choose another configuration (e. g. another encoder), you must enter more values yourself, because the reading of the data isn't completely available anymore.

Commissioning of motors of other manufacturers

Motors of other manufacturers we have not included into the motor data base. In this case you must feed all values yourself. However, it is possible to include these motors into the motor database.

6.3 Preparations

Precondition for the commissioning is that mounting and installation are correctly executed.

1 Assure, that mounting is correctly executed and especially that all safety instructions were referred to (see mounting in manual of b maXX® 4400).

NOTE

Figures referring to the next working steps are to be found in the manual of the basic unit b maXX4400.

2 Assure, that the installation is correctly executed, and that especially all safety instructions were referred to.

3 WinBASS II must be installed onto the PC/laptop. The controller firmware versions, which are supported by WinBASS II / ProDrive are to be found in WinBASS II / ProDrive-Online-Help in the menu 'User indications/supported b maXX devices'.

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NOTE

The controller firmware versions, which are supported by WinBASS II / ProDrive are to be found in the
WinBASS II / ProDrive Online Help in the menu 'User indications/Supported b maXX® devices', or on the WinBASS II / ProDrive CD in the readme file under 'User indications/Supported b maXX® devices'.

At commissioning you can among other things enter motor- and encoder data in the operating software or wrong values can be corrected. In order, to carry out commissioning efficiently, it is advantageous, if you have all data when starting with commissioning. Data for Baumüller motors can be found within the operating software in form of a 'motor database'.

4 Assure, that you have all necessary data.

Motor data (type plate)

This data is, e. g. on the type plate of the motor, which you use when commissioning.

Name	Value, e. g.	is required for input parameter list/parameters
Motor type, -designation	DS 56-M	Parameter list/configuration motor P0050 Motor type key
Rated voltage U_N	330 V	Parameter list/configuration motor P0053 Motor nominal voltage
Rated current I_N	4.0 A	Parameter list/configuration motor P0053 Motor nominal current
Rated speed n_N	3000 RPM	Parameter list/configuration motor P0057 Motor nominal speed

In this example we are using the motor data base, the values from the chart then only serve as a purpose of control.

Motor data (data sheet)

This data is to be found on the data sheet of the motor, which you use when you are commissioning.

Name	Value, e. g.	is used to enter parameter list/parameters
Limit current I_{peak}	14.3 A	Parameter list/configuration motor P0069 Motor peak current
Number of pole pairs	3	Parameter list/configuration motor P0065 Motor number of pole pairs
Max. Speed $n_{max.}$	6000	Parameter list/configuration motor P0072 Motor maximum speed mechanical
Pole position, if specified[1)]	240°	Parameter list/configuration motor P0082 Motor notch position

1) You can also let the notch position be determined by WinBASS II / ProDrive (see ▹Find notch position◃ on page 54).

Encoder data (data sheet)

This data you will find on the data sheet of the encoder, which you use during commissioning.

Name	Value, e. g.	is used to enter parameter list/parameters
Encoder type	Sincos-encoder Stegmann SRS 50/60	at sine-cosine encoders with HIPERFACE®interface the encoder type is automatically entered via the HIPERFACE®interface
PPR count	1024	Parameter list/configuration encoder/ BM_u_Enc1PulsesPerRev
Encoder type	Resolver	-
PPR count	1	Parameter list/configuration encoder/ BM_u_Enc1PulsesPerRev

5 Assure, that the motor fulfills the following conditions:

- equipped with a suitable encoder, in our example: Resolver or SinCos encoder SRS50
- connected to b maXX® 4400
- Ready-to-operate

6 Make sure, that switching elements for pulse enable and quickstop clearance are connected to b maXX4400 (e. g. in a switchboard) and are operating. Assure, that the switches are in off-position (inactive).

7 Assure, that all safety devices are connected line- and motor sided and are ready-to-operate.

8 Assure, that the encoder for motor control (resolver or sine-cosine encoder) is connected with the encoder cable to the encoder module BM4-ENC-01 or BM4-ENC-02 in slot A.

9 If necessary, assure, that the safety relay is plugged in and is connected according to the instructions.

10 Assure, that PC/laptop is connected with a serial cable (RS232/9-pin sub-d connector) to the plug connection X1 of the controller.Start WinBASS II / ProDrive.

NOTE

The company Baumüller Nürnberg GmbH recommends the usage of optically decoupled transmitters (e.g. from the company Ratioplast part no. 901SV232C6095 and part no. 901SV232T6095)

You can get an optically decoupled interface cable as an accessories named programming cable.

11 After starting the ProDrive Startpage appears. Usually you can proceed as follows.

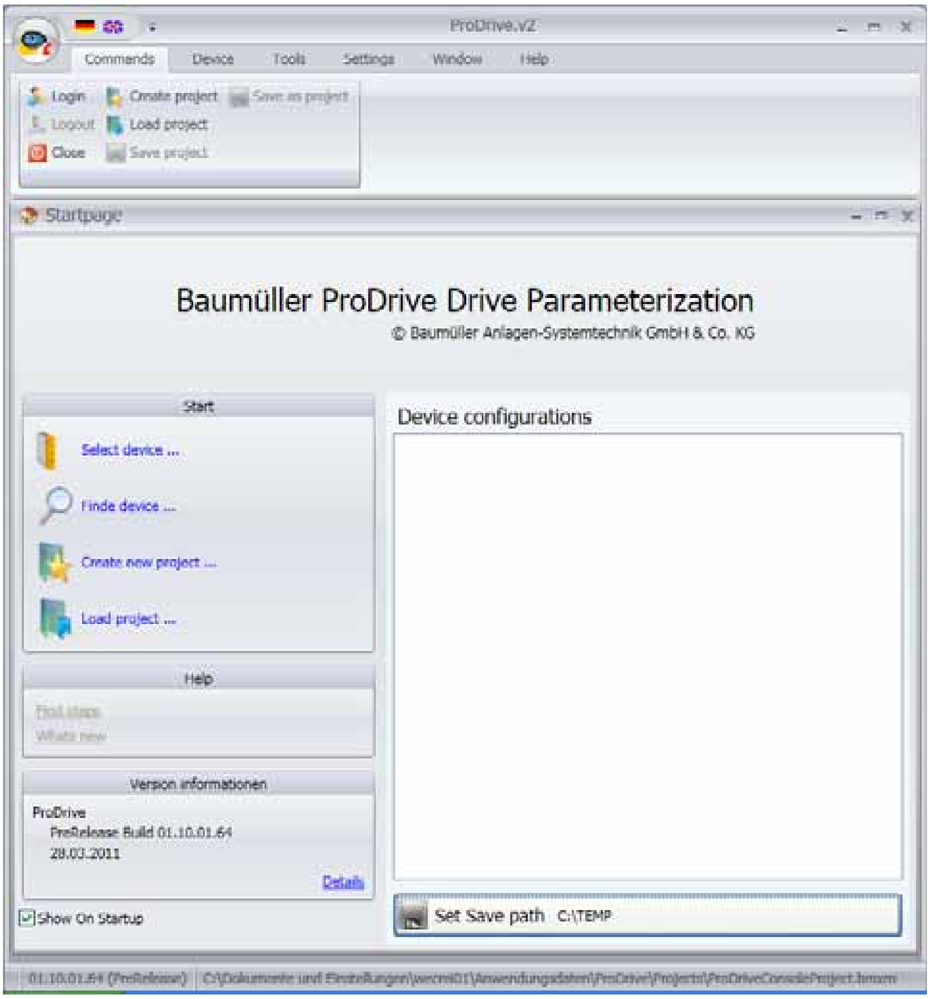


Figure 19: ProDrive: Start window

12 On the Startpage select ’Select device’. The window ’Select device’ appears (see ▷Figure 21◁ on page 39)

13 Select the serial interface under (1), where the PC is connected with the b maXX device.

14 Then select the type of device, b maXX4400 drive under (2).

15 Then press ’test’ (3). If an online connection with the b maXX device is generated, then an according session (4) is shown. The shown version and the version of the device have to match. If you press ’Connect’ (see ▷Figure 22◁ on page 40) and the versions don’t match the error message ’version conflict’ will appear. This conflict can be solved by the offered XML data update.

NOTE

In case there is no session for the present controller firmware version you need an update for the WinBASS II / ProDrive program.

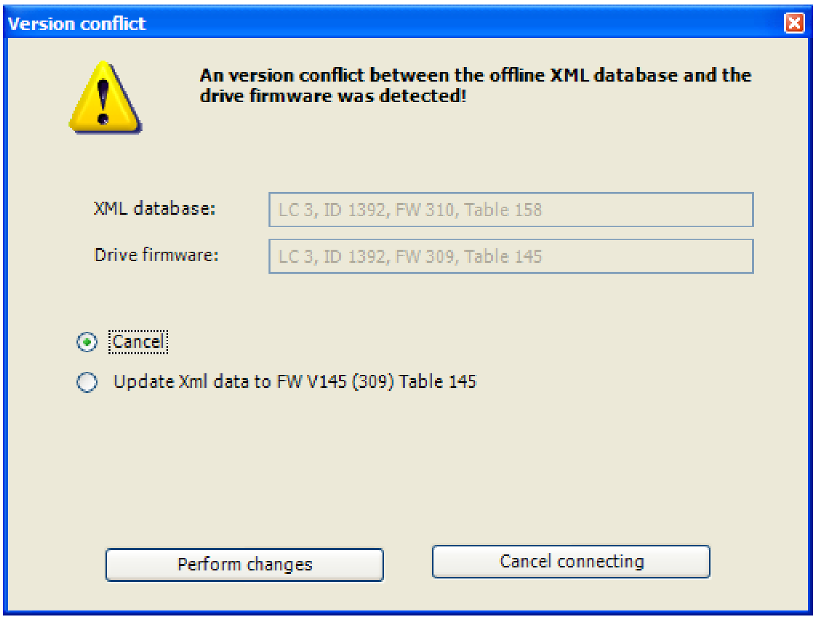


Figure 20: ProDrive: version conflict

NOTE

In case there is a PLC in the b maXX® device a communication with WinBASS II / ProDrive to the controller only can be established, if a project is existing in the PLC!

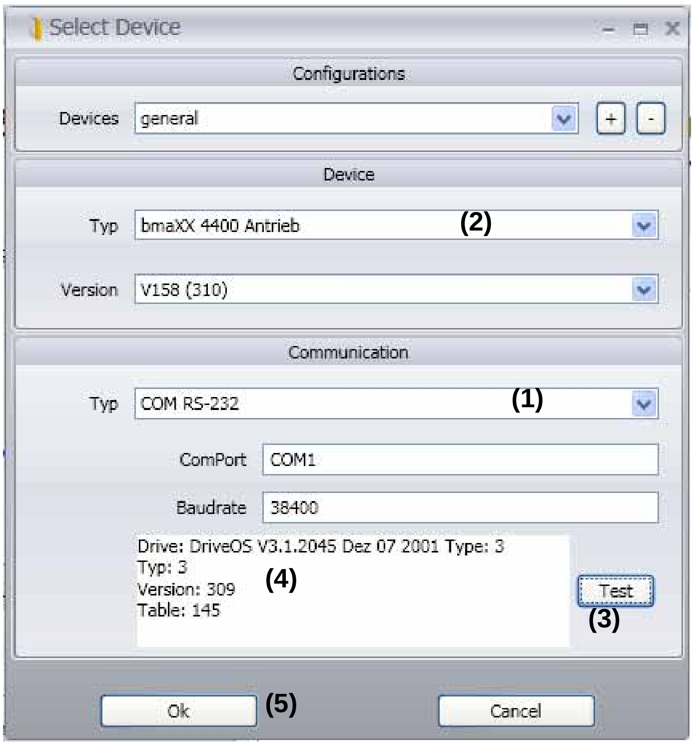


Figure 21: ProDrive: Select device

16With a click on ’Ok’ (5) the graphically user interface is started.

Further notes and explanations are to be found in the online help of the program. This online help is initiated with F1 or under ?/help subjects or on the following starting window with ’help’.

17 Wait until the following display mask appears and there, click on the 'project tree' button.

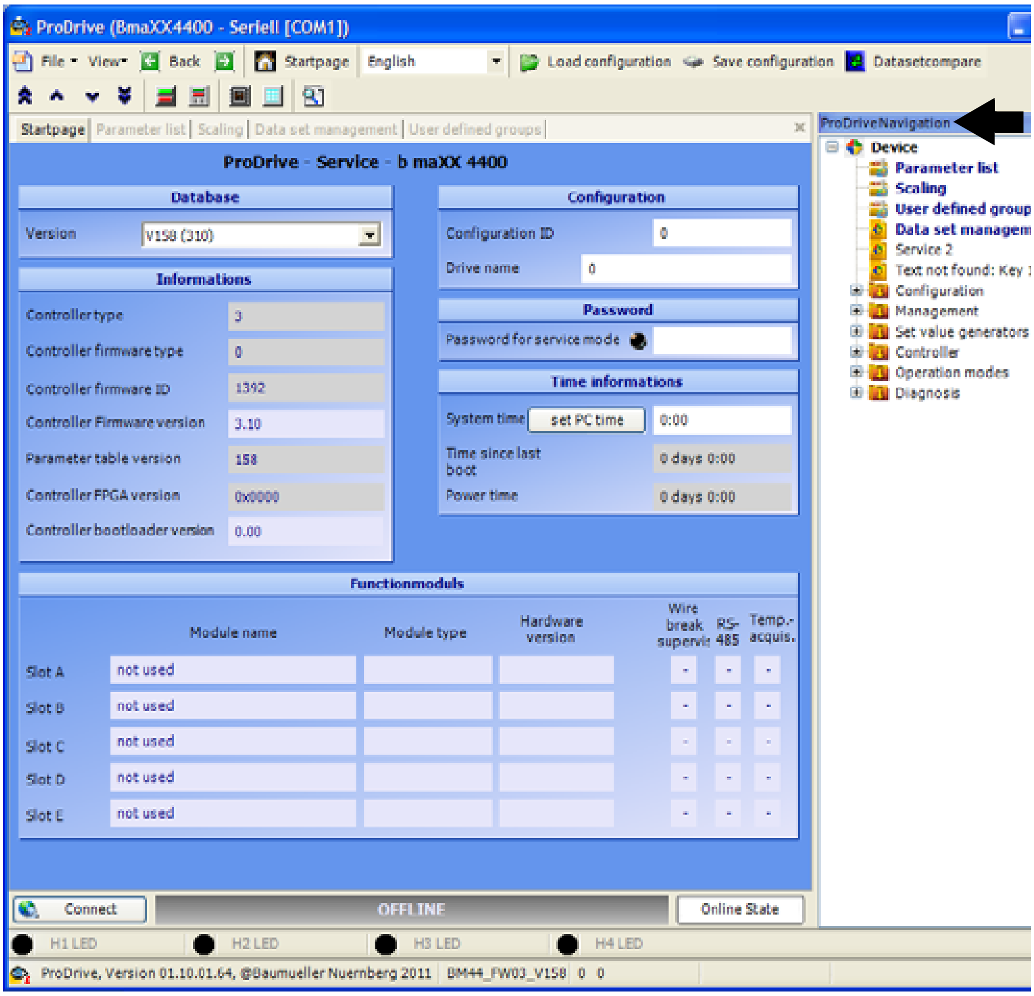


Figure 22: ProDrive: Startpage

18 Click in the ProDrive Navigation on 'power unit'.

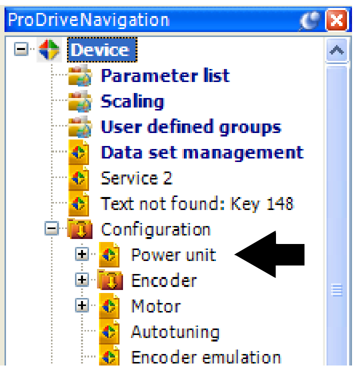


Figure 23: ProDrive: Navigation

6.4 Survey

The following survey shows commissioning schematically. The individual steps of the commissioning you will find described in detail in ▷Executing commissioning◁ from page 43.

NOTE

If your device has not got a safety relay, pass over the steps 5, 6, 13 and 14 of the starting sequence (see ▷Figure 24◁).

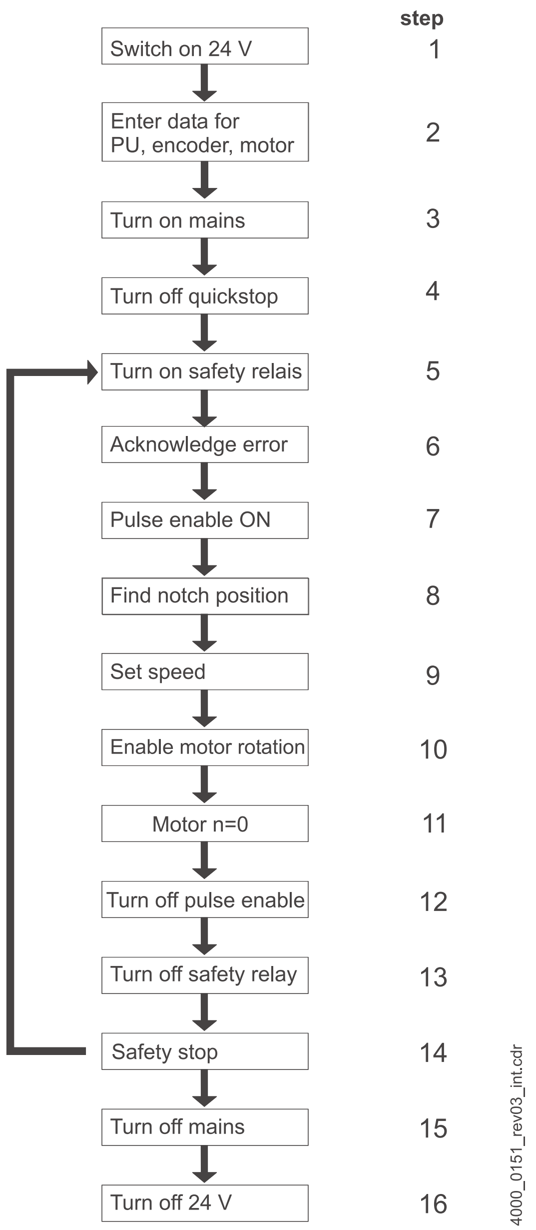


Figure 24: Starting sequence

6.5 Executing commissioning

Start with the commissioning, after you have completed the preparations.

1 Effectuate the power supply to the b maXX®
(supply voltage + control voltage).
Hereupon the device starts up and shows its operational readiness by flashing of the orange-colored LED H-2 (Power ON).

- LED H-2 must light up orange, this means Power ON, the device is ready-to-operate.
- LED H-2 may **not** light up green: The green shining LED H-2 signified 'operation enabled'! The motor is power supplied and can rotate! Immediately cancel this with the switch element pulse enable or quickstop enable!
- LED H-3; the red luminous LED means current limit reached. Reduce the load of the motor. Continue the parameterization.
- LED H-4; a red flashing LED signifies a state of error. Later the error is removed with the help of the operating program WinBASS II / ProDrive. Continue the parameterization.

2 **Now** plug on the (RS232-)cable connector from the PC/laptop to the controller at the bmaXX®.
The communication between the processor and the b maXX® runs through the connection cable.

3 Start WinBASS II (up to FW 3.09) or ProDrive (from FW 3.07), as far as it isn't running yet.

NOTE

In case you get an error message referring a plug-in module, then please first check if the plug-in module is accurately cabled and if need be, is supplied with voltage.

Warnings/ reset errors

4 Then click on ’drive management’

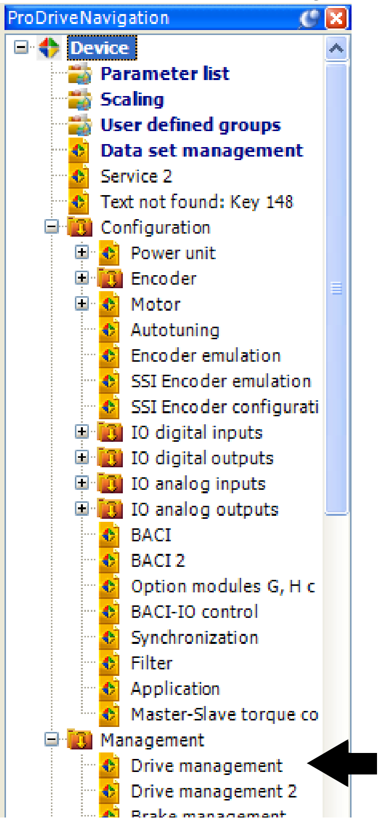


Figure 25: ProDrive: Navigation

5 Activate the voltage supply for the safety relay (in case a safety relay exists).

6 „Acknowledge“ existing warnings/errors in the window „Device management“ (if necessary press the button „Acknowledge messages“ several times).

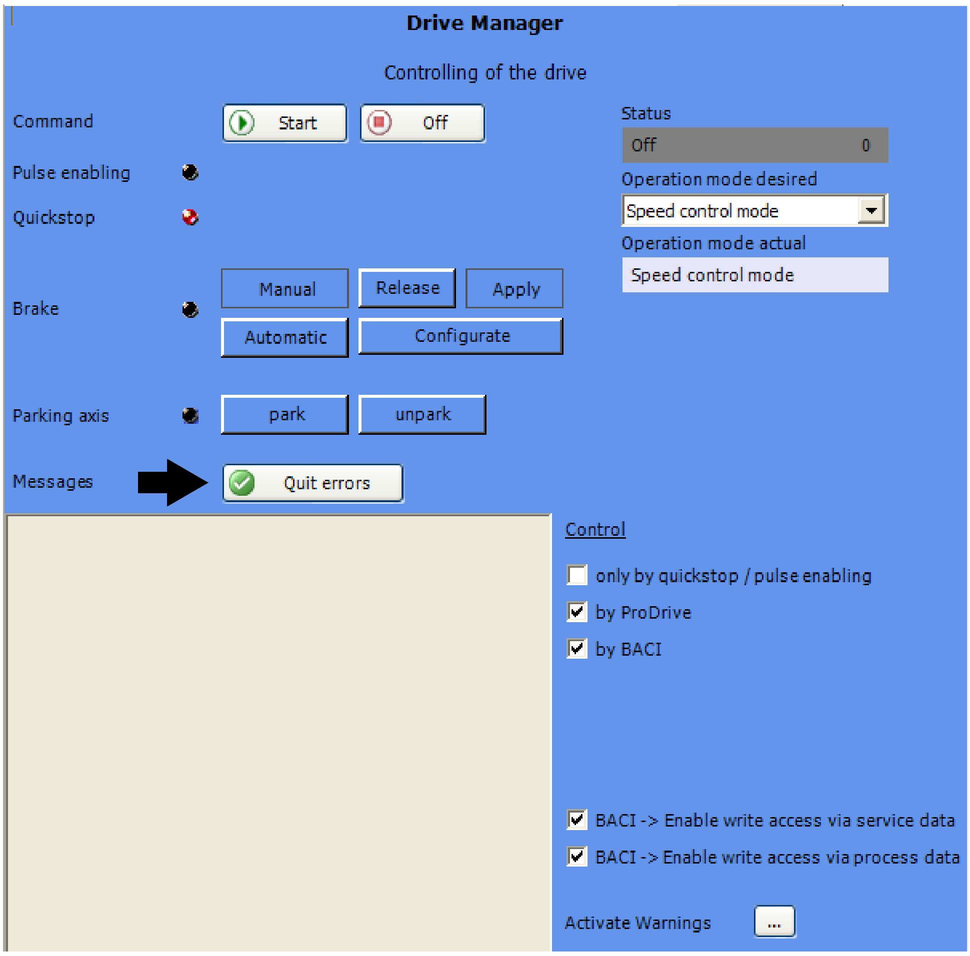


Figure 26: ProDrive: Drive Manager

NOTE

Because of the manifold combination possibilities of motors and encoders we will only give one example. Enter the **given** data of motor and encoder!

7 Click on 'power unit'.

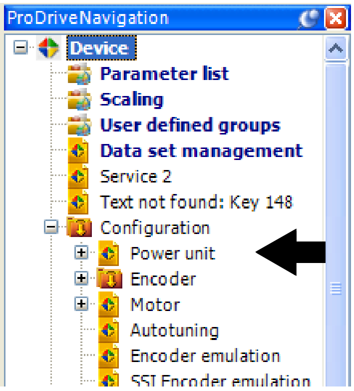


Figure 27: ProDrive: Navigation

8 The current, which is necessary for your application is entered in 'Maximum current of the drive', the maximum is the limit current of the motor (according to data sheet): 2.5 A in order to operate the motor and the power unit.

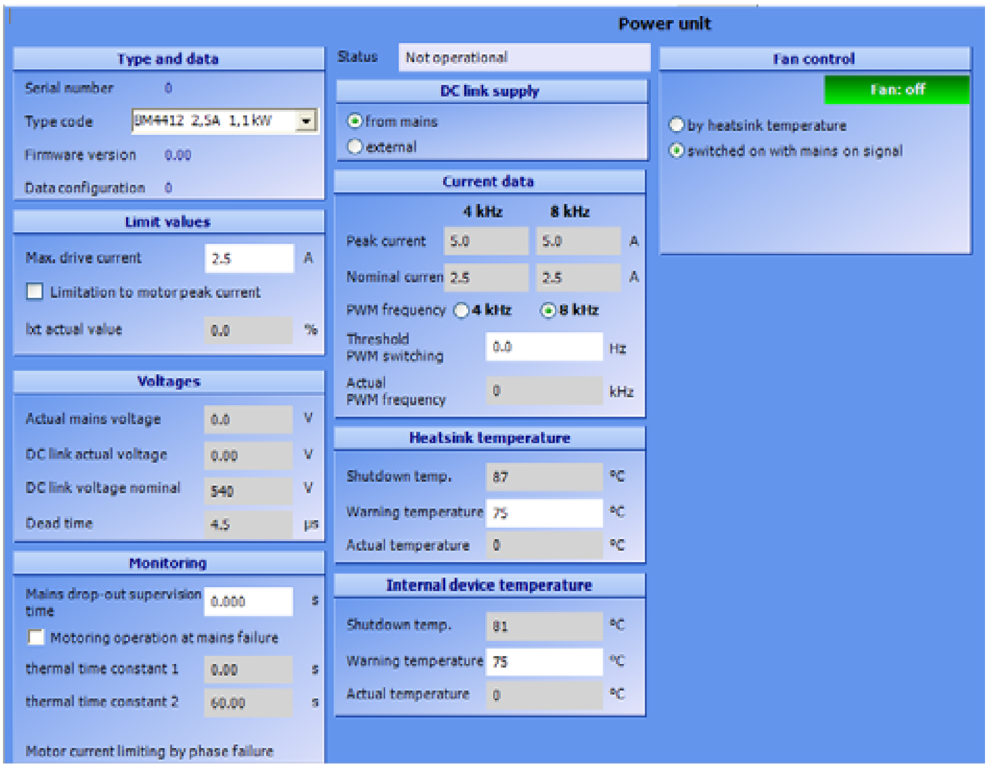


Figure 28: ProDrive: Power unit

Parameterize encoder

Now parameters still have to be entered for the encoder.

9 Go back to the ProDrive Navigation .

10 Click on the tab ’Startpage’

On the Startpage you can see, at which slot the encoder module is plugged in (resolver - BM4-ENC-01 or sine-cosine - BM4-ENC-02).

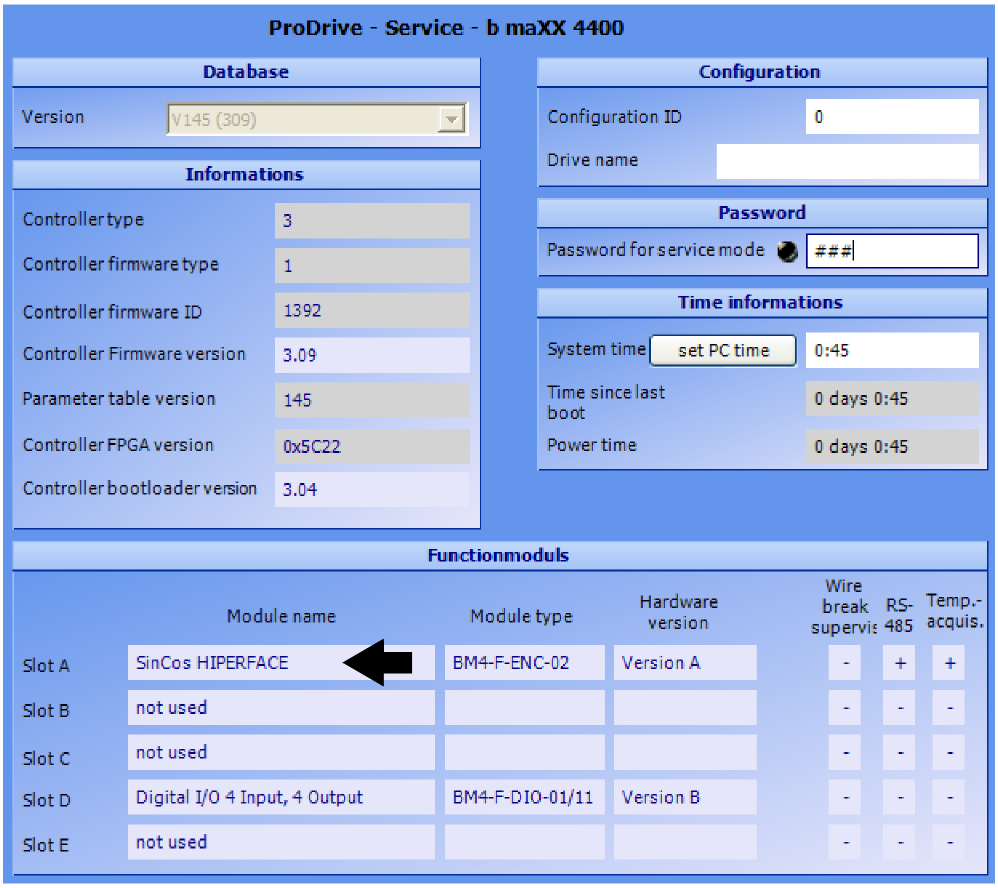


Figure 29: ProDrive: Startpage

11 Check, if the plug-in modules were detected correctly.

CAUTION

The following **may occur**, if you disregard these safety notes:

- Property damage

The danger is: ***errors in the hardware identification.*** *The device in which the b maXX®4400 is installed, can be damaged or can work defective, if a module or more modules were not recognized or were recognized wrong.*

Cancel commissioning, if at least one plug-in module was not or was wrong recognized. Contact Baumüller Nürnberg GmbH.

12 Go back to the ProDrive Navigation.

13 Double-click on ’encoder’.

14Click on ’encoder1’ if your encoder module is in slot A.
Click on ’encoder2’ if your encoder module is in slot B.

The window ’encoder1-configuration’ opens.

Figure 30: ProDrive: Encoder 1 configuration

15When using a resolver or sine-cosine encoder without HIPERFACE®-interface. With a sine-cosine encoder with HIPERFACE-interface the data is automatically transferred over the HIPERFACE-interface - do not change data.

- (1) Resolver: PPR count = 1, sine-cosine without HIPERFACE® e.g. PPR count = 1024
- (2) Resolver: rotations = 1, sine-cosine without HIPERFACE® e.g. rotations = 1
- both encoders: activation (activate encoder)

Enter overspeed limit manually in block ’speed threshold’.

16 Change to the ProDrive Navigation and there click on 'motor'.

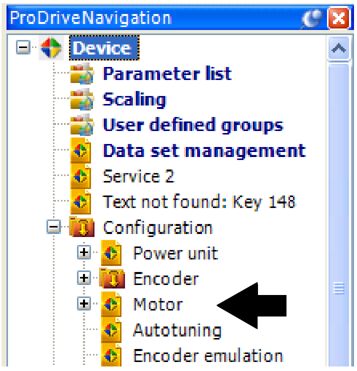


Figure 31: ProDrive: Navigation

Use motor database

17 Click in the motor window on the button 'Motor database'.

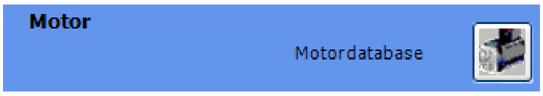


Figure 32: ProDrive: Motor database

18 The following window appears

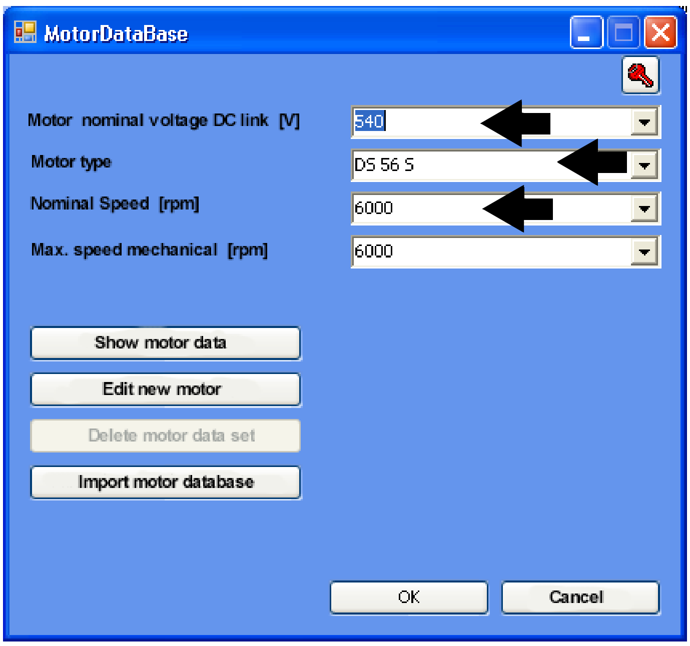


Figure 33: ProDrive: Selection of the motor

19 In this window you enter with:

- the motor nominal voltage : „540 V“
- the motor type: 'DS 56-S'
- the nominal speed: '6000 rev/min'
- the maximum speed is automatically taken over from the value for basic speed.

NOTE

The values for the nominal speed and the maximum speed are the same at synchronous motors and therefore, at choice of nominal speed, are taken over into the maximum speed.

At asynchronous motors you must select both values separately. Software for asynchronous motors: in preparation.

20 Activate button Ok.

With this all data is taken from the motor database over in the accordant parameters and display fields of WinBASS II / ProDrive.

21 Check all values of the motor with the motor data sheets (this is only a purpose of control, if you use the motor database of Baumüller). When you are using a motor of an other manufacturer, you must do this anyway).

NOTE

When you use a motor of an other manufacturer, you can also take his data into the motor database.

Motor data change

Normally, you will find no deviations between the motor data sheet and the automatically from the motor database taken values.

In case, you want to change values, you have got to do the following:

22 Click on the tab 'startpage'. On the start page you enter next to 'enable service operation': Service' and close this input with enter'.

Now you are able to change the so-far write-protected data in the screen menu. If you would like to re-establish the write-protection, then enter with 'off' instead of service'.

23 Click on the ProDrive Navigation of 'motor'.

Check motor data **24** In the motor window and in the sub-window synchronous motor or asynchronous motor all important motor data or motor parameters are displayed.
Check all data.

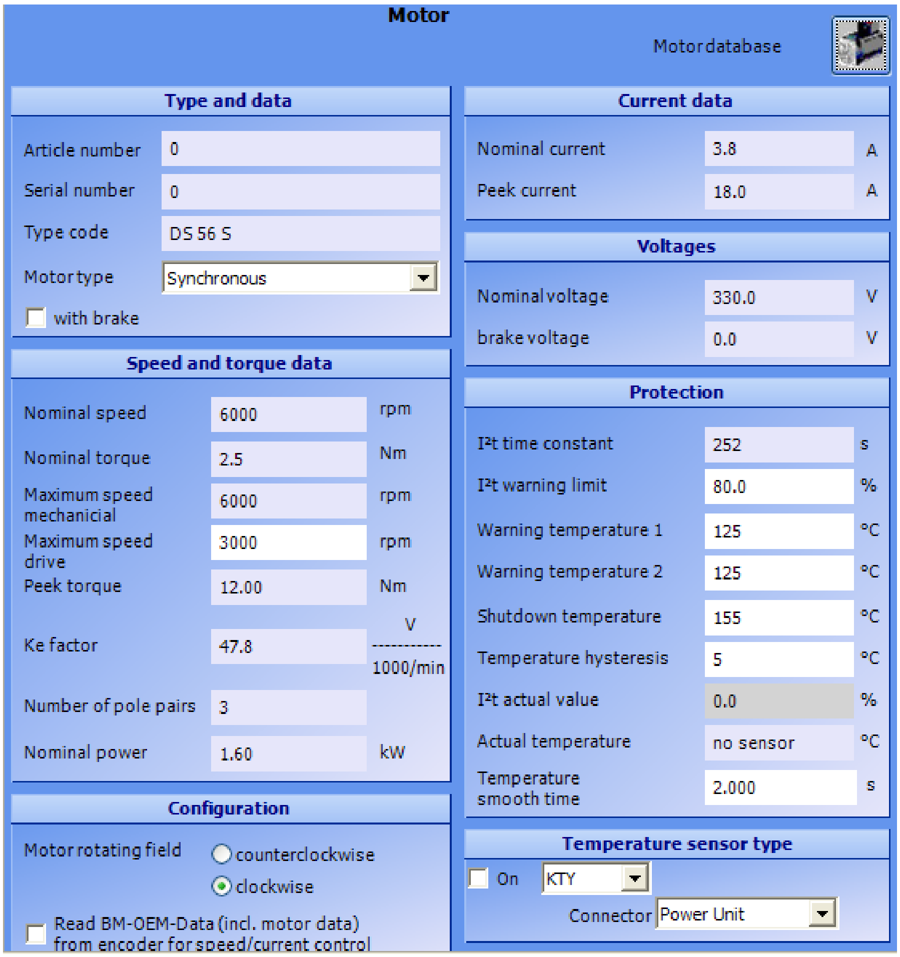


Figure 34: ProDrive: Motor

Use parameter list If you **are not** using the Baumüller motor database, you can enter all motor parameters also with help of the 'parameter list'.

25 Click on the tab parameter list.

26 In the parameter list click on 'configuration motor'.

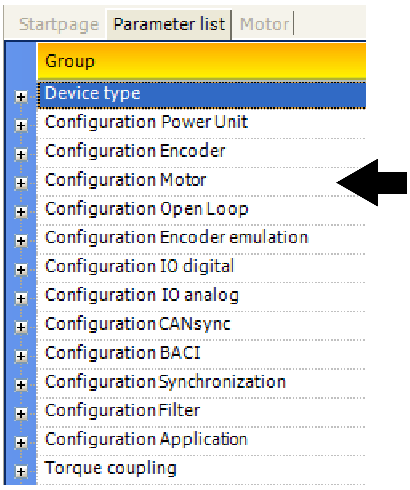


Figure 35: ProDrive: Parameter list

The following motor parameters must be described:

- Maximum speed mech. (P0072 motor maximum speed mechanical)
- Number of pole pairs (P0065 Motor number of pole pairs)
- Rotating field (P0087 Motor rotating field)

Now save the entered data.

27 Click in the icon bar on the icon 'Data set management'.

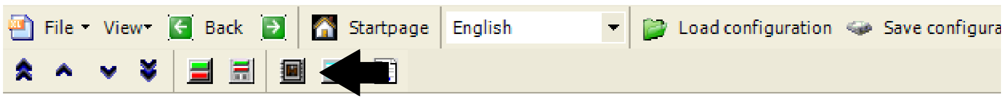


Figure 36: ProDrive: Data set management

28 Click in the data set management on the button 'save all'.

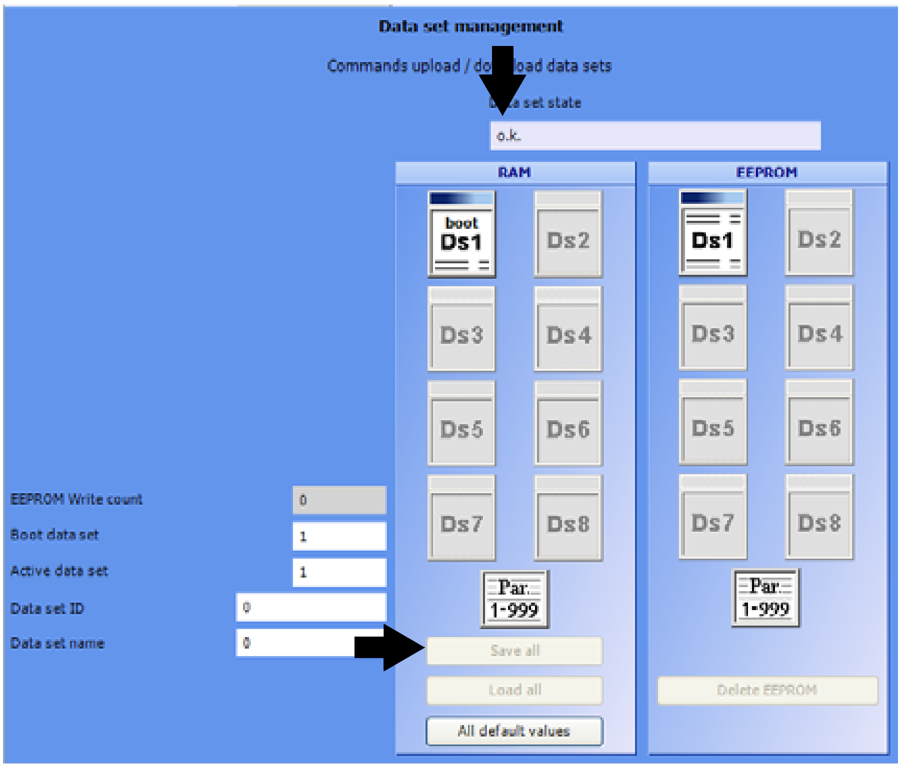


Figure 37: ProDrive: Data set management

29 Wait until next to 'data set status' is shown: 'o.k.'

Thus the data set is saved in the EEPROM.

30 Turn off the voltage supply for the safety relay (if existing).

31 Disconnect the device from the mains- and the control voltage.

32 Turn on the power supply for the safety relay (if a safety relay is existing)

33 Effectuate the power supply to the b maXX®
(supply voltage + control voltage).

By switching on and off you can check, if your settings lead to warnings or errors.

Find notch position

Now the notch position of the motor still has to be found.

34 Go to the ProDrive Navigation and double-click on 'operating mode', then click on 'find notch position'.

35 Click on the icon 'drive manager dialogue'.

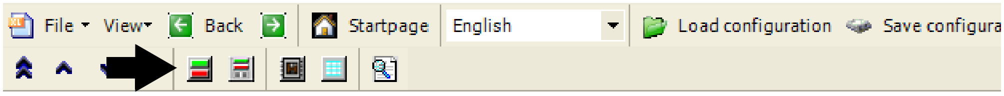


Figure 38: ProDrive: Drive manager dialogue

Additionally the window 'drive manager dialogue' appears.

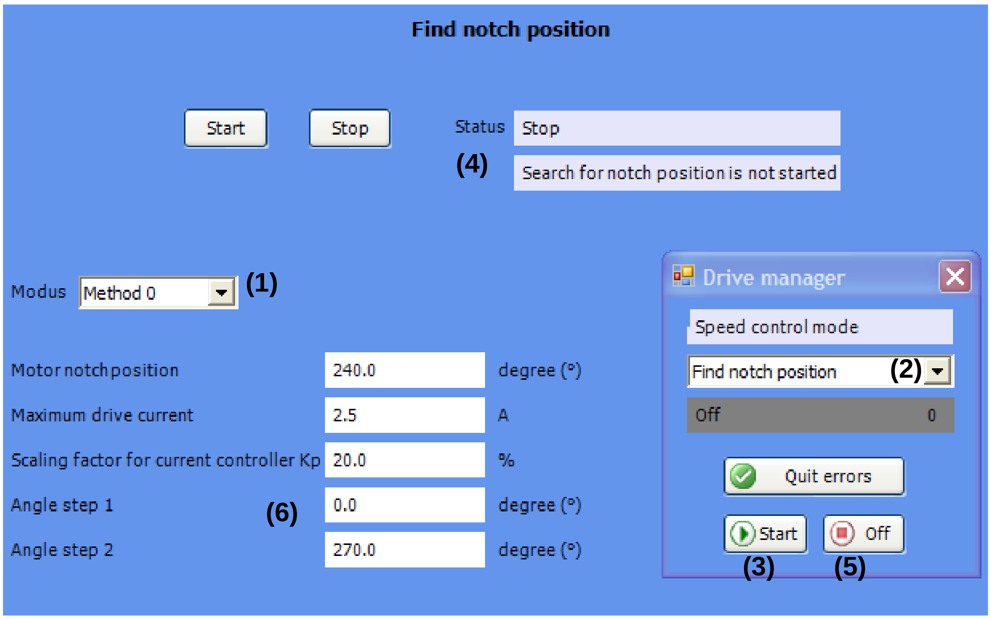
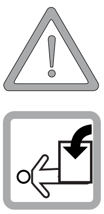


Figure 39: ProDrive: Find notch position: Drive manager

36 Select method 0 for 'mode' (1).

37 Select 'find notch position' in the scroll list (2).



WARNING

The following **may occur**, if you disregard these safety notes:

- serious personal injury • death

The danger is: ***mechanical effects.*** *With a non-free-rotating motor the motor and parts, which are connected to the motor can be damaged/destroyed.*

Assure, that the motor can rotate freely during commissioning.

38 Activate the pulse enable and the quickstop clearance.

39 Click on 'start' (3).

40 Wait until the text appears in this field (4): 'notch position was found'.

41 Then click on „Off" (5).

42 Check if the measured value meets the expected value (6)
(at Baumüller motors: resolver: 330°, sine-cosine 240° ± 5°).

43 Inactivate the pulse enable and quickstop clearance.

With this activity all parameterization workings for an exemplary commissioning are completed. You can now convince yourself from the proper functions, by letting the motor rotate shortly.

First rotating of the motor.

44 Go back to the ProDrive Navigation.

45 Double-click on: 'setpoint generators'.

46 Click on: 'ramp function generator'.

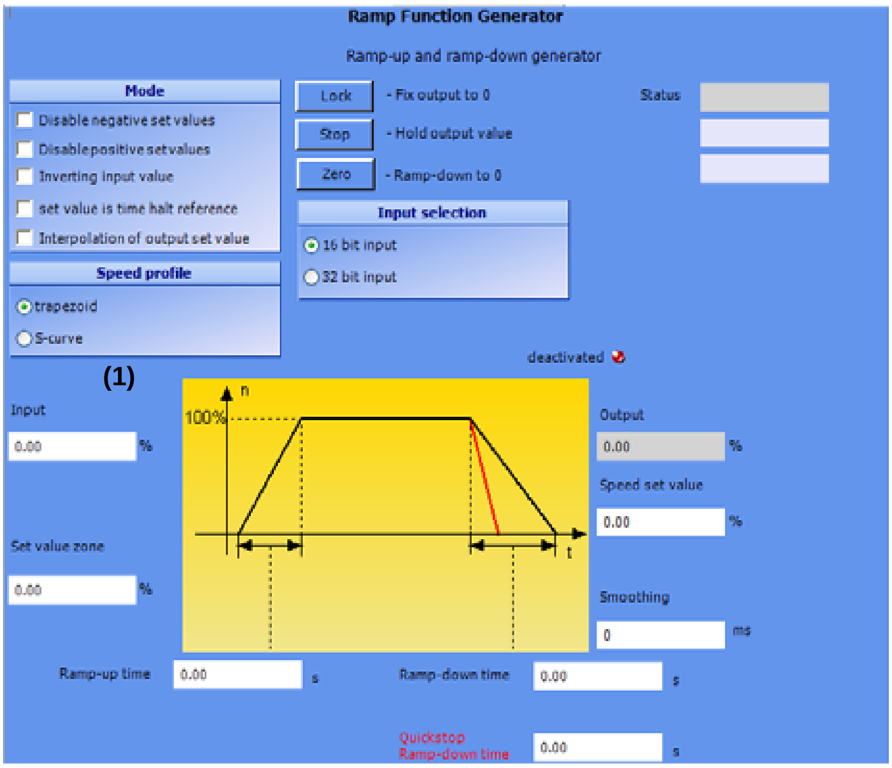


Figure 40: ProDrive: Ramp function generator

47 Enter the values into the following entry fields:

- (Ramp function generator) input (1)

➲ Enter with value ’10’.

48 In case you have shut the window ’drive manager dialogue’: click on the icon ’Drive management’.

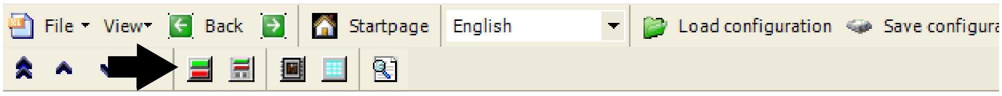


Figure 41: ProDrive: Drive manager dialogue

Additionally the window ’drive manager dialogue’ appears.

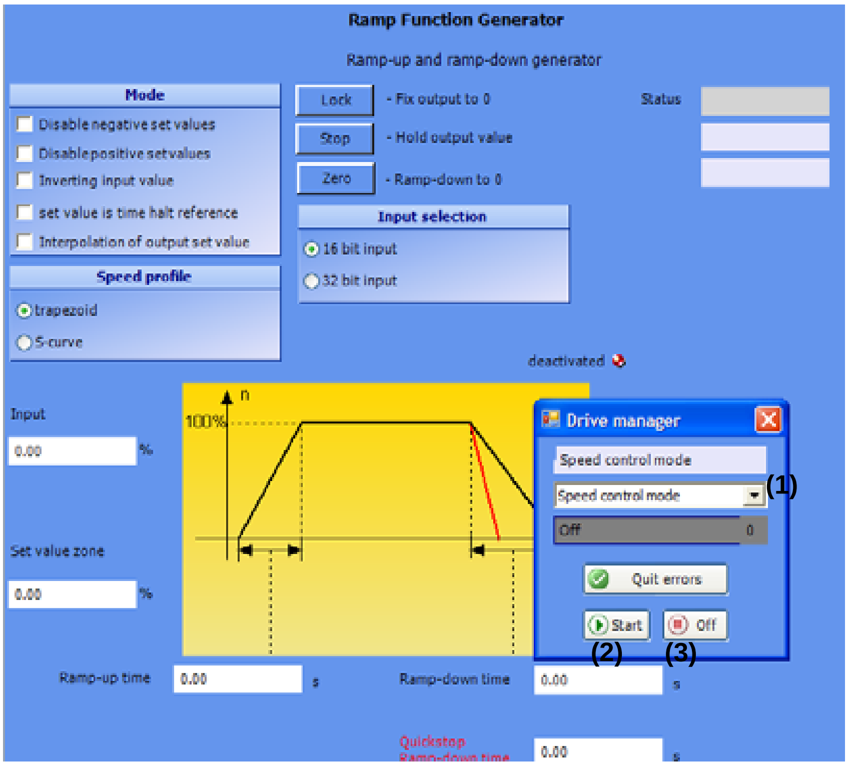


Figure 42: ProDrive: Ramp function generator - Drive manager

49 Select in the drive manager dialogue in the scroll list (1) the operating mode ’speed control’.

50 Activate the pulse enable and the quickstop clearance.

51 Click on the drive manager dialogue menu on the button ’start’ (2)

Now the motor should rotate with 10% of the maximum speed.

52 Click in the drive manager menu on the button ’off’ (3)

Now the motor will stop.

53 Inactivate the pulse enable and quickstop clearance.

Data set save

This data set now should be saved.

54Click in the icon bar on the icon 'data set management'.

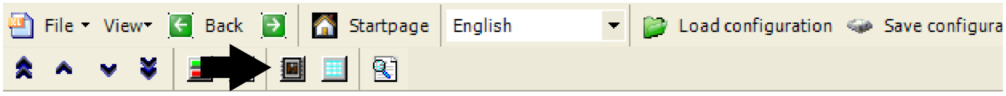


Figure 43: ProDrive: Data set management - icon bar

55Click in the data set management on the button 'save all'.

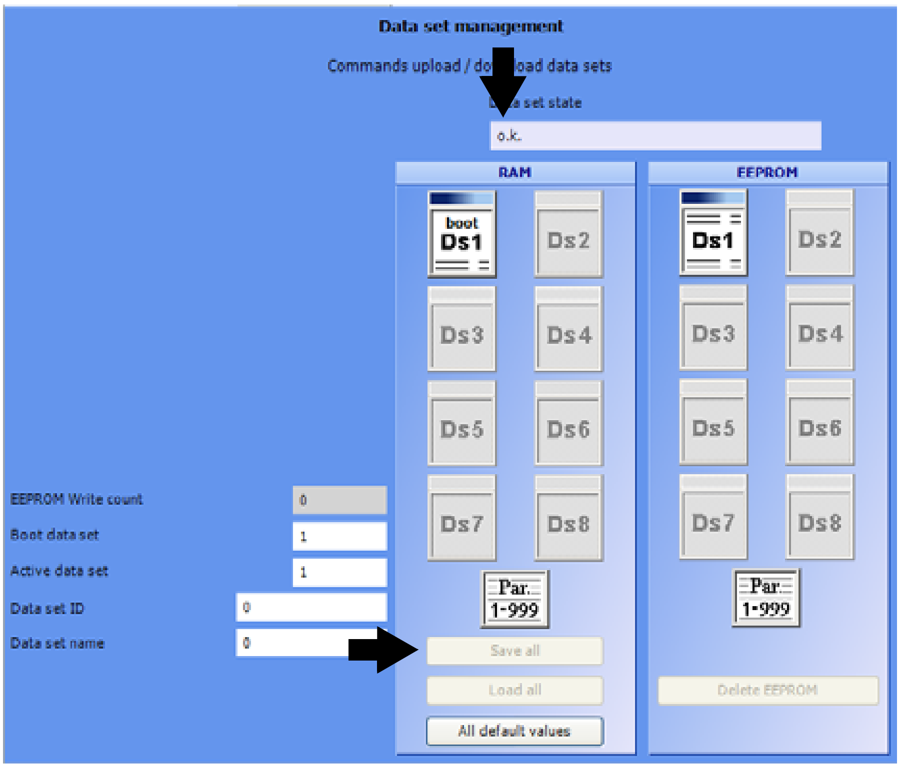


Figure 44: ProDrive: Data set management

56Wait until next to 'data set status' is shown: 'o.k.'

Thus the data set is saved in the EEPROM.

Drive switch off

To complete commissioning we switch off the drive.

57Turn off the voltage supply for the safety relay (if existing).

58Separate over the accordant switching elements the device from the mains- and control voltage.

Thus the commissioning is successfully completed.

7

OPERATION

In this chapter we describe, how the device works during operation and how you handle the device during operation.

7.1 Enable signals

These signals must have a signal level of 24 V (DC) and must be connected to the terminals X3-4 and X3-5 (▷Figure 18◁ on page 32).

Pulse enable During operation the signal 'pulse enable' must constantly be created, so that the device supplies power. Additionally the pulse enable has to be done by the controller. Both signals are AND-linked, so the failure of one of these signals results in impulse inhibit of the power unit.

Quickstop Allow the signal 'quickstop' only then, if you must stop the installation/device as quick as possible.

During operation the signal 'quickstop' must constantly be applied, that the device supplies power.

7.2 Switch-on frequency

The device may not be switched on and off as often as you like. Between two switch-on-sequences there should be a certain time period, in order to protect the devices/fuses.

NOTE

- refer to the specified waiting time, if you switch on the supply voltage for the device again, after you have switched off the device.

Imperative for the devices **BM441X** and **BM442X** is:
between two switch-on-sequences at least **one minute** must have passed, before you switch on the device again. In case you switch off the device beforehand, the durability of the device will be shortened.

Imperative for the devices **BM443X, BM444X, BM445X, BM446X** and **BM447X**is:
No waiting time has to be complied with.

7.3 Display elements - LED

BM44XX - XXX - XX0XX and BM44XX - XXX - XX1XX:

On the front side of the device there are 4 LEDs. The 4 LEDs (H1 to H4) show information about the operating status and are also displayed in WinBASS II / ProDrive.

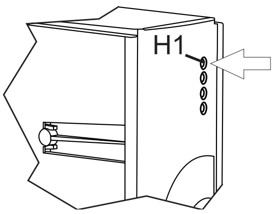
BM44XX - XXX - XX2XX:

On the front side of the device there are six LEDs. Both upper LEDs (UH1 and UH2: 2) are freely programmable. The four lower LEDs (H1 to H4) show information abut the operating status and are also displayed in WinBASS II / ProDrive.

▷Figure 18◁ on page 32 shows the position of the display elements.

7.3.1 Operating condition (H1, H2)

Both of the upper LEDs (H1 and H2) indicate, how the device is working at the time.

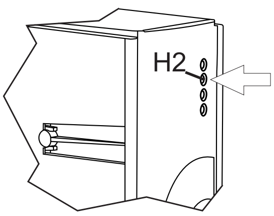


4000_0064_rev01_int.cdr

green: the motor rotates, torque direction 1.
orange: the motor rotates, torque direction 2.

NOTE

The LED H1 cannot be taken as rotational direction indicator. It only shows the torque directions.



4000_0065_rev01_int.cdr

green: Pulse enable. The motor is power supplied by the power unit.

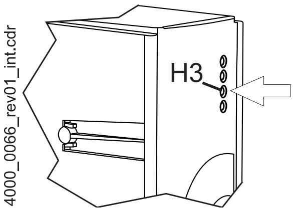
orange: Power ON, the device is ready-to-operate. In case the LED lights up orange colored during operation, maybe the pulse enable is missing or the quickstop was activated.

flashing in turn green/orange:
Pulses for field generation at asynchronous machines enabled.
No release for torque generation.

green with a short orange-colored flashing or
orange with a short green flashing:
Saving procedure active in the EEPROM,
if possible do not switch off device in this phase.

7.3.2 Current limit (H3)

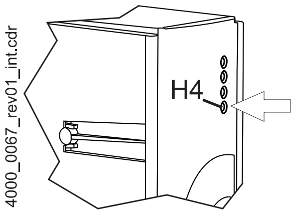
The third LED (H-3) indicates whether the current limit has been reached.



red: adjusted current limit of the controller has been reached.

- Application is adapted or ’no reaction’.

7.3.3 Error (H4)



LED doesn’t light up: the internal monitoring have not found an error.

Red, continuously: Error.

- Remove the error with help of the operating program WinBASS II / ProDrive. Further information is to be found in ▷Error detection and troubleshooting◁ from page 63.

red, flashing: Warning.

- Warnings you are able to see in the drive manager of the operating program WinBASS II / ProDrive. Warnings do not affect operation of the device. Further infor-

7.3.4 Display

The 7-segment-display in normal operation shows the operation status. In case of error the error number is shown.

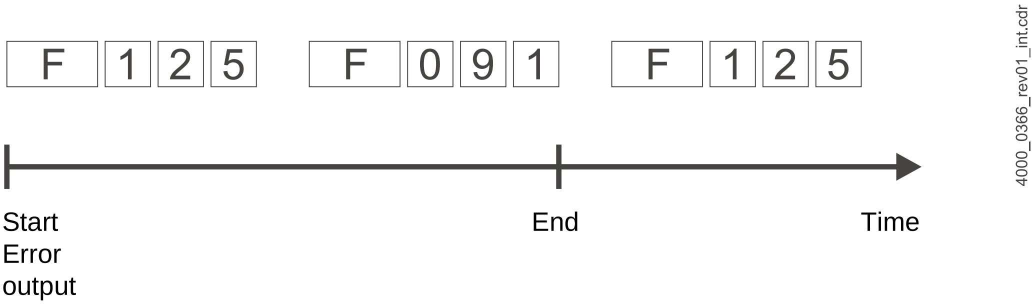
Display	Status	Meaning
0	Not ready-to-start	Initialization phase, pulses inhibited.
1	Inhibit start	Pulses inhibited, initialization completed error-free.
2	Ready-to-start	Pulses inhibited
3	Switched on	Pulses for field generation at asynchronous machines enabled, no torque generation yet.
4	Operation enabled	Pulses enabled, drive function enabled
5	Inhibit operation active	Pulses enabled, braking procedure active
6	Shutdown active	Pulses enabled, braking procedure active
7	Quickstop active	Pulses enabled, braking procedure active
E	Error reaction active	Pulses enabled, braking procedure active
F	Error	Pulses inhibited, error status In the display the error number is shown.

The single drive statuses are specified in chapter device management in parameter manual 5.03039.

In the status error the error numbers are shown in the display. Only the errors are shown, which enable an error reaction in the drive or have enabled one. Errors without reaction and also warnings are not displayed.

First of all the display of error no. starts in showing for about 1.5 s „F“. Then, three digits of the error code are displayed. The individual digits are displayed for about 0.8 s, interrupted by a short break. If there are further errors, they are displayed according to the same principle. The procedure recurs, as soon as all errors have been displayed.

Example: Error 125 and 91 are existing:



If the mains voltage and the 24-volt supply is applied to the device after the electric installation has been completed, then, at least the LEDs should flash and the 7-segment display should show a status.

ERROR DETECTION AND TROUBLE-SHOOTING

8.1 Error detection

In the following we will inform you about the different errors and the consequential error messages. The errors can either be of mechanical or of electrical causes. The devices of the series b maXX® 4400 signal an error status via the lighting up of the lowest red LED H4 on the front side of the cabinet. Additionally the error number is displayed via the 7-segment display on the front side of the cabinet. By the error number the error message can be determined with the help of the error list in this documentation. Furthermore the error message is displayed in the operating software WinBASS II / ProDrive:

- Start the operating program WinBASS II (up to FW 3.09) or ProDrive (from FW 3.07), if it isn't running yet.

The error message signaled with 'error' is to be found in WinBASS II / ProDrive:

- Open a list in the project tree by clicking on the **+** in front of 'management'.
- Select from this list 'Device management'.

NOTE

If you are not able to start the motor, although the red LED H4 isn't lighting up and although the LED H2 is lighting up green, check the parameterization of the b maXX® 4400 with the parameter list in WinBASS II / ProDrive.
Error possibilities are e. g.: torque limit = 0 has been set or notch position is not correct (also see parameter manual b maXX® 4400).

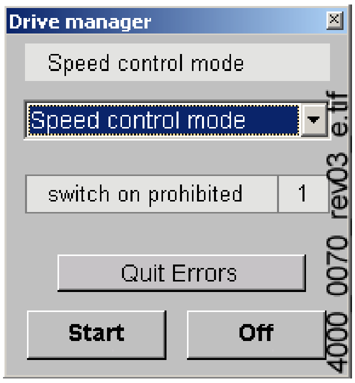
If no LEDs are lighting up on the front side of the device, check the 24V supply.

8.2 Troubleshooting

The error messages are based on the troubleshooting in the b maXX® devices, which also are termed as error lists. If an error appears, the according definite error message is displayed within a short time in WinBASS II / ProDrive in the menu „drive manager', whose meaning you can look up in the error list.

8.2.1 Reset errors

If the red error LED is lighting up, there is at least one error. You can react upon this, by 'Quit' the error in WinBASS II / ProDrive, that means, that you inform the device, that you have noted the error, that you have removed it or that you want to pass over it. Due to error reset all error messages are reset. An individual error reset is not possible. The acceptance causes a resetting of the error, in case the reset was possible due to the error situation.



8.2.2 Error parameters - error messages (error list) - error reactions

In the following you will find all error messages. An (error) message is shown in WinBASS II in the window 'drive manager'. In the list field 'messages' you will find the (abbreviated) error names, at HIPERFACE® errors also the device part, the error number (not at errors according to HIPERFACE® specification) and, separated by a colon, the meaning of this error, e.g. 'MotorError 96: Short-circuit temperature sensor'. At HIPERFACE® errors e.g. 'Encoder 1 communication: Parity error'.

Error processor P0201

Error no.	Meaning	Reaction	Troubleshooting
0	reserved		
1	Watchdog-Error	IS	Execute a restart of b maXX® 4400
2	Incorrect or unexpected interrupt has occurred	IS	Execute a restart of b maXX® 4400
3	NMI interrupt/bus error	IS	Execute a restart of b maXX® 4400
4 to 15	reserved not assigned = 0		

Error operating system P0202

Error no.	Meaning	Reaction	Troubleshooting
16	Errors while booting	IS	Execute a restart of b maXX® 4400
17	Software error:	IS	Execute a restart of b maXX® 4400
18	Time slot configuration	IS	Execute a restart of b maXX® 4400
19	Time slot - time error	IS	Execute a restart of b maXX® 4400; Change configuration of the time slice operation system
20	1 = No free memory	IS	Execute a restart of b maXX® 4400
21	Invalid error code	IS	Execute a restart of b maXX® 4400
22	Invalid warning code	IS	Execute a restart of b maXX® 4400
23	False FPGA version	IS	Contact Baumüller
24	Two position controller: error while writing to target parameter	IS	Ensure that the target parameter is writeable in these operating conditions and the value to write is in the valid value margin.
25	Checksum error flash system data	IS	The system data in the controller flash is invalid and was replaced by default values. These default values are written to the flash by switching off and on.
26	Power unit is not supported	IS	Use an appropriate power unit or contact Baumüller
27 to 31	reserved Not assigned = 0		

Error Proprog communicationP203

Error no.	Meaning	Reaction	Troubleshooting
32	Timeout protocol	adjustable	Execute a restart of b maXX® 4400
33	Protocol structure	adjustable	Execute a restart of b maXX® 4400
34	Wrong module type	adjustable	Contact Baumüller
35	Too many data in the telegram	adjustable	Contact Baumüller
36	Not enough data in telegram	adjustable	Contact Baumüller
37	Invalid operand	adjustable	Contact Baumüller
38	Invalid memory type	adjustable	Test RAM
39	Invalid operand address	adjustable	Enter a valid address

Error no.	Meaning	Reaction	Troubleshooting
40	Value less than the minimum value	adjustable	Check data set and adjust
41	Value greater than the maximum value	adjustable	Check data set and adjust
42	Parameter is write-protected	adjustable	Check data set and adjust
43	Parameters in this operation status not writable	adjustable	Check operating condition and parameterization
44	Invalid parameter value	adjustable	Enter with a valid value
45	Communication error WinBASS controller	adjustable	Establish connection again or set parameter P0290 to 0.
46 to 47	reserved not assigned = 0		

Error in function or option modules P0204

Error no.	Meaning	Reaction	Troubleshooting
48	Error in Function module A	Level 3 error	see ▷Error Function module A to E P0240 to P0244◁ on page 82 (= 3. level)
49	Error in Function module B	Level 3 error	see ▷Error Function module A to E P0240 to P0244◁ on page 82 (= 3. level)
50	Error in Function module C	Level 3 error	see ▷Error Function module A to E P0240 to P0244◁ on page 82 (= 3. level)
51	Error in Function module D	Level 3 error	see ▷Error Function module A to E P0240 to P0244◁ on page 82 (= 3. level)
52	Error in Function module E	Level 3 error	see ▷Error Function module A to E P0240 to P0244◁ on page 82 (= 3. level)
53	Error in Option module G	Level 3 error	see ▷Error option module G to M P0245 to P0250◁ on page 83 (= 3. level)
54	Error in Option module H	Level 3 error	see ▷Error option module G to M P0245 to P0250◁ on page 83 (= 3. level)
55	Error in Option module J	Level 3 error	see ▷Error option module G to M P0245 to P0250◁ on page 83 (= 3. level)
56	Error in Option module K	Level 3 error	see ▷Error option module G to M P0245 to P0250◁ on page 83 (= 3. level)
57	Error in Option module L	Level 3 error	see ▷Error option module G to M P0245 to P0250◁ on page 83 (= 3. level)
58	Error in Option module M	Level 3 error	see ▷Error option module G to M P0245 to P0250◁ on page 83 (= 3. level)

Error no.	Meaning	Reaction	Troubleshooting
59	Timeout when waiting for the RST signal of the slaves	IS	Execute a restart
60	CRC error in SPI transmission module ▸ controller	adjustable	Error indicates that there are high EMC interferences; please reduce these. Contact Baumüller.
61	CRC error in SPI transmission Controller ▸ module	adjustable	Error indicates high EMC interferences; please reduce these. Contact Baumüller.
62 to 63	reserved not assigned = 0		

Error power Supply P0205

Error no.	Meaning	Reaction	Troubleshooting
64	Mains failure	adjustable	Restore the connection to the power supply
65	Phase failure	IS	Check if all phases are correctly connected and voltage-carrying
66	Mains undervoltage	IS	Assure the compliance with the mains specifications (see techn. data)
67	Mains overvoltage	IS	Assure the compliance with the mains specifications (see techn. data)
68	Undervoltage 24V	IS	Assure the compliance with the mains specifications (see techn. data)
68 to 79	reserved not assigned = 0		
79	Mains monitor collected errors	Adjustable	See P0236

Error power unit P0206

Error no.	Meaning	Reaction	Troubleshooting
80	Communication error after HIPERFACE ® specification	IS	see ▹**Error power unit - serial interface P0233**◃ **on page 77** **(= 3. level)**
81	Heatsink temperature	IS	Let the device cool down and/or reduce the load
82	U DC link overvoltage	IS	Reduce the DC link voltage
83	Overcurrent	IS	Reduce the load and check the current controller settings as well as the cabling and the motor

Error no.	Meaning	Reaction	Troubleshooting
84	Ground current	IS	Check the installation of the device (from b maXX 443x) and check the motor for ground fault
85	Device internal overtemperature	IS	Make sure of a sufficient ventilation in the device
86	Cable break temperature sensor	IS	Pass on the device for repair
87	Safety relay off (or defect)	IS	Check the safety relay, exchange it for a new
88	Bridge short-circuit	IS	Carry out a restart. At recurring error messages renew the controller cartridge
89	Power unit not ready-to-operate	IS	Complete the operational readiness to the power unit
90	Phase failure	IS	Check if all phases are correctly connected and voltage-carrying
91	Mains failure	IS	Restore the mains supply
92	Mains undervoltage	IS	Assure the compliance with the mains specification (see technical data)
93	Mains overvoltage	IS	Assure the compliance with the mains specification (see technical data)
94	Undervoltage U DC link	IS	Check the power connections
95	reserved not assigned = 0		

Error motor P0207

Error no.	Meaning	Reaction	Troubleshooting
96	Short-circuit temperature sensor (Tm <= -30 °C)	adjustable	Remove the short-circuit in the temperature sensor
97	Temperature sensor - motor not connected (Tm > +300 °C)	adjustable	Remove open circuit in the temperature sensor circuit
98	Motor overtemperature	IS	Remove motor over temperature by cooling down and/or reducing the load
99	Error I^2t > 100%	IS	Leave drive in inhibited status until I^2t-actual value decreases under 100%
100	Power unit maximal current > motor maximal current	adjustable	Set power unit maximal current P1241 lower than motor maximal current P0069
101	reserved Not assigned = 0		
102	Collective error finding notch position	IS	see ▷Error finding notch position P0237◁ on page 133 (= 3. level)
103 to 111	reserved Not assigned = 0		

Error Encoder1 P0208

Error no.	Meaning	Reaction	Troubleshooting
112	Communication error (HIPERFACE®-Specification)	IS	see encoder 1 (HIPERFACE® P0234 (= 3rd level)
113	reserved		
114	Error at overwriting of encoder position information	IS	Execute the command again. If the error occurs again, contact Baumüller Nürnberg GmbH.
115	Cable break encoder 1	IS	Remove the cable break in the encoder cable of encoder 1 or check the assignment of the encoder cable
116	Overspeed encoder 1	IS	Check the allowable rotational speed for encoder 1
117	Amplitude limit exceeded	IS	Use another encoder
118	Encoder type unknown	IS	Check if the correct encoder is connected or use another encoder
119	Invalid data field for motor data	IS	Use another encoder
120	Incorrect motor data	IS	Use another encoder
121	Saving error of motor data	IS	Use another encoder
122	Motor data write-protected. (is not valid for BM motors)	IS	Use another encoder
123	Field angle error	IS	Check the shielding of the encoder cable
124	Encoder without temperature measuring	adjustable	Use an encoder module with temperature measuring
125	Memory capacity in the encoder for electronic type plate too small	adjustable	Use another encoder with a greater memory
126 to 127	reserved not assigned = 0		

Error encoder 2 P0209

Error no.	Meaning	Reaction	Troubleshooting
128	Communication error (HIPERFACE®-Specification)	IS	see encoder 2 (HIPERFACE®) P0235 **(= 3rd level)**
129	reserved		
130	Error at overwriting of Encoder position information	IS	Execute the command again. If the error occurs again, contact Baumüller Nürnberg GmbH.
131	Cable break encoder 2	IS	Remove the cable break in the encoder cable of encoder 1 or check the assignment of the encoder cable
132	Overspeed encoder 2	IS	Check the allowable rotational speed for encoder 2
133	Amplitude limit exceeded	IS	Use another encoder
134	Encoder type unknown	IS	Check if the correct encoder is connected or use another encoder
135	Invalid data field for motor data	IS	Use another encoder
136	Incorrect motor data	IS	Use another encoder
137	Saving error of motor data	IS	Use another encoder
138	Motor data write-protected. (is not valid for BM motors)	IS	Use another encoder
139	Field angle error	IS	Check the shielding of the encoder cable
140	Encoder without temperature measuring	adjustable	Use an encoder module with temperature measuring
141	Memory capacity in the encoder for electronic type plate too small	adjustable	Use another encoder with a greater memory
142 to 143	reserved not assigned = 0		

Error encoder manager P0210

Error no.	Meaning	Reaction	Troubleshooting
144	Absolute position of encoder 1 unknown	IS	Use another encoder
145	Absolute position of encoder 2 unknown	IS	Use another encoder
146	Encoder module 1 is missing	IS	Check, if the right encoder is connected to module position A
147	Encoder module 2 is missing	IS	Check, if the right encoder is connected to module position B
148	Encoder module for measured value storage is missing	IS	Install the encoder module
149	At resolver no measured value storage possible	IS	Use a SinCos- or incremental encoder
150	Triggering not possible, because no incremental encoder	IS	Use for this option an incremental incremental encoder
151	Digital I/o-module is missing	IS	Install the digital I/O-Module
152	Incremental encoder emulation module is necessary and is missing	IS	Install the incremental encoder-emulation module
153	Encoder module 1 is necessary for incremental encoder emulation and is missing	IS	Install the encoder module to slot A
154	Encoder module 2 is necessary for incremental encoder emulation and is missing	IS	Install encoder module to slot B
155	Initialization error of the incremental encoder-emulation module	IS	Restart system
156	Incremental encoder-emulation module (HW) signals error	IS	Restart system, if error message recur change the module
157	Error incremental encoder emulation module	IS	Use for this option an incremental encoder
158	SSI encoder emulation module is missing	IS	Install the SSI-encoder-emulation module
159	Error in setpoint source encoder 1 or 2	IS	See encoder error message

Error drive manager P0211

Error no.	Meaning	Reaction	Troubleshooting
160	Timeout communication	adjustable	Remove the timeout of the Proprog communication
161	Timeout BACI	adjustable	Remove the timeout of the BACI communication option module
162	Timeout cyclic communication	adjustable	Remove the timeout of the cyclic communication:
163	Timeout required data	adjustable	Remove the timeout of the required data communication
164	Field bus error	adjustable	Check the field bus communication
165	Controller not synchronous to external signal	adjustable	set the Sync-Offset and / or Sync-tolerance
166	Error at brake control	IS	Check the wiring and the function of the brake
167	No release of holding brake when starting the drive	IS	Check the holding brake
168	No closing of holding brake at stopping of drive	adjustable	Check the holding brake
169	Error holding brake status (cyclic monitoring)	adjustable	Check the holding brake
170	Error holding brake lining	adjustable	Check the holding brake
171	Initialize holding brake error	IS	Check, if there is a DIO module, if it is in the correct position and if it is correctly parameterized (also see P0883)
172	Error holding brake: holding torque not reached	IS	Ensure that the torque limits are not set too small |P1402| < Min (|P1036|, |P1037|, |P1038|)
173 to 175	reserved not assigned = 0		

Error data record manager P0212

Error no.	Meaning	Reaction	Troubleshooting
176	EEPROM copy error	adjustable	Copy the data set once more
177	Write timeout EEPROM	adjustable	The data in the EEPROM are invalid, please safe all data records
178	Checksum error EEPROM	IS	EEPROM faulty or described faulty
179	No boot data set	IS	The data in the EEPROM are invalid, please safe all data records
180	Incompatible software	IS	The data in the EEPROM are invalid, please safe all data records
181	There is no data set	adjustable	The data in the EEPROM are invalid, please safe all data records
182	Checksum error im PSI module	adjustable	PSI EEPROM faulty or described faulty
183	PSI is reset	adjustable	Please save all data records
184	PSI data invalid	adjustable	The data in the PSI are invalid, please save all data records
185	Autotuning tables invalid.	adjustable	Restart autotuning
186	A/D correction table invalid	adjustable	Replace the controller cartridge
187	EEPROM is reset	IS	The data in the EEPROM are invalid, please safe all data records
188 to 191	reserved not assigned = 0		

Error position controller P0213

Error no.	Meaning	Reaction	Troubleshooting
192	Position deviation dynamic	adjustable	Remove the dynamical position deviation error
193	Position deviation static	adjustable	Remove the statical position deviation error
194	Encoder 1 is used for position control, but is inactive. This error is also shown, if the faulty positioning is in one of the inactive data records.	IS	Activate encoder 1
195	Encoder 2 is used for position control, but is inactive. This error is also shown, if the faulty positioning is in one of the inactive data records.	IS	Activate encoder 2
196	Software limit switch 1 exceeded	adjustable	Check the target position with the by the limit switch enabled travelling range
197	Software limit switch 2 exceeded	adjustable	Check the target position with the by the limit switch enabled travelling range
198	Hardware limit switch 1 exceeded	adjustable	Check the target position with the by the limit switch enabled travelling range
199	Hardware limit switch 2 exceeded	adjustable	Check the target position with the by the limit switch enabled travelling range
200	Homing necessary and not yet executed	adjustable	Execute homing
201	Setpoint in mode Set-of-setpoints didn't arrive in time	adjustable	Assure, that positioning data and handshake take place in time (also see parameter manual)
202	Target position ≥ Modulo position	Adjustable	Minimize target position or adjust Modulo position P1239
203	Spindle positioning: Error while initialization of the trigger	Adjustable	Used encoder without triggersignal (zero pulse) or incorrect adjustment in P1425 spindle positioning mode
204	Spindle positioning: Timeout at trigger signal	Adjustable	Check encoder for zero pulse; check encoder connector; check zero pulse signal by means of the toggle bit (encoder 1/2 status bit 8)
205	Error occured while executing homing	Adjustable	Check the function of the reference switch and the hardware limit switch; adjust the encoder input selection where necessary; select only supported homing methods
206 to 207	not assigned = 0		

Error speed controller P0214

Error no.	Meaning	Reaction	Troubleshooting
208	Drive blocked	IS	Remove the blockade of the drive
209	Encoder 1 is parameterized as encoder for the motor control, but the evaluation is not activated. This error is also shown, if the faulty positioning is in one of the inactive data records.	IS	You have got to either activate the encoder in the encoder 1 (mode P0150) or you set the encoder 2 as encoder for the position control (parameter P1030)
210	Encoder 2 is parameterized as encoder for the motor control, but the evaluation is not activated. This error is also shown, if the faulty positioning is in one of the inactive data records.	IS	You have got to either activate the encoder in the encoder 2 (mode P0160) or you set the encoder 1 as encoder for the position control (parameter P1030)
211	Overspeed Open loop	IS	Check parameterization and reduce speed
212 to 223	not assigned = 0		

Error free control section P0215

Error no.	Meaning	Reaction	Troubleshooting
224 to 234	Not assigned = 0	adjustable	
235	Torque coupling: General error in the master	adjustable	
236	Torque coupling: Operating mode in the slave is not speed control	IS	
237	C onfiguration error reaction return motion is invalid	IS	
238	Return motion destination was not rea-ched	adjustable	
239	Application error (enabled by P0302 bit 1)	adjustable	

Error CANsync P0216

Error no.	Meaning	Reaction	Troubleshooting
240 to 245	not assigned = 0	no reaction	Check the parameterization of the DC-parameters, see parameter manual
246	Invalid DIP switch settings	according to setting	Correct the wrong setting of the DIP switch on the module
247 to 255	not assigned = 0		

3. Level **Error power unit - serial interface** P0233

(communication error to the power unit)

Error code	Meaning	Troubleshooting
6	Data overflow	Error indicates high EMC problems; please reduce these. Contact Baumüller
7	Bit frame error	Error indicates high EMC problems; please reduce these. Contact Baumüller
8	Invalid command state	Contact Baumüller
9	Parity error	Restart of b maXX®
10	Checksum error	Error indicates high EMC problems; please reduce these. Contact Baumüller
11	Unknown error code	Error indicates high EMC problems; please reduce these. Contact Baumüller
12	Data number error	Error indicates high EMC problems; please reduce these. Contact Baumüller
13	Invalid argument	Error indicates high EMC problems; please reduce these. Contact Baumüller
14	Data field is write protected	Error indicates high EMC problems; please reduce these. Contact Baumüller
15	Invalid access code	Error indicates high EMC problems; please reduce these. Contact Baumüller
16	Data field is not changeable in its size	Error indicates high EMC problems; please reduce these. Contact Baumüller
17	Word address outside of data field	Error indicates high EMC problems; please reduce these. Contact Baumüller
18	Data field is nonexistent	Error indicates high EMC problems; please reduce these. Contact Baumüller

Error code	Meaning	Troubleshooting
36	Wrong data checksum	Error indicates high EMC problems; please reduce these. Contact Baumüller
37	No response	Error indicates high EMC problems; please reduce these. Contact Baumüller
66	Invalid response	Restart of b maXX®

2 encoders can be connected to a b maXX® 4400 at most. Accordingly maximum errors can appear in function module 1 and function module 2. The term ’encoder 1’ or ’encoder 2’ in the column ’device part’ stands for one of the five currently existing encoder module types.

Error encoder 1 - serial interface P0234

Error encoder 2 - serial interface P0235

(communication error after HIPERFACE® specification in the encoder 1 /encoder 2)

Error code	Meaning	Troubleshooting
1	Analog signals outside specification	Check the encoder cable and if the encoder has been connected correctly.
2	Error in internal angle offset	Check the encoder cable and if the encoder has been connected correctly.
3	Data field partitioning table destroyed	Check the encoder cable and if the encoder has been connected correctly.
4	Analog limit values not available	Check the encoder cable and if the encoder has been connected correctly.
5	Internal I^2C-bus not operative	Check the encoder cable and if the encoder has been connected correctly.
6	Internal checksum error	Check the encoder cable and if the encoder has been connected correctly.
7	Internal watchdog error - encoder reset	Check the encoder cable and if the encoder has been connected correctly.
8	Overflow of the counter	Check the encoder cable and if the encoder has been connected correctly.
9	Parity error	Check the encoder cable and if the encoder has been connected correctly.
10	Checksum error	Check the encoder cable and if the encoder has been connected correctly.
11	Unknown error code	Check the encoder cable and if the encoder has been connected correctly.

Error code	Meaning	Troubleshooting
12	Data number error	Check the encoder cable and if the encoder has been connected correctly.
13	Invalid argument	Check the encoder cable and if the encoder has been connected correctly.
14	Data field is write protected	Check the encoder cable and if the encoder has been connected correctly.
15	Invalid access code	Check the encoder cable and if the encoder has been connected correctly.
16	Data field is not changeable in its size	Check the encoder cable and if the encoder has been connected correctly.
17	Word address outside of data field	Check the encoder cable and if the encoder has been connected correctly.
18	Data field is nonexistent	Check the encoder cable and if the encoder has been connected correctly.
19 to 27	reserved	
28	Absolute monitoring of the analog signals	Check the encoder cable and if the encoder has been connected correctly.
29	Transmission current critical	Check the encoder cable and if the encoder has been connected correctly.
30	Encoder temperature critical	Check the motor temperature
31	Rotational speed too high - no formation of positioning possible	Check the encoder cable and if the encoder has been connected correctly.
32	Position singleturn unreliable	Internal encoder error Contact Baumüller
33	Multiturn position error	Internal encoder error Contact Baumüller
34	Multiturn position error	Internal encoder error Contact Baumüller
35	Multiturn position error	Internal encoder error Contact Baumüller
36	Invalid power unit data checksum	Check the encoder cable and if the encoder has been connected correctly.
37	No response from encoder	Check the encoder cable and if the encoder has been connected correctly.
38	Encoder address unknown	Check the encoder cable and if the encoder has been connected correctly.
39	Error reading the absolute angle position	Check the encoder cable and if the encoder has been connected correctly.

Error code	Meaning	Troubleshooting
40	Invalid checksum of received data	Check the encoder cable and if the encoder has been connected correctly.
41	Unknown encoder type	Check the encoder cable and if the encoder has been connected correctly.
42 to 63	reserved	
64	No response of HIPERFACE® encoder	Check the encoder cable and if the encoder has been connected correctly.
65	No response from EnDat encoder	Check the encoder cable and if the encoder has been connected correctly.
66	Useless response to encoder command	Check the encoder cable and if the encoder has been connected correctly.
67	Type of encoder is not applicable	Use an other type of encoder
68 to 79	reserved	
80	CRC has determined an error	Check the encoder cable and if the encoder has been connected correctly.
81	Invalid command	Check the encoder cable and if the encoder has been connected correctly.
82	Error in response telegram	Check the encoder cable and if the encoder has been connected correctly.
83	Alarm bit is set	Restart the system
84	Memory is occupied	Check the encoder cable and if the encoder has been connected correctly.
85	Incorrect data checksum	Check the encoder cable and if the encoder has been connected correctly.
86	Motor data length and/or data version of encoder and controller firmware are not identical	Check the encoder cable and if the encoder has been connected correctly.
87	No EnDat interface	Check the encoder cable and if the encoder has been connected correctly.
88	Exceeding of transmission format which is able to be evaluated	Use another length measuring system type
89	Exceeding of the evaluable measuring step length	Use another length measuring system type
90	Signal period length < measuring step length	Use another length measuring system type
91	EnDat 2.2: Error during initialization the master module	

Error code	Meaning	Troubleshooting
92	EnDat 2.2: Timeout during measuring the signal propagation time	
93	EnDat 2.2: Error - propagation time compensation is switched off	
94	EnDat 2.2:Type of encoder does not support EnDat2.2 (introduction set, power supply, clock frequency)	
95	EnDat 2.2: No RM-Bit is set, encoder absolute position is not referenced	
96	Error lighting	Connect encoder
97	Error signal amplitude	Connect encoder
98	Error position value	Connect encoder
99	Error overvoltage	Exchange the encoder module
100	Error undervoltage	Exchange the encoder module
101	Error overcurrent	Exchange the encoder module
102	Error battery	Connect encoder
103 to 111	reserved	
112	Position error detected during multiple request	
113	Error triggered by additional info 1	Fehler durch Zusatzinfo 1 ausgelöst
114	Error triggered by additional info 2	Fehler durch Zusatzinfo 2 ausgelöst
115	Error triggered by additional info 3	Fehler durch Zusatzinfo 3 ausgelöst
116	Error triggered by additional info 4	Fehler durch Zusatzinfo 4 ausgelöst
117	Error triggered by additional info 5	Fehler durch Zusatzinfo 5 ausgelöst
118	Error triggered by additional info 6	Fehler durch Zusatzinfo 6 ausgelöst
119	Error triggered by additional info 7	Fehler durch Zusatzinfo 7 ausgelöst

Error Function module A to E P0240 to P0244

Level 3 error no.	Meaning	Reaction	Troubleshooting
0	Reserved error		
1	Module not detected	adjustable	Check if the correct module is located at the correct slot
2	Module not permitted at this position	adjustable	Check if the correct module is located at the correct slot
3	24 V missing or output short-circuited	adjustable	Check the wiring of the digital outputs
4	Wrong target parameter value by digital input	adjustable	Check the parametrization of the input channel
5	Direct PLC-I/O access for this module not permitted	adjustable	Do not select the module
6	Reserved error		
7	Module not allowed in controller	IS	Remove the module
8 to 15	Reserved error		

Error option module G to M P0245 to P0250

Sub-error no.	Meaning	Reaction	Troubleshooting
4096	Wrong parameter no. at setpoint parameter 1	adjustable	Check the according setpoint parameter
4097	Wrong parameter no. at setpoint parameter 2	adjustable	Check the according setpoint parameter
4098	Wrong parameter no. at setpoint parameter 3	adjustable	Check the according setpoint parameter
4099	Wrong parameter no. at setpoint parameter 4	adjustable	Check the according setpoint parameter
4100	Wrong parameter no. at setpoint parameter 5	adjustable	Check the according setpoint parameter
4101	Wrong parameter no. at setpoint parameter 6	adjustable	Check the according setpoint parameter
4102	Wrong parameter no. at setpoint parameter 7	adjustable	Check the according setpoint parameter
4103	Wrong parameter no. at setpoint parameter 8	adjustable	Check the according setpoint parameter
4104	Wrong parameter no. at setpoint parameter 9	adjustable	Check the according setpoint parameter
4105	Wrong parameter no. at setpoint parameter 10	adjustable	Check the according setpoint parameter
4106	Wrong parameter no. at setpoint parameter 11	adjustable	Check the according setpoint parameter
4107	Wrong parameter no. at setpoint parameter 12	adjustable	Check the according setpoint parameter
4108	Wrong parameter no. at setpoint parameter 13	adjustable	Check the according setpoint parameter
4109	Wrong parameter no. at setpoint parameter 14	adjustable	Check the according setpoint parameter
4110	Wrong parameter no. at setpoint parameter 15	adjustable	Check the according setpoint parameter
4111	Wrong parameter no. at setpoint parameter 16	adjustable	Check the according setpoint parameter
4112	Wrong parameter no. at actual value parameter 1	adjustable	Check the according actual value parameter
4113	Wrong parameter no. at actual value parameter 2	adjustable	Check the according actual value parameter

Sub-error no.	Meaning	Reaction	Troubleshooting
4114	Wrong parameter no. at actual value parameter 3	adjustable	Check the according actual value parameter
4115	Wrong parameter no. at actual value parameter 4	adjustable	Check the according actual value parameter
4116	Wrong parameter no. at actual value parameter 5	adjustable	Check the according actual value parameter
4117	Wrong parameter no. at actual value parameter 6	adjustable	Check the according actual value parameter
4118	Wrong parameter no. at actual value parameter 7	adjustable	Check the according actual value parameter
4119	Wrong parameter no. at actual value parameter 8	adjustable	Check the according actual value parameter
4120	Wrong parameter no. at actual value parameter 9	adjustable	Check the according actual value parameter
4121	Wrong parameter no. at actual value parameter 10	adjustable	Check the according actual value parameter
4122	Wrong parameter no. at actual value parameter 11	adjustable	Check the according actual value parameter
4123	Wrong parameter no. at actual value parameter 12	adjustable	Check the according actual value parameter
4124	Wrong parameter no. at actual value parameter 13	adjustable	Check the according actual value parameter
4125	Wrong parameter no. at actual value parameter 14	adjustable	Check the according actual value parameter
4126	Wrong parameter no. at actual value parameter 15	adjustable	Check the according actual value parameter
4127	Wrong parameter no. at actual value parameter 16	adjustable	Check the according actual value parameter
4128	Invalid value at setpoint parameter no. 1	adjustable	Make sure that you have got correct values within the permitted value range.
4129	Invalid value at setpoint parameter no. 2	adjustable	Make sure that you have got correct values within the permitted value range.
4130	Invalid value at setpoint parameter no. 3	adjustable	Make sure that you have got correct values within the permitted value range.
4131	Invalid value at setpoint parameter no. 4	adjustable	Make sure that you have got correct values within the permitted value range.
4132	Invalid value at setpoint parameter no. 5	adjustable	Make sure that you have got correct values within the permitted value range.

Sub-error no.	Meaning	Reaction	Troubleshooting
4133	Invalid value at setpoint parameter no. 6	adjustable	Make sure that you have got correct values within the permitted value range.
4134	Invalid value at setpoint parameter no. 7	adjustable	Make sure that you have got correct values within the permitted value range.
4135	Invalid value at setpoint parameter no. 8	adjustable	Make sure that you have got correct values within the permitted value range.
4136	Invalid value at setpoint parameter no. 9	adjustable	Make sure that you have got correct values within the permitted value range.
4137	Invalid value at setpoint parameter no. 10	adjustable	Make sure that you have got correct values within the permitted value range.
4138	Invalid value at setpoint parameter no. 11	adjustable	Make sure that you have got correct values within the permitted value range.
4139	Invalid value at setpoint parameter no. 12	adjustable	Make sure that you have got correct values within the permitted value range.
4140	Invalid value at setpoint parameter no. 13	adjustable	Make sure that you have got correct values within the permitted value range.
4141	Invalid value at setpoint parameter no. 14	adjustable	Make sure that you have got correct values within the permitted value range.
4142	Invalid value at setpoint parameter no. 15	adjustable	Make sure that you have got correct values within the permitted value range.
4143	Invalid value at setpoint parameter no. 16	adjustable	Make sure that you have got correct values within the permitted value range.
4144	Invalid value for Setpoint period	adjustable	Make sure that you have got correct values within the permitted value range.
4145	Invalid value for Actual value period	adjustable	Make sure that you have got correct values within the permitted value range.
4146	False value for Cycle offset setpoints	adjustable	Make sure that you have got correct values within the permitted value range.
4147	False value for Cycle offset actual values	adjustable	Make sure that you have got correct values within the permitted value range.
4148	BACI timeout at cyclic data	adjustable	Check the communication rate with the adjusted timeout P0839
4149	BACI timeout at Service data	adjustable	
4150	Check results in faulty checksum	IS	Execute a restart by switching on and off
4151	ramp-up Timeout when waiting for the slave type or when waiting for the resetting of config-pending-flag	adjustable	Execute a restart by switching on and off
4152	Invalid data transfer structure type	adjustable	Contact Baumüller

Sub-error no.	Meaning	Reaction	Troubleshooting
4153	Internal error: Wrong BACI status	adjustable	Contact Baumüller
4154	Access conflicts with slave at cyclic Communication:	adjustable	Contact Baumüller
4155	Error cyclic Communication: Parameter value wrong	adjustable	Contact Baumüller
4156	Error cyclic Communication: Alive-counter conflict	adjustable	Check the value of the transmitted parameter
4157	Cmd interface: Channel number wrong (0 or > 6)	adjustable	Check if the option module and the controller are synchronous.
4158	Cmd interface: The channel which was indicated does not exist	adjustable	Contact Baumüller
4159	Cmd interface: Internal error - wrong pointer	adjustable	Contact Baumüller
4160	Cmd interface: Internal error - wrong status	adjustable	Contact Baumüller
4161	Cmd interface: Wrong package number	adjustable	Contact Baumüller
4162	Cmd interface: Wrong command num-ber	adjustable	Contact Baumüller
4163	Cmd interface: Wrong status when handling the package	adjustable	Contact Baumüller
4164	Cmd interface: Timeout at command processing	adjustable	Contact Baumüller
4165	Cmd interface: Wrong package length	adjustable	Contact Baumüller
4166	Cmd interface: Descriptor not available	adjustable	Contact Baumüller
4167	Cmd interface: Wrong package type	adjustable	Contact Baumüller
4168	Cmd interface: Checksum error	adjustable	Contact Baumüller
4169	Module identification: PCI-error when reading	adjustable	Check the reliability performance of the option module
4170	Module identification: PCI-error when writing	adjustable	Check the reliability performance of the option module
4171	Module identification: general reading error	adjustable	Check the reliability performance of the option module
4172	Module identification: general error at writing	adjustable	Check the reliability performance of the option module
4173	Internal error	adjustable	Contact Baumüller

Sub-error no.	Meaning	Reaction	Troubleshooting
4174	Configuration cyclic services: Parameters are not cyclic writable	adjustable	Select another parameter
4175	Configuration cyclic services: Invalid parameter number	adjustable	Select another parameter
4176	Wrong option module error code	adjustable	Contact Baumüller
4177 to 8191	reserved		
8192	Error CANopen timeout on CAN bus	adjustable	Error node guarding Further information is to be found in programming manual CANopen Slave for b maXX® controller

8.2.3 Parameter description – warnings (warning bit list)

Warning power supply P0261

Warning no.	Meaning	Troubleshooting
0	reserved warning	
1	Undervoltage 24V	Assure the compliance with the specification
2	Mains undervoltage	Assure the compliance with the mains specification
3	Mains overvoltage	Assure the compliance with the mains specification
4	Mains failure	Restore the mains supply
5	Phase failure	Check if all phases are correctly connected and voltage-carrying
6 to 15	reserved warning	

Warnings power unit P0262

Warning no.	Meaning	Troubleshooting
16	Inside temperature of device	Establish the specified environmental conditions, assure correct ventilation conditions
17	Heatsink temperature	Reduce the power output, check the fans of the device
18	Timeout at DC link charging	Check the mains phase sequence (clockwise phase sequence) and avoid taking energie from the DC link during charging
19	not assigned = 0	
20	Safety relay not controlled	Check the cabling of the safety relay
21 to 22	reserved warning	
23	Difference of voltage Mains DC link > 40 V	Check the power connections
24	Ixt-threshold 1 is exceeded	Take steps, so that the Ixt actual value doesn't exceed 100 %
25 to 31	reserved warning	

Warnings motor P0263

Warning no.	Meaning	Troubleshooting
32	Temperature threshold 1 exceeded	Reduce the power output of the motor
33	Temperature threshold 2 exceeded	Reduce the power output of the motor
34	I^2t threshold exceeded	Reduce the power output of the motor
35 to 47	reserved warning	

Table of figures

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Revision survey

Version	Date of issue	Changings
5.06014.01	15.05.2006	First edition
5.06014.02	24.05.2011	ProDrive added. BM4600 und BM4700 integrated.

Notes:

be in motion

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