



**BAUMÜLLER**

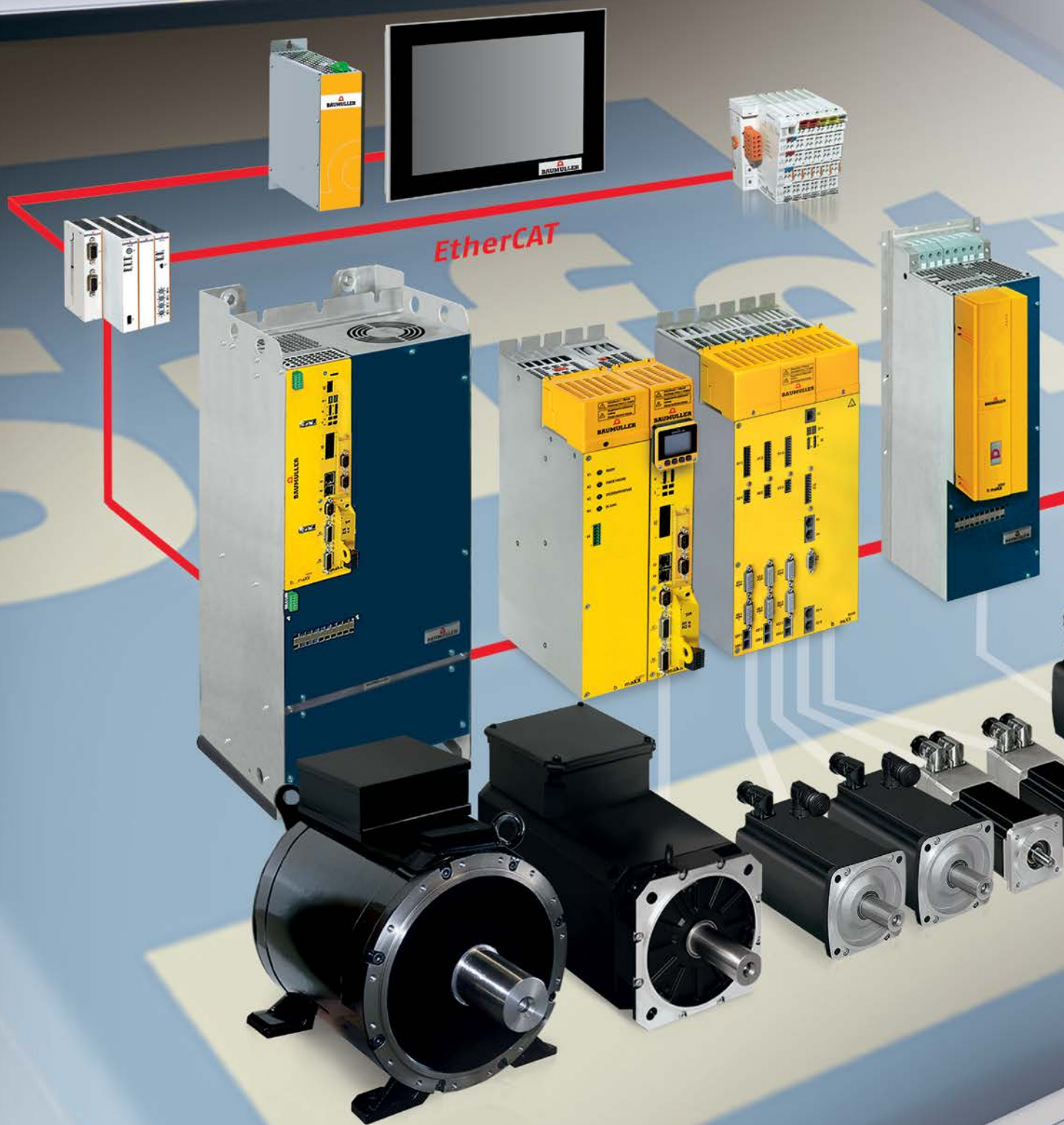
b maXX

b maXX 5000, b maXX 4000, b maXX 3000

b maXX 2000, b maXX 1000

ProDrive, ProSafePara

be in motion



Added value for our customers

Our goal is to enable more flexibility in your machine design and ensuring your machine users the necessary productivity and efficiency in production, thereby giving your machines a competitive edge.

That is why the focus of our development is not just the entire system of a machine, but also the added value that we make available to our customers with the modularization of machines, the scalability of components and flexible technology blocks.

www.baumueller.com



| | |
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b maXX 5000 Servo drive family



b maXX 5000 Side-by-side technology



BM50xx
Supply units

BM51xx
Regenerative units

BM53xx
Axis/double axis units

b maXX 5000 Mono technology



BM55xx
Standard units

BM56xx
Peak load units

BM57xx
Nominal load units

b maXX 5000

The safe, modular servo drive



Baumüller sets standards with the servo controller generation b maXX 5000. The further development of the successful b maXX series towards modular systems convinces with high-performance power units in air-cooled, water-cooled and cold plate cooling versions and with flexible expandability and the accessibility to an integrated communication concept. Standardized as well as complex automation solutions can be implemented with Baumüller's drives and converters within a power range between 1 and 100 kW, passive and active

frontends up to 200 kW.

The machine and installation requirements with regard to future reliability, flexible expansion possibilities and a simple adjustment to changed production processes were already considered during the preliminary development process stages of the b maXX 5000.

Individual modules easily can be removed or added over an integrated drive connect system without having to disconnect the entire drive system.



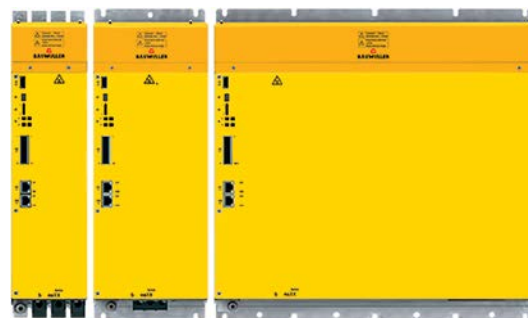
b maXX 5000 – The modular servo drive



Frame size 3 4 7

Technical data b maXX 5000 – Supply units

| Type | Frame size | DC link power | | DC link peak power ¹⁾ | | Overload factor | Dimensions WxHxD [mm] |
|------|------------|---------------|------|----------------------------------|------|-----------------|-----------------------------------|
| | | [kW] | [hp] | [kW] | [hp] | | |
| 5030 | 3 | 5 | 6.7 | 7.5 | 10.1 | 1.5 | 75 x 395 x 280/210 ²⁾ |
| 5031 | 3 | 10 | 13.4 | 15 | 20.1 | 1.5 | 75 x 395 x 280/210 ²⁾ |
| 5032 | 3 | 18 | 24.1 | 27 | 36.2 | 1.5 | 75 x 395 x 280/210 ²⁾ |
| 5043 | 4 | 36 | 48.2 | 54 | 72.4 | 1.4 | 100 x 395 x 280/210 ²⁾ |
| 5044 | 4 | 70 | 93.8 | 70 | 93.8 | 1.0 | 100 x 395 x 280/210 ²⁾ |
| 5074 | 7 | 150 | 201 | 300 | 402 | 2 | 175 x 395 x 280/250 ³⁾ |
| 5075 | 7 | 200 | 268 | 300 | 402 | 1.5 | 175 x 395 x 280/250 ³⁾ |



Frame size 4 7 9

Technical data b maXX 5100 – Regenerative units

| Type | Frame size | DC link power | | DC link peak power ¹⁾ | | Overload factor | Dimensions WxHxD [mm] |
|------|------------|---------------|------|----------------------------------|-------|-----------------|-----------------------------------|
| | | [kW] | [hp] | [kW] | [hp] | | |
| 5143 | 4 | 36 | 48.2 | 52 | 69.7 | 1.4 | 100 x 395 x 280/210 ²⁾ |
| 5174 | 7 | 64 | 87 | 96 | 130.2 | 1.5 | 175 x 395 x 280/210 ²⁾ |
| 5192 | 9 | 150 | 201 | 300 | 402 | 2 | 425 x 395 x 280/250 ³⁾ |
| 5193 | 9 | 200 | 268 | 300 | 402 | 1.5 | 425 x 395 x 250 ³⁾ |

Supply units, regenerative units:

Supply voltage: 207 – 528 V ± 0% AC

Supply frequency: 50/60 Hz

Electronics supply: external 24 V DC

Supply rated voltage: 400 V

DC link rated voltage: 540 V (supply unit),
640 V (regenerative unit)

Certification: CE, cUL

1) for 150 seconds

2) depth air cooling / depth cold plate

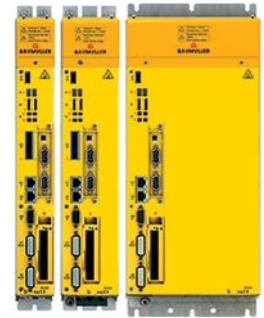
3) depth water cooling

Height and depth without mounting brackets;

Depth including required bending radius of connecting cables

Subject to alteration

Technical data b maXX 5300 – Axis units



Frame size 2 3 7

| Type | Frame size | I _N [A] | I _{MAX} [A] | typ. motor rating | | Overload factor | Dimensions W x H x D [mm] |
|--------------------|------------|-----------------------|-------------------------|-------------------|---------|--------------------|-------------------------------------|
| | | | | [kW] | [hp] | | |
| 5323 | 2 | 2x 3 | 2x 9 | 2x 1.6 | 2x 2.1 | 3 | 50 x 395 x 280 / 210 ²⁾ |
| 5323 ¹⁾ | 2 | 2x 4.5 | 2x 9 | 2x 2.4 | 2x 1.8 | 2 | 50 x 395 x 280 / 210 ²⁾ |
| 5325 | 2 | 2x 6 | 2x 18 | 2x 3.2 | 2x 4.2 | 3 | 50 x 395 x 280 / 210 ²⁾ |
| 5325 ¹⁾ | 2 | 2x 8.5 | 2x 18 | 2x 4.6 | 2x 3.5 | 2,1 | 50 x 395 x 280 / 210 ²⁾ |
| 5326 | 2 | 12 | 24 | 6.5 | 8.7 | 2 | 50 x 395 x 280 / 210 ²⁾ |
| 5327 | 2 | 20 | 40 | 10.8 | 14.5 | 2 | 50 x 395 x 280 / 210 ²⁾ |
| 5328 | 2 | 30 | 60 | 16.2 | 21.7 | 2 | 50 x 395 x 280 / 210 ²⁾ |
| 5331 | 3 | 2x 12 | 2x 24 | 2x 6.5 | 2x 8.7 | 2 | 75 x 395 x 280 / 210 ²⁾ |
| 5332 | 3 | 2x 20 | 2x 40 | 2x 10.8 | 2x 14.5 | 2 | 75 x 395 x 280 / 210 ²⁾ |
| 5333 | 3 | 2x 30 | 2x 60 | 2x 16.2 | 2x 21.7 | 2 | 75 x 395 x 280 / 210 ²⁾ |
| 5334 | 3 | 40 | 60 | 21.6 | 29.0 | 1.5 | 75 x 395 x 280 / 210 ²⁾ |
| 5335 | 3 | 60 | 90 | 32.4 | 43.4 | 1.5 | 75 x 395 x 280 / 210 ²⁾ |
| 5372 | 7 | 90 | 180 | 48.6 | 65.1 | 2 | 175 x 395 x 280 / 250 ³⁾ |
| 5373 | 7 | 120 | 240 | 64.8 | 86.8 | 2 | 175 x 395 x 280 / 250 ³⁾ |
| 5374 | 7 | 150 | 300 | 81 | 108.5 | 2 | 175 x 395 x 280 / 250 ³⁾ |
| 5375 | 7 | 180 | 360 | 97.2 | 130.2 | 2 | 175 x 395 x 250 ³⁾ |
| 5376 | 7 | 150 | 420 | 81 | 105.5 | 2.8 | 175 x 395 x 280 |
| 5376 | 7 | 180 | 420 | 92.2 | 130.2 | 2.3 | 175 x 395 x 250 ³⁾ |

Axis units:

Electronics supply: external 24 V DC

DC link voltage: 540 V rated voltage

Chopping frequency: 4/8 kHz

Certification: CE, cUL

1) Load cycles as per EN 61800

2) depth air cooling / depth cold plate

3) depth water cooling

Height and depth without mounting brackets;

Depth including required bending radius of connecting cables

Subject to alteration

For further information, see the b maXX complete catalog

b maXX 5500 – The servo drive for higher output ratings



The modular servo drives 5000 have been extended to mono units in the range 5500. This covers power ratings of 10 to 315 kW and higher safety

functions such as SLS (safely limited speed) and SLP (safely limited position) can be integrated up to high power ratings.

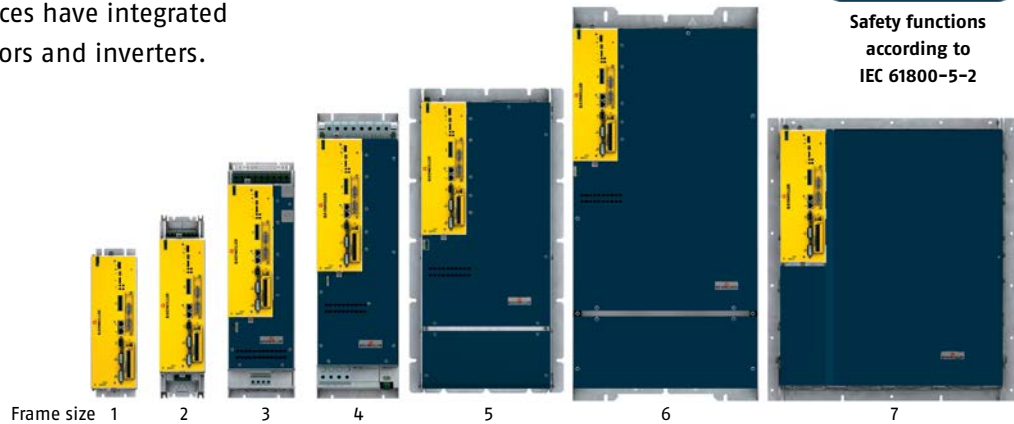
b maXX 5500 servo drive family

b maXX 5500 offers a performance range from 1.1 kW to 315 kW. All devices have integrated rectifiers, DC link capacitors and inverters.



Safety functions
according to
IEC 61800-5-2

Technical data b maXX 5500



| Type | Frame size | I _N [A] | I _{MAX} [A] | typ. motor rating | | Overload factor | Dimensions W x H x D ¹⁾ [mm] |
|--------------------|------------|-----------------------|-------------------------|-------------------|------|--------------------|--|
| | | | | [kW] | [hp] | | |
| 5512 | 1 | 2.5 | 5 | 1.1 | 1.5 | 2 | 106 x 310 x 263 ⁴⁾ |
| 5513 | 1 | 4.5 | 9 | 2 | 2.7 | 2 | 106 x 310 x 263 ⁴⁾ |
| 5522 | 2 | 7.5 | 15 | 3.4 | 4.6 | 2 | 106 x 428 x 340 / 320 |
| 5523 | 2 | 11 | 22 | 5 | 6.7 | 2 | 106 x 428 x 340 / 320 |
| 5524 | 2 | 15 | 30 | 6.8 | 9.1 | 2 | 106 x 428 x 340 / 320 |
| 5525 | 2 | 15 | 40 ³⁾ | 6.8 | 9.1 | 2.6 | 106 x 428 x 340 / 320 |
| 5526 ³⁾ | 2 | 22.5 | 45 ³⁾ | 6 | 8.0 | 2 | 106 x 428 x 340 / 320 |
| 5526 | 2 | 22.5 | 45 ³⁾ | 10 | 13.4 | 2 | 106 x 428 x 340 / 320 |
| 5532 | 3 | 22.5 | 45 | 10 | 13.4 | 2 | 155 x 510 x 340 / 325 |
| 5533 | 3 | 30 | 60 | 13 | 17.4 | 2 | 155 x 510 x 340 / 325 |
| 5534 | 3 | 45 | 90 | 20 | 26.8 | 2 | 155 x 510 x 340 / 325 |
| 5535 | 3 | 60 | 90 | 28 | 37.5 | 1.5 | 155 x 510 x 340 / 325 |
| 5543 | 4 | 80 | 120 | 36 | 48 | 1.5 | 190 x 624 x 374 / 327 |
| 5544 | 4 | 100 | 130 | 45 | 60 | 1.3 | 190 x 624 x 374 / 327 |
| 5545 | 4 | 130 | 170 | 58 | 78 | 1.3 | 190 x 624 x 374 / 327 |
| 5546 | 4 | 150 | 200 | 75 | 100 | 1.3 | 190 x 624 x 374 / 327 |
| 5553 | 5 | 150 | 195 | 75 | 100 | 1.3 | 307 x 656 x 374 / 321 |
| 5554 | 5 | 210 | 260 | 110 | 147 | 1.3 | 307 x 656 x 374 / 321 |
| 5562 | 6 | 250 | 325 | 132 | 177 | 1.3 | 437 x 815 x 378 / 316 |
| 5563 | 6 | 300 | 390 | 160 | 215 | 1.3 | 437 x 815 x 378 / 316 |
| 5566 | 6 | 350 | 450 | 175 | 234 | 1.3 | 437 x 815 x 378 / 316 |
| 5572 | 7 | 450 | 585 | 225 | 302 | 1.3 | 520 x 600 x 340 ⁵⁾ |
| 5573 | 7 | 615 | 800 | 315 | 422 | 1.3 | 520 x 600 x 340 ⁵⁾ |

Supply voltage: 207–528 V ± 0% AC
Supply frequency: 50/60 Hz
Supply rated voltage: 400 V
DC link voltage: 540 V rated voltage
Chopping frequency: 2/4/8 kHz
Output voltage: 0–95 % of supply voltage

Electronics supply: external 24 V DC (diagnostic capability)
Fan connection: frame size 1–3: 24 V DC electronics supply,
frame size 4–7: 230 V AC ± 10 %
Certification: CE, CSA, UL

Subject to alteration

1) Depth air cooling / depth water cooling
2) for 1 second
3) single phase
4) air cooling only
5) water cooling only
Height and depth w/o mounting brackets; depth
incl. required bending radius of connecting cables

b maXX 5600/5700

The application specific servo drive



The established automation and drive solution b maXX was expanded with the new peak load and nominal load devices of the 5600 and 5700 series. The units complete the b maXX series and are available in five sizes. Therewith, Baumüller meets the requirements of industry-specific applications such as in the field of injection moulding or extrusion processes, because here either short-term

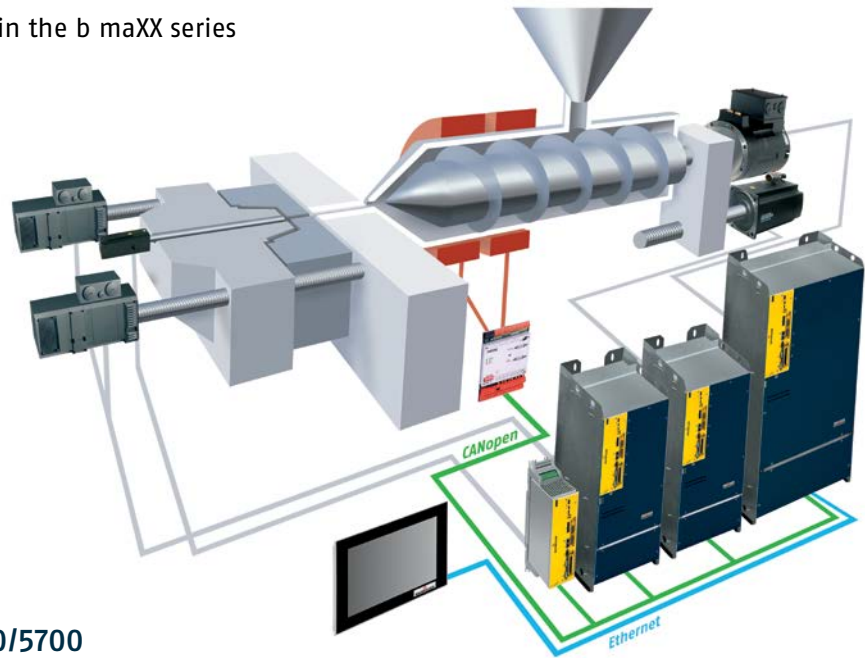
peak power or permanent maximum power in constant operation are in demand. The drive can optimally be matched to the power demands of the respective application. Even though the series is equipped with greater power rating it is available in smaller sizes and minimizes the required space in the control cabinet – hence the user benefits twice.



Safety functions
according to
IEC 61800-5-2

b maXX 5600/5700 – Your benefits at a glance

- Optimized drive solution for specific industry requirements
- Different sizes available for compatible drive dimensions
- Less space required in the control cabinet due to smaller devices and the use of water cooling, control cabinet therefore less expensive to manufacture
- Water cooling in the control cabinet provides a cost-effective solution
- Compatible with other devices in the b maXX series



Technical data b maXX 5600/5700

| b maXX 5600 Type | Frame size | I_N [A] | I_{MAX} [A] | Overload factor ¹⁾ | Dimensions WxHxD [mm] |
|----------------------|------------|--------------|------------------|----------------------------------|--------------------------|
| 5632-F | 3 | 60 | 120 | 2 | 208 x 556.5 x 325 |
| 5641-F | 4 | 85 | 170 | 2 | 242 x 681 x 327 |
| 5642-F | 4 | 100 | 200 | 2 | 242 x 681 x 327 |
| 5650-F ²⁾ | 5 | 130 | 260 | 2 | 360 x 550 x 285 |
| 5651-F ²⁾ | 5 | 165 | 330 | 2 | 360 x 550 x 285 |
| 5652-F ²⁾ | 5 | 200 | 400 | 2 | 360 x 550 x 285 |
| 5661-F ²⁾ | 6 | 250 | 500 | 2 | 490 x 710 x 285 |
| 5662-F ²⁾ | 6 | 300 | 600 | 2 | 490 x 710 x 285 |

| b maXX 5700 Type | Frame size | I_N [A] | I_{MAX} [A] | Overload factor ¹⁾ | Dimensions WxHxD [mm] |
|----------------------|------------|--------------|------------------|----------------------------------|--------------------------|
| 5755-F ²⁾ | 5 | 260 | 260 | 1 | 360 x 550 x 285 |
| 5766-F ²⁾ | 6 | 450 | 450 | 1 | 490 x 710 x 285 |
| 5773-F | 7 | 720 | 800 | 1.1 | 580 x 660 x 340 |

1) for 1 second with a cycle of 5 seconds

2) compact design, water-cooled

Subject to alteration

b maXX 5000 – The modular servo drive

Braking energy

Brake resistor activation is integrated in the form of a brake chopper. A regenerative resistor is connected externally. This paves the way for optimal dimensioning and also reduces the volume of the control cabinet.

Line filter

To optimize configuration from a cost perspective, line filters are always connected in series outside the device. Several power modules can thus be grouped for each line filter resulting in reduced costs for the system as a whole.

Temperature-dependent fan control

The fan is controlled relative to the temperature inside the device. This leads to a reduction in energy consumption and therefore lowers the overall costs of a system.

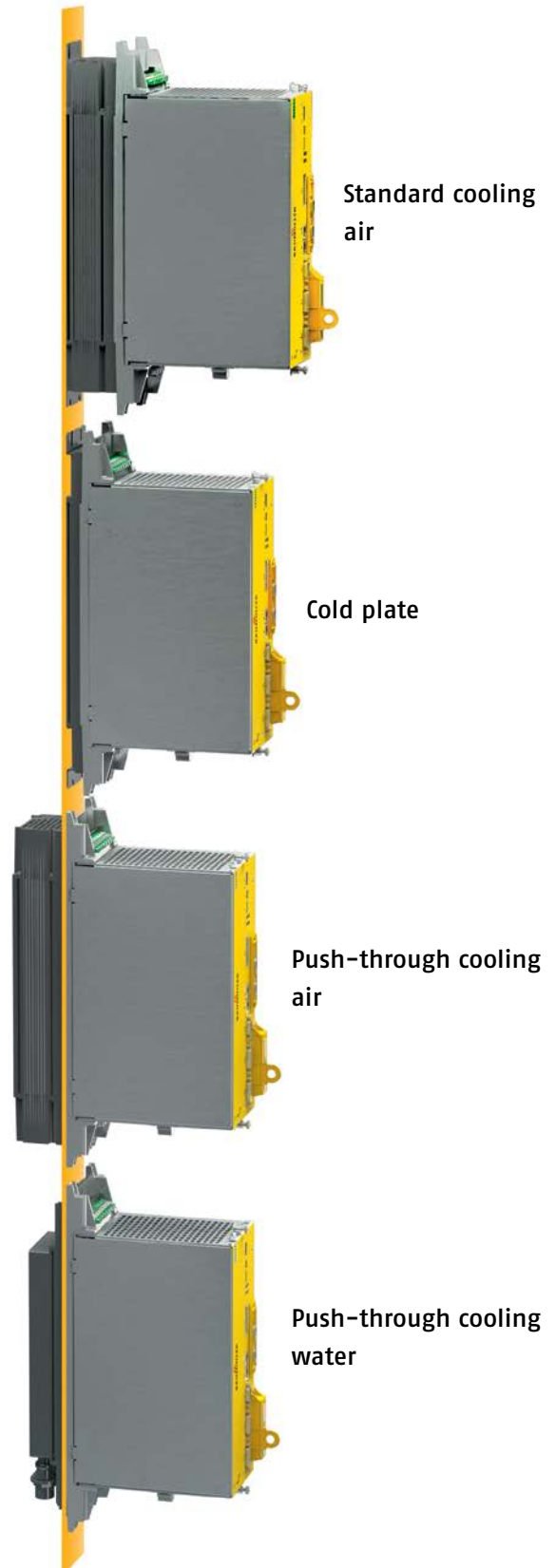
DC link coupling

DC link coupling can be achieved for a number of power modules for the purpose of energy compensation. Surplus energy is not “burned”. It is made available to other drive units without taking additional energy from the supply network.

Safety module

With the optional safety module, the option “safety stop” in accordance with EN ISO 13849 safety category 4 can easily be realized without the integration of additional contactors in the motor line. This ensures that the structure of the safety circuit remains simple and transparent. The danger potential of the machine is reduced. The machine works reliably.

Types of cooling



b maXX 5000/3000 – The modular servo drive

Electronic type plate

The b maXX 3300 and 5000 series can read or describe a memory area in the encoder system. This so-called electronic type plate is generally divided into two areas:

Baumüller-specific memory area: Among other things, this is where Baumüller stores motor-specific data that the converters can automatically read out during commissioning.

Customer-specific memory area: The customer can save his or her own data here using the b maXX converter. This begins with the customer-specific item numbers and ends with machine or model numbers.

Control panel (service control panel)

The control panel offers a device for the display, parameterization, commissioning and service of b maXX drives of the 3000, 5000 and 5500 series. It is an ideal tool for service technicians on site at the machine or system. This device can be used to display, change and store controller parameters.



Features

- Access to all parameters
- Menu structure
- Upload/download data set
- Hot plug capable (can be connected and disconnected during operation)

Available languages

- English
- German

Configuration

- Normalization
- Predefined list for parameter display
- Predefined list for display of the controller status
- Management of up to 8 parameter sets

Voltage supply

- Internally via controller

Encoder systems

- Resolver
- Incremental encoder
- SinCos-Hyperface
- EnDAT 2.1
- EnDAT 2.2
- Hiperface DSL
- SSI
- Digital I/Os (8 In / 4 Out)
- Analog I/Os (1 In / 2 Out)

Optional modules

It is also possible to expand with add-on modules for the b maXX 5000 series. There are add-on modules for encoder emulation, expansion of the fieldbus variance as well as expansion of the number of analog inputs and outputs as well as the digital inputs and outputs.

| | |
|--------------------|--|
| IEE-002-001 | Rectangle incremental encoder emulation ¹⁾ with external 24V power supply |
| SIE-001-001 | SSI encoder emulation ²⁾ with external 24V power supply |
| EIP-001-001 | Fieldbus optional module Ethernet/IP with rectangle incremental encoder emulation |
| MOD-001-001 | Fieldbus optional module Modbus/TCP with rectangle incremental encoder emulation |

1) The signal generated can either be used to synchronize a following axis or to detect the position of the axis via a superordinated control.

2) The signal generated can be used to detect the position of the axis via a superordinated control.

| Optional modules | Analog inputs -10 V | Analog outputs ±10 V | Analog inputs 4...20 mA | Digital inputs | Digital outputs |
|------------------|------------------------|-------------------------|----------------------------|----------------|-----------------|
| SVP-001-001 | 4 | 4 | - | 4 | 4 |
| SVP-001-002 | 2 | 4 | 2 | 4 | 4 |
| SVP-001-003 | - | 4 | 4 | 4 | 4 |

Controller functionalities

Encoder angle via fieldbus:

The encoder cable is operated without splitting for motors with multiple windings

Error response "Return motion in event of power supply failure":

In the event of a power supply failure, the drive carries out a positioning to a parameterizable position, provided there is enough energy in the DC link.

» Advantage: Protection of the machine from uncontrolled coasting down and therefore damage protection.

Master-slave coupling for load compensation:

This function can be used to split the load of two drives, which are moving a load together, in a defined ratio.

» Advantage: more compact controller technology > cost savings

Cogging torque compensation:

The cogging torque of the synchronous motors influences the concentricity precision of the motors. An automated measurement is used to identify cogging torques and pre-control angle-dependent current. This compensates for the cogging torque

» Advantage: Improved concentricity of the motors, especially at low speeds > cost savings

DC link capacitance unit for the b maXX 5000 series



Energy and cost savings in dynamic applications

With the DC link capacitance unit, the braking energy can be temporarily stored for dynamic applications and used for subsequent acceleration. Can be used in devices of the converter generation b maXX 5000.

Customer benefits

- **Temporary storage of the brake energy:**
Low energy use
- **Peak load leveling:** Lowering the contractually-agreed consumption peaks with the energy supply company
- **Lower thermal radiation:** Smaller dimensioning of the cooling units possible
- **Smaller dimensioning of the control cabinet and power supply unit:** Less space required and cost savings possible
- **Temporarily stored energy allows for controlled system shutdown in the event of errors and power failure:** Cost reduction by not needing an independent power supply (UPS)

Coupler modules for the b maXX family



DC link coupler module

Connection of the Drive Connect system of the modular technology with DC link cables of the mono devices

Signal bus coupler module

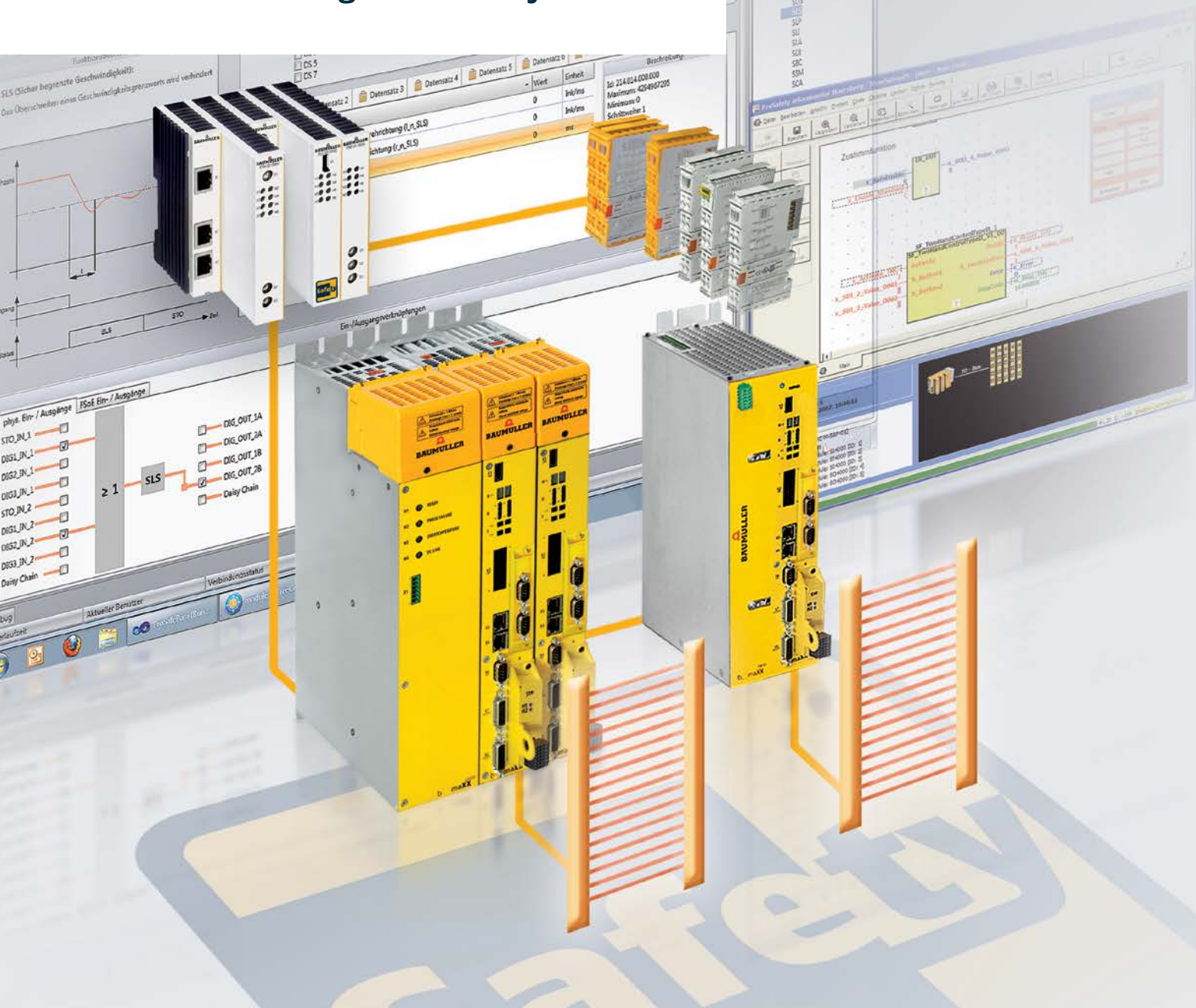
Extension of the signal bus at more than 12 devices

Both have been developed to be able to connect different b maXX characteristics in one automation system.

Customer benefits

- Cost-efficient connection of the rail system with cables
- Star wiring of the DC link
- More than 12 axes possible in the group
- Easily forward the state of the supply to the power inverters

Drive-integrated safety



The machine manufacturer as well as the operator must comply with the safety requirements of the standard EN ISO 13849. In order to ensure this, Baumüller starts where all machine processes are coordinated: in the automation system. Baumüller prefers a holistic solution contrary to conventional concepts, which require for example, additional emergency stop devices. Precondition for a holistic solution are hardware components which are

scalable and configured with high-class safety functions.

Baumüller provides such a control system – the b maXX-safePLC. This is an essential component of the comprehensive drive-integrated safety concept. In this way Baumüller complies with the requirements of the new Machinery Directive. The new safety control b maXX-safePLC and the new converter generation b maXX 5000 are the main components.



SAF-000



Safety function:
none
Parameter memory: yes

SAF-001



Safety function:
STO
Safely controlled via: I/O
Parameter memory: yes

SAF-002



Safety function:
STO, SS1, SS2, SOS, SDI, SLS, SBC
Safely controlled via:
I/O and field bus
Parameter memory: yes

SAF-003



Safety function:
STO, SS1, SS2, SOS, SLA, SLS,
SLP, SLI, SDI, SBC,SSM,SCA
Safely controlled via:
I/O and field bus
Parameter memory: yes

Plug-in safety for the b maXX 5000

Four modules with plug-in board design for the b maXX 5000 provide the perfect solution for drive-based safety. Machine manufacturers can quickly and flexibly adapt the converter to meet the relevant application requirements.

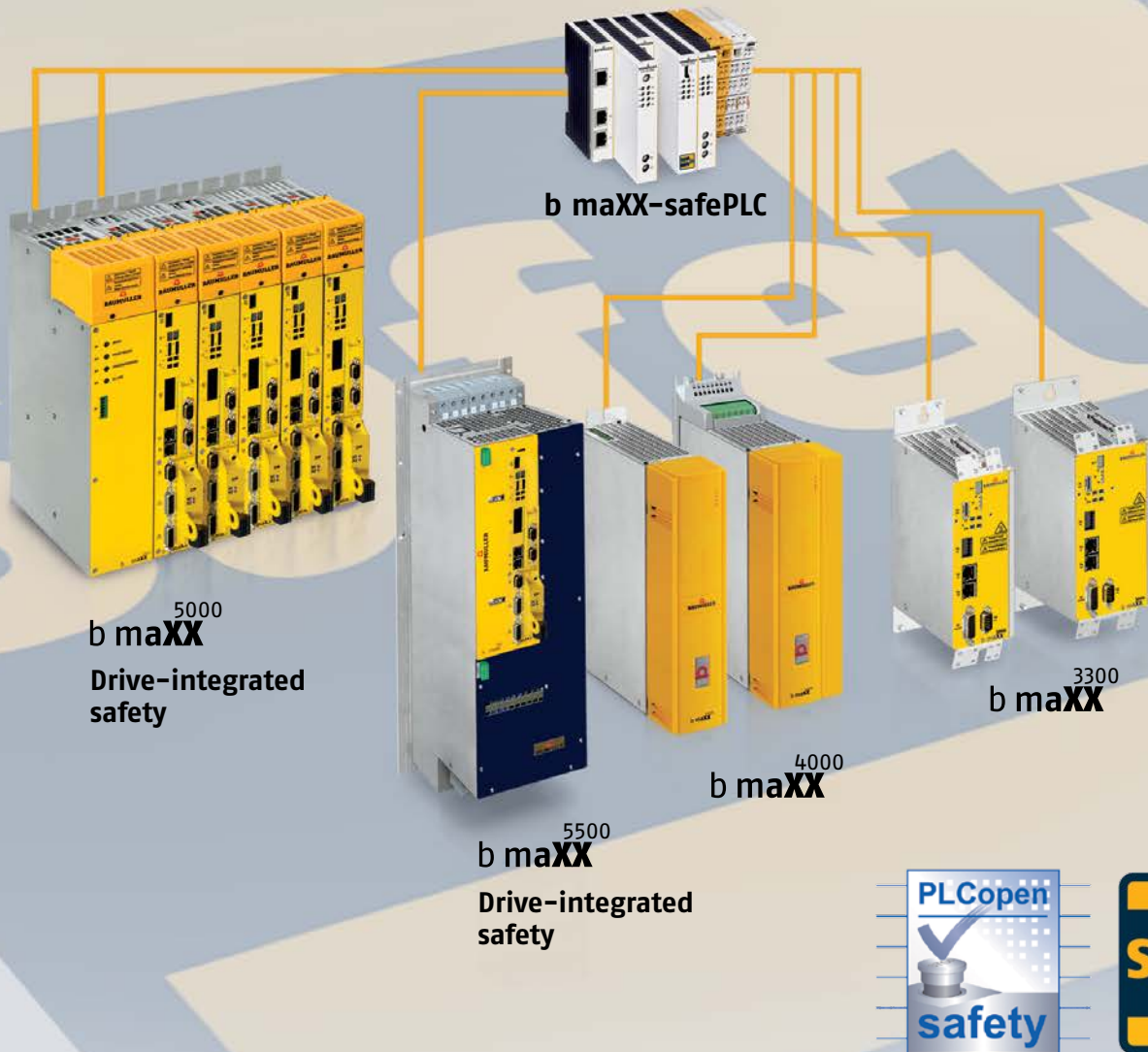
Three safety options with the safety modules

The SAF-001, 002 and 003 safety modules guarantee the required machine safety and future compatibility in line with the latest standards. The b maXX 5000 fulfils the guidelines in standard EN ISO 13849 up to SIL 3 with its scalable range of functions and EN 62061 up to PL_e.

The plug-in SAF modules allow the user to respond to new requirements with maximum speed and flexibility. All modules are equipped with an integral parameter memory that stores all the safe and unsafe parameters preset on the b maXX drive controller.

The safe functions are selected via safe local I/Os or EtherCAT-FSoE, which are integrated on the safety module.

The safe application



EN 13849-1 builds on the qualitative aspect of EN 954-1 by including a quantitative calculation of safety functions. For many systems, this will mean that a safety control will need to be used. As a member of the PLCopen Safety organization, Baumüller has addressed the new automation sector requirements, enabling it to offer you safety solutions in conformance with PLCopen Safety and which

can be integrated into the machine's automation system as a whole.

The concept encompasses centralized, modular decentralized, and hybrid automation structures and is reflected in every area of the application. In this way, Baumüller integrates its safety concept into all automation components – including communication – as well as into the ProMaster Engineering Framework.

b maXX-safePLC safety control

In addition to the safety aspect, the b maXX-safePLC is also characterized by the way in which it reduces complexity. This is achieved by eliminating the need for complicated wiring, reducing the number of wires involved, and minimizing the inspection effort required. Centralized safety controls often make multi-coupled units completely superfluous to requirements. Therefore, the combined SIL0/SIL3 safety control not only reduces the complexity of your system or machine and ensures safe operation, it also offers a cost benefit compared to conventional solutions.

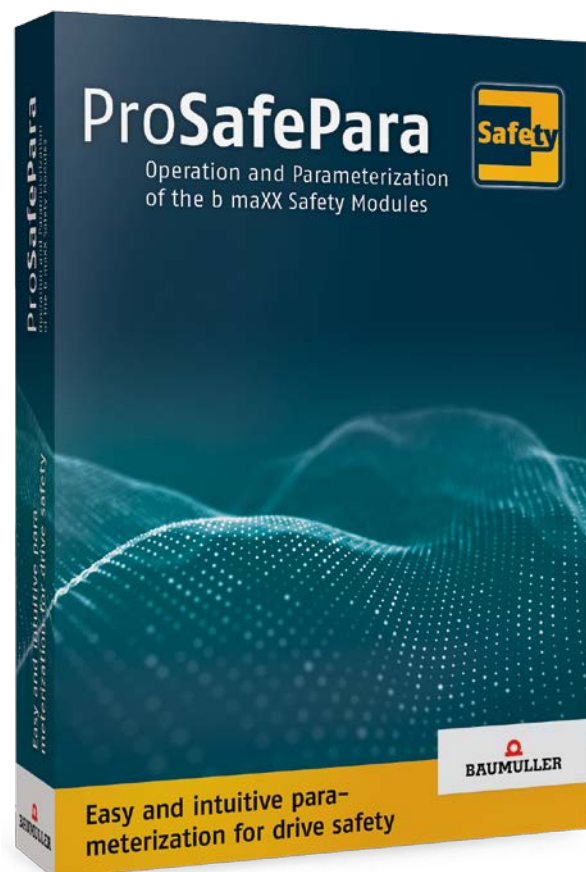


Easy, intuitive parameterisation of drive safety with ProSafePara

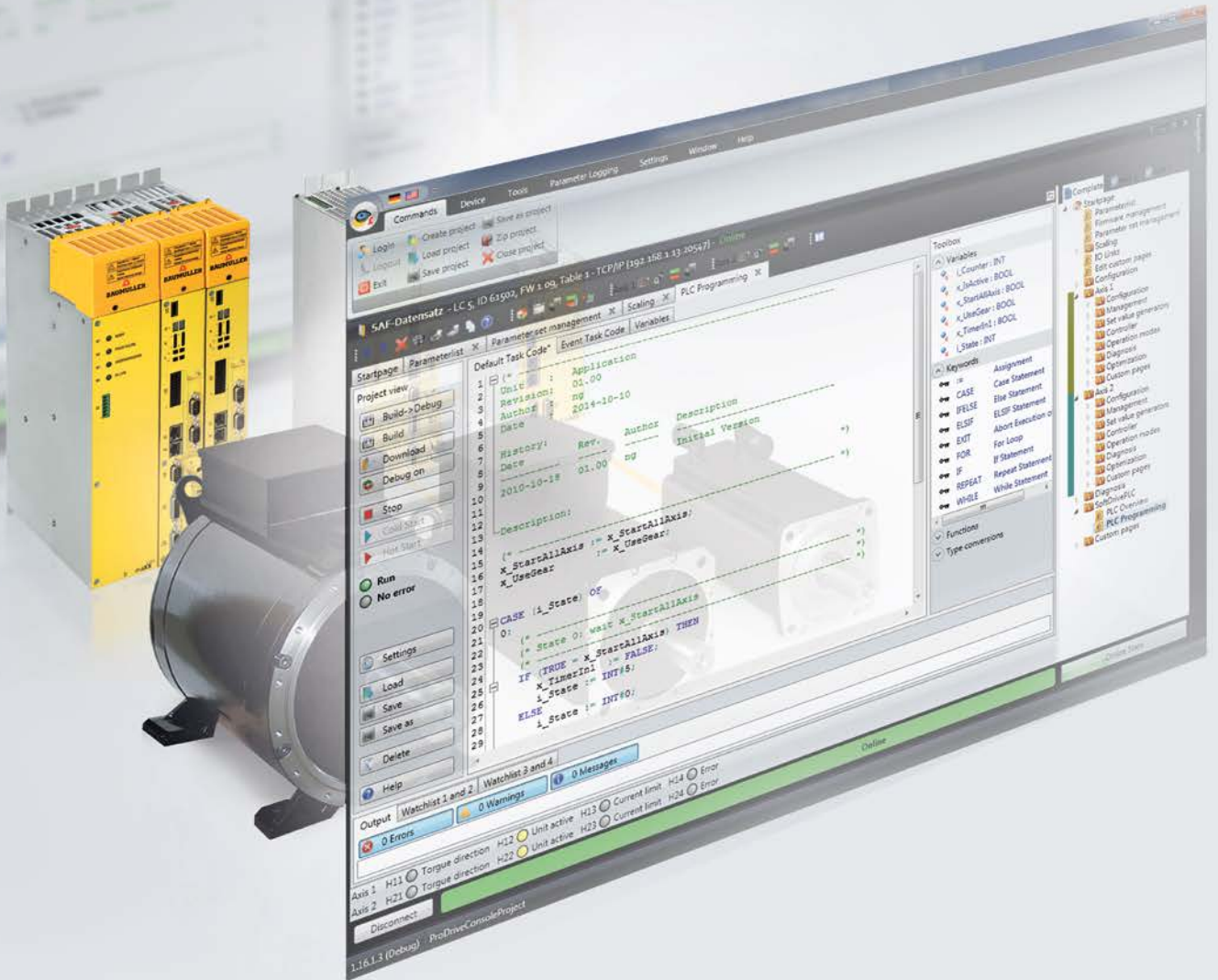
Baumüller is one of the few drive and automation manufacturers that consistently offers integral safety solutions for central, local modular and hybrid automation structures in line with the standards stipulated in the Machinery Directive, EN ISO 13849-1 and EN IEC 62061 up to Performance Level e and Safety Integrity Level 3. The ProMaster engineering tool supports configuration of the parameters of the b maXX safety modules SAF-002 and SAF-003. ProMaster enables the scalable integration of b maXX 5000 safety modules in standard automation technology using the integral safe parameterisation environment ProSafePara.

Safety technology is fully integrated in the ProMaster engineering tool in the ProSafePara environment and accesses the same project database.

The environment was developed according to the requirements of standard IEC 61508 and covers all safety requirements up to SIL 3, thereby guaranteeing the safe parameterisation of safety modules SAF-002 and SAF-003.



b maXX-softdrivePLC



With the new b maXX-softdrivePLC Baumüller makes separate control hardware unnecessary for some applications. Due to the combination of motion control and SPS functions in the controller, Baumüller has created a decentralized control architecture for programming according to IEC 161131 which enables the simple structuring of distributed intelligence in the machine. Using the parameterization tool ProDrive, tasks such as the

simple evaluation of digital inputs up to sophisticated control algorithms can be easily completed, without the need for complex control programming tools.

b maXX softdrivePLC runs as part of the firmware in the Baumüller drive concepts b maXX 5000, b maXX 3300 as well as in the decentralized drive concept b maXX 2500 and works with single axis applications as well as with double axis applications.

By means of the softdrivePLC, programs run highly synchronous to the control cycle at cycle times up to 125 μ in the controller and special filters, for example, can be programmed. You can furthermore profit from many other advantages:

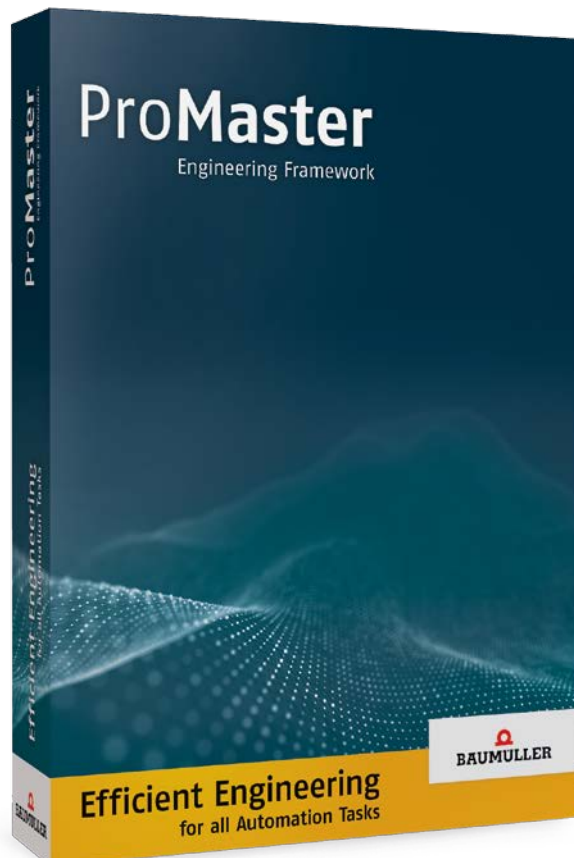
- Cost saving due to omission of control hardware
- Fieldbus communication between two axes not applicable
- Easy implementation of master-slave functionalities
- Multi-axis access to the parameters is possible

Programming with ProDrive for basic version

Using the softdrivePLC you no longer require complex tools for control programming. Control tasks can be locally implemented very easily with the parameterization tool ProDrive in the controller – from simple calculations to highly complex control algorithms.

Embedded in ProMaster and programmable with PROPROG 5 as an extended version

The extended version of the softdrivePLC is completely integrated into the engineering framework ProMaster. Here you will find all applications for the generation of a machine and installation topology, the fieldbus / and I/O configurations as well as the programming environment PROPROG 5, the cam editor ProCAM and much more.



b maXX 5000/3000 – Single cable solution for power and feedback systems



The new single cable technology, with which the Baumüller motors are equipped, saves the user from having to use a feedback cable or an expensive inflexible hybrid cable that is otherwise required in addition to the obligatory motor cable.

Unlike with sensorless control, single cable technology allows for highly accurate positioning. The encoder data, rotor position, multi-turn information as well as the status of the thermal conditions in the motor are reliably transmitted interference-free via a purely digital interface. This results in significant cost savings, since both motor and controller side connectors and cables are omitted. Costly, analog evaluation modules in the drive amplifier can be dispensed with.

The diagnostic capability is also a given. The wiring is significantly simplified, which eliminates possible sources of error and also has a positive effect on the peripheral equipment, since now mobile cable handlers, cable glands and reserved areas for the cables in machines and control cabinets are significantly smaller.

The new technology supports an "electronic type plate." This results in greater degrees of freedom on the motor side: The elimination of a plug connection makes it possible to use the new technology in the smallest of installation sizes too.

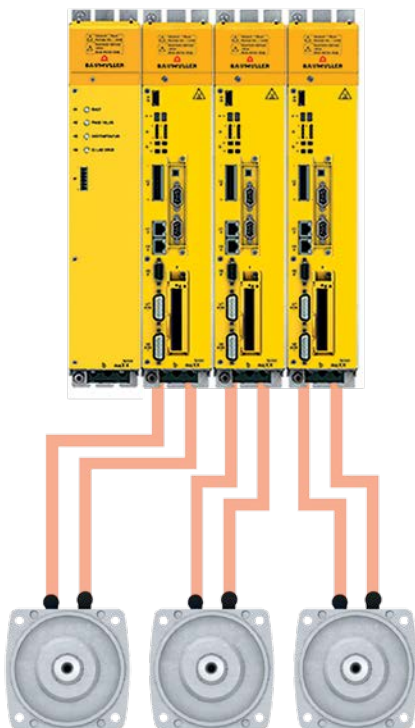
Customer benefits

- Quick and easy commissioning. Wiring and commissioning are simplified due to fewer cables and plugs
- Reduced wiring costs
- Thanks to the change to just one cable now, costs are eliminated for additional plugs and cables
- Efficient feedback control
- Increased performance thanks to digital feedback
- Reliable system
- Data transmission not susceptible to errors
- Supports electronic type plate

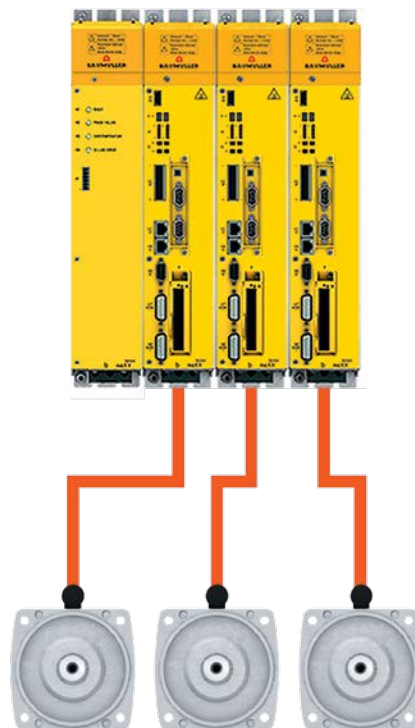
Operative range

- Robotics
- Packaging machines
- Filling plants
- Machine tools
- Paper and processing machines
- and many more

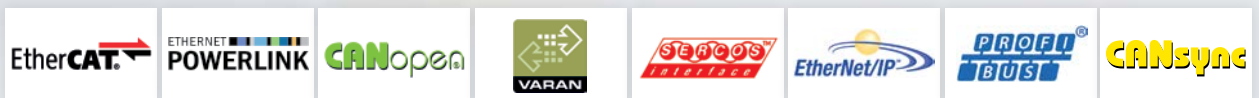
Standard solution



Single cable solution



b maXX 4000 Modular servo drive



b maXX has up to eleven inserts for plug-in modules and can therefore be individually adapted for special automation tasks. Special plug-in modules interface b maXX, including interface adaptors for most standard bus systems. The plug-in b maXX-drivePLC module provides integrated intelligent control.

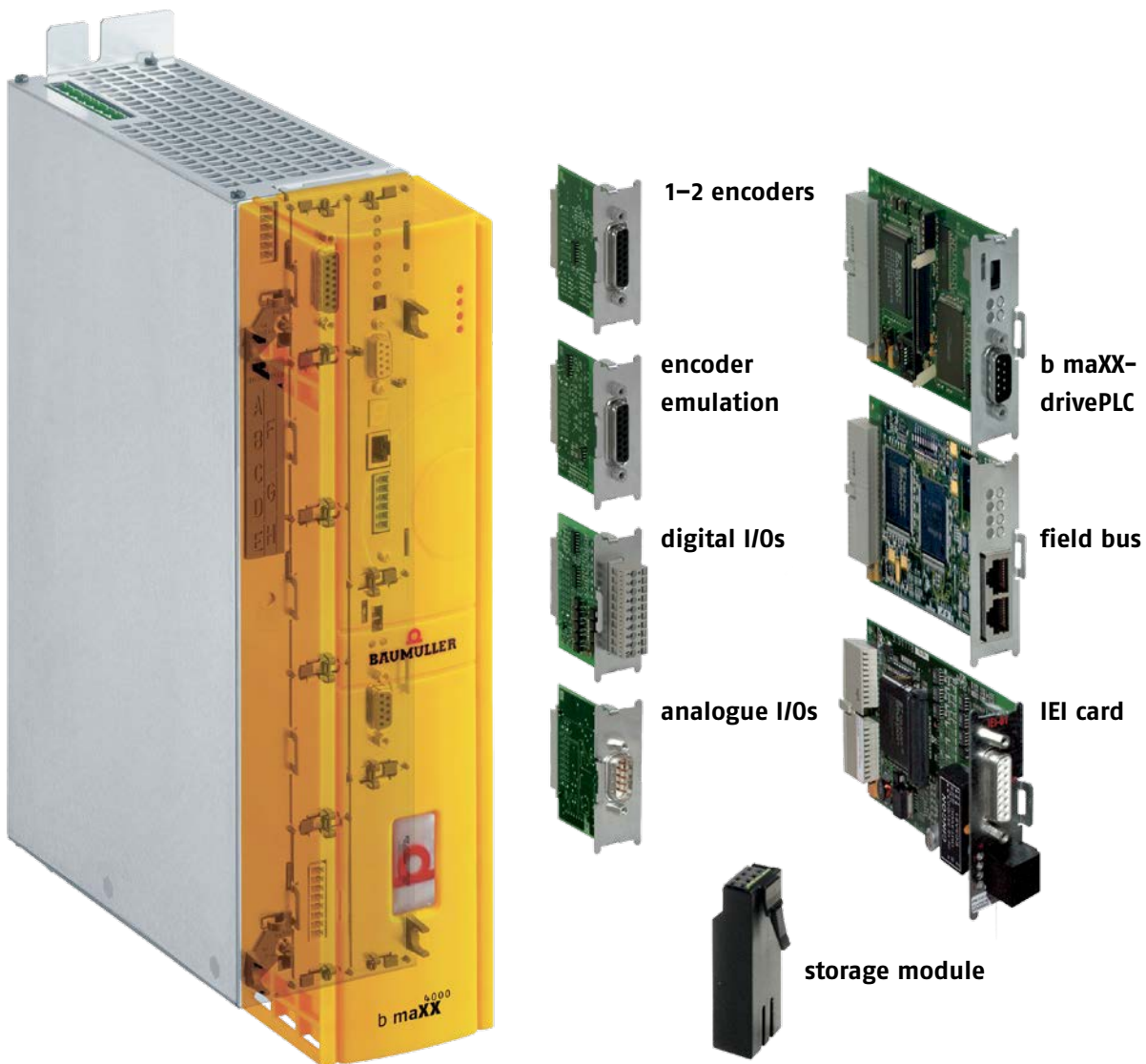
Function and option modules for b maXX 4400

With more than 30 different function and option modules b maXX can easily be adapted in line with the individual tasks of the automation and drive solution.

The individual modules are designed as plug-in boards and therefore the drive controller no longer has to be ordered as a preassembled unit. By using various plug-in boards, the machine manufacturer

can secure a wide variety of functions and configure the appropriate combinations on their own. In this way, he can react quickly and flexibly to new requirements.

This system also ensures that the drive can be quickly expanded at the user's facility. Production adjustments can be implemented within a short space of time and with minimal effort.



Digital I/Os



- 4 inputs, 24 V industrial logic, isolated
- 4 outputs, 24 V industrial logic, isolated, 0.5 A

Encoder Interfaces



- SinCos encoder
With hipurface interface and electronic rating plate. Resolution: up to several million incr./rev.
- Resolver, resolution: 1024 incr./rev.
- 5 V-square-wave incremental encoder, res.: (stroke no. x 4) incr./rev.
- SinCos encoder with EnDat® interface
Sine/cosine encoder with EnDat 2.1 and 2.2 interface for single and multiturns, length measurement systems and absolute position recognition.
- SinCos encoder with SSI interface
Sine/cosine encoder with SSI standard interface, with internal and external encoder power supply.
- Incremental encoder emulation
5 V-square-wave/differential signal, 90° phase shift

Storage module



The parameter storage module contains all the parameters that are set on the drive controller of the b maXX for all 8 parameter data records and all 16 positioning profiles. New parameters can be loaded to the drive controller simply by plugging in the module.

Given that the parameter module is pluggable, a drive can be replaced during servicing without the need for any knowledge of the operating software. Servicing could not be easier.

Analog I/Os



- 2 inputs ± 10 V 12 Bit and 2 outputs ± 10 V 8 Bit
- 2 inputs ± 10 V 16 Bit and 2 outputs ± 10 V 16 Bit
- 2 inputs ± 10 V 12 Bit and 2 outputs ± 10 V 12 Bit
- 2 inputs 4–20 mA, 16 Bit, 2 outputs ± 10 V 16 Bit

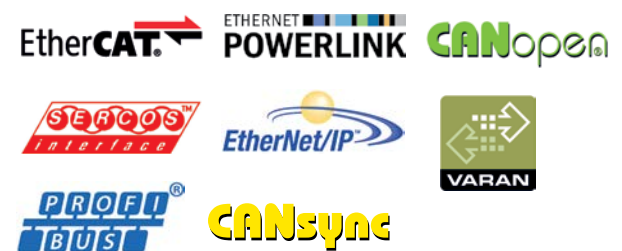
Field bus modules for b maXX 4400



b maXX 4400 supports all conventional field bus systems. b maXX can be optimally integrated into all systems by simply replacing the corresponding option module. EtherCAT is the standard field bus.

Field bus interfaces

| Field bus | b maXX 4400 | b maXX-drivePLC |
|-------------|-------------|------------------------|
| EtherCAT | Slave | Slave, Master, Cluster |
| EtherNet/IP | Slave | - |
| CANopen | Slave | Slave, Master |
| CANsync | Slave | Slave, Master |
| Profibus | Slave | Slave |
| Sercos | Slave | - |
| Varan | Slave | - |
| POWERLINK | Slave | Slave |
| Ethernet | TCP/IP | TCP/IP |





b maXX-drivePLC

PLC
INSIDE

Clever. Fast. Effective.

The b maXX-drivePLC module makes the drive intelligent. This in-drive control intelligence allows very fast access to the setpoints and actual values of the drive controller. Therefore, the functionality of the drive can be enhanced with complex motion, control and technology functions. This ensures that the application can be created quickly and economically.

Speed up your applications

- Makes drives user-programmable
- Delivers excellent real-time performance
- Increases availability
- Reduces control cabinet size
- Ensures a consistently stable system

In-drive PLC

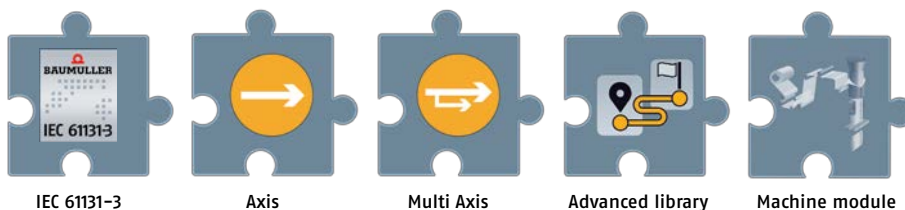
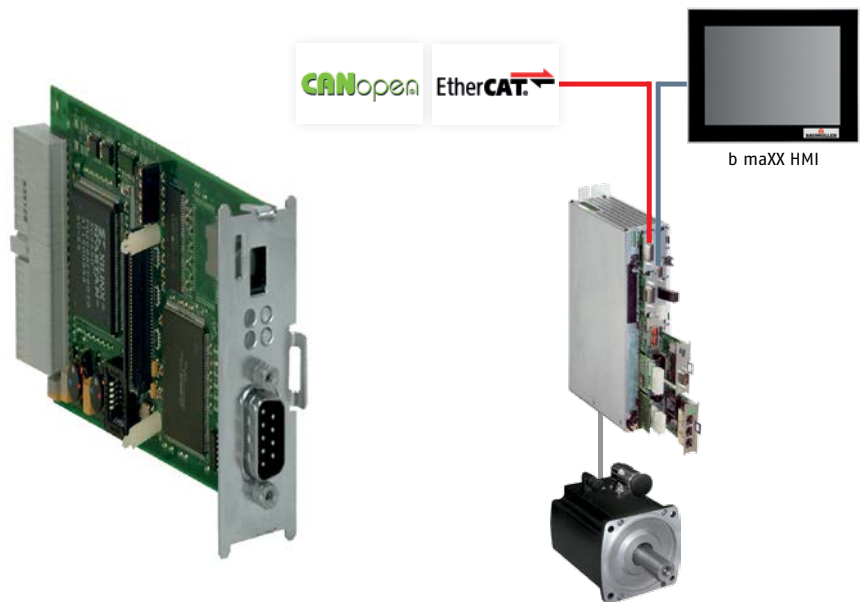
With a cycle time of 100 μ s for 1,000 lines of STL, the b maXX-drivePLC is suitable for both comprehensive control and demanding motion control tasks. Through the use of our drivePLC, the PLC can be assisted, down-sized or even completely replaced. A new transparency and clarity is also created in the application via the clean decoupling of motion control applications from the machine program. The drivePLC can be integrated into the b maXX 4400 servo controller series and enables the uncomplicated creation of control technology programs with ProMaster or PROPROG.

A CANopen master is included with the CAN option module for b maXX-drivePLC. This enables up to 65,536 digital I/O points to be switched. With the

existing EtherCAT master challenging and highly synchronized movement processes are controlled directly on the b maXX-drivePLC. The extensive product range includes decentralized analog and digital I/O modules.

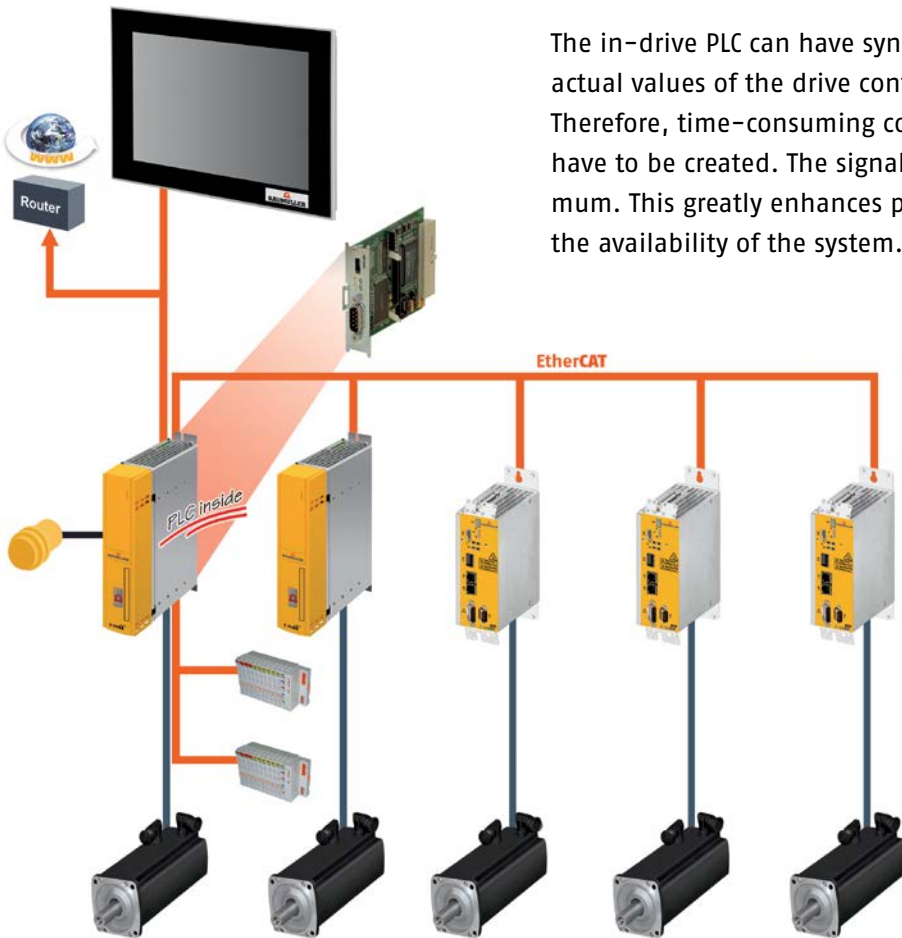
The program memory of the b maXX-drivePLC is sufficient for typical 120,000 lines of IL. 2 MB of RAM are available for variables. The optional residual data memory of 100 KB is buffered battery-free with a NVRAM. This means there is enough memory available for sufficient code. Costly memory expansions can be dispensed with. The battery-free NVRAM means that data is available maintenance-free and after every time the system is switched off and on without any data loss.

- 32-bit Risc CPU 120 MHz
- 16 MB flash memory, of which 2 MB is reserved for the IEC program and 4 MB for cams
- 100 KB non-volatile RAM



PLC and drive are synchronous

The in-drive PLC can have synchronized access to all setpoints and actual values of the drive controller via the internal parallel bus. Therefore, time-consuming communications programs do not have to be created. The signal transit times are reduced to a minimum. This greatly enhances process security and also increases the availability of the system.



Further details on how b maXX 4400 can be extended into a complete automation system can be found in the brochure with the title "Automation".

All the advantages at a glance

- Fast, synchronous PLC access to the drive controller:
Sophisticated communications programs are no longer required – the burden on the system is relieved
- No wiring between the PLC and the drive:
Fault-prone cable connections can be reduced – availability is increased
- Compact design saves control cabinet space:
The volume of the control cabinet can be reduced
- Maximum PLC and servo controller performance due to independent processors:
No limitations due to overlapping processes – the system remains stable and reliable
- Baumüller is the contact partner for the PLC and drive system, and therefore the automation system as a whole: Experience and competence for the entire automation system – direct communication with one reliable partner reduces the amount of engineering that is required

b maXX 4400 – The modular servo drive

Braking energy

Brake resistor activation is integrated in the form of a brake chopper. A regenerative resistor is connected externally. This paves the way for optimal dimensioning and also reduces the volume of the control cabinet.

Line filter

To optimize configuration from a cost perspective, line filters are always connected in series outside the device. Several power modules can thus be grouped for each line filter resulting in reduced costs for the system as a whole.

Temperature-dependent fan control

The fan is controlled relative to the temperature inside the device. This leads to a reduction in energy consumption and therefore lowers the overall costs of a system.

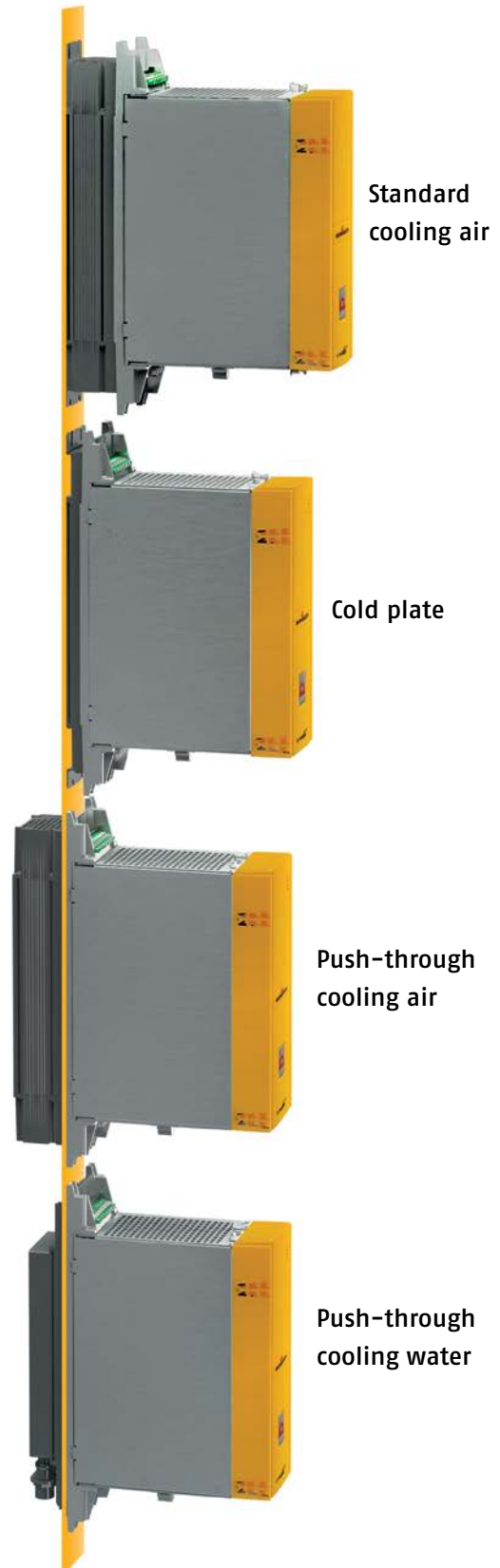
DC link coupling

DC link coupling can be achieved for a number of power modules for the purpose of energy compensation. Surplus energy is not “burned”. It is made available to other drive units without taking additional energy from the supply network.

Safety module

With the optional safety module, the option “safety stop” in accordance with EN ISO 13849 safety category 4 can easily be realized without the integration of additional contactors in the motor line. This ensures that the structure of the safety circuit remains simple and transparent. The danger potential of the machine is reduced – the machine works reliably.

Types of cooling

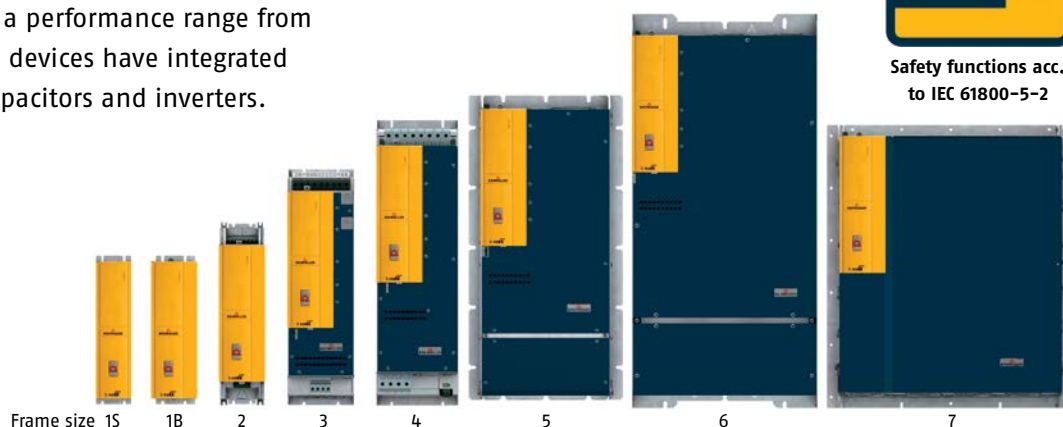


b maXX 4400 servo drive family

b maXX 4400 offers a performance range from 1.1 kW to 315 kW. All devices have integrated rectifiers, DC link capacitors and inverters.



Safety functions acc. to IEC 61800-5-2



Technical data b maXX 4400

| Type | Frame size | I _N [A] | I _{MAX} [A] | typ. motor rating | | Overload factor | Dimensions WxHxD ¹⁾ [mm] |
|--------------------|------------|--------------------|----------------------|-------------------|------|-----------------|-------------------------------------|
| | | | | [kW] | [hp] | | |
| 4412 | 1 S | 2.5 | 5 | 1.1 | 1.5 | 2 | 80 x 310 x 263 ⁴⁾ |
| 4413 | 1 S | 4.5 | 9 | 2 | 2.7 | 2 | 80 x 310 x 263 ⁴⁾ |
| 4412 | 1 B | 2.5 | 5 | 1.1 | 1.5 | 2 | 106 x 310 x 263 ⁴⁾ |
| 4413 | 1 B | 4.5 | 9 | 2 | 2.7 | 2 | 106 x 310 x 263 ⁴⁾ |
| 4422 | 2 | 7.5 | 15 | 3.4 | 4.6 | 2 | 106 x 428 x 340 / 320 |
| 4423 | 2 | 11 | 22 | 5 | 6.7 | 2 | 106 x 428 x 340 / 320 |
| 4424 | 2 | 15 | 30 | 6.8 | 9.1 | 2 | 106 x 428 x 340 / 320 |
| 4425 | 2 | 15 | 40 ²⁾ | 6.8 | 9.1 | 2.6 | 106 x 428 x 340 / 320 |
| 4426 ³⁾ | 2 | 22.5 | 45 ²⁾ | 6 | 8.0 | 2 | 106 x 428 x 340 / 320 |
| 4426 | 2 | 22.5 | 45 ²⁾ | 10 | 13.4 | 2 | 106 x 428 x 340 / 320 |
| 4432 | 3 | 22.5 | 45 | 10 | 13.4 | 2 | 155 x 510 x 340 / 325 |
| 4433 | 3 | 30 | 60 | 13 | 17.4 | 2 | 155 x 510 x 340 / 325 |
| 4434 | 3 | 45 | 90 | 20 | 26.8 | 2 | 155 x 510 x 340 / 325 |
| 4435 | 3 | 60 | 90 | 28 | 37.5 | 1.5 | 155 x 510 x 340 / 325 |
| 4443 | 4 | 80 | 120 | 36 | 48 | 1.5 | 190 x 624 x 374 / 327 |
| 4444 | 4 | 100 | 130 | 45 | 60 | 1.3 | 190 x 624 x 374 / 327 |
| 4445 | 4 | 130 | 170 | 58 | 78 | 1.3 | 190 x 624 x 374 / 327 |
| 4446 | 4 | 150 | 200 | 75 | 100 | 1.3 | 190 x 624 x 374 / 327 |
| 4453 | 5 | 150 | 195 | 75 | 100 | 1.3 | 307 x 656 x 374 / 321 |
| 4454 | 5 | 210 | 260 | 110 | 147 | 1.3 | 307 x 656 x 374 / 321 |
| 4462 | 6 | 250 | 325 | 132 | 177 | 1.3 | 437 x 815 x 378 / 316 |
| 4463 | 6 | 300 | 390 | 160 | 215 | 1.3 | 437 x 815 x 378 / 316 |
| 4466 | 6 | 350 | 450 | 175 | 234 | 1.3 | 437 x 815 x 378 / 316 |
| 4472 | 7 | 450 | 585 | 225 | 302 | 1.3 | 520 x 600 x 340 ⁵⁾ |
| 4473 | 7 | 615 | 780 | 315 | 422 | 1.3 | 520 x 600 x 340 ⁵⁾ |

Supply voltage: 207–528 V ± 0% AC
 Supply frequency: 50/60 Hz
 Supply rated voltage: 400 V
 DC link voltage: 540 V rated voltage
 Chopping frequency: 2/4/8 kHz
 Output voltage: 0–95% of supply voltage

Electronics supply: external 24 V DC (diagnostic capability)
 Fan connection: frame size 1–3: 24 V DC electronics supply
 frame size 4–7: 230 V AC ± 10%
 Certification: CE, CSA, UL

Subject to alteration

1) Depth air cooling / depth water cooling
 2) for 1 second
 3) single phase
 4) air cooling only
 5) water cooling only
 Height and depth w/o mounting brackets; depth incl. required bending radius of connecting cables

b maXX 4100 Regenerative power supply unit

It is often the case with electrical drives that energy costs make up almost 90% of the overall life-cycle costs. With this in mind, regenerative systems help to reduce the total cost of ownership.



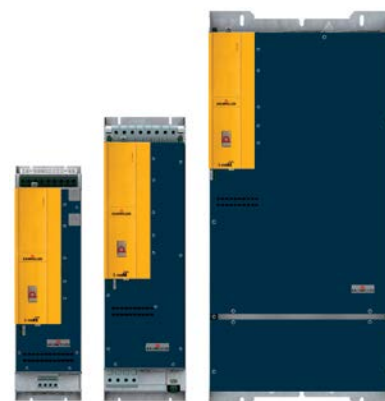
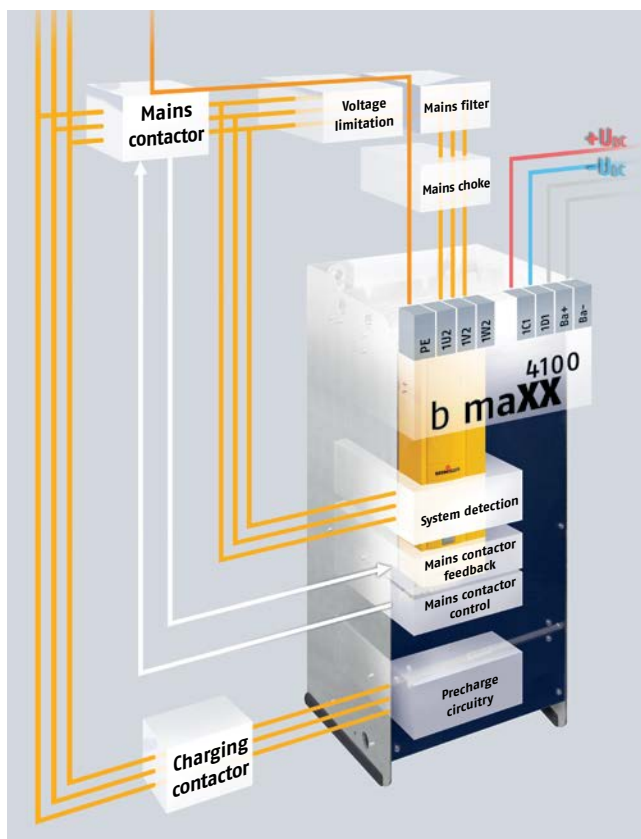
Baumüller's tried-and-tested b maXX automation and drive solution is being expanded with the addition of the new b maXX 4100 series regenerative power supplies. These units work in conjunction with b maXX 4400 series units, and can supply the DC link voltage to one or more drives. By using a b maXX 4100, all excess regenerative brake energy generated by the system is returned to the AC

mains supply rather than wastefully dissipating this energy as heat.

From the standpoint of energy costs, this offers the user considerable savings over the machine's service life. Regenerative systems help to lower energy consumption (and do their bit for the environment) by feeding the available brake energy back to the power grid rather than wasting it via a regenerative resistor.

The b maXX 4100 units are fully integrated into Baumüller's b maXX automation and drive solution family of products. The benefits which the b maXX series offers to its users such as modularity and flexibility, are also provided by the b maXX 4100. Four different frame sizes cover a DC link power range of 35 kW to 150 kW with the option of air or water cooling. The b maXX 4100 can also be integrated in the Baumüller automation environment by means of various optional fieldbuses. System consistency is achieved by adopting the same housing technology and connection arrangements as well as integrating the parameters of the b maXX 4400 into the existing b maXX ProDrive operating software.

- Regenerative brake energy is returned as a sine wave
- 3 frame sizes with 35 kW to 150 kW
- 60 second overload capability
- Current-controlled charging circuit
- Integrated control of charging and mains contactors
- Integral regenerative switching transistor
- Monitoring of mains, charging connection, mains contactor, DC link voltage, and heat sink temperature
- Optional fieldbus modules



Frame size 3 4 6

Technical data b maXX 4100

| Type | Frame size | DC link power ¹⁾ | | DC link peak power | | Overload factor ²⁾ | Dimensions WxHxD ³⁾ [mm] |
|------|------------|-----------------------------|------|--------------------|------|-------------------------------|-------------------------------------|
| | | [kW] | [hp] | [kW] | [hp] | | |
| 4135 | 3 | 35 | 47 | 52 | 70 | 1.5 | 155 x 510 x 340 |
| 4145 | 4 | 80 | 107 | 104 | 139 | 1.3 | 190 x 624 x 374 |
| 4163 | 6 | 150 | 201 | 190 | 255 | 1.3 | 437 x 815 x 378 |

Supply voltage: 360–528 V ± 0% AC
 Supply frequency: 45–65 Hz
 Supply rated voltage: 400 V AC
 DC link rated voltage: 640 V DC
 Switching frequency: 8 kHz
 Regenerative switching transistor: Integrated

Electronics supply: external, 19.3–30 V DC (diagnostic capability)
 Fan connection: frame size 3: 24 V DC electronics supply
 frame sizes 4–6: 230 V AC ± 10%
 Certification: CE, CSA, UL

Subject to alteration

1) For 640 V DC DC link rated voltage
 2) For 60 seconds
 3) Height and depth without mounting brackets; depth including required bending radius of connecting cables

b maXX 4600/4700 Peak and nominal load devices



Peak and nominal load devices available in five sizes supplement the proven b maXX series. Regardless of whether you require maximum performance on a continuous or temporary basis – the b maXX series offers customised drive solutions for every application.

The tried-and-tested b maXX automation and drive solution is being expanded to include new peak and nominal load devices from the 4600 and 4700 series. Baumüller is now able to meet the specific requirements of applications in the injection moulding or extrusion sector, for example, where either short-term peak output or permanent

high performance is required. As a result, the drive can be adapted perfectly to the power requirements of the relevant application.

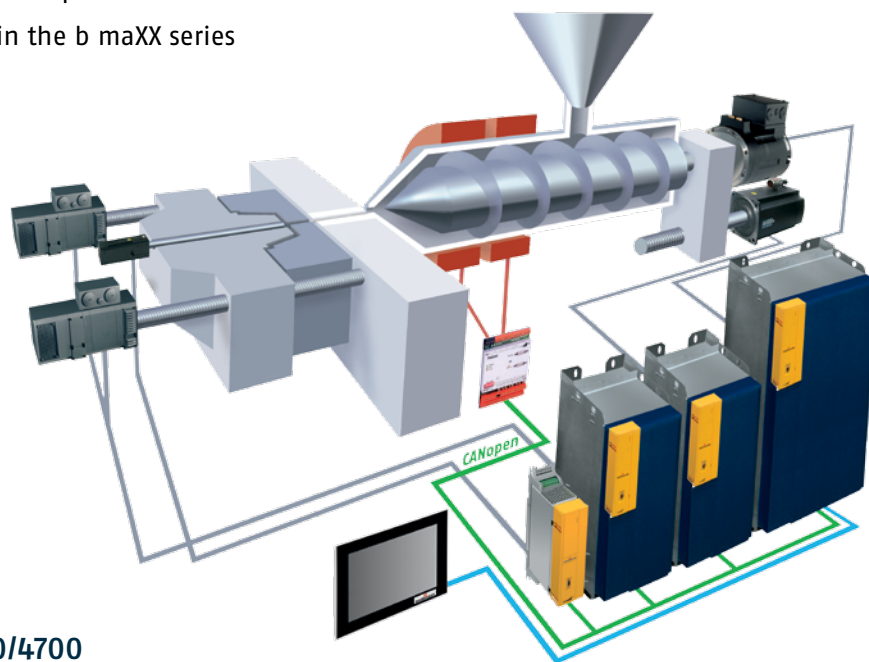
Although the devices in the series are more powerful, they have a compact design and take up much less space in the control cabinet – double benefits for the user.

b maXX 4600/4700 – Your benefits at a glance

- Optimized drive solution for specific industry requirements
- Different sizes available for compatible drive dimensions
- Less space required in the control cabinet due to smaller devices and the use of water cooling, control cabinet therefore less expensive to manufacture
- Water cooling in the control cabinet provides a cost-effective solution
- Compatible with other devices in the b maXX series



Safety functions acc.
to IEC 61800-5-2



Technical data b maXX 4600/4700

| b maXX 4600 Type | Frame size | I_N [A] | I_{MAX} [A] | Overload factor ¹⁾ | Dimensions WxHxD [mm] |
|----------------------|------------|--------------|------------------|----------------------------------|--------------------------|
| 4632-F | 3 | 60 | 120 | 2 | 208 x 556.5 x 325 |
| 4641-F | 4 | 85 | 170 | 2 | 242 x 681 x 327 |
| 4642-F | 4 | 100 | 200 | 2 | 242 x 681 x 327 |
| 4650-F ²⁾ | 5 | 130 | 260 | 2 | 360 x 550 x 285 |
| 4651-F ²⁾ | 5 | 165 | 330 | 2 | 360 x 550 x 285 |
| 4652-F ²⁾ | 5 | 200 | 400 | 2 | 360 x 550 x 285 |
| 4661-F ²⁾ | 6 | 250 | 500 | 2 | 490 x 710 x 285 |
| 4662-F ²⁾ | 6 | 300 | 600 | 2 | 490 x 710 x 285 |

| b maXX 4700 Type | Frame size | I_N [A] | I_{MAX} [A] | Overload factor ¹⁾ | Dimensions WxHxD [mm] |
|----------------------|------------|--------------|------------------|----------------------------------|--------------------------|
| 4755-F ²⁾ | 5 | 260 | 260 | 1 | 360 x 550 x 285 |
| 4766-F ²⁾ | 6 | 450 | 450 | 1 | 490 x 710 x 285 |
| 4773-F | 7 | 720 | 800 | 1.1 | 580 x 660 x 340 |

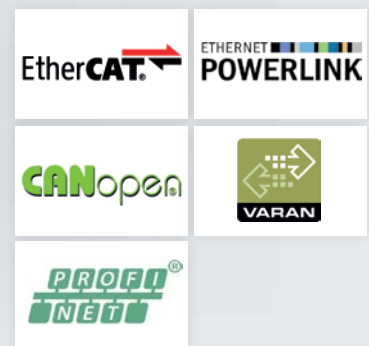
1) for 1 second with a cycle of 5 seconds

2) compact design, water-cooled

Subject to alteration

b maXX 3300

Servo drive up to 5 kW



The servo drive b maXX 3300 is a premium-quality servo controller with an integrated position control for the small power range. The b maXX 3300 distinguishes itself with its compact and space-saving construction. The field-oriented control provides an excellent rotational accuracy. Higher-level speed and position control ensure a precise positioning. b maXX 3300 is compatible with servo controllers b maXX 5000 with regards to handling, communication parameter structure, main functionality and operation. b maXX 3300 is parameterized in ProDrive.

The highly dynamic control of b maXX 3300 in conjunction with the highly dynamic small-sized servo

motors of the series DSD increase the cycle-times of the application and increase the production output of machines and installations. The high chopping frequency (16 kHz) reduces noise emission and therefore relieves the burden on the environment.

The servo controller is specifically designed for the operation with the servo motors DSD 28–100 as well as for the Baumüller disc motor series and the linear motor series. The consequent design focus of the controller on efficiency and compact construction form qualifies the b maXX 3300 for applications in the handling or robotics fields as well as for applications within the printing, textile and packing industry.

b maXX 3300 – Compact mini servo drive

The following control types are available for synchronous machines

- Current control (sampling times 62.5 μs)
- Speed control (sampling times 125 μs)
- Position control (sampling times 125 μs)
- Jogging mode
- Referencing

Functions

- 230 V or 400 V mains supply voltage
- Chopping frequency 4/8/16 kHz
- Integrated regenerative switching transistor
- Integrated ballast resistor
- External 24 V supply
- Optional 1 or 2
- 1 encoder input
- Digital I/Os 24 V/; 4 In; 2 Out
- Analog I/Os ± 10 V; 2 In; 2 Out;
- 7 parameter data sets
- Open loop control and closed loop control
- EtherCAT/CANopen on board

Encoder types

- Resolver
- Rectangle incremental encoder
- SINCOS absolute encoder (single/multiturn)
- SINCOS incremental encoder
- ENDAT 2.1
- ENDAT 2.2
- SSI-Encoder
- Hiperface DSL

Softdrive PLC

- Basic and extended version

Safety Technology

Certified Safety Function STO according to EN ISO 13849 up to PL_e



Frame size 0 1

Technical data b maXX 3300

| Type | Frame size | I _N [A] | I _{MAX} [A] | typ. motor rating | | max. peak current time [s] | Dimensions WxHxD [mm] |
|------|------------|--------------------|----------------------|-------------------|------|----------------------------|-----------------------|
| | | | | [kW] | [hp] | | |
| 3302 | 0 | 1.5 | 6 | 0.8 | 1.07 | 60 | 65 x 170 x 170 |
| 3303 | 0 | 2.7 | 11 | 1.4 | 1.9 | 60 | 65 x 170 x 170 |
| 3304 | 0 | 5.0 | 15 | 2.5 | 3.4 | 30 | 65 x 170 x 170 |
| 3312 | 1 | 6.5 | 20 | 3.3 | 4.4 | 10 | 85 x 170 x 170 |
| 3313 | 1 | 10 | 20 | 5.0 | 6.7 | 10 | 85 x 170 x 170 |

Mains supply voltage: frame size 0: 110 V–243 V, single-phase; supply rated voltage: 230 V
frame size 0/1: 180 V–528 V, three-phase; supply rated voltage: 400 V

Supply frequency: 50/60 Hz

Chopping frequency: 4/8/16 kHz

Output voltage: 0–85% (single-phase), 0–95% (three-phase) of supply voltage

Electronics supply: external 24 V DC

Data is valid for 4 kHz clock frequency; Dimensions without mounting brackets

Subject to alteration

b maXX 2400 Mini servo inverter up to 2 kW

b maXX 2430

b maXX 2415

b maXX 2410

b maXX 2405



CANopen

EtherCAT

PROFIBUS

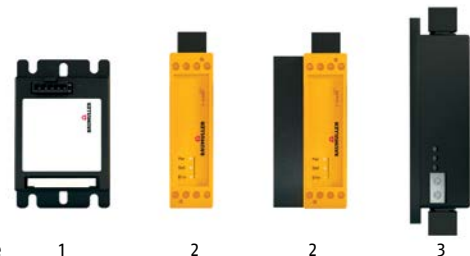
Modbus

The b maXX 2400, in combination with the servo motors DSD2 28–36 and the disc motors of Baumüller forms a powerful compact system for industrial applications such as handling, packaging and robotics as well as for mobile applications for warehousing and logistics.

The mini servo inverter with integrated intelligence supports the fieldbuses CANopen, EtherCAT, PROFIBUS and Modbus and can thus be flexibly integrated into networked drive structures.

b maXX 2400 – compact mini servo controller

- Compact servo inverter with integrated MPU (Motion Process Unit)
- Support of the fieldbus systems: CANopen, EtherCAT, PROFIBUS, Modbus
- Applicable for drive systems with supply voltage 9 to 60 VDC
- Suitable for use with BLDC and DC motors with closed-loop control and for DC motors in speed control mode with open-loop control
- The servo controller is freely programmable
- Optional operating modes include: Positioning control, 4Q-speed controller or current controller
- Positioning controller (sampling time 2000 μ s), speed controller (sampling time 250 μ s), current controller (sampling time 125 μ s)
- Protection functions: over voltage, under voltage and over temperature monitoring
- LED-display for Power, Status, Error
- The controllers have digital inputs and outputs and at least one analogue input
- The integrated MPU is freely programmable up to 1500 lines in Python script
- The programming of the inputs and outputs in the MPU enable following functionalities: SPS, brake control, analogue setpoint value, selectable reference travel modes
- All connections are plug-in
- Options: CAN-adapter USB for parameterization and programming, external ballast module with integrated ballast resistor
- Possibility of remote diagnosis



Frame size 1 2 2 3

Technical data b maXX 2400

| Type | Frame size | I_N [A] | I_{MAX} [A] | typ. motor rating | | Supply voltage electronics U_e [VDC] | Supply voltage performance U_p [VDC] | Dimensions ¹⁾ WxHxD [mm] |
|------|------------|-----------|---------------|-------------------|------|--|--|-------------------------------------|
| | | | | [kW] | [hp] | | | |
| 2405 | 1 | 5 | 15 | 0.2 | 0.26 | 9 ... 30 | 9 ... 60 | 45.5 x 74 x 14 ²⁾ |
| 2410 | 2 | 10 | 50 | 0.4 | 0.53 | 9 ... 30 | 9 ... 60 | 22.5 x 77 x 110 ²⁾ |
| 2415 | 2 | 15 | 50 | 0.65 | 0.86 | 9 ... 30 | 9 ... 60 | 40 x 77 x 110 ³⁾ |
| 2430 | 3 | 30 | 100 | 1.2 | 1.60 | 9 ... 30 | 9 ... 60 | 30 x 100 x 111 ²⁾ |

| Type | Frame size | Digital inputs # | Digital outputs # | Continuous output current [A] | Analog inputs #, type |
|------|------------|------------------|-------------------|-------------------------------|---|
| 2405 | 1 | 3 | 1 | 2.5 | 1 \pm 10 V; differential |
| 2410 | 2 | 8 | 2 | 2.5 | 1 \pm 10 V; differential + single ended |
| 2415 | 2 | 8 | 2 | 2.5 | 1 \pm 10 V; differential + single ended |
| 2430 | 3 | 8 | 2 | 2.5 | 1 \pm 10 V; differential + single ended |

Chopping frequency: 16 kHz

Output voltage: 0–100% of supply voltage

1) The housing dimensions vary according to the additional fieldbus modules

2) Dimensions without cooling-element, connector or additional fieldbus modules

3) Dimensions with cooling-element but without connector or additional fieldbus modules

Subject to alteration

b maXX 1000 Variable frequency drive



The b maXX 1000 is a frequency converter that provides for the highly efficient vector control of standard motors in three sizes with output power ranging from 0.2 kW to 11 kW. In designing the b maXX 1000, Baumüller has placed their primary focus on providing an easy to use line of products. The b maXX 1000 offers an integrated EMC filter as standard, for compliance with the applicable EU standard (EN 55011A/ Second Environment). Numerous protective and overload functions, such as phase failure detection on the line and motor side, ensure error-free operation. A comprehensive control scheme provides a constant, precise overview of the current drive status.

The b maXX 1000 is also equipped for applications, thanks to its 15 different preset speeds. Its adjustable pulse width modulation, from 1 kHz to 15 kHz, also means that it emits barely any noise during operation. It can achieve a rotating field frequency of between 0.1 Hz and 400 Hz, meaning that even multi-pole machines can be operated at high speeds.

The b maXX 1000 can be connected to CANopen, the premier open fieldbus system. It is also able to work as a motion control slave, due to its integrated protocols.

b maXX 1000 – Highly efficient, easy to operate variable frequency drive

- Comprehensive protective functions: overvoltage and undervoltage protection, ensuring that the device cannot be destroyed; ground-fault, short-circuit, overload, and no-load protection, ensuring that the motor is protected effectively; protection against overheating
- Adjustable PWM frequency, 1 kHz to 15 kHz – for extremely quiet machine operation
- Intelligent output current monitoring
- Automatic energy-saving function – reduces cost of ownership
- CANopen and ModBus onboard
- Auto tuning – improves ease of setup
- Automatic slip tracking – always provides optimum efficiency
- Starting torque up to 150% – simple compensation for high breakaway torques
- PID control – fast response to perturbation, constant speed
- 15 preset speeds – for optimum speed range
- S-curve function for smooth acceleration and deceleration – soft starting is better for your mechanical systems
- Detachable keypad available as an option



Frame size 1 2 3

Technical data b maXX 1000

| Type | Frame size | I _N [A] | I _{MAX} [A] | typ. motor rating | | Overload factor ³⁾ | Dimensions W x H x D ⁴⁾ [mm] |
|--------------------|------------|--------------------|----------------------|-------------------|------|-------------------------------|---|
| | | | | [kW] | [hp] | | |
| 1211 ¹⁾ | 1 | 1.6 | 2.4 | 0.2 | 0.27 | 1.5 | 72 x 142 x 152 |
| 1212 ¹⁾ | 1 | 2.5 | 3.75 | 0.4 | 0.54 | 1.5 | 72 x 142 x 152 |
| 1213 ¹⁾ | 1 | 4.2 | 6.3 | 0.75 | 1.0 | 1.5 | 72 x 142 x 152 |
| 1412 ²⁾ | 1 | 1.5 | 2.25 | 0.4 | 0.54 | 1.5 | 72 x 142 x 152 |
| 1413 ²⁾ | 1 | 2.5 | 3.75 | 0.75 | 1.0 | 1.5 | 72 x 142 x 152 |
| 1414 ²⁾ | 1 | 4.2 | 6,3 | 1.5 | 2.0 | 1.5 | 72 x 142 x 152 |
| 1224 ¹⁾ | 2 | 7.5 | 11.25 | 1.5 | 2.0 | 1.5 | 100 x 174 x 152 |
| 1225 ¹⁾ | 2 | 11.0 | 16.5 | 2.2 | 3.0 | 1.5 | 100 x 174 x 152 |
| 1425 ²⁾ | 2 | 5.5 | 8.25 | 2.2 | 3.0 | 1.5 | 100 x 174 x 152 |
| 1426 ²⁾ | 2 | 8.2 | 12.3 | 3.7 | 5.0 | 1.5 | 100 x 174 x 152 |
| 1437 ²⁾ | 3 | 13.0 | 19.5 | 5.5 | 7.4 | 1.5 | 130 x 260 x 169 |
| 1438 ²⁾ | 3 | 18.0 | 27.0 | 7.5 | 10.0 | 1.5 | 130 x 260 x 169 |
| 1439 ²⁾ | 3 | 24.0 | 36.0 | 11.0 | 14.8 | 1.5 | 130 x 260 x 169 |

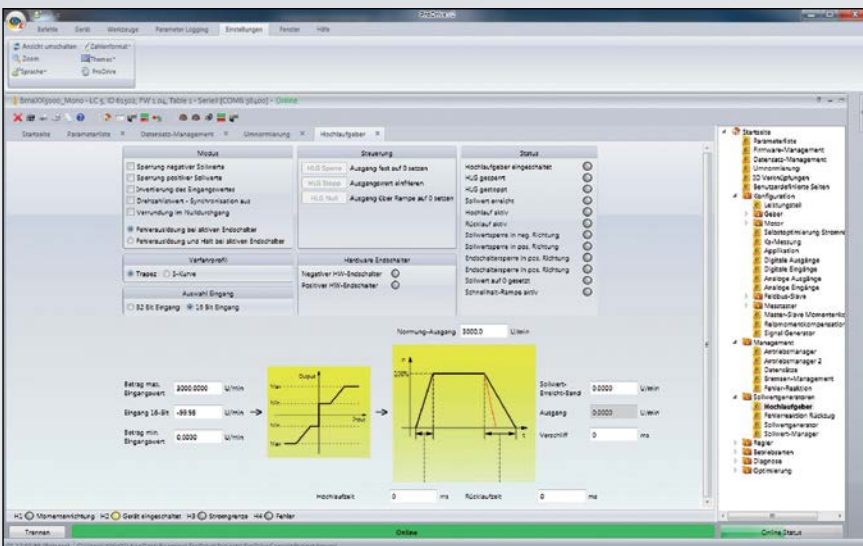
Supply voltage:
200–240 V ± 10 % (TN-, TT-, IT mains)
380–480 V ± 10 % (TN-, TT-, IT mains)
Supply frequency: 47–63 Hz
Clock frequency: 1–15 kHz
Adjustable frequency: 0.1–400 Hz

Electronics supply: internal, 24 V DC
Type of protection: IP20
Operating temperature: -10°C to 50°C (to 40°C if adding)
Certification: CE, UL

Subject to alteration

1) Single-phase, 230 V
2) Three-phase, 400 V
3) For 60 seconds
4) Height and depth with mounting brackets; depth without required bending radius of connecting cables

ProDrive Commissioning and operation

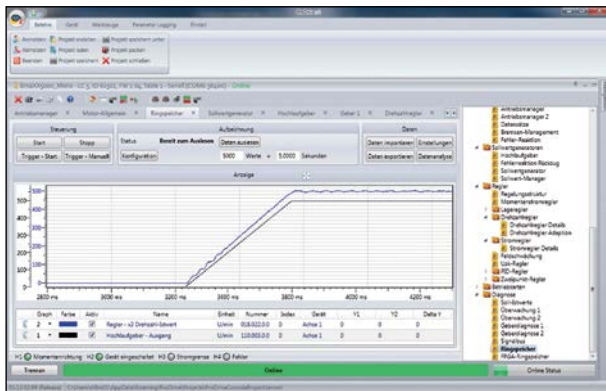


Commissioning, parameterization and operation of all b maXX controllers is simplified with ProDrive – for the beginner as well as for the professional. Especially the initial commissioning can be performed with ease and minimal effort due to ProDrive's intuitive operational guidance.

ProDrive

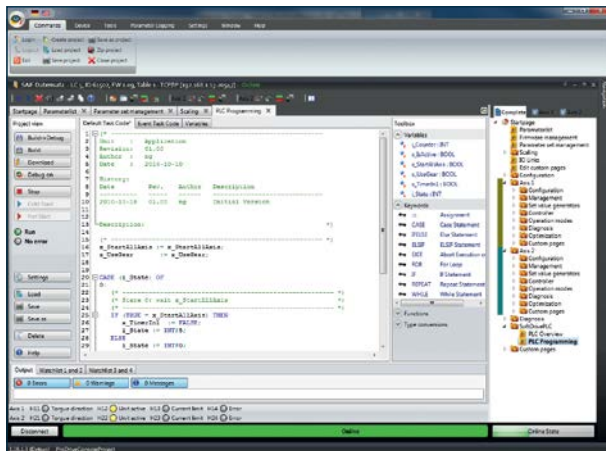
User friendly

The support provided by the graphic user interface is very important for newcomers when parameterizing the controller. By clicking on the overview page, the user gains quick access to the individual interfaces of the drive functions. Here, he will initially only find the most important parameters, clearly arranged. In the details view, all the parameters of the corresponding drive function are listed on one page. This enhances transparency and eliminates the possibility of a maloperation.



Range of functions

- Integrated, updateable power module, motor and encoder database, thus ensuring up-to-date maintenance via subsequently loaded modules
- Diagnosis/analysis tools such as oscilloscope function and FFT-analysis for optimization down to the last detail and for the simple and transparent analysis of the drive system; additional diagnosis devices are not necessary
- On-/offline-parameterization
- Single Axis or Multi Axis operation via Ethernet
- Language selection: German/English
- Guided commissioning with wizard



With the b maXX softdrivePLC Baumüller combines motion control and SPS functions in the controller and makes separate control hardware unnecessary for some applications.

Hence, ProDrive is a tool that can save newcomers and advanced users a great deal of time: parameterization, commissioning, analysis and (remote) diagnosis.

ProMaster Engineering Framework



The more intuitive the engineering, the more efficient will be the automation solution. ProMaster allows you to introduce new machine concepts to the marketplace more quickly and you systematically increase the added value of your machine. Consistent machine configuration, parametrization, programming and diagnosis are the fundamental

aspects for a machine-oriented application. The implementation of the independent standards such as Motion Control functionalities in accordance with PLCopen or EtherCAT field bus are used. Your knowledge is managed in the form of parameters and functions in data-sets and libraries – over the entire machine life cycle.

Operating and visualizing with b maXX HMI

With the b maXX HMIs, Baumüller offers an extensive portfolio of operating devices: Various formats with 16 million colors, LED background lighting and front frames in aluminum, aluminum true flat or glass. The devices are available with display sizes from 4.3 to 15.6 inches in the Basic and Standard product lines, and 7.0 to 15.6 inches in the Premium product line. They are equipped with USB and Ethernet ports and a configurable serial interface.



Drive-integrated control system

The intelligent control b maXX-drivePLC, which is completely integrated in the Engineering Framework ProMaster, allows a very fast access to the set-points and actual values of the drive controller. With this, the drive function can now be extended by complex motion control-, technology- and control functions. Furthermore, with the use of the softdrivePLC, Baumüller has integrated SPS functions directly in the controller and thus additional control hardware for specific applications is no longer necessary. In this way, a decentralized control architecture for the programming in accordance to IEC 61131 was created. Control jobs, as for example simple calculations of digital inputs as well as extremely sophisticated control algorithms, can now be easily implemented via the parameterization tool ProDrive.



b maXX-controllerPLC – modular and safe

The b maXX-controllerPLC consistently implements the concept of scalability and modularity for flexible individual adapting by the mechanical engineer. Thus the b maXX-safePLC has extended the standard motion control range by a two-channel safety control system that fulfils the requirements of IEC 61508 to SIL3 and EN 13849 to PL e.



b maXX PCC-04

The calculation performance of an industrial PC in combination with a powerful PLC supplements the range of control systems with a reliable and innovative platform. It is equipped with components of the highest level of performance and is based on open standards in the fields of automation and IT. The b maXX PCC-04 is the latest generation of industrial PCs from Baumüller. It offers users a scalable and versatile platform that provides a large number of interfaces, can be expanded, and thus enables a flexible machine design.



Motors



DSD2 – Dynamic servo motors



The servo motors for highly dynamic applications with the highest requirements of acceleration capacity and the best start-stop qualities.

Sizes 28, 36, 45, 56, 71, 100, 132, power range 0.3–150 kW (0.4–200 hp), speeds up to 6000 min⁻¹, up to IP65 type of protection

DSC1 – Compact servo motors

The DSC 45–100 is a series of high-torque servo motors that are up to 30% more compact than conventional servo designs.

Sizes 45, 56, 71, 100, power range 0.5–18 kW (0.67–24 hp), speeds up to 6000 min⁻¹, up to IP65 type of protection



DSP1 – For high speed performance



For applications requiring high rotary speeds, the DSP motors complete the existing DSD range.

Sizes 45, 56, 71, 100, power range 1.2–32 kW (1.6–43 hp), speeds up to 6000 min⁻¹, up to IP65 type of protection

DSH1 – High precision motors

The DSH1 high-precision servo motors were developed specifically for applications with the highest standards for quality and smooth operation.

Sizes 45, 56, 71, 100, power range 0.5–8 kW (0.68–11 hp), speeds up to 6000 min⁻¹, up to IP65 type of protection



DS/DS2/DA1 – General purpose servo motors

The servo motor for all applications with strict energy efficiency requirements.

Type DS/DS2: Sizes 45, 56, 71, 100, 132, 160, 200, power range 0.25–295 kW (0.33–396 hp), speeds up to 6000 min⁻¹, type of protection: unventilated IP54, ventilated IP23/IP54, water-cooled IP54.

Type DA1: Sizes 100, 132, 160, 180, 225, 280, power range 3.5–400 kW (4.7–536 hp), speeds up to 8000 min⁻¹, type of protection: ventilated IP23/IP54, water-cooled IP54



DST2 – Powerful high-torque motors

The high-torque motor DST2 for application with maximum torque requirements.

Sizes 135, 200, 260, 315, 400, 560*,

power range 2.7–1150 kW (3.6–1542 hp), speeds up to 1500 min⁻¹,

torque up to 80,000 Nm, IP54 type of protection, water-cooled *) on request



GDM & DSM – Disc motors

Baumüller offers a wide range of disc rotors for use in a large number of different applications where installation space is at a premium.

GDM DC disc motors: Power range 16–3000 W (0.02–4 hp)

DSM brushless disc motors: Power range 180–6300 W (0.24–8.4 hp)



DSE – Embedded three-phase current synchronous motors

The DSE synchronous motors are available either as a housing version or as a built-in motor. The motor covering a rotational speed range of up to 9000 min⁻¹ features buried magnets and therefore impresses with a particularly high power density.



BPx – Planetary gear series

The BPx planetary gear series in combination with our servo motors are ideally suited for applications with high demands on torque and dynamic.



LSC – Coreless linear motors

The coreless LSC linear motors from Baumüller achieve maximum current and power rise rates. They are therefore ideal for highly dynamic applications with maximum resilience against disruptive forces.



DSDI/DSMI – Motors with integrated control/power electronics

The DSDI and DSMI servo motors with integrated control and power electronics meet the requirements of modern, decentralized drive architectures. The DSDI is a highly dynamic motor and the DSMI is a high torque servo drive. Power range 170–385 W (0.23–0.52 hp), speeds up to 6000 min⁻¹, type of protection up to IP65



House of Automation

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BAUMÜLLER ANLAGEN-SYSTEMTECHNIK System Engineering
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NÜRMONT Mounting and Relocation
BAUMÜLLER SERVICES Intelligent Services



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