**BLEMO®**
The sustainable specialists
in drive technology

***BLEMO® rfequency converter***
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**BLEMO® frequency converter ER24K und ER24B**

# *The universal drive for all applications with synchronous and asynchronous motors*


*ER24B in book form, ER24K in cubic form*

Frequency converter for adjusting the speed of synchronous and asynchronous motors. 0.18 to 22.0 kW; 200 to 600 V, 1-phase and 3-phase.

## THE INNOVATION

**ER24K & ER24B – The new generation of drive technology**

Maximum performance, highest flexibility: The ER24 combines the best of the proven ER23 and ER51 series and sets new standards in mechanical and plant engineering.

**Versatile & powerful –** The ER24 controls both synchronous and asynchronous motors with the highest precision. Thanks to the new control algorithm (up to 599 Hz), it offers optimized performance for permanent magnet synchronous motors – completely without feedback.

**Integrated safety –** Benefit from STO, SLS, SS1, SMS and GDL for maximum operational safety.

**Intelligent control –** Programmable function blocks enable customized automation, from timer and counter functions to logical and arithmetic operations.

**Integrated security**
Without additional components

**STO: Safe Torque Off**
Free coasting to standstill by disconnecting the motor torque.

**SLS: Safely reduced speed**
Braking, maintaining a predefined speed.

**SS1: Secure hold**
Stopping the motor according to a predefined, safely monitored ramp. Checks whether the motor has completely stopped or reached a minimum predefined speed; then activates the STO function.

**SMS: Safe monitoring of two engine speeds**
STO is activated when the limit speeds are reached.

**GDL: Safe release of protective doors**
Safe control of safety doors with a safe exit delay. Safety Integrity Level (SIL 1, 2, or 3) according to IEC 61508 (Parts 1 and 2) Performance Level (PL e) according to ISO 13849-1/-2 Category 3

## STANDARD FEATURES

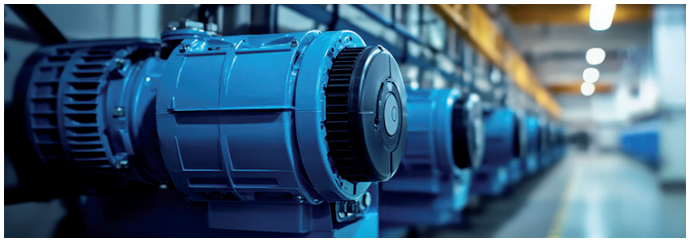
- 4-digit 7-segment display, optionally multilingual plain text display
- 150 application-specific functions
- integrated PID controller, navigation wheel for programming and as setpoint potentiometer
- Integrated are Modbus, CANopen, optionally, PROFIBUS DP V1, DeviceNet, EtherCAT, Ethernet/IP, Modbus, TCP, POWERLINK and ProfiNet
- Integrated EMC filter
- PTC thermistor input, STO input (also two-channel)
- RoHs, WEEE compliant (recycling rate: 88%)
- CE, UL, CSA, RCM, EAC, ATEX
- Painted circuit boards

*Plain text display with door mounting kit, IP65 protection rating*

*ER24 with regenerative unit*

## APPLICATION EXAMPLES:

Torque-dependent drives, conveyor technology, lifting technology, pumps and fans, machine & plant engineering



# DEVICE OVERVIEW ER24

| Mains voltage | Type designation | Rated power (kW) | Continuous output current (A) | Short-term overload current (A) | Power loss at full load (W) | Mass (HxBxT) | Weight* (Kg) |
|---|---|---|---|---|---|---|---|
| 1~200...240 V | **ER24-0.18K(B)** | 0,18 | **1,5** | 2,3 | 24 | 143(325) x 72(45) x 109(232) | 0,8(1,6) |
| 50/60 Hz | **ER24-0.37K(B)** | 0,37 | **3,3** | 5,0 | 41 | 143(325) x 72(45) x 128(232) | 1,0(1,7) |
| | **ER24-0.55K(B)** | 0,55 | **3,7** | 5,6 | 46 | 143(325) x 72(45) x 138(232) | 1,1(1,7) |
| | **ER24-0.75K(B)** | 0,75 | **4,8** | 7,2 | 60 | 143(325) x 72(45) x 138(232) | 1,1(1,7) |
| | **ER24-1.1K(B)** | 1,1 | **6,9** | 10,4 | 74 | 143(325) x 105(60) x 158(234) | 1,6(2,0) |
| | **ER24-1.5K(B)** | 1,5 | **8,0** | 12,0 | 90 | 143(325) x 105(60) x 158(234) | 1,6(2,0) |
| | **ER24-2.2K(B)** | 2,2 | **11,0** | 16,5 | 123 | 143(325) x 105(60) x 158(234) | 1,6(2,1) |
| 3~380...500 V | **ER24-0.37/4K(B)** | 0,37 | **1,5** | 2,3 | 32 | 143(325) x 105(45) x 138(232) | 1,2(1,6) |
| 50/60 Hz | **ER24-0.55/4K(B)** | 0,55 | **1,9** | 2,9 | 37 | 143(325) x 105(45) x 138(232) | 1,2(1,7) |
| | **ER24-0.75/4K(B)** | 0,75 | **2,3** | 3,5 | 41 | 143(325) x 105(45) x 138(232) | 1,2(1,7) |
| | **ER24-1.1/4K(B)** | 1,1 | **3,0** | 4,5 | 48 | 143(325) x 105(45) x 138(232) | 1,3(1,7) |
| | **ER24-1.5/4K(B)** | 1,5 | **4,1** | 6,2 | 61 | 143(325) x 105(45) x 138(232) | 1,3(1,7) |
| | **ER24-2.2/4K(B)** | 2,2 | **5,5** | 8,3 | 79 | 184(325) x 140(60) x 158(234) | 2,1(2,1) |
| | **ER24-3.0/4K(B)** | 3,0 | **7,1** | 10,7 | 125 | 184(325) x 140(60) x 158(234) | 2,1(2,1) |
| | **ER24-4.0/4K(B)** | 4,0 | **9,5** | 14,3 | 150 | 184(325) x 140(60) x 158(234) | 2,2(2,2) |
| | **ER24-5.5/4K** | 5,5 | **14,3** | 21,5 | 232 | 232 x 150 x 232 | 4,2 |
| | **ER24-7.5/4G** | 7,5 | **17,0** | 25,5 | 269 | 232 x 150 x 232 | 4,4 |
| | **ER24-11.0/4K** | 11,0 | **27,7** | 41,6 | 397 | 330 x 180 x 232 | 6,8 |
| | **ER24-15.0/4K** | 15,0 | **33,0** | 49,5 | 492 | 330 x 180 x 232 | 6,8 |
| | **ER24-18.5/4K** | 18,5 | **40,0** | 60,0 | 615 | 330 x 180 x 198 | 6,9 |
| | **ER24-22.0/4K** | 22,0 | **46,0** | 69,0 | 768 | 330 x 180 x 198 | 6,9 |
| 3~200...240 V | ER24-0.18/3K | 0,18 | **1,5** | 2,3 | 23 | 143 x 72 x 109 | 0,8 |
| 1~200...240 V* | ER24-0.37/3K | 0,37 | **3,3** | 5,0 | 38 | 143 x 72 x 128 | 0,9 |
| 50/60 Hz | ER24-0.55/3K | 0,55 | **3,7** | 5,6 | 43 | 143 x 72 x 138 | 1,0 |
| | ER24-0.75/3K | 0,75 | **4,8** | 7,2 | 55 | 143 x 72 x 138 | 1,0 |
| | ER24-1.1/3K | 1,1 | **6,9** | 10,4 | 71 | 143 x 105 x 138 | 1,4 |
| | ER24-1.5/3K | 1,5 | **8,0** | 12,0 | 86 | 143 x 105 x 138 | 1,4 |
| | ER24-2.2/3K | 2,2 | **11,0** | 16,5 | 114 | 143 x 105 x 138 | 1,4 |
| | ER24-3.0/3K | 3,0 | **13,7** | 20,6 | 146 | 184 x 140 x 158 | 2,2 |
| | ER24-4.0/3K | 4,0 | **17,5** | 26,3 | 180 | 184 x 140 x 158 | 2,2 |
| | ER24-5.5/3K | 5,5 | **27,5** | 41,3 | 292 | 232 x 150 x 178 | 3,5 |
| | ER24-7.5/3K | 7,5 | **33,0** | 49,5 | 388 | 232 x 150 x 178 | 3,6 |
| | ER24-11.0/3K | 11,0 | **54,0** | 81,0 | 477 | 330 x 180 x 198 | 6,8 |
| | ER24-15.0/3K | 15,0 | **66,0** | 99,0 | 628 | 330 x 180 x 198 | 6,9 |
| 3~525...600 V | ER24-0.75/6K | 0,75 | **1,7** | 2,6 | 36 | 143 x 105 x 158 | 1,4 |
| 50/60 Hz | ER24-1.5/6K | 1,5 | **2,7** | 4,1 | 48 | 143 x 105 x 158 | 1,4 |
| | ER24-2.2/6K | 2,2 | **3,9** | 5,9 | 62 | 184 x 140 x 158 | 2,2 |
| | ER24-4.0/6K | 4,0 | **6,1** | 9,2 | 94 | 184 x 140 x 158 | 2,2 |
| | ER24-5.5/6K | 5,5 | **9,0** | 13,5 | 133 | 232 x 150 x 178 | 3,5 |
| | ER24-7.5/6K | 7,5 | **11,0** | 16,5 | 165 | 232 x 150 x 178 | 3,6 |
| | ER24-11.0/6K | 11,0 | **17,0** | 25,5 | 257 | 330 x 180 x 198 | 6,8 |
| | ER24-15.0/6K | 15,0 | **22,0** | 33,0 | 335 | 330 x 180 x 198 | 6,9 |

* For single-phase mains connection, increase the unit size by one. **Unit types in bold: preferred type, available from stock. Subject to prior sale.**

# TECHNICAL DATA

### Mains connection

- **Voltage:** (Toleranz –15%/+10 %):
  - 1-phasig 200 bis 240 V (0,18-2,2 kW)
  - 1-phase and 3-phase, 200 to 240 V (0.18-15.0 kW)
  - 3-phase, 380 to 500 V (0.37-22.0 kW)
  - 3-phase, 525 to 600 V (0.75-22.0 kW)
- **Frequency:** 50/60 Hz ± 5%

### Motor connection

- Voltage:
  3-phase, 0 to max. $U_{Mains}$
- Output frequency:
  0.1 to 599 Hz
- Overload torque:
  max. 170 ... 220% of motor load torque
- Max. overload current:
  150% of the rated current for 60 seconds.
- Braking torque:
  30% of the rated motor torque without braking resistor;
  up to 150% with optional braking resistor (braking chopper integrated as standard)
- Rated motor frequency:
  40 to 599 Hz
- Clock frequency:
  2 to 16 kHz (factory setting 4 kHz)
- Ramp times:
  0.05 to 6000 sec.

### Control connections

- 3 analog inputs:
  - AI1: 0...+10 V, Ri = 30 kΩ, (also programmable as digital input)
  - AI2: -10 V...0...+10 V, Ri = 30 kΩ, (also programmable as digital input)
  - AI3: 0(4) - 20 mA, Ri = 250 Ω
- 1 analog output:
  - programmable as current or voltage output,
  - AQ1: 0(4)...20 mA, Ri = 800 Ω; 0...10 V, Ri = 470 Ω
    (also programmable as digital output)
- 1 logic output:
  - DQ+/DQ-: open collector, max. 30 VDC
- 6 programmable digital inputs:
  - DI1...DI6: +24 VDC supply (min./max. 19/30 VDC), internal or external, PLC compatibility level 1, EN61131-2;
  - DI5 can be used as a 20 kHz pulse input;
  - DI6 can be used as a PTC input.
- 1 STO input:
  Safe Stop (STO) 2...30 VDC, Ri = 1.5 kΩ
- 1 input for external power supply:
  - P24: 24 VDC, max. 1.1 A
- 2 programmable relay outputs:
  - R1: 1 changeover contact, min. 10 mA at 5 VDC, max. 5 A at 250 VAC and 30 VDC and resistive load
  - R2: 1 contact S, min. 10 mA at 5 VDC, max. 5 A at 250 VAC and 30 VDC and resistive load
- 2 internal voltage sources:
  +24 VDC, max. 100 mA, +10 VDC, max. 10 mA
- Integrated communication protocols:
  Modbus, CANopen

### Environmental conditions

- Ambient temperature:
  -10 to +50°C without derating,
  +50 to +60°C with derating
- Storage temperature:
  -25 to +70°C
- Relative humidity:
  <95%, no condensation
- nstallation altitude:
  max. 1000 m above sea level. Above 1000 m, the indoor altitude must be reduced by 1% for every additional 100 m

### Protection class::

- K: IP41 from above, IP20 without protective cover on top
- B: IP20 according to EN61800-5-1

### Approvals:

- CE, UL, CSA, RCM, EAC, ATEX
- IEC/EN 61800-5-1, IEC/EN 61800-3 ((Environments 1 and 2, Categories C2), UL508C, EN 954-1 Category 3, ISO/EN 13849-1/-2
- Category 3 (PL e), IEC 61800-5-2, IEC 61508 (parts 1+2)
- Safety levels SIL2 und SIL3
- Draft standard EN 50495E, IEC 60721-3-3, Categories 3C3 and 3S2
- CE, UL, CSA, RCM, EAC, ATEX

### Integrated safety functions according to IEC 61508-5-2:

- STO, SLS, SS1, SMS, GDL

## Do you have any questions about the ER24 K/B?

Contact us! We're happy to help! The operating instructions and further information on the ER24 K/B and all BLEMO® products can be found at

**www.blemo.com**