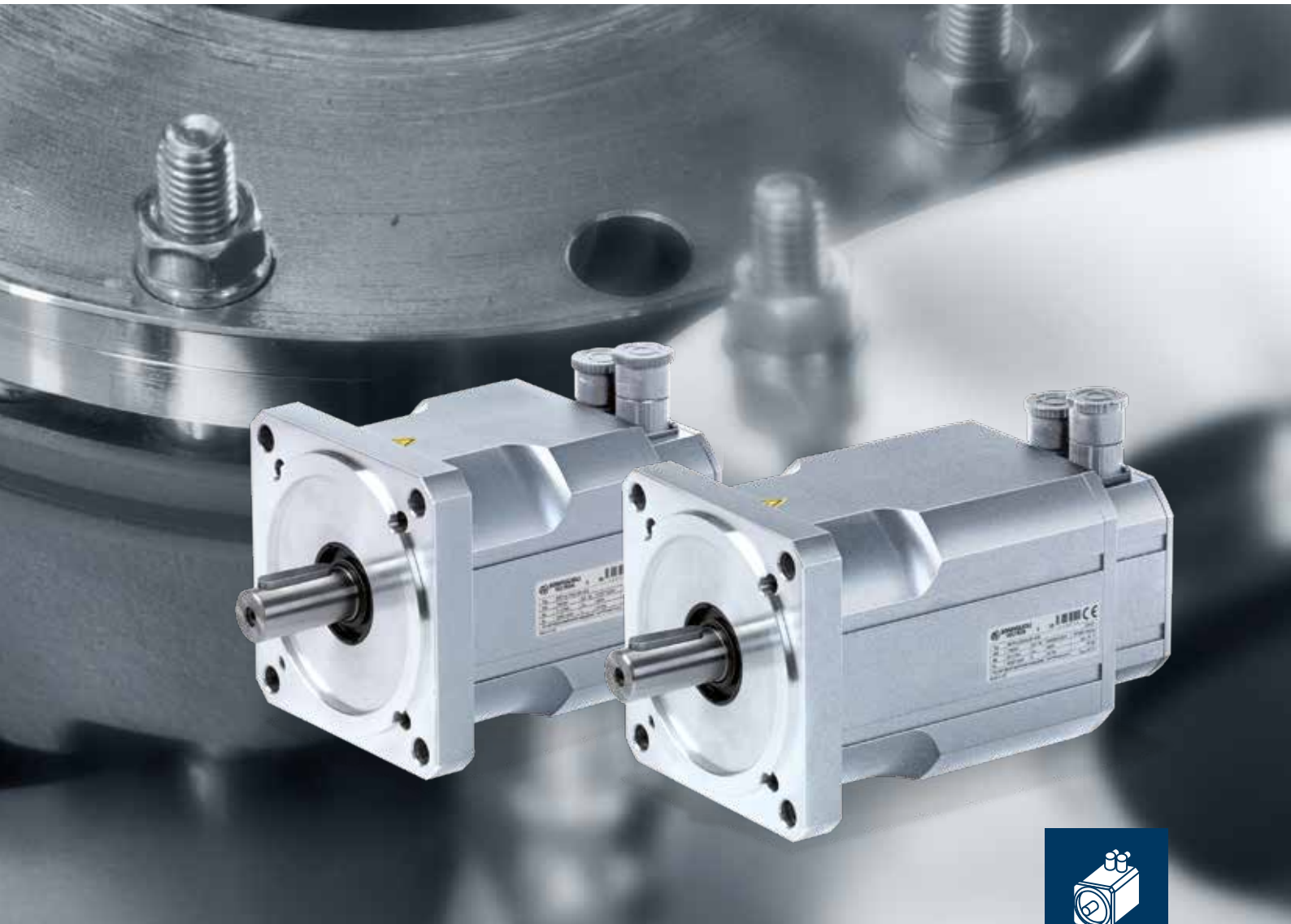


Bonfiglioli **Vectron**

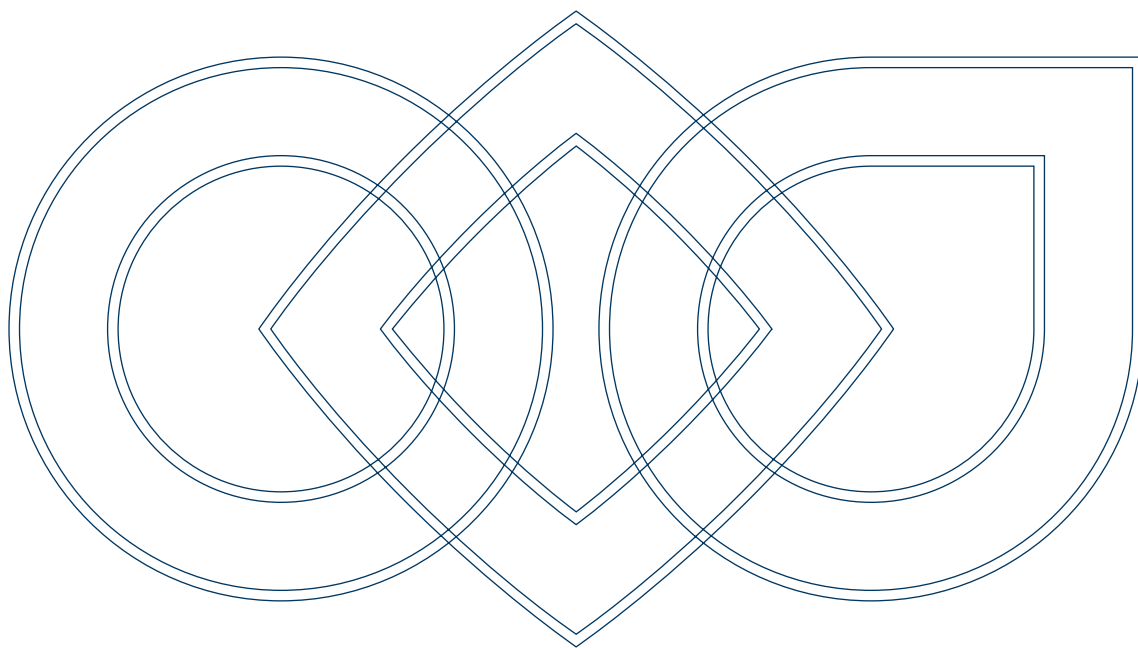
BTD - BCR

Synchronous Servomotors



PRODUCT

 **Bonfiglioli**
Forever Forward



Bonfiglioli, one name for a large international group.

It was back in 1956 that Clementino Bonfiglioli established in Bologna, Italy, the company that still bears his name. Now, some fifty years later, the same enthusiasm and dedication is driving Bonfiglioli to become the world's top name in power transmission and control solutions. Through directly controlled subsidiaries and production plants around the world, Bonfiglioli designs, manufactures and distributes a complete range of gearmotors, drive systems and planetary gearboxes, and boasts the most integrated offering on the market today.

Now, to emphasise its commitment to health, safety and environmental sustainability, Bonfiglioli is adding the term "green" to the description of its offering.

This commitment can be seen too in the Group's new trademark, made up of three shapes and colours identifying Bonfiglioli's three main business areas - Power, Control & Green Solutions and symbolising a set of values that includes openness and respect for other cultures.

In a market in which excellent product quality alone is no longer sufficient, Bonfiglioli also provides experience, know-how, an extensive sales network, excellent pre-sales and after-sales service and modern communication tools and systems to create high level solutions for industry, mobile machinery and renewable energy.

Bonfiglioli solutions



Innovative solutions for industrial field.

Bonfiglioli Riduttori today is one of the top brands in the power transmission industry. The company's success is the result of a business strategy that relies on three fundamental factors: know-how, innovation and quality. The complete range of Bonfiglioli brand gearmotors offers excellent technical characteristics and guarantees the highest performance. Substantial investment and technical expertise have enabled the company to achieve an annual production output of 1600000 units using completely automated processes.

Certification of the company's Quality System by DNV and TÜV is proof of the high quality standards achieved. With the acquisition of the Vectron brand, Bonfiglioli is now established as leader of the industrial automation sector.

Bonfiglioli Vectron delivers products and services for completely integrated inverter solutions. These solutions complement Bonfiglioli's power transmission and control offering to the industrial sector.

Since 1976, Bonfiglioli Trasmital's know-how in the power transmission industry has focused on special applications offering 100% reliability in the manufacturing of gearmotors for mobile machinery.

This includes the full range of slew and wheel drive applications and gearboxes for wind turbine pitch and yaw drive systems.

Today Bonfiglioli Trasmital stands at the forefront of the industry as a key partner to top manufacturers worldwide.



Synchronous Servomotors



Advanced technologies for all industrial fields.

BTD/BCR brushless, sinusoidal motors are designed for a three phase power supply, 200 V AC and 330 V AC, and feature free ventilation. All models are equipped with a thermistor type temperature sensor.

These synchronous servomotors are ideal for applications in machines with high dynamic requirements. They are particularly suited to robotic applications in plastic and metal machining, packaging, food and beverage processing, winding and textile industries.

They are manufactured using the latest technology for optimised magnetic circuitry and electric motor windings and offer significantly improved torque reserve and motor longevity.

BTD and BCR Series servomotors can only be controlled in speed and/or torque by a suitable electronic servo drive. The servo drive therefore constitutes an integral part of the actuator and requires perfect synchronisation with it in order to achieve optimum performance.

The combination of BTD and BCR servomotors with frequency inverters from Bonfiglioli Vectron's

ACTIVE CUBE Series guarantees excellent synergy by optimising the mathematical model of the motor in the drive using a self-learning function assisted by the frequency inverter's own configuration software. For further information on frequency inverters, refer to the Bonfiglioli Vectron Active Cube catalogues and manuals.

BTD and BCR Series motors are designed for use as part of a machine and should only be installed after a thorough check on compatibility with other devices.

Since each servomotor has a protective temperature sensor (PTC) integrated in the motor windings, operating temperature is constantly acquired and monitored by the drive to prevent all risk of damage to the motor irrespective of operating conditions.

An optional electromechanical holding brake is available for all models. Brake operation is controlled entirely by the frequency inverter.

Always bear in mind that synchronous servomotors are designed for use by expert mechatronic technicians.



Standards and directives

BTD and BCR Series servomotors to the requirements of EEC directive 73/23 (Low Voltage Directive) and EEC directive 89/336 (Electromagnetic Compatibility Directive) and carry the CE mark on their data plate.

For the purposes of the EMC Directive, they are manufactured according to CEI EN standard 60034-1 section 12, EN 50081, EN 50082.

Even when fitted with electromechanical brakes, these motors still fall within the emission limits specified by EN 50081-1 "Electromagnetic Compatibility – Generic Requirements - Part 1: Residential, commercial and light industry".

They also satisfy the requirements of CEI EN standard 60204-1 "Electrical equipment of machines".

They likewise conform to CEI EN 61000-6-4 "Electromagnetic compatibility, Part 6-4: generic standards, Emission standards for industrial environments" and CEI EN 61000-6-2 Ed.

2 "Electromagnetic compatibility (EMC), Part 6-2: generic standards, Immunity for industrial environments".

As far as UL conformity for the North American market is concerned, these Bonfiglioli servomotors satisfy the requirements of UL 1004 (file number E 321737).

It is the responsibility of the manufacturer or assembler of the machine in which these motors are incorporated to ensure the safety of that machine as a whole and its conformity to all relevant end product directives.

Symbols and units of measure

| Symbol | U.m. | Description |
|----------------|----------------------------|---|
| n_n | [min ⁻¹] | Rated speed |
| M_n | [Nm] | Rated torque |
| P_n | [kW] | Rated power |
| I_n | [A] | Rated current |
| M_0 | [Nm] | Stall torque |
| I_0 | [A] | Stall current |
| M_{max} | [Nm] | Peak torque |
| I_{max} | [A] | Peak current |
| n_{max} | [min ⁻¹] | Max. speed |
| K_T | [Nm/A] | Torque constant |
| K_E | [V/1000min ⁻¹] | Counter-electromotive force constant |
| R_{pp} | [Ω] | Statoric resistance between two phases |
| L_{pp} | [mH] | Statoric inductance between two phases |
| τ_{el} | [ms] | Electric time constant |
| τ_{therm} | [min] | Thermal time constant |
| J_M | [Kgcm ²] | Motor moment of inertia |
| m | [kg] | Mass (weight) of motor |
| J_{Br} | [Kgcm ²] | Holding brake moment of inertia |
| m_{Br} | [Kg] | Weight of holding brake |
| M_{Br} | [Nm] | Torque of holding brake |
| P_{Br} | [W] | Electrical power absorbed by holding brake |
| V_{Br} | [V] | Supply voltage to holding brake |
| t_{Brc} | [ms] | Braking torque stabilisation time from voltage disconnect to brake |
| t_{Brs} | [ms] | Reduction time to 10% of braking torque from voltage reconnect to brake |

The Bonfiglioli Vectron servomotor range

The Bonfiglioli Vectron servomotor range is made up of two series of actuators, one designated BCR and the other BTD. The difference between the two series lies in the extension of their speed and torque interval as well their overload and efficiency.

That is reached thanks two different construction technologies:

- standard wound-stator technology for BCR
- advanced wound-poles technology for BTD.

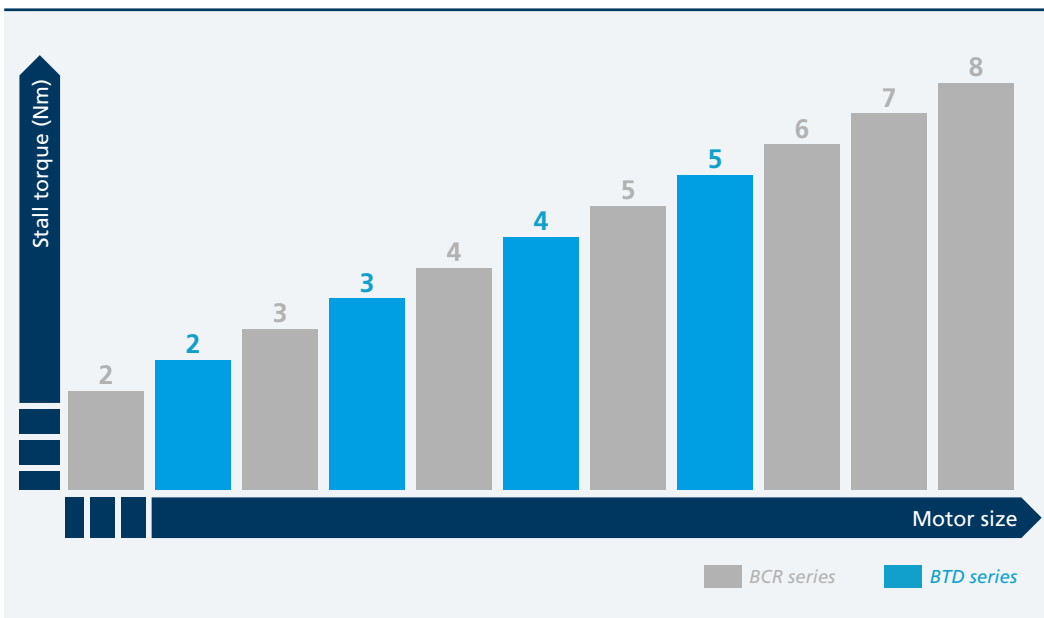
Thanks to features above, BCR offers a wide torque range and a significant overload capacity, as well BTD provide a high dynamic coefficient and high efficiency.

Each series is split on several sizes corresponding to equal flange dimension.

Each flange is available on several motor length able to provide as many torque levels.

BCR series warrant continuous duty torque up to 115 Nm with 400% overload.

BTB series fulfils the needs of compactness where the torque comes out from space saving. The winding construction and permanent magnets quality allows to reach torque density up to 16 Nm/dm³.



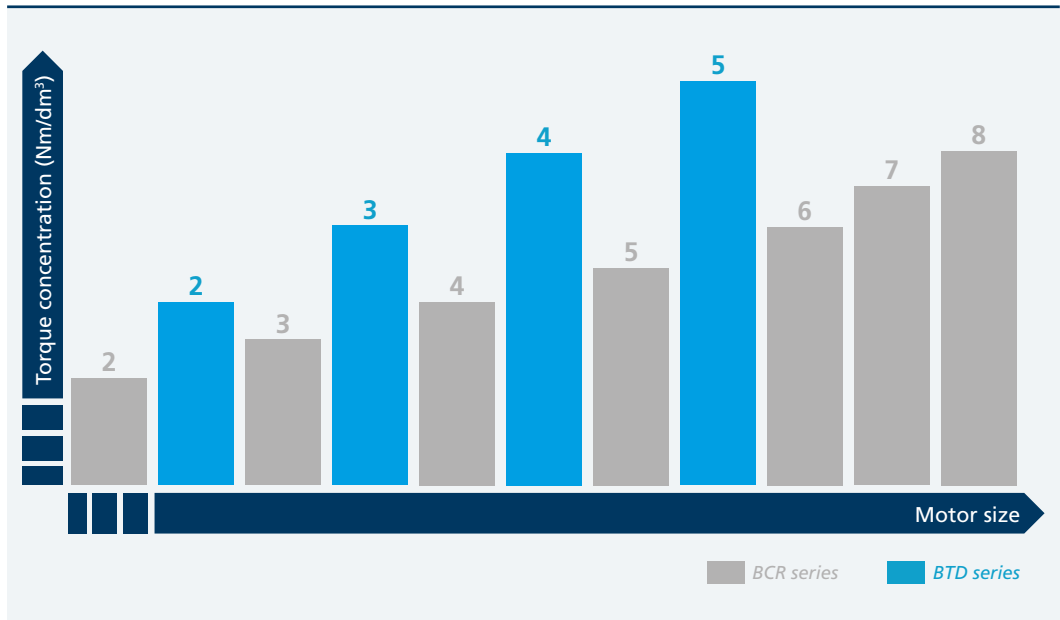
Torque distribution

The Bonfiglioli Vectron servomotor range

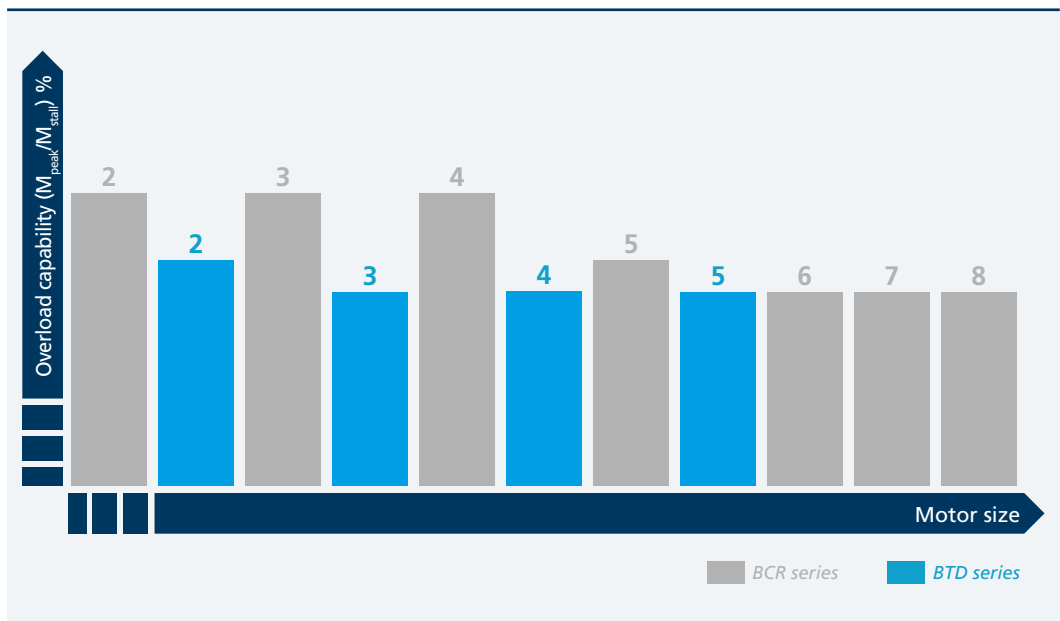
BCR and BTD share out the torque range and overall dimensions with extreme efficiency, offering a wide spectrum of application solutions

characterized by strong dynamics and rational compactness.

Specific torque



Dynamic torque

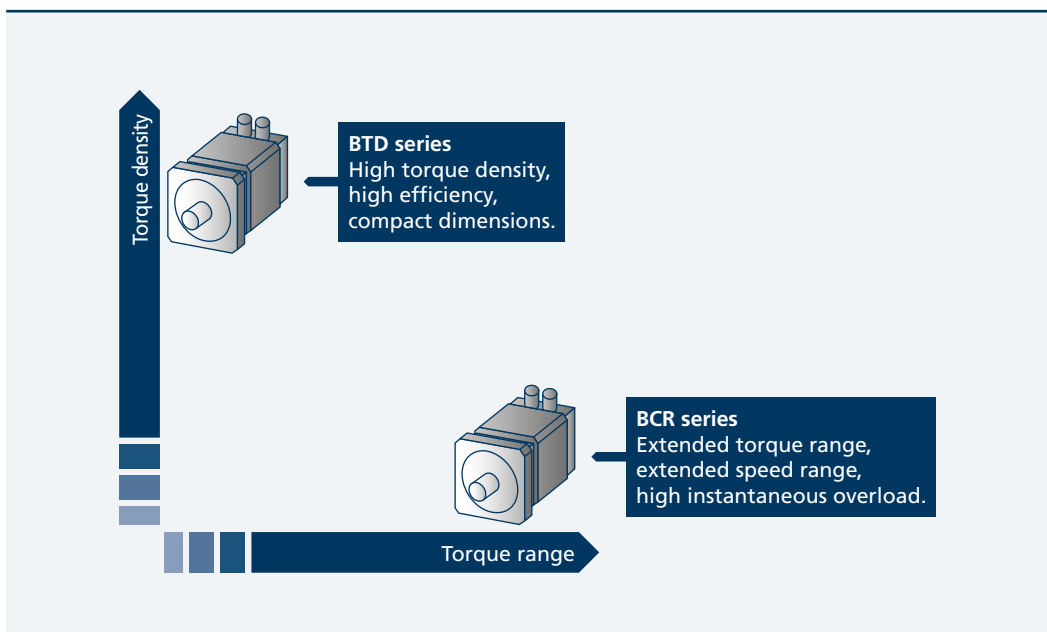


The Bonfiglioli Vectron servomotor range

BTD and BCR series are the ideal solutions for designers of servosystems which find always in them a successful answer to opposed needs of dynamics and compactness.

Every motion control application find its right solution choosing among BTD or BCR:

- high torque and high overload
- high torque and narrow space
- high torque and high efficiency
- high overload and wide torque range
- wide range of feedback



Commercial designation of Bonfiglioli servomotors

Bonfiglioli servomotors are technically identified by their designation. This consists of a rigorous succession of alphanumeric characters, whose positions and values conform to precise rules and define the characteristics of the product.

The complete designation provides a unique identification of the exact servomotor configuration and distinguishes it from all the other possible configurations available from the catalogue.

The designation is made up of two main parts, containing fields for:

- BASIC variants
- OPTIONAL variants

Both the basic variant and optional variant sections of the designation are divided into fields, each of which defines a particular design feature of the motor.

The basic variant fields are all mandatory. Those of the optional variants are only used if the motor has different characteristics to those that are standard for the basic variants.

Each Bonfiglioli servomotor is identified by its series (BCR or BTB), size (2, 3, 4, 5, 6, 7, 8), (stall) torque, (rated) speed and AC supply voltage.

The BASIC variant fields are used to designate the 5 properties of BCR and BTB servomotors listed above and define the following standard characteristics:

- Standard geometric dimensions (see the technical specifications section)
- IP65 index of protection
- Motor shaft without keyway
- No electromechanical holding brake
- feedback type
- Vertically fixed 8 - pin power connectors
- Vertically fixed 12 - pin control connectors
- CE, UL and cUL certification

Any deviation from the above standard characteristics implies an OPTIONAL variant. This is expressed using the next 8 optional fields in the designation string.

All basic variant and optional variant fields can assume only one value at a time. These values are selected from a limited set of pre-defined values for each field in the designation.

Commercial designation of Bonfiglioli servomotors

Designation BTD

Basic variants

BTD **2** **0026** **45** **230**

Series
BTD

Motor size
2 size 2
3 size 3
4 size 4
5 size 5

Motor stall torque
0026 0.26 Nm
0053 0.53 Nm
0074 0.74 Nm
0095 0.95 Nm
0190 1.90 Nm
0325 3.25 Nm
0410 4.10 Nm
0420 4.20 Nm
0630 6.30 Nm
0860 8.60 Nm
1160 11.60 Nm
1490 14.90 Nm
1870 18.70 Nm
2730 27.30 Nm

Motor rated speed
30 3000 min⁻¹
45 4500 min⁻¹

Motor AC voltage
230 200 VAC
400 330 VAC

Optional variants

... **67** **FD24** **K** **...** **PA08** **CA12** **...**

Standards compliance
(blank) CE, UL, cUL (default)

Signal connector
(blank) fixed vertical 12 pins (default)
CA12 fixed flange oriented 12 pins
CB12 fixed flange-symmetric oriented 12 pins
CT12 revolving 12 pins

Power connector
(blank) fixed vertical 8 pins (default)
PA08 fixed flange oriented 8 pins
PB08 fixed flange-symmetric oriented 8 pins
PT08 revolving 8 pins

Feed-back transducer
(blank) 2poles RESOLVER (default)
S1 absolute encoder ERN 1387
S2 absolute encoder ERN 1185
S3 absolute encoder ERN 1185
D1 absolute encoder ECI 1319
D2 absolute encoder EQ1 1331
D3 absolute encoder ECN 1113
D4 absolute encoder EQN 1125
H1 absolute encoder SRM 50
H2 absolute encoder SRM 50
H3 absolute encoder SKS 36
H4 absolute encoder SKM 36
H5 absolute encoder SEL 37
H6 absolute encoder SEK 37
H7 absolute encoder SEL 52
H8 absolute encoder SEK 52

Shaft keyway
(blank) no keyway (default)
K keyway according to DIN 6885

Holding brake
(blank) no brake (default)
FD24 DC-current brake 24VDC

IP degree
(blank) IP65 (default)
67 IP67
67OV IP67 o-ring viton

Mechanical interface
(blank) dimensions conform to the default table IMB

Commercial designation of Bonfiglioli servomotors

Designation BCR

Basic variants

| | | | | |
|-----|---|------|----|--|
| BCR | 2 | 0020 | 20 | 230 |
| | | | | <p>Motor AC voltage 230 200 VAC 400 330 VAC (350VAC only for BCR8)</p> <p>Motor rated speed 20 2000 min⁻¹ 30 3000 min⁻¹ 45 4500 min⁻¹</p> <p>Motor stall torque 0020 0.2 Nm 0040 0.4 Nm 0060 0.6 Nm 0065 0.65 Nm 0080 0.8 Nm 0130 1.3 Nm 0250 2.5 Nm 0260 2.6 Nm 0300 3.0 Nm 0530 5.3 Nm 0660 6.6 Nm 0750 7.5 Nm 1050 10.5 Nm 1350 13.5 Nm 1700 17.0 Nm 1900 19.0 Nm 2200 22.0 Nm 2700 27.0 Nm 2900 29.0 Nm 3200 32.0 Nm 4000 40.0 Nm 0400 40.0 Nm (only for BCR8) 0680 68.0 Nm (only for BCR8) 0930 93.0 Nm (only for BCR8) 1150 115.0 Nm (only for BCR8)</p> <p>Motor size 2 size 2 3 size 3 4 size 4 5 size 5 6 size 6 7 size 7 8 size 8</p> <p>Series BCR</p> |

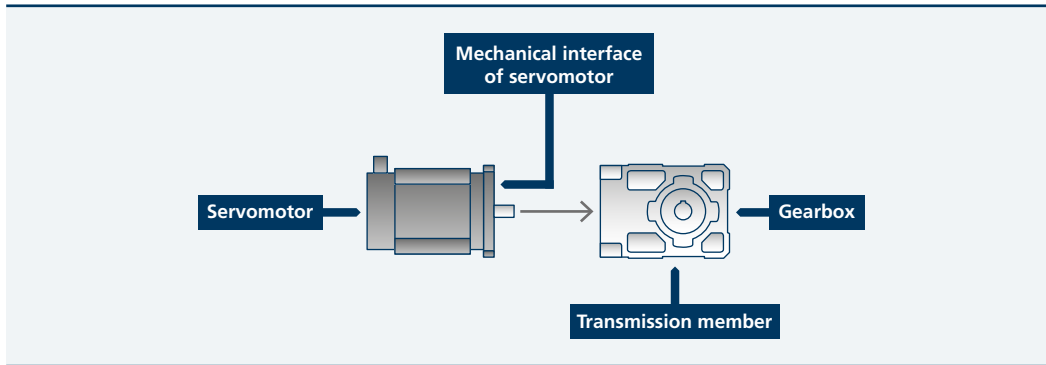
Optional variants

| | | | | | | | |
|-----|----|------|---|-----|------|------|--|
| ... | 67 | FD24 | K | ... | PA08 | CA12 | ... |
| | | | | | | | |
| | | | | | | | <p>Standards compliance (blank) CE, UL, cUL (default)</p> <p>Signal connector (blank) fixed vertical 12 pins (default) CA12 fixed flange oriented 12 pins CB12 fixed flange-symmetric oriented 12 pins CT12 revolving 12 pins</p> <p>Power connector (blank) fixed vertical 8 pins (default) PA08 fixed flange oriented 8 pins PB08 fixed flange-symmetric oriented 8 pins PT08 revolving 8 pins</p> <p>Feed-back transducer (blank) 2poles RESOLVER (default) S1 absolute encoder ERN 1387 S2 absolute encoder ERN 1185 S3 absolute encoder ERN 1185 D1 absolute encoder ECI 1319 D2 absolute encoder EQI 1331 D3 absolute encoder ECN 1113 D4 absolute encoder EQN 1125 H1 absolute encoder SRS 50 H2 absolute encoder SRM 50 H3 absolute encoder SKS 36 H4 absolute encoder SKM 36 H5 absolute encoder SEL 37 H6 absolute encoder SEK 37 H7 absolute encoder SEL 52 H8 absolute encoder SEK 52</p> <p>Shaft keyway (blank) no keyway (default) K keyway according to DIN 6885</p> <p>Holding brake (blank) no brake (default) FD24 DC-current brake 24VDC</p> <p>IP degree (blank) IP65 (default) 67 IP67 67OV IP67 o-ring viton</p> <p>Mechanical interface (blank) dimensions conform to the default table IMB</p> |

Mechanical interface

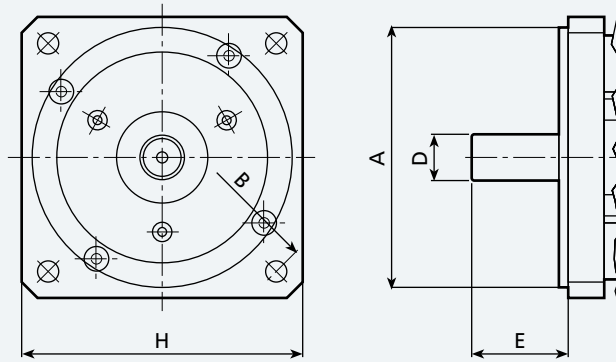
Concerning BTD and BCR servomotors, the physical part in charge of coupling with other transmission components (gearboxes, joints, ...) is named Mechanical Interface. Therefore the Mechanical Interface is a part of the motor and includes both flange and shaft

univocally defined by its geometrical dimensions. The flange and the shaft of BTD and BCR are described by fixed geometrics according to a standard Bonfiglioli configuration oriented to coupling with gearboxes, but also available to be adapted to other application requirements.



Mechanical interface: connection Flange + transmission Shaft.
The interface geometry is defined by quantities

H, B, A, D, E published in the side drawing whose numerical values (mm) depend on motor series and motor size.



The basic configuration of BTD and BCR servomotors is defined by the following table:

IMB table (Basic Mechanical Interface)

| Mechanical interface | Servomotor | | | | | | | |
|----------------------------|--------------|--------------|--------------|--------------|------|------|------|-----|
| | BTD2 BCR2 | BTD3 BCR3 | BTD4 BCR4 | BTD5 BCR5 | BCR6 | BCR7 | BCR8 | |
| ø shaft (D) [mm] | 9 | 14 | 19 | 24 | 24 | 28 | 38 | 42 |
| Shaft length (E) [mm] | 21.5 | 27 | 37 | 46.5 | 46.5 | 54 | 76 | 106 |
| ø motor centering (A) [mm] | 40 | 80 | 95 | 130 | 180 | 180 | 230 | 230 |
| ø holes distance (B) [mm] | 63 | 100 | 115 | 165 | 215 | 215 | 265 | 265 |
| Flange (H) [mm] | 55 | 86 | 98 | 142 | 190 | 190 | 240 | 240 |

The data of the table correspond to blank character into designation field named "mechanical interface". Different interface dimensions can be agreed

together Bonfiglioli Drive Service Centre upon technical evaluation and feasibility analysis of application.

BTD - Servomotor brushless (compact)

The modern magnet and electrical circuits employed in BTD allow to reduce the temperature and to increase the motor torque keeping limited the dimensions.

The BTD series is developed in 4 sizes identified by progressive digits (from 2 to 5) corresponding to identical quantity of flanges designed for defined coupling with gearboxes.

To each size of flange several torque values are

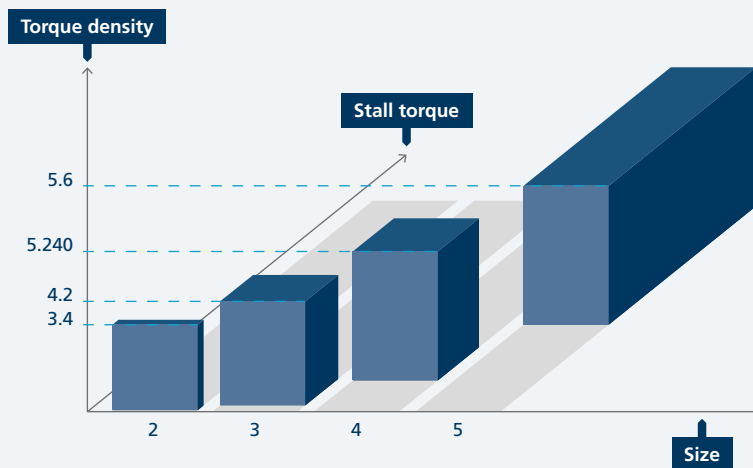
available corresponding to different motor length from which it is possible to extract great torque quantities inside reduced volumes.

The meaning of the name is the following:

BTD = **B**rushless-**T**orque-**D**ensity

The high torque concentration (3.4 ÷ 5.6 Nm/dm³) makes the BTD able to fulfil the applications in which a space saving is required without renouncing to performances.

| Series | Size | Flange [mm] | Speed [min ⁻¹] | Stall torque | | | Torque density | |
|--------|------|----------------|-------------------------------|--------------|------|------|-----------------------|-----|
| | | | | | [Nm] | | [Nm/dm ³] | |
| BTD | 2 | 55 | 4500 | 0.26 | 0.53 | 0.74 | 0.95 | 3.4 |
| | 3 | 86 | 3000 | 0.95 | 1.9 | 3.25 | 4.2 | 4.2 |
| | 4 | 98 | 3000 | 4.1 | 6.3 | 8.6 | - | 5.2 |
| | 5 | 142 | 3000 | 11.6 | 14.9 | 18.7 | 27.3 | 5.6 |

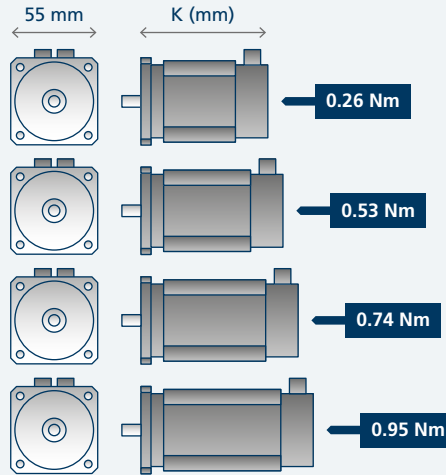


BTD2 - 0.26 ÷ 0.95 Nm

All BTD servomotors belonging to size 2 are equipped by the same geometrical flange, whereas they are differentiated by the length correlated to torque capacity.

The basic motor configuration does not provide the electromechanical brake which is an option. When the brake is installed the motor length is increased.

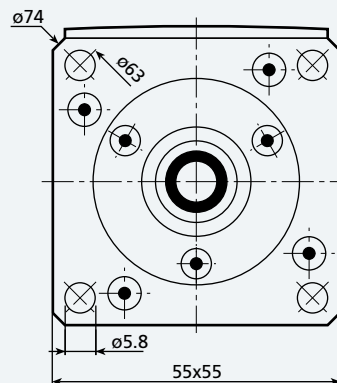
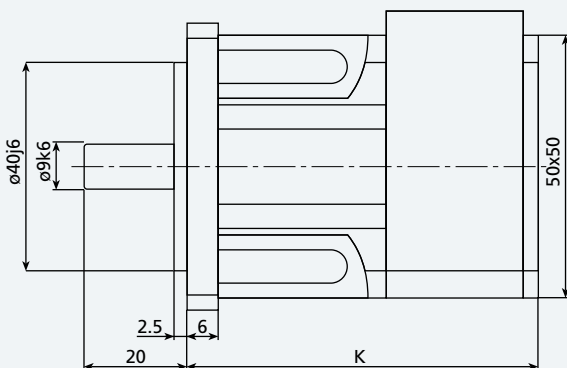
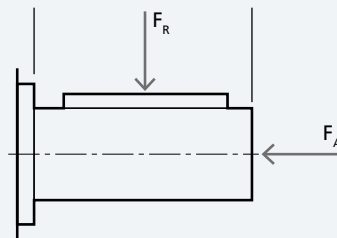
The motor size BTD2 is structured on four torque levels corresponding to different four motor lengths with nominal speed equal to 4500 min⁻¹. The motor is available with power supply both 3ph x 400VAC and 3ph x 230VAC, keeping the same mechanical performances. On standard motor both power and control connectors are installed for electrical connection to the inverter. On demand, several connectors orientation can be supplied.



| Motor | Stall torque | Rated speed | Flange | Length K * | |
|-----------|--------------|----------------------|--------|---------------|------------|
| | [Nm] | [min ⁻¹] | | Without brake | With brake |
| BTD2-0026 | 0.26 | 4500 | 55 | 67 | 105 |
| BTD2-0053 | 0.53 | | | 82 | 120 |
| BTD2-0074 | 0.74 | | | 97 | 135 |
| BTD2-0095 | 0.95 | | | 112 | 150 |

(*) With reference to motors equipped with resolver.

| Motor | Max load on shaft (N) | |
|-----------|-----------------------|----------------------|
| | Radial F _R | Axial F _A |
| BTD2-0026 | 219 | 42 |
| BTD2-0053 | 234 | 45 |
| BTD2-0074 | 245 | 46 |
| BTD2-0095 | 252 | 48 |



BTD2 400V

Motor **BTD2-0026-45-400** **BTD2-0053-45-400** **BTD2-0074-45-400** **BTD2-0095-45-400**

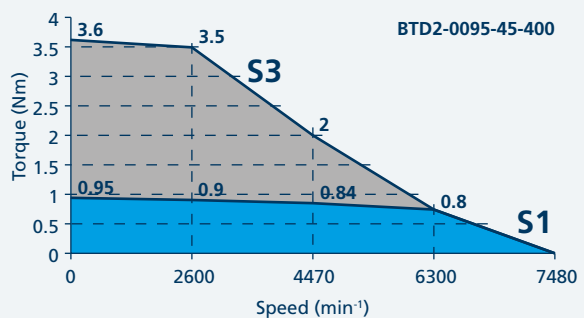
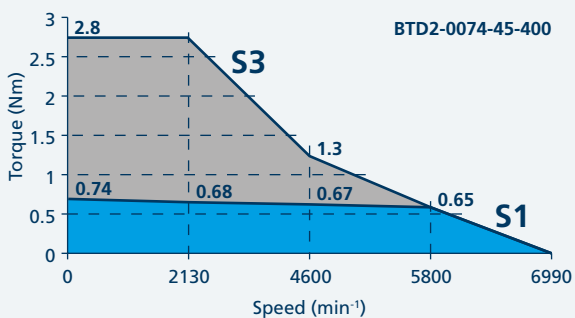
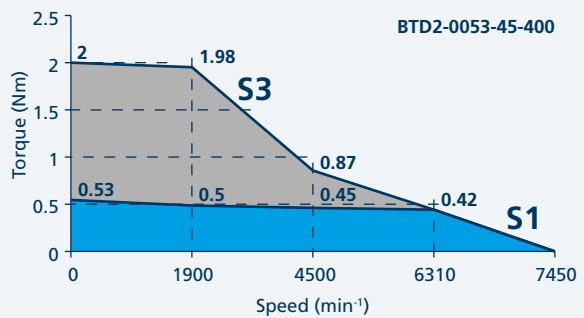
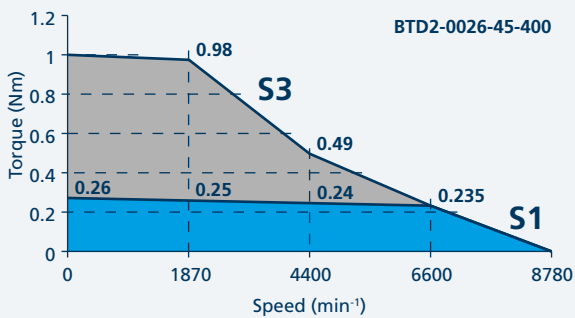
| | | | | | |
|----------------------------------|----------------------------------|-------|-------|-------|-------|
| Stall torque | M_o [Nm] | 0.26 | 0.53 | 0.74 | 0.95 |
| Rated speed | n_n [min ⁻¹] | 4500 | 4500 | 4500 | 4500 |
| Inverter DC-bus | V_{dc} [V] | 560 | 560 | 560 | 560 |
| Rated AC motor voltage | V_n [V] | 330 | 330 | 330 | 330 |
| Motor poles number | p_{mot} | 6 | 6 | 6 | 6 |
| Resolver poles number | p_{res} | 2 | 2 | 2 | 2 |
| Rated torque | M_n [Nm] | 0.24 | 0.45 | 0.67 | 0.84 |
| Rated AC current | I_n [A] | 0.68 | 0.66 | 0.89 | 1.19 |
| Stall AC current | I_o [A] | 0.42 | 0.73 | 0.96 | 1.31 |
| Torque peak | M_{max} [Nm] | 1.0 | 2.0 | 2.8 | 3.6 |
| Current peak | I_{max} [A] | 1.7 | 3.0 | 3.9 | 5.3 |
| EMF constant | K_E [V/1000min ⁻¹] | 37.5 | 44.0 | 47.0 | 44.0 |
| Torque constant | K_T [Nm/A] | 0.62 | 0.73 | 0.78 | 0.73 |
| Rated power | P_n [W] | 110 | 210 | 315 | 395 |
| Phase to phase stator resistance | R_{pp} [Ω] | 106 | 54 | 37.9 | 21.6 |
| Phase to phase stator inductance | L_{pp} [mH] | 176.0 | 104.0 | 70.0 | 49.1 |
| Rotor inertia | J_m [kgcm ²] | 0.06 | 0.08 | 0.10 | 0.12 |
| Electrical time constant | τ_{el} [ms] | 1.7 | 1.9 | 1.8 | 2.3 |
| Thermal time constant | τ_{th} [min] | 13 | 15 | 20 | 22 |
| Mechanical time constant | τ_{mec} [ms] | 2.9 | 1.4 | 1.1 | 0.8 |
| Weight without brake | m_M [kg] | 0.750 | 0.920 | 1.090 | 1.260 |
| Weight with brake | m_{MF} [kg] | 1.190 | 1.360 | 1.530 | 1.700 |

All motor characteristics are referred to following conditions:

T_{amb} = 40 °C (ambient temperature)
 ΔT = 105 °C (winding heating temperature)

S1 curve = for continuous duty
 S3 curve = for intermittent duty

Torque-speed characteristic: ambient temperature 40°C



BTD2 230V

Motor

BTD2-0026-45-230 BTD2-0053-45-230 BTD2-0074-45-230 BTD2-0095-45-230

| | | | | | |
|----------------------------------|----------------------------------|-------|-------|-------|-------|
| Stall torque | M_o [Nm] | 0.26 | 0.53 | 0.74 | 0.95 |
| Rated speed | n_n [min ⁻¹] | 4500 | 4500 | 4500 | 4500 |
| Inverter DC-bus | V_{dc} [V] | 320 | 320 | 320 | 320 |
| Rated AC motor voltage | V_n [V] | 200 | 200 | 200 | 200 |
| Motor poles number | p_{mot} | 6 | 6 | 6 | 6 |
| Resolver poles number | p_{res} | 2 | 2 | 2 | 2 |
| Rated torque | M_n [Nm] | 0.24 | 0.45 | 0.67 | 0.84 |
| Rated AC current | I_n [A] | 0.68 | 1.11 | 1.55 | 1.90 |
| Stall AC current | I_o [A] | 0.70 | 1.26 | 1.66 | 2.10 |
| Torque peak | M_{max} [Nm] | 1.0 | 2.0 | 2.8 | 3.6 |
| Current peak | I_{max} [A] | 2.9 | 5.1 | 6.7 | 8.5 |
| EMF constant | K_e [V/1000min ⁻¹] | 21.0 | 25.5 | 27.0 | 27.5 |
| Torque constant | K_T [Nm/A] | 0.37 | 0.42 | 0.45 | 0.45 |
| Rated power | P_n [W] | 110 | 210 | 315 | 395 |
| Phase to phase stator resistance | R_{pp} [Ω] | 36.8 | 17.4 | 12.1 | 8.4 |
| Phase to phase stator inductance | L_{pp} [mH] | 62.0 | 34.1 | 22.8 | 19.4 |
| Rotor inertia | J_m [kgcm ²] | 0.06 | 0.08 | 0.10 | 0.12 |
| Electrical time constant | τ_{el} [ms] | 1.7 | 2.0 | 1.9 | 2.3 |
| Thermal time constant | τ_{th} [min] | 13 | 15 | 20 | 22 |
| Mechanical time constant | τ_{mec} [ms] | 3.2 | 1.4 | 1.0 | 0.8 |
| Weight without brake | m_M [kg] | 0.750 | 0.920 | 1.090 | 1.260 |
| Weight with brake | m_{MF} [kg] | 1.190 | 1.360 | 1.530 | 1.700 |

All motor characteristics are referred to following conditions:

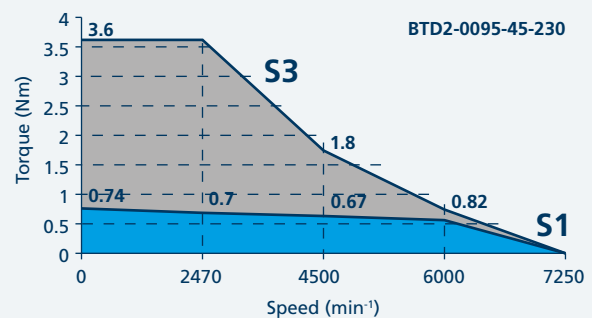
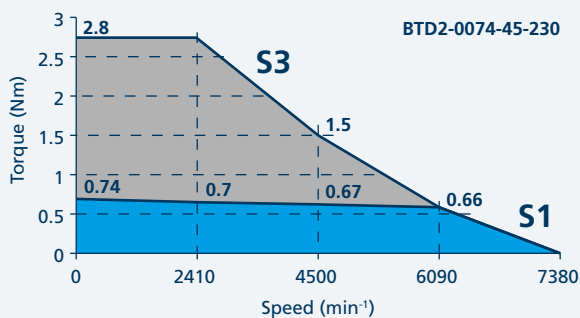
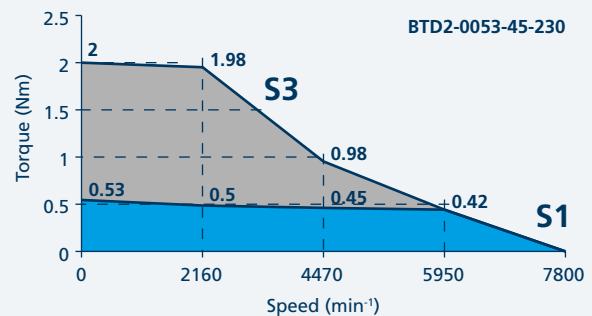
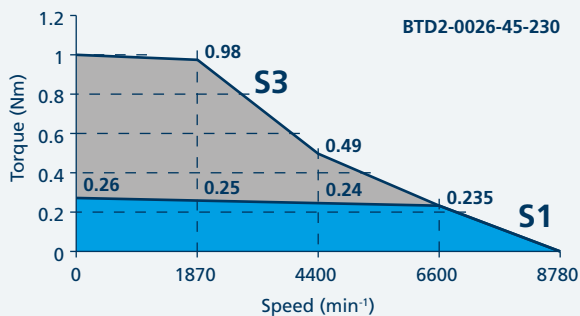
T_{amb} = 40 °C (ambient temperature)

ΔT = 105 °C (winding heating temperature)

S1 curve = for continuous duty

S3 curve = for intermittent duty

Torque-speed characteristic: ambient temperature 40°C

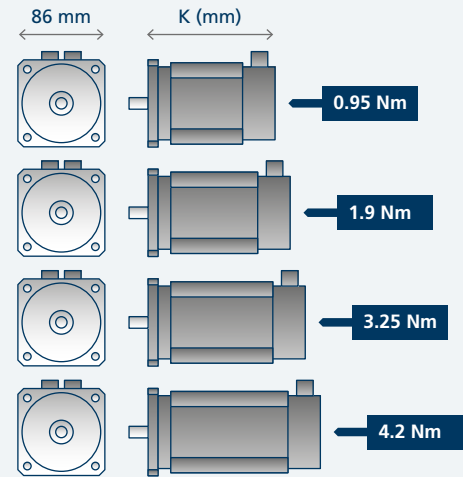


BTD3 - 0.95 ÷ 4.2 Nm

All BTD servomotors belonging to size 3 are equipped by the same geometrical flange, whereas they are differentiated by the length correlated to torque capacity.

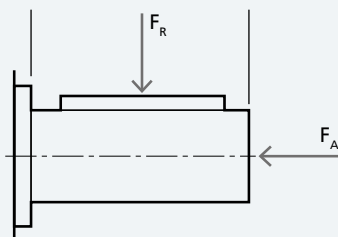
The basic motor configuration does not provide the electromechanical brake which is an option. When the brake is installed the motor length is increased.

The motor size BTD3 is structured on four torque levels corresponding to different four motor lengths with nominal speed equal to 3000 min⁻¹. The motor is available with power supply both 3ph x 400VAC and 3ph x 230VAC, keeping the same mechanical performances. On standard motor both power and control connectors are installed for electrical connection to the inverter. On demand, several connectors orientation can be supplied.

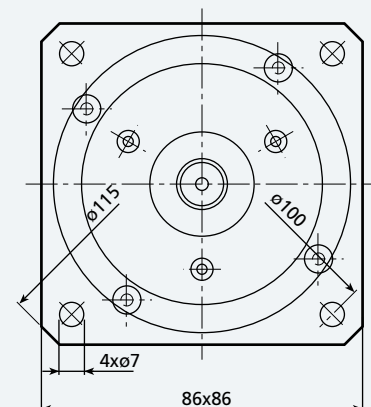
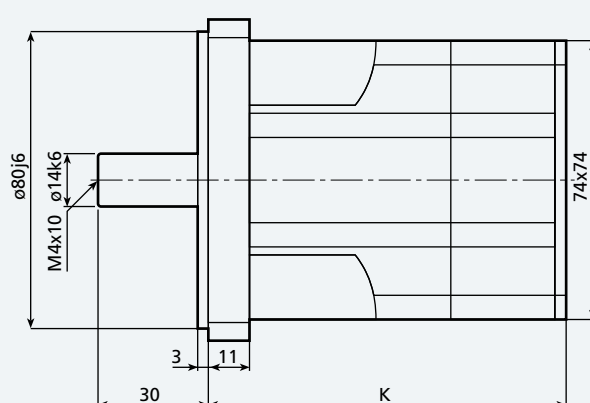


| Motor | Stall torque [Nm] | Rated speed [min ⁻¹] | Flange [mm] | Length K* | |
|-----------|----------------------|-------------------------------------|----------------|---------------|------------|
| | | | | Without brake | With brake |
| BTD3-0095 | 0.95 | 3000 | 86 | 95 | 135 |
| BTD3-0190 | 1.9 | | | 113 | 153 |
| BTD3-0325 | 3.25 | | | 149 | 189 |
| BTD3-0420 | 4.2 | | | 185 | 225 |

(*) With reference to motors equipped with resolver.



| Motor | Max load on shaft (N) | |
|-----------|-----------------------|----------------------|
| | Radial F _R | Axial F _A |
| BTD3-0095 | 335 | 64 |
| BTD3-0190 | 368 | 70 |
| BTD3-0325 | 406 | 77 |
| BTD3-0420 | 427 | 81 |



BTD3 400V

Motor

BTD3-0095-30-400 BTD3-0190-30-400 BTD3-0325-30-400 BTD3-0420-30-400

| | | | | | |
|----------------------------------|----------------------------------|-------|-------|-------|-------|
| Stall torque | M_o [Nm] | 0.95 | 1.9 | 3.25 | 4.2 |
| Rated speed | n_n [min ⁻¹] | 3000 | 3000 | 3000 | 3000 |
| Inverter DC-bus | V_{dc} [V] | 560 | 560 | 560 | 560 |
| Rated AC motor voltage | V_n [V] | 330 | 330 | 330 | 330 |
| Motor poles number | p_{mot} | 10 | 10 | 10 | 10 |
| Resolver poles number | p_{res} | 2 | 2 | 2 | 2 |
| Rated torque | M_n [Nm] | 0.86 | 1.6 | 2.9 | 3.1 |
| Rated AC current | I_n [A] | 1.28 | 1.46 | 2.3 | 2.3 |
| Stall AC current | I_o [A] | 1.32 | 1.66 | 2.4 | 3 |
| Torque peak | M_{max} [Nm] | 2.4 | 5.2 | 9.5 | 12.3 |
| Current peak | I_{max} [A] | 4.9 | 6.7 | 10.6 | 12.9 |
| EMF constant | K_e [V/1000min ⁻¹] | 43.5 | 69 | 81 | 86 |
| Torque constant | K_T [Nm/A] | 0.72 | 1.14 | 1.34 | 1.42 |
| Rated power | P_n [W] | 270 | 500 | 910 | 970 |
| Phase to phase stator resistance | R_{pp} [Ω] | 12.6 | 11.6 | 6.5 | 4.6 |
| Phase to phase stator inductance | L_{pp} [mH] | 38 | 42.3 | 30.6 | 26.1 |
| Rotor inertia | J_m [kgcm ²] | 0.5 | 0.7 | 1.1 | 1.5 |
| Electrical time constant | τ_{el} [ms] | 3 | 3.6 | 4.7 | 5.7 |
| Thermal time constant | τ_{th} [min] | 25 | 30 | 33 | 36 |
| Mechanical time constant | τ_{mec} [ms] | 2.1 | 1.1 | 0.7 | 0.6 |
| Weight without brake | m_M [kg] | 1.525 | 2.090 | 3.220 | 4.350 |
| Weight with brake | m_{MF} [kg] | 2.115 | 2.680 | 3.810 | 4.940 |

All motor characteristics are referred to following conditions:

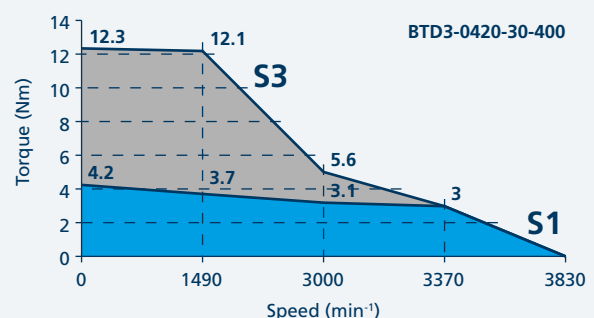
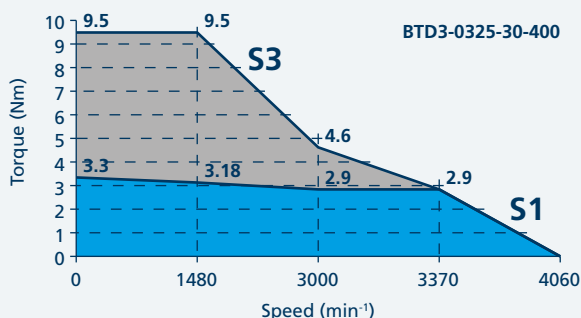
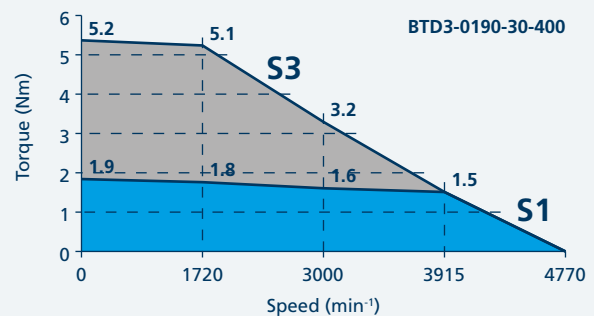
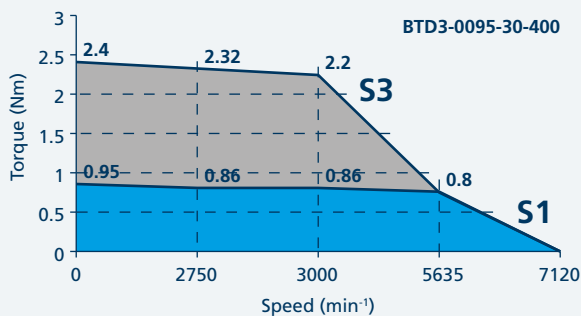
T_{amb} = 40 °C (ambient temperature)

ΔT = 105 °C (winding heating temperature)

S1 curve = for continuous duty

S3 curve = for intermittent duty

Torque-speed characteristic: ambient temperature 40°C



BTD3 230V

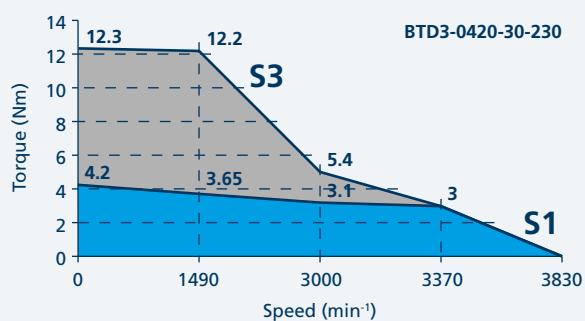
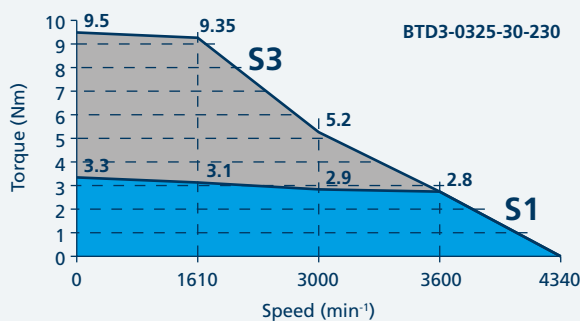
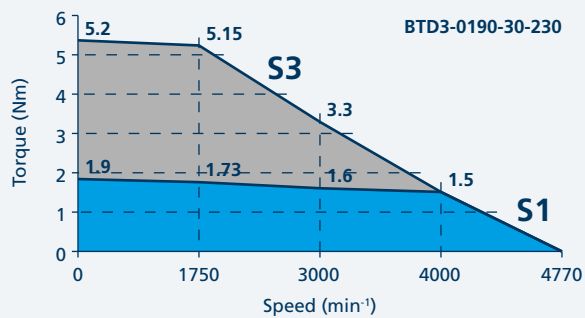
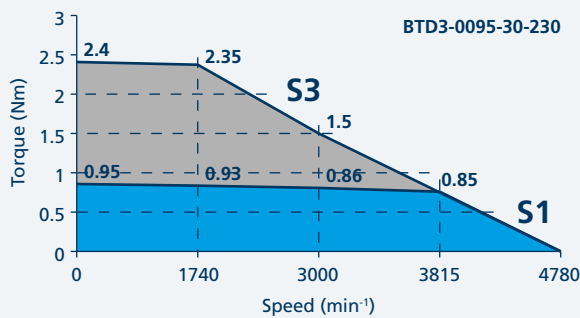
Motor **BTD3-0095-30-230** **BTD3-0190-30-230** **BTD3-0325-30-230** **BTD3-0420-30-230**

| | | | | | |
|----------------------------------|----------------------------------|-------|-------|-------|-------|
| Stall torque | M_o [Nm] | 0.95 | 1.9 | 3.25 | 4.2 |
| Rated speed | n_n [min ⁻¹] | 3000 | 3000 | 3000 | 3000 |
| Inverter DC-bus | V_{dc} [V] | 320 | 320 | 320 | 320 |
| Rated AC motor voltage | V_n [V] | 200 | 200 | 200 | 200 |
| Motor poles number | p_{mot} | 10 | 10 | 10 | 10 |
| Resolver poles number | p_{res} | 2 | 2 | 2 | 2 |
| Rated torque | M_n [Nm] | 0.86 | 1.6 | 2.9 | 3.1 |
| Rated AC current | I_n [A] | 1.43 | 2.4 | 4 | 3.7 |
| Stall AC current | I_o [A] | 1.47 | 2.8 | 4.3 | 4.8 |
| Torque peak | M_{max} [Nm] | 2.4 | 5.2 | 9.5 | 12.3 |
| Current peak | I_{max} [A] | 5.4 | 11.1 | 18.6 | 21 |
| EMF constant | K_E [V/1000min ⁻¹] | 39 | 41.5 | 46 | 53 |
| Torque constant | K_T [Nm/A] | 0.65 | 0.69 | 0.76 | 0.88 |
| Rated power | P_n [W] | 270 | 500 | 910 | 970 |
| Phase to phase stator resistance | R_{pp} [Ω] | 9.9 | 4 | 2.2 | 1.77 |
| Phase to phase stator inductance | L_{pp} [mH] | 30.6 | 15.4 | 9.8 | 10 |
| Rotor inertia | J_m [kgcm ²] | 0.5 | 0.7 | 1.1 | 1.5 |
| Electrical time constant | τ_{el} [ms] | 3.1 | 3.9 | 4.5 | 5.6 |
| Thermal time constant | τ_{th} [min] | 25 | 30 | 33 | 36 |
| Mechanical time constant | τ_{mec} [ms] | 2.1 | 1.0 | 0.7 | 0.6 |
| Weight without brake | m_M [kg] | 1.525 | 2.090 | 3.220 | 4.350 |
| Weight with brake | m_{MF} [kg] | 2.115 | 2.680 | 3.810 | 4.940 |

All motor characteristics are referred to following conditions:

- T_{amb} = 40 °C (ambient temperature)
- ΔT = 105 °C (winding heating temperature)
- S1 curve = for continuous duty
- S3 curve = for intermittent duty

Torque-speed characteristic: ambient temperature 40°C



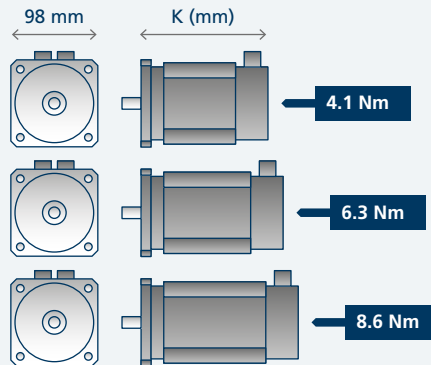
BTD4 - 4.1 ÷ 8.6 Nm

All BTD servomotors belonging to size 4 are equipped by the same geometrical flange, whereas they are differentiated by the length correlated to torque capacity.

The basic motor configuration does not provide the electromechanical brake which is an option. When the brake is installed the motor length is increased.

The motor size BTD4 is structured on three torque levels corresponding to different three motor lengths with nominal speed equal to 3000 min⁻¹. The motor is available with power supply both 3ph x 400VAC and 3ph x 230VAC, keeping the same mechanical performances.

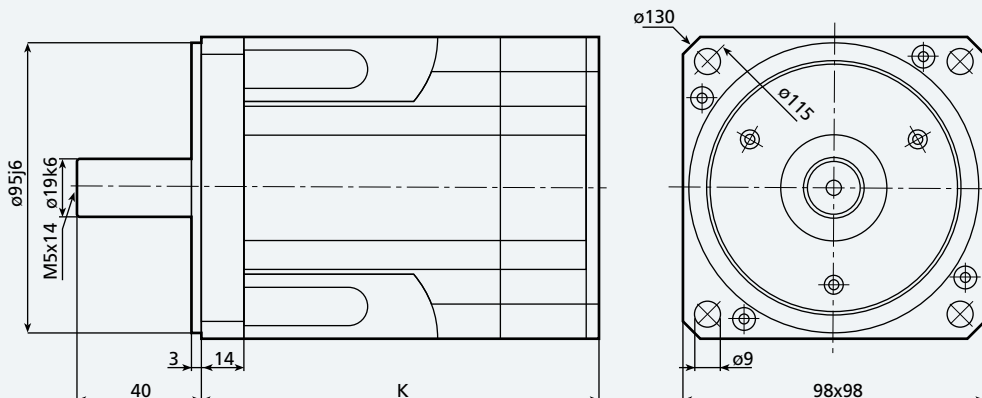
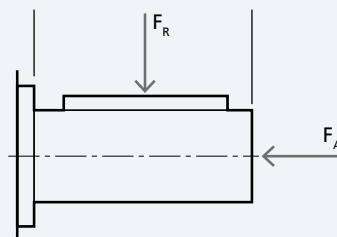
On standard motor both power and control connectors are installed for electrical connection to the inverter. On demand, several connectors orientation can be supplied.



| Motor | Stall torque | Rated speed | Flange | Length K * | |
|-----------|--------------|-------------|--------|----------------------|---------------|
| | [Nm] | | | [min ⁻¹] | Without brake |
| BTD4-0410 | 4.1 | 3000 | 98 | 125 | 166 |
| BTD4-0630 | 6.3 | | | 155 | 196 |
| BTD4-0860 | 8.6 | | | 185 | 226 |

(*) With reference to motors equipped with resolver.

| Motor | Max load on shaft (N) | |
|-----------|-----------------------|----------------------|
| | Radial F _R | Axial F _A |
| BTD4-0410 | 594 | 113 |
| BTD4-0630 | 648 | 123 |
| BTD4-0860 | 682 | 130 |



BTD4 400V

| Motor | | BTD4-0410-30-400 | BTD4-0630-30-400 | BTD4-0860-30-400 |
|-------|--|------------------|------------------|------------------|
|-------|--|------------------|------------------|------------------|

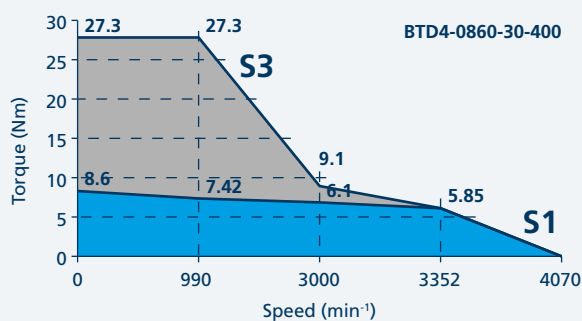
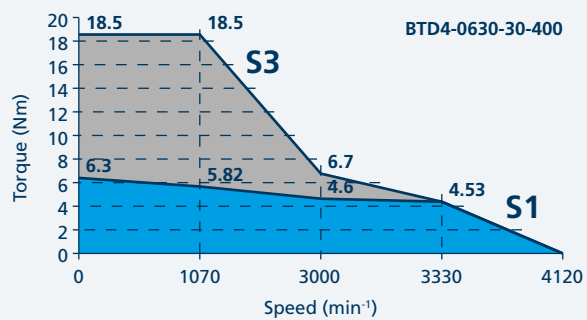
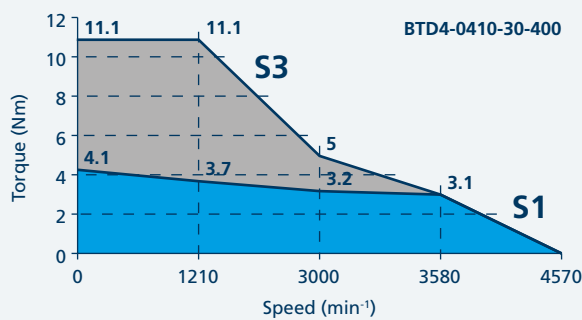
| | | | | |
|----------------------------------|----------------------------------|-------|-------|-------|
| Stall torque | M_o [Nm] | 4.1 | 6.3 | 8.6 |
| Rated speed | n_n [min ⁻¹] | 3000 | 3000 | 3000 |
| Inverter DC-bus | V_{dc} [V] | 560 | 560 | 560 |
| Rated AC motor voltage | V_n [V] | 330 | 330 | 330 |
| Motor poles number | p_{mot} | 10 | 10 | 10 |
| Resolver poles number | p_{res} | 2 | 2 | 2 |
| Rated torque | M_n [Nm] | 3.2 | 4.6 | 6.1 |
| Rated AC current | I_n [A] | 2.8 | 3.6 | 4.8 |
| Stall AC current | I_o [A] | 3.4 | 4.77 | 6.4 |
| Torque peak | M_{max} [Nm] | 11.1 | 18.5 | 27 |
| Current peak | I_{max} [A] | 13.6 | 21 | 31 |
| EMF constant | K_E [V/1000min ⁻¹] | 72 | 80 | 81 |
| Torque constant | K_T [Nm/A] | 1.19 | 1.32 | 1.34 |
| Rated power | P_n [W] | 1000 | 1440 | 1910 |
| Phase to phase stator resistance | R_{pp} [Ω] | 4 | 2.7 | 1.81 |
| Phase to phase stator inductance | L_{pp} [mH] | 34 | 25 | 18.6 |
| Rotor inertia | J_m [kgcm ²] | 1.7 | 2.6 | 3.5 |
| Electrical time constant | τ_{el} [ms] | 8.5 | 9.9 | 10.3 |
| Thermal time constant | τ_{th} [min] | 29 | 31 | 33 |
| Mechanical time constant | τ_{mec} [ms] | 0.8 | 0.7 | 0.6 |
| Weight without brake | m_M [kg] | 4.275 | 5.340 | 6.960 |
| Weight with brake | m_{MF} [kg] | 5.095 | 6.160 | 7.780 |

All motor characteristics are referred to following conditions:

T_{amb} = 40 °C (ambient temperature)
 ΔT = 105 °C (winding heating temperature)

S1 curve = for continuous duty
 S3 curve = for intermittent duty

Torque-speed characteristic: ambient temperature 40°C



BTD4 230V

Motor

BTD4-0410-30-230

BTD4-0630-30-230

BTD4-0860-30-230

| | | | | |
|----------------------------------|----------------------------------|-------|-------|-------|
| Stall torque | M_o [Nm] | 4.1 | 6.3 | 8.6 |
| Rated speed | n_n [min ⁻¹] | 3000 | 3000 | 3000 |
| Inverter DC-bus | V_{dc} [V] | 320 | 320 | 320 |
| Rated AC motor voltage | V_n [V] | 200 | 200 | 200 |
| Motor poles number | p_{mot} | 10 | 10 | 10 |
| Resolver poles number | p_{res} | 2 | 2 | 2 |
| Rated torque | M_n [Nm] | 3.2 | 4.6 | 6.1 |
| Rated AC current | I_n [A] | 5 | 7 | 8.3 |
| Stall AC current | I_o [A] | 6 | 9.13 | 11.2 |
| Torque peak | M_{max} [Nm] | 11.1 | 18.5 | 27 |
| Current peak | I_{max} [A] | 24 | 40 | 53 |
| EMF constant | K_e [V/1000min ⁻¹] | 40.5 | 41.5 | 46.5 |
| Torque constant | K_T [Nm/A] | 0.67 | 0.69 | 0.77 |
| Rated power | P_n [W] | 1000 | 1440 | 1910 |
| Phase to phase stator resistance | R_{pp} [Ω] | 1.24 | 0.70 | 0.59 |
| Phase to phase stator inductance | L_{pp} [mH] | 10.6 | 6.9 | 6.2 |
| Rotor inertia | J_m [kgcm ²] | 1.7 | 2.6 | 3.5 |
| Electrical time constant | τ_{el} [ms] | 8.5 | 9.9 | 10.3 |
| Thermal time constant | τ_{th} [min] | 29 | 31 | 33 |
| Mechanical time constant | τ_{mec} [ms] | 0.8 | 0.6 | 0.6 |
| Weight without brake | m_M [kg] | 4.275 | 5.340 | 6.960 |
| Weight with brake | m_{MF} [kg] | 5.095 | 6.160 | 7.780 |

All motor characteristics are referred to following conditions:

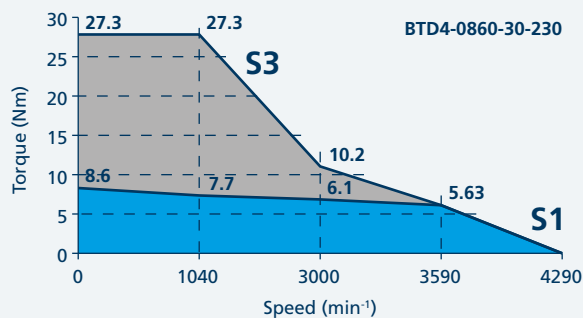
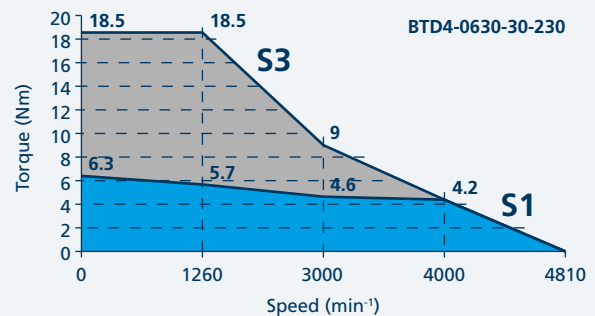
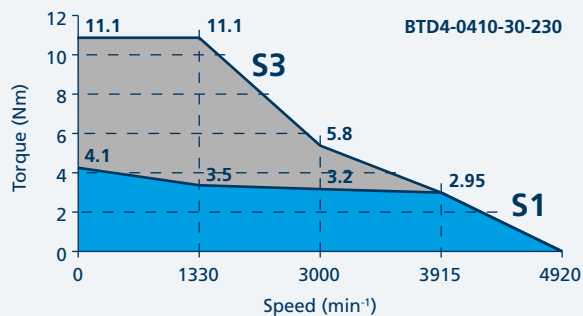
T_{amb} = 40 °C (ambient temperature)

ΔT = 105 °C (winding heating temperature)

S1 curve = for continuous duty

S3 curve = for intermittent duty

Torque-speed characteristic: ambient temperature 40°C

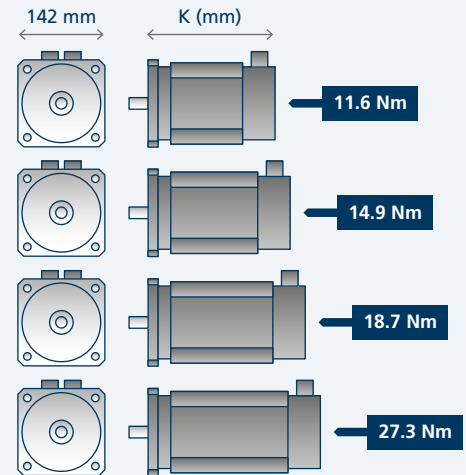


BTD5 - 11.6 ÷ 27.3 Nm

All BTD servomotors belonging to size 5 are equipped by the same geometrical flange, whereas they are differentiated by the length correlated to torque capacity.

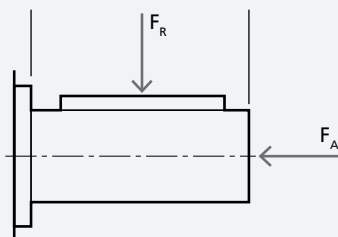
The basic motor configuration does not provide the electromechanical brake which is an option. When the brake is installed the motor length is increased.

The motor size BTD5 is structured on four torque levels corresponding to different four motor lengths with nominal speed equal to 3000 min⁻¹. The motor is available with power supply both 3ph x 400VAC and 3ph x 230VAC, keeping the same mechanical performances. On standard motor both power and control connectors are installed for electrical connection to the inverter. On demand, several connectors orientation can be supplied.

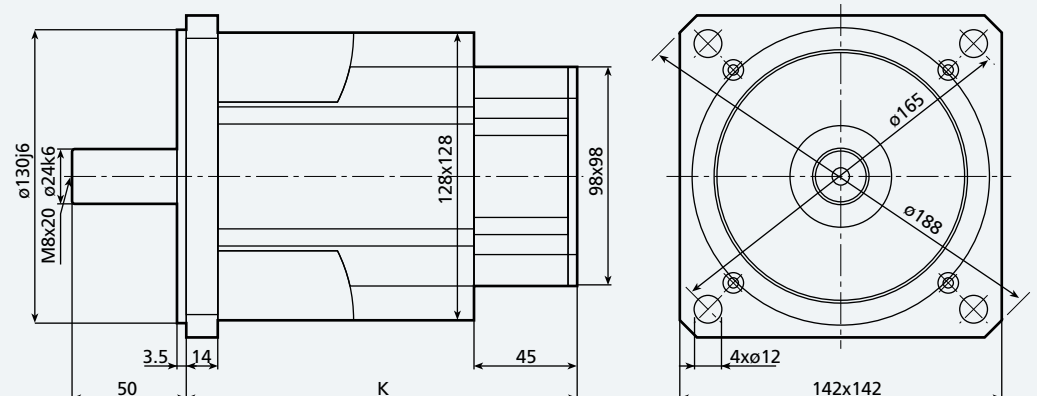


| Motor | Stall torque | Rated speed | Flange | Length K* | |
|-----------|--------------|-------------|--------|----------------------|------|
| | [Nm] | | | [min ⁻¹] | [mm] |
| BTD5-1160 | 11.6 | 3000 | 142 | 173 | 224 |
| BTD5-1490 | 14.9 | | | 201 | 252 |
| BTD5-1870 | 18.7 | | | 231 | 282 |
| BTD5-2730 | 27.3 | | | 291 | 342 |

(*): With reference to motors equipped with resolver.



| Motor | Max load on shaft (N) | |
|-----------|-----------------------|----------------------|
| | Radial F _R | Axial F _A |
| BTD5-1160 | 672 | 128 |
| BTD5-1490 | 713 | 135 |
| BTD5-1870 | 743 | 141 |
| BTD5-2730 | 783 | 149 |



BTD5 400V

Motor

BTD5-1160-30-400 BTD5-1490-30-400 BTD5-1870-30-400 BTD5-2730-30-400

| | | | | | |
|----------------------------------|----------------------------------|-------|--------|--------|--------|
| Stall torque | M_o [Nm] | 11.6 | 14.9 | 18.7 | 27.3 |
| Rated speed | n_n [min ⁻¹] | 3000 | 3000 | 3000 | 3000 |
| Inverter DC-bus | V_{dc} [V] | 560 | 560 | 560 | 560 |
| Rated AC motor voltage | V_n [V] | 330 | 330 | 330 | 330 |
| Motor poles number | p_{mot} | 10 | 10 | 10 | 10 |
| Resolver poles number | p_{res} | 2 | 2 | 2 | 2 |
| Rated torque | M_n [Nm] | 8.4 | 10.9 | 14.3 | 21 |
| Rated AC current | I_n [A] | 7.9 | 9.6 | 13.1 | 14.9 |
| Stall AC current | I_o [A] | 10.4 | 12.5 | 16.4 | 19 |
| Torque peak | M_{max} [Nm] | 32 | 41 | 51 | 75 |
| Current peak | I_{max} [A] | 49 | 49 | 61 | 68 |
| EMF constant | K_e [V/1000min ⁻¹] | 68 | 72 | 69 | 87 |
| Torque constant | K_T [Nm/A] | 1.12 | 1.19 | 1.14 | 1.44 |
| Rated power | P_n [W] | 2640 | 3420 | 4490 | 6600 |
| Phase to phase stator resistance | R_{pp} [Ω] | 0.71 | 0.48 | 0.35 | 0.32 |
| Phase to phase stator inductance | L_{pp} [mH] | 11.4 | 8.5 | 6.4 | 6.8 |
| Rotor inertia | J_m [kgcm ²] | 6.8 | 8.3 | 11.0 | 15.3 |
| Electrical time constant | τ_{el} [ms] | 16.0 | 16.8 | 18.3 | 21 |
| Thermal time constant | τ_{th} [min] | 50 | 55 | 60 | 75 |
| Mechanical time constant | τ_{mec} [ms] | 0.7 | 0.5 | 0.5 | 0.4 |
| Weight without brake | m_M [kg] | 8.100 | 10.100 | 12.100 | 16.100 |
| Weight with brake | m_{MF} [kg] | 9.180 | 11.180 | 13.180 | 17.180 |

All motor characteristics are referred to following conditions:

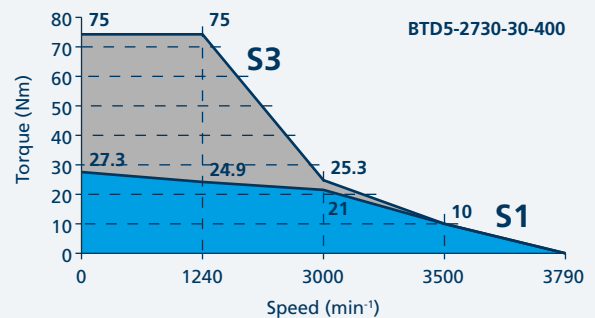
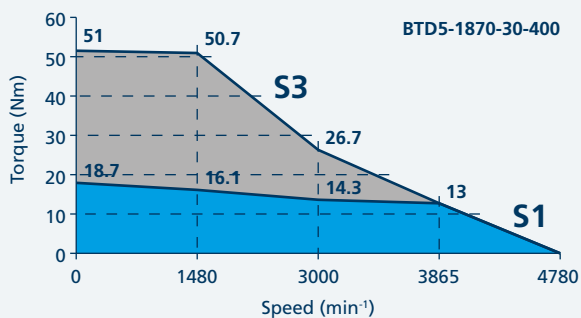
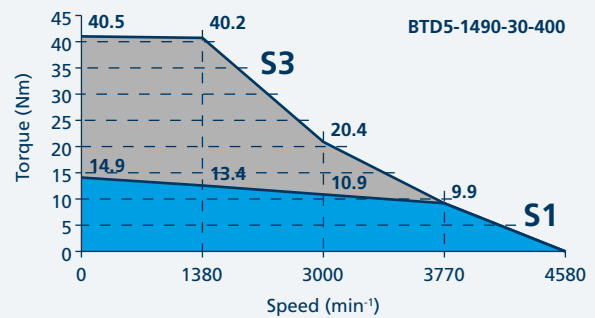
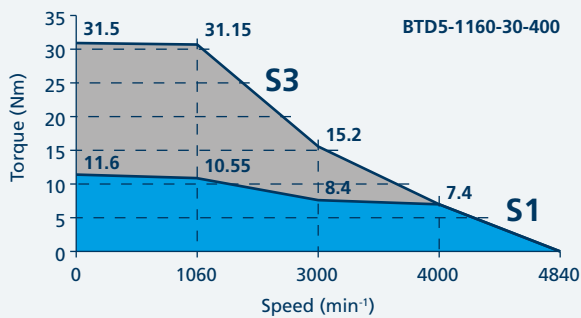
T_{amb} = 40 °C (ambient temperature)

ΔT = 105 °C (winding heating temperature)

S1 curve = for continuous duty

S3 curve = for intermittent duty

Torque-speed characteristic: ambient temperature 40°C



BTD5 230V

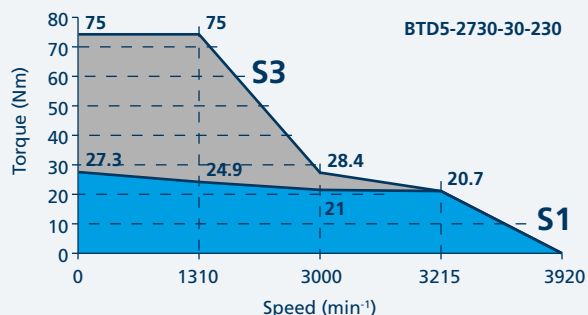
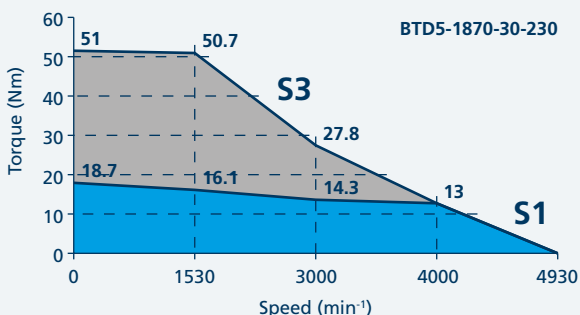
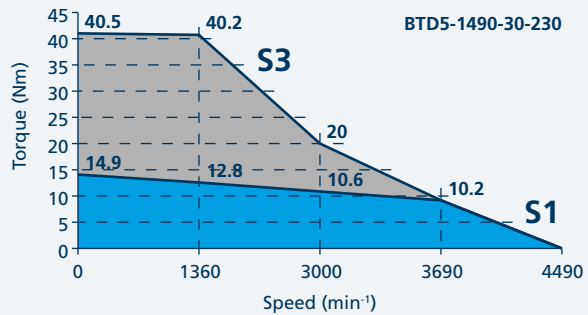
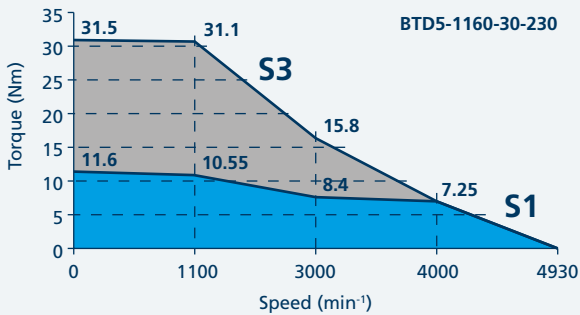
Motor **BTD5-1160-30-230** **BTD5-1490-30-230** **BTD5-1870-30-230** **BTD5-2730-30-230**

| | | | | | |
|----------------------------------|----------------------------------|-------|--------|--------|--------|
| Stall torque | M_o [Nm] | 11.6 | 14.9 | 18.7 | 27.3 |
| Rated speed | n_n [min ⁻¹] | 3000 | 3000 | 3000 | 3000 |
| Inverter DC-bus | V_{dc} [V] | 320 | 320 | 320 | 320 |
| Rated AC motor voltage | V_n [V] | 200 | 200 | 200 | 200 |
| Motor poles number | p_{mot} | 10 | 10 | 10 | 10 |
| Resolver poles number | p_{res} | 2 | 2 | 2 | 2 |
| Rated torque | M_n [Nm] | 8.4 | 10.9 | 14.3 | 21.0 |
| Rated AC current | I_n [A] | 13.2 | 15.6 | 22.4 | 25.4 |
| Stall AC current | I_o [A] | 17.3 | 20.1 | 27.9 | 32.4 |
| Torque peak | M_{max} [Nm] | 32 | 41 | 51 | 75 |
| Current peak | I_{max} [A] | 82 | 80 | 105 | 116 |
| EMF constant | K_E [V/1000min ⁻¹] | 40.5 | 44.5 | 40.5 | 51.0 |
| Torque constant | K_T [Nm/A] | 0.67 | 0.74 | 0.67 | 0.84 |
| Rated power | P_n [W] | 2640 | 3420 | 4490 | 6600 |
| Phase to phase stator resistance | R_{pp} [Ω] | 0.25 | 0.19 | 0.12 | 0.12 |
| Phase to phase stator inductance | L_{pp} [mH] | 4.0 | 3.2 | 2.2 | 2.3 |
| Rotor inertia | J_m [kgcm ²] | 6.8 | 8.3 | 11.0 | 15.3 |
| Electrical time constant | τ_{el} [ms] | 16.0 | 16.8 | 18.3 | 19.2 |
| Thermal time constant | τ_{th} [min] | 50 | 55 | 60 | 75 |
| Mechanical time constant | τ_{mec} [ms] | 0.7 | 0.5 | 0.5 | 0.4 |
| Weight without brake | m_M [kg] | 8.100 | 10.100 | 12.100 | 16.100 |
| Weight with brake | m_{MF} [kg] | 9.180 | 11.180 | 13.180 | 17.180 |

All motor characteristics are referred to following conditions:

- T_{amb} = 40 °C (ambient temperature)
- ΔT = 105 °C (winding heating temperature)
- S1 curve = for continuous duty
- S3 curve = for intermittent duty

Torque-speed characteristic: ambient temperature 40°C

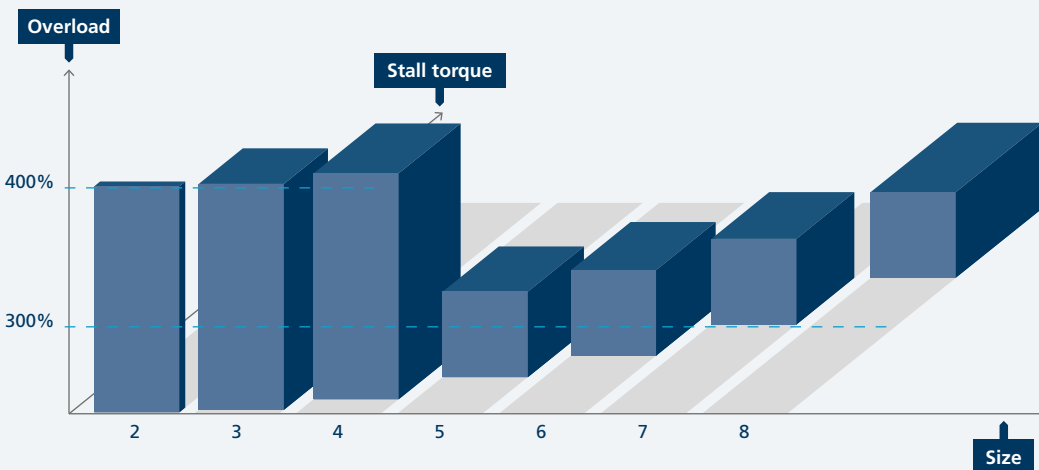


BCR - Servomotor brushless (high dynamics)

The architecture of magnet circuits and the winding insulation give to BCR high dynamic performances always assuring a long life time to him. The BCR series is developed in 7 sizes identified by progressive digit (from 2 to 8) corresponding to identical quantity of flanges designed for defined coupling with gearboxes. BTD alike, BCR series also makes available several torque values obtained from several motor lengths

from which it is possible to extract high continuous torque and high temporary overload up to 400% of nominal levels. The meaning of the name is the following: BCR = **B**rushless-**C**lassic-**R**ange. The large torque range (0.2 ÷ 115 Nm) in continuous duty and the high overload make the BCR very suitable for high dynamic applications where significant accelerations are involved.

| Series | Size | Flange | Speed | Stall torque | | | | Overload | |
|--------|------|--------|-----------|--------------|----------------------|------|-------|----------|-----|
| | | | | [mm] | [min ⁻¹] | [Nm] | | [%] | |
| BCR | 2 | 55 | 4500 | 0.2 | 0.4 | 0.6 | 0.8 | - | 400 |
| | 3 | 86 | 4500 | 0.65 | 1.3 | 2.5 | 3.0 | - | 400 |
| | 4 | 98 | 3000 | 1 | 2.6 | 5.3 | 7.5 | - | 400 |
| | 5 | 142 | 3000 | 6.6 | 10.5 | 13.5 | 17.0 | 22.0 | 300 |
| | 6 | 190 | 3000 | 13.5 | 19.0 | 22.0 | 29.0 | - | 300 |
| | 7 | 190 | 3000 | 27.0 | 32.0 | 40.0 | - | - | 300 |
| | 8 | 240 | 3000/2000 | 40.0 | 68.0 | 93.0 | 115.0 | - | 300 |

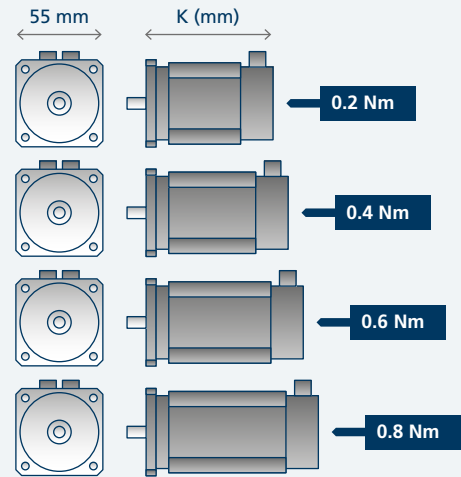


BCR2 - 0.2 ÷ 0.8 Nm

All BCR servomotors belonging to size 2 are equipped by the same geometrical flange, whereas they are differentiated by the length (K) correlated to torque capacity.

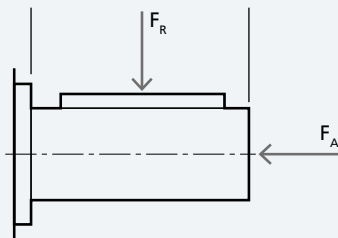
The basic motor configuration does not provide the electromechanical brake which is an option. When the brake is installed the motor length is increased.

The motor size BCR2 is structured on four torque levels corresponding to different four motor lengths with nominal speed equal to 4500 min⁻¹. The motor is available with power supply both 3ph x 400VAC and 3ph x 230VAC, keeping the same mechanical performances. On standard motor both power and control connectors are installed for electrical connection to the inverter. On demand, several connectors orientation can be supplied.

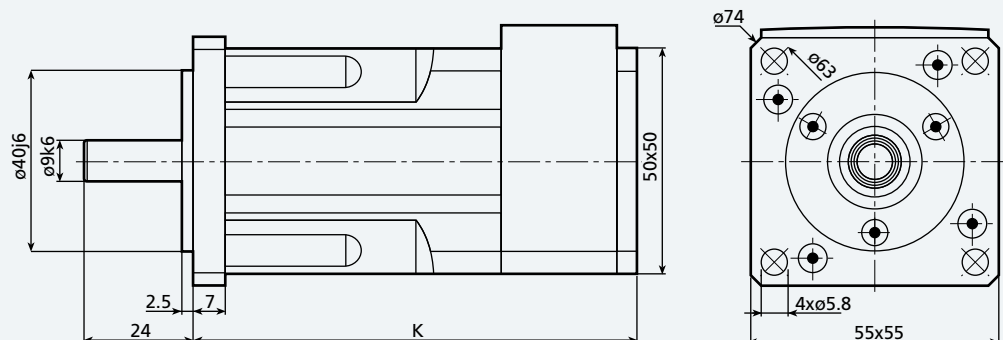


| Motor | Stall torque [Nm] | Rated speed [min ⁻¹] | Flange [mm] | Length K* | |
|-----------|----------------------|-------------------------------------|----------------|---------------|------------|
| | | | | Without brake | With brake |
| BCR2-0020 | 0.2 | 4500 | 55 | 98 | 131 |
| BCR2-0040 | 0.4 | | | 113 | 146 |
| BCR2-0060 | 0.6 | | | 128 | 161 |
| BCR2-0080 | 0.8 | | | 143 | 176 |

(*): With reference to motors equipped with resolver.



| Motor | Max load on shaft (N) | |
|-----------|-----------------------|----------------------|
| | Radial F _R | Axial F _A |
| BCR2-0020 | 225 | 43 |
| BCR2-0040 | 237 | 45 |
| BCR2-0060 | 245 | 47 |
| BCR2-0080 | 252 | 48 |



BCR2 400V

Motor

BCR2-0020-45-400 BCR2-0040-45-400 BCR2-0060-45-400 BCR2-0080-45-400

| | | | | | |
|----------------------------------|----------------------------------|------|------|------|------|
| Stall torque | M_o [Nm] | 0.2 | 0.4 | 0.6 | 0.8 |
| Rated speed | n_n [min ⁻¹] | 4500 | 4500 | 4500 | 4500 |
| Inverter DC-bus | V_{dc} [V] | 560 | 560 | 560 | 560 |
| Rated AC motor voltage | V_n [V] | 330 | 330 | 330 | 330 |
| Motor poles number | p_{mot} | 6 | 6 | 6 | 6 |
| Resolver poles number | p_{res} | 2 | 2 | 2 | 2 |
| Rated torque | M_n [Nm] | 0.19 | 0.36 | 0.55 | 0.72 |
| Rated AC current | I_n [A] | 0.48 | 0.51 | 0.70 | 0.86 |
| Stall AC current | I_o [A] | 0.47 | 0.54 | 0.73 | 0.91 |
| Torque peak | M_{max} [Nm] | 0.8 | 1.6 | 2.4 | 3.2 |
| Current peak | I_{max} [A] | 2.0 | 2.3 | 3.1 | 3.9 |
| EMF constant | K_e [V/1000min ⁻¹] | 25.5 | 45.0 | 50.0 | 53.0 |
| Torque constant | K_T [Nm/A] | 0.42 | 0.74 | 0.83 | 0.88 |
| Rated power | P_n [W] | 90 | 170 | 260 | 340 |
| Phase to phase stator resistance | R_{pp} [Ω] | 84.0 | 77.0 | 51.0 | 38.4 |
| Phase to phase stator inductance | L_{pp} [mH] | 50.0 | 62.0 | 45.5 | 39.7 |
| Rotor inertia | J_m [kgcm ²] | 0.06 | 0.08 | 0.11 | 0.13 |
| Electrical time constant | τ_{el} [ms] | 0.59 | 0.80 | 0.90 | 1.00 |
| Thermal time constant | τ_{th} [min] | 10 | 15 | 20 | 22 |
| Mechanical time constant | τ_{mec} [ms] | 4.9 | 1.9 | 1.4 | 1.1 |
| Weight without brake | m_M [kg] | 0.9 | 1.06 | 1.21 | 1.36 |
| Weight with brake | m_{MF} [kg] | 1.05 | 1.21 | 1.36 | 1.51 |

All motor characteristics are referred to following conditions:

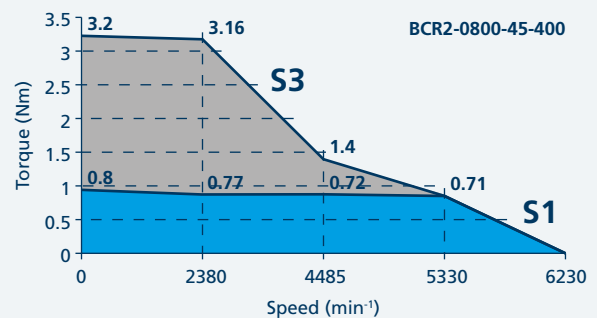
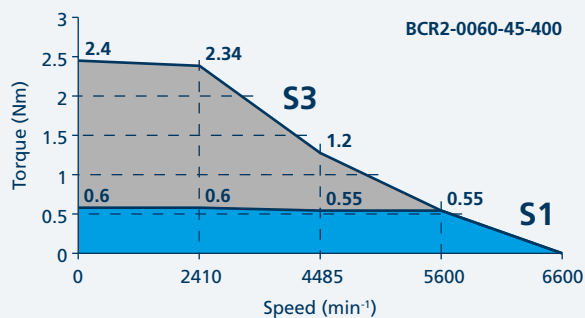
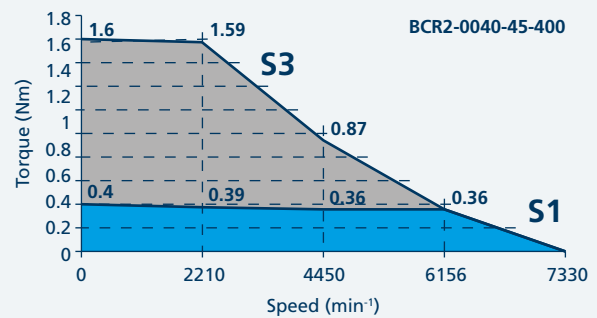
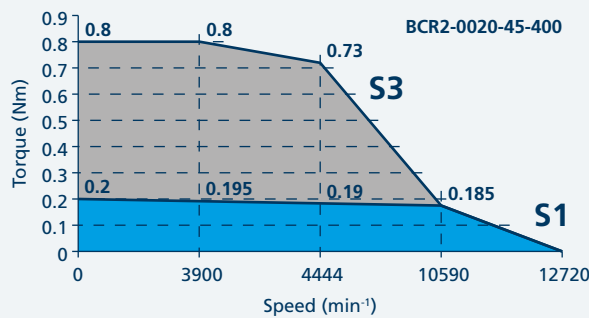
T_{amb} = 40 °C (ambient temperature)

ΔT = 105 °C (winding heating temperature)

S1 curve = for continuous duty

S3 curve = for intermittent duty

Torque-speed characteristic: ambient temperature 40°C



BCR2 230V

Motor **BCR2-0020-45-230** **BCR2-0040-45-230** **BCR2-0060-45-230** **BCR2-0080-45-230**

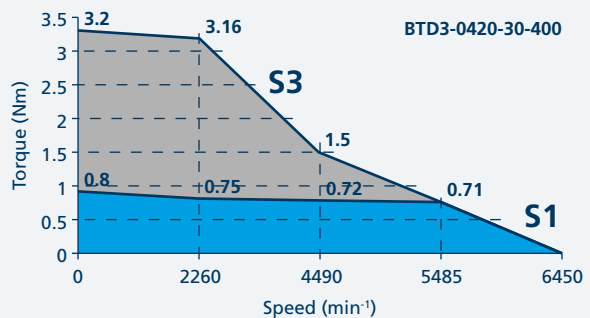
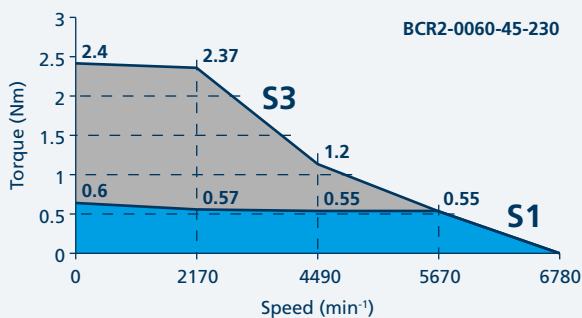
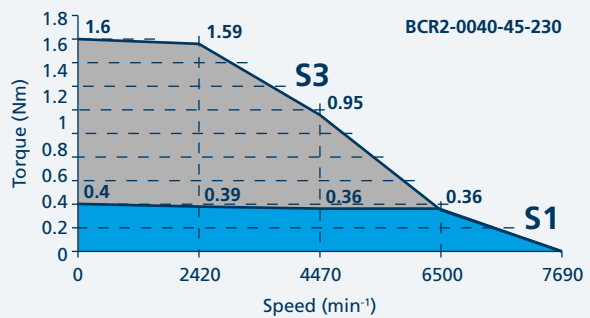
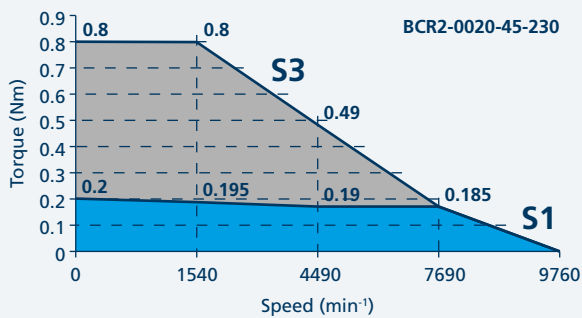
| | | | | | |
|----------------------------------|----------------------------------|------|------|------|------|
| Stall torque | M_o [Nm] | 0.2 | 0.4 | 0.6 | 0.8 |
| Rated speed | n_n [min ⁻¹] | 4500 | 4500 | 4500 | 4500 |
| Inverter DC-bus | V_{dc} [V] | 320 | 320 | 320 | 320 |
| Rated AC motor voltage | V_n [V] | 200 | 200 | 200 | 200 |
| Motor poles number | p_{mot} | 6 | 6 | 6 | 6 |
| Resolver poles number | p_{res} | 2 | 2 | 2 | 2 |
| Rated torque | M_n [Nm] | 0.19 | 0.36 | 0.55 | 0.72 |
| Rated AC current | I_n [A] | 0.60 | 0.88 | 1.18 | 1.47 |
| Stall AC current | I_o [A] | 0.59 | 0.93 | 1.23 | 1.56 |
| Torque peak | M_{max} [Nm] | 0.8 | 1.6 | 2.4 | 3.2 |
| Current peak | I_{max} [A] | 2.5 | 4.0 | 5.3 | 6.7 |
| EMF constant | K_E [V/1000min ⁻¹] | 20.5 | 26.0 | 30.0 | 31.0 |
| Torque constant | K_T [Nm/A] | 0.34 | 0.43 | 0.49 | 0.51 |
| Rated power | P_n [W] | 90 | 170 | 260 | 340 |
| Phase to phase stator resistance | R_{pp} [Ω] | 54.0 | 26.3 | 19.9 | 14.6 |
| Phase to phase stator inductance | L_{pp} [mH] | 32.0 | 21.4 | 17.2 | 14.4 |
| Rotor inertia | J_m [kgcm ²] | 0.06 | 0.08 | 0.11 | 0.13 |
| Electrical time constant | τ_{el} [ms] | 0.59 | 0.82 | 0.87 | 0.98 |
| Thermal time constant | τ_{th} [min] | 10 | 15 | 20 | 22 |
| Mechanical time constant | τ_{mec} [ms] | 4.9 | 2.0 | 1.5 | 1.3 |
| Weight without brake | m_M [kg] | 0.9 | 1.06 | 1.21 | 1.36 |
| Weight with brake | m_{MF} [kg] | 1.05 | 1.21 | 1.36 | 1.51 |

All motor characteristics are referred to following conditions:

T_{amb} = 40 °C (ambient temperature)
 ΔT = 105 °C (winding heating temperature)

S1 curve = for continuous duty
 S3 curve = for intermittent duty

Torque-speed characteristic: ambient temperature 40°C

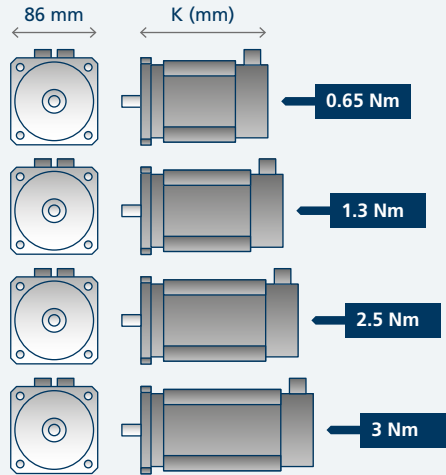


BCR3 - 0.65 ÷ 3 Nm

All BCR servomotors belonging to size 3 are equipped by the same geometrical flange, whereas the are differentiated by the length (K) correlated to torque capacity.

The basic motor configuration does not provide the electromechanical brake which is an option. When the brake is installed the motor length is increased.

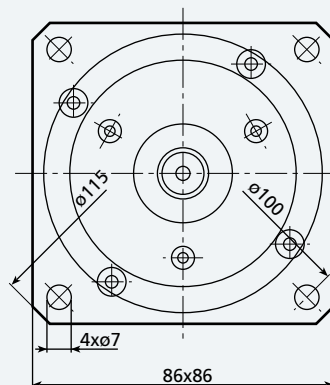
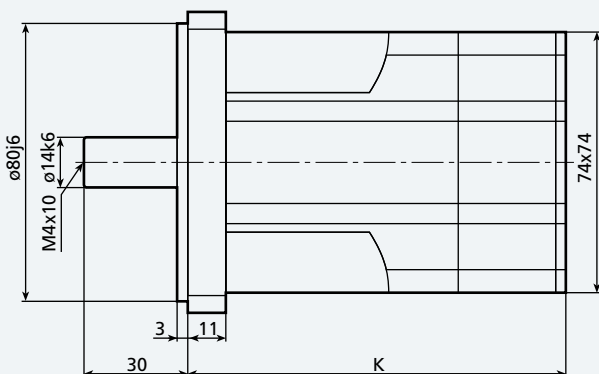
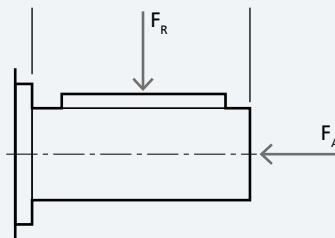
The motor size BCR3 is structured on four torque levels corresponding to different four motor lengths with nominal speed equal to 4500 min⁻¹. The motor is available with power supply both 3ph x 400VAC and 3ph x 230VAC, keeping the same mechanical performances. On standard motor both power and control connectors are installed for electrical connection to the inverter. On demand, several connectors orientation can be supplied.



| Motor | Stall torque | Rated speed | Flange | Length K * | |
|-----------|--------------|----------------------|--------|---------------|------------|
| | [Nm] | [min ⁻¹] | | Without brake | With brake |
| BCR3-0065 | 0.65 | 4500 | 86 | 109 | 142 |
| BCR3-0130 | 1.3 | | | 127 | 160 |
| BCR3-0250 | 2.5 | | | 163 | 196 |
| BCR3-0300 | 3.0 | | | 181 | 214 |

(*) With reference to motors equipped with resolver.

| Motor | Max load on shaft (N) | |
|-----------|-----------------------|----------------------|
| | Radial F _R | Axial F _A |
| BCR3-0065 | 370 | 70 |
| BCR3-0130 | 393 | 75 |
| BCR3-0250 | 422 | 80 |
| BCR3-0300 | 431 | 82 |



BCR3 400V

Motor **BCR3-0065-45-400** **BCR3-0130-45-400** **BCR3-0250-45-400** **BCR3-0300-45-400**

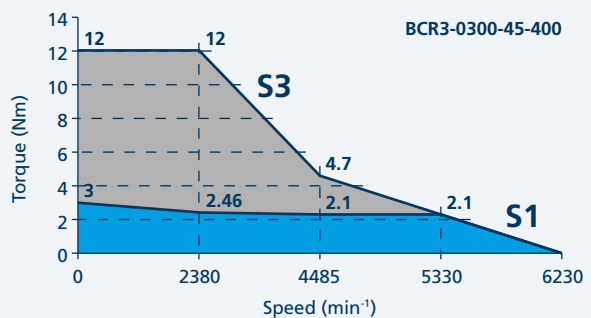
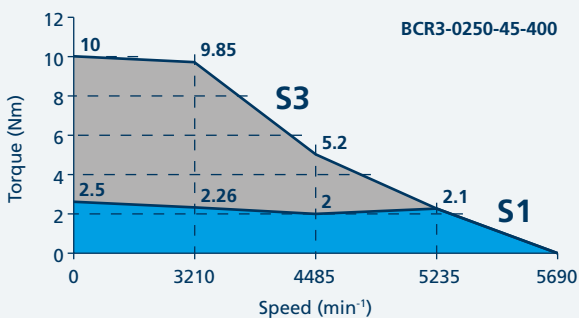
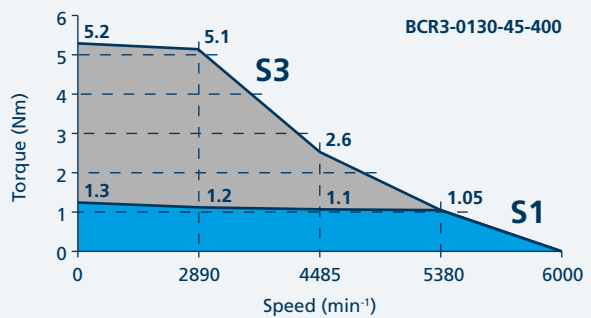
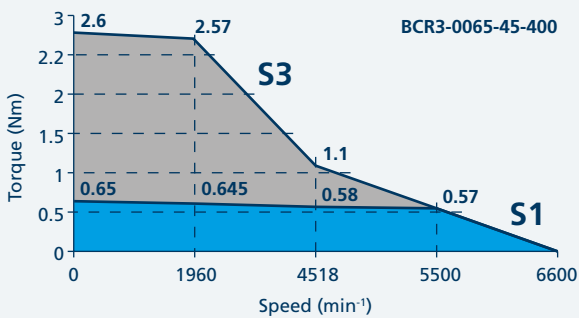
| | | | | | |
|----------------------------------|----------------------------------|------|------|------|------|
| Stall torque | M_o [Nm] | 0.65 | 1.3 | 2.5 | 3 |
| Rated speed | n_n [min ⁻¹] | 4500 | 4500 | 4500 | 4500 |
| Inverter DC-bus | V_{dc} [V] | 560 | 560 | 560 | 560 |
| Rated AC motor voltage | V_n [V] | 330 | 330 | 330 | 330 |
| Motor poles number | p_{mot} | 6 | 6 | 6 | 6 |
| Resolver poles number | p_{res} | 2 | 2 | 2 | 2 |
| Rated torque | M_n [Nm] | 0.58 | 1.05 | 2.0 | 2.1 |
| Rated AC current | I_n [A] | 0.75 | 1.24 | 2.2 | 2.0 |
| Stall AC current | I_o [A] | 0.79 | 1.43 | 2.6 | 2.6 |
| Torque peak | M_{max} [Nm] | 2.6 | 5.2 | 10.0 | 12.0 |
| Current peak | I_{max} [A] | 3.4 | 6.1 | 11.2 | 12.4 |
| EMF constant | K_E [V/1000min ⁻¹] | 50.0 | 55.0 | 58.0 | 63.0 |
| Torque constant | K_T [Nm/A] | 0.83 | 0.91 | 0.96 | 1.04 |
| Rated power | P_n [W] | 220 | 495 | 940 | 990 |
| Phase to phase stator resistance | R_{pp} [Ω] | 50.0 | 17.0 | 7.0 | 6.0 |
| Phase to phase stator inductance | L_{pp} [mH] | 62.0 | 29.9 | 15.4 | 14.2 |
| Rotor inertia | J_m [kgcm ²] | 0.50 | 0.65 | 1.4 | 1.5 |
| Electrical time constant | τ_{el} [ms] | 1.2 | 1.8 | 2.2 | 2.3 |
| Thermal time constant | τ_{th} [min] | 25 | 30 | 32 | 33 |
| Mechanical time constant | τ_{mec} [ms] | 6.4 | 2.3 | 1.8 | 1.4 |
| Weight without brake | m_M [kg] | 1.75 | 2.25 | 3.20 | 3.65 |
| Weight with brake | m_{MF} [kg] | 2.22 | 2.72 | 3.67 | 4.12 |

All motor characteristics are referred to following conditions:

T_{amb} = 40 °C (ambient temperature)
 ΔT = 105 °C (winding heating temperature)

S1 curve = for continuous duty
 S3 curve = for intermittent duty

Torque-speed characteristic: ambient temperature 40°C



BCR3 230V

Motor

BCR3-0065-45-230 BCR3-0130-45-230 BCR3-0250-45-230 BCR3-0300-45-230

| | | | | | |
|----------------------------------|----------------------------------|------|------|------|------|
| Stall torque | M_o [Nm] | 0.65 | 1.3 | 2.5 | 3 |
| Rated speed | n_n [min ⁻¹] | 4500 | 4500 | 4500 | 4500 |
| Inverter DC-bus | V_{dc} [V] | 320 | 320 | 320 | 320 |
| Rated AC motor voltage | V_n [V] | 200 | 200 | 200 | 200 |
| Motor poles number | p_{mot} | 6 | 6 | 6 | 6 |
| Resolver poles number | p_{res} | 2 | 2 | 2 | 2 |
| Rated torque | M_n [Nm] | 0.58 | 1.05 | 2.0 | 2.1 |
| Rated AC current | I_n [A] | 1.31 | 2.0 | 3.4 | 3.6 |
| Stall AC current | I_o [A] | 1.38 | 2.4 | 4.0 | 4.8 |
| Torque peak | M_{max} [Nm] | 2.6 | 5.2 | 10.0 | 12.0 |
| Current peak | I_{max} [A] | 5.9 | 10.1 | 17.3 | 21.0 |
| EMF constant | K_e [V/1000min ⁻¹] | 28.5 | 33.5 | 37.5 | 37.5 |
| Torque constant | K_T [Nm/A] | 0.47 | 0.55 | 0.62 | 0.62 |
| Rated power | P_n [W] | 220 | 495 | 940 | 990 |
| Phase to phase stator resistance | R_{pp} [Ω] | 15.6 | 6.5 | 3.0 | 2.1 |
| Phase to phase stator inductance | L_{pp} [mH] | 20.0 | 11.1 | 6.0 | 5.0 |
| Rotor inertia | J_m [kgcm ²] | 0.50 | 0.65 | 1.4 | 1.5 |
| Electrical time constant | τ_{el} [ms] | 1.3 | 1.7 | 2.0 | 2.4 |
| Thermal time constant | τ_{th} [min] | 25 | 30 | 32 | 33 |
| Mechanical time constant | τ_{mec} [ms] | 6.1 | 2.4 | 1.9 | 1.4 |
| Weight without brake | m_M [kg] | 1.75 | 2.25 | 3.20 | 3.65 |
| Weight with brake | m_{MF} [kg] | 2.22 | 2.72 | 3.67 | 4.12 |

All motor characteristics are referred to following conditions:

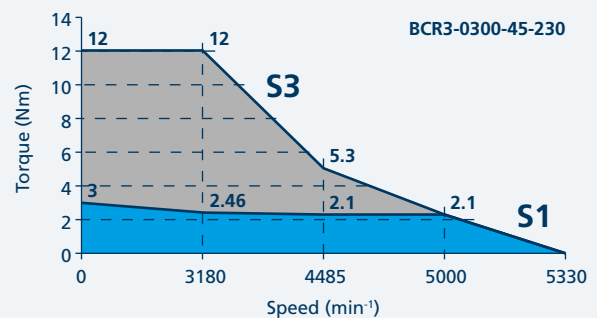
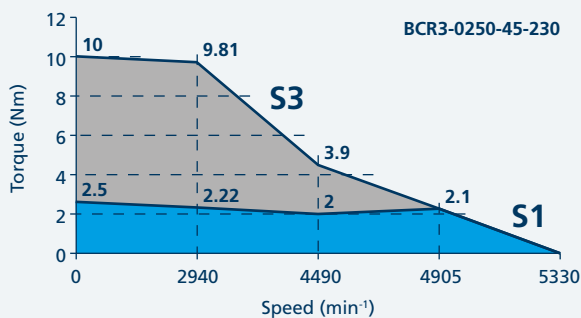
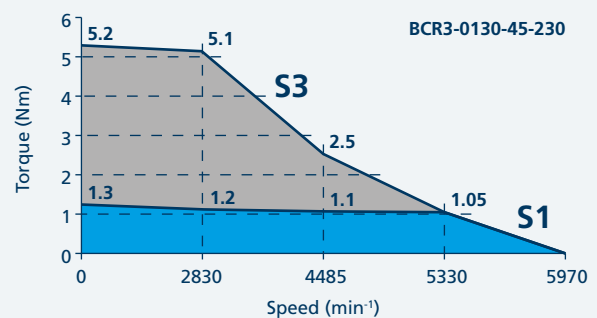
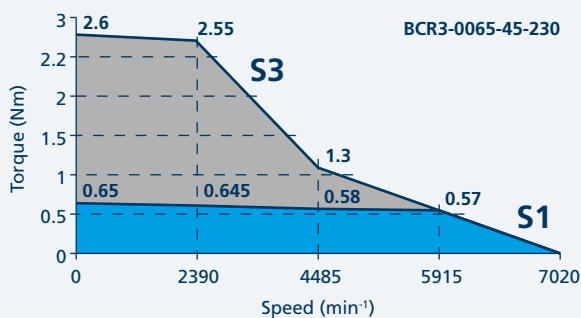
T_{amb} = 40 °C (ambient temperature)

ΔT = 105 °C (winding heating temperature)

S1 curve = for continuous duty

S3 curve = for intermittent duty

Torque-speed characteristic: ambient temperature 40°C

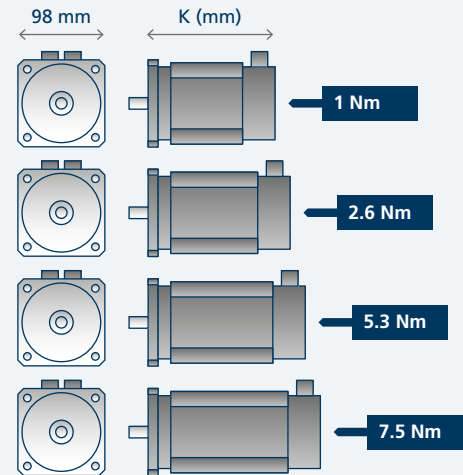


BCR4 - 1 ÷ 7.5 Nm

All BCR servomotors belonging to size 4 are equipped by the same geometrical flange, whereas they are differentiated by the length (K) correlated to torque capacity.

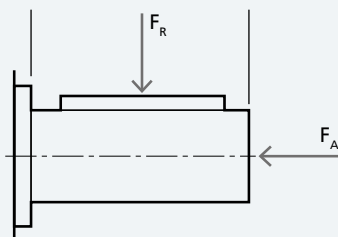
The basic motor configuration does not provide the electromechanical brake which is an option. When the brake is installed the motor length is increased.

The motor size BCR4 is structured on four torque levels corresponding to different four motor lengths with nominal speed equal to 3000 min⁻¹. The motor is available with power supply both 3ph x 400VAC and 3ph x 230VAC, keeping the same mechanical performances. On standard motor both power and control connectors are installed for electrical connection to the inverter. On demand, several connectors orientation can be supplied.

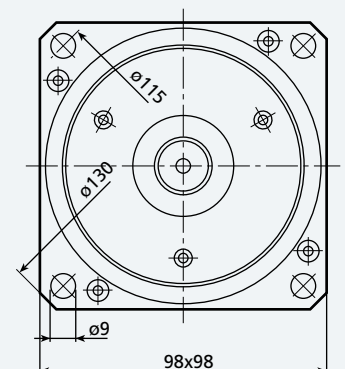
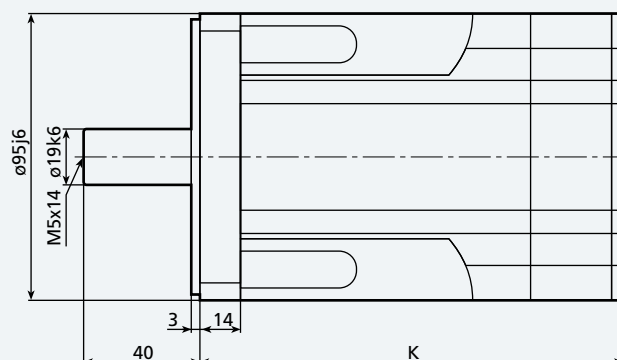


| Motor | Stall torque [Nm] | Rated speed [min ⁻¹] | Flange [mm] | Length K* | |
|-----------|----------------------|-------------------------------------|----------------|---------------|------------|
| | | | | Without brake | With brake |
| BCR4-0100 | 1 | 3000 | 98 | 116 | 148 |
| BCR4-0260 | 2.6 | | | 146 | 178 |
| BCR4-0530 | 5.3 | | | 176 | 208 |
| BCR4-0750 | 7.5 | | | 221 | 253 |

(*) With reference to motors equipped with resolver.



| Motor | Max load on shaft (N) | |
|-----------|-----------------------|----------------------|
| | Radial F _R | Axial F _A |
| BCR4-0100 | 328 | 62 |
| BCR4-0260 | 638 | 121 |
| BCR4-0530 | 676 | 128 |
| BCR4-0750 | 711 | 135 |



BCR4 400V

Motor

BCR4-0100-30-400 BCR4-0260-30-400 BCR4-0530-30-400 BCR4-0750-30-400

| | | | | | |
|----------------------------------|----------------------------------|------|------|------|------|
| Stall torque | M_o [Nm] | 1.0 | 2.6 | 5.3 | 7.5 |
| Rated speed | n_n [min ⁻¹] | 3000 | 3000 | 3000 | 3000 |
| Inverter DC-bus | V_{dc} [V] | 560 | 560 | 560 | 560 |
| Rated AC motor voltage | V_n [V] | 330 | 330 | 330 | 330 |
| Motor poles number | p_{mot} | 6 | 6 | 6 | 6 |
| Resolver poles number | p_{res} | 2 | 2 | 2 | 2 |
| Rated torque | M_n [Nm] | 0.98 | 2.3 | 4.6 | 6.4 |
| Rated AC current | I_n [A] | 1.05 | 1.85 | 3.8 | 4.4 |
| Stall AC current | I_o [A] | 1.06 | 1.92 | 4.1 | 4.8 |
| Torque peak | M_{max} [Nm] | 4 | 10.4 | 21.0 | 30.0 |
| Current peak | I_{max} [A] | 6.4 | 11.5 | 25.0 | 29.0 |
| EMF constant | K_e [V/1000min ⁻¹] | 57 | 82.0 | 78.0 | 94.0 |
| Torque constant | K_T [Nm/A] | 0.94 | 1.36 | 1.29 | 1.55 |
| Rated power | P_n [W] | 280 | 720 | 1440 | 2010 |
| Phase to phase stator resistance | R_{pp} [Ω] | 16.3 | 9.6 | 4.2 | 3.0 |
| Phase to phase stator inductance | L_{pp} [mH] | 75 | 41.5 | 24.0 | 19.2 |
| Rotor inertia | J_m [kgcm ²] | 0.79 | 1.9 | 2.7 | 4.2 |
| Electrical time constant | τ_{el} [ms] | 2.1 | 4.3 | 5.7 | 6.4 |
| Thermal time constant | τ_{th} [min] | 45 | 60 | 64 | 66 |
| Mechanical time constant | τ_{mec} [ms] | 5.6 | 1.7 | 1.2 | 0.9 |
| Weight without brake | m_M [kg] | 2.7 | 4.5 | 5.6 | 7.7 |
| Weight with brake | m_{MF} [kg] | 3.52 | 5.32 | 6.42 | 8.52 |

All motor characteristics are referred to following conditions:

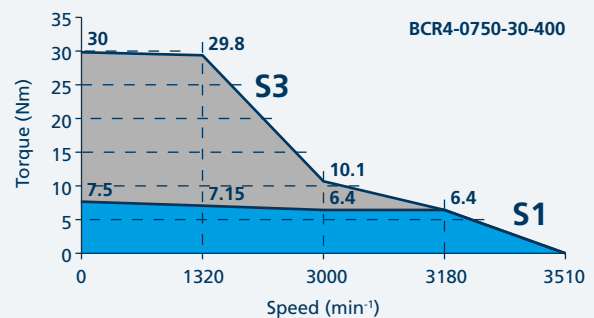
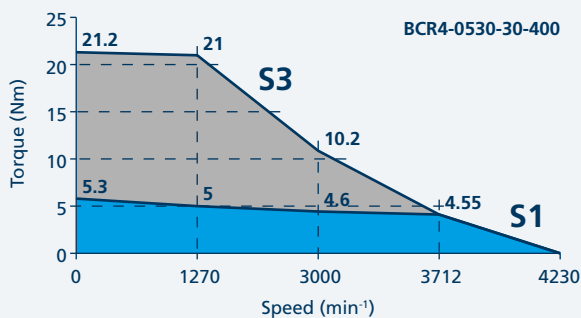
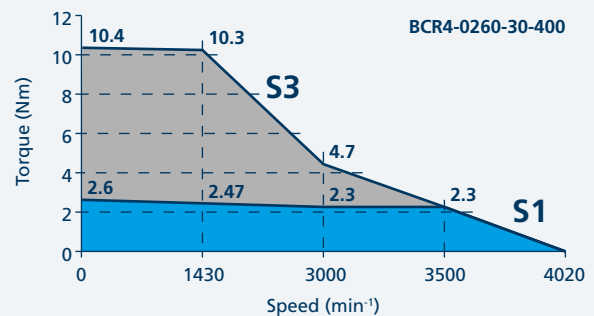
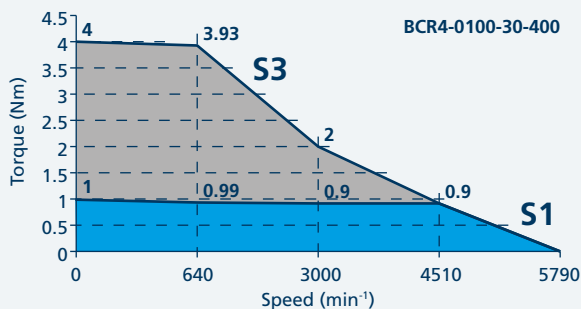
T_{amb} = 40 °C (ambient temperature)

ΔT = 105 °C (winding heating temperature)

S1 curve = for continuous duty

S3 curve = for intermittent duty

Torque-speed characteristic: ambient temperature 40°C



BCR4 230V

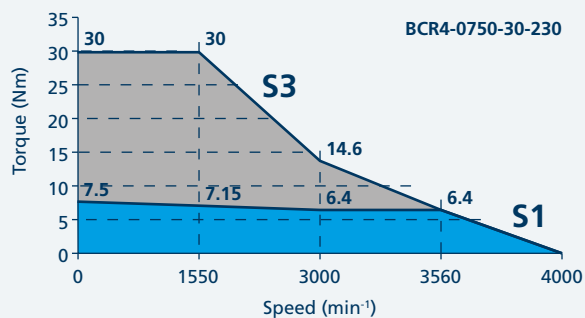
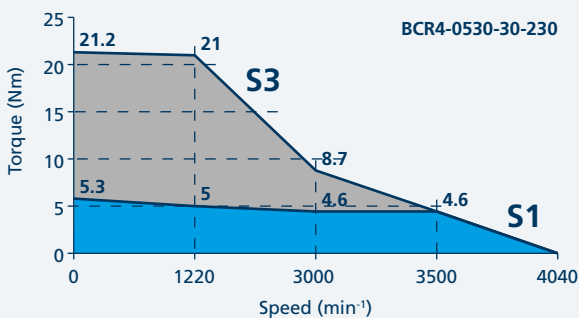
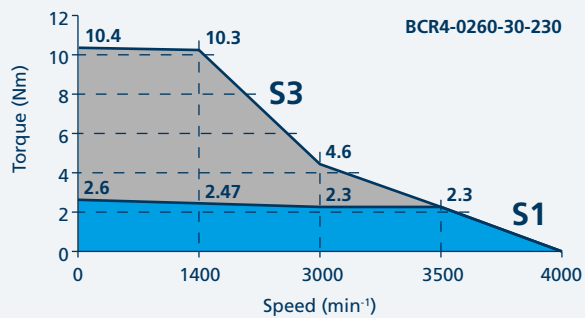
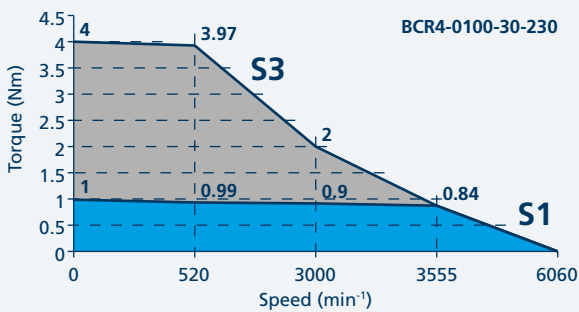
Motor **BCR4-0100-30-230** **BCR4-0260-30-230** **BCR4-0530-30-230** **BCR4-0750-30-230**

| | | | | | |
|----------------------------------|----------------------------------|------|------|------|------|
| Stall torque | M_o [Nm] | 1.0 | 2.6 | 5.3 | 7.5 |
| Rated speed | n_n [min ⁻¹] | 3000 | 3000 | 3000 | 3000 |
| Inverter DC-bus | V_{dc} [V] | 320 | 320 | 320 | 320 |
| Rated AC motor voltage | V_n [V] | 200 | 200 | 200 | 200 |
| Motor poles number | p_{mot} | 6 | 6 | 6 | 6 |
| Resolver poles number | p_{res} | 2 | 2 | 2 | 2 |
| Rated torque | M_n [Nm] | 0.98 | 2.3 | 4.6 | 6.4 |
| Rated AC current | I_n [A] | 1.8 | 3.0 | 5.9 | 8.1 |
| Stall AC current | I_o [A] | 1.83 | 3.1 | 6.5 | 9.1 |
| Torque peak | M_{max} [Nm] | 4 | 10.4 | 21.0 | 30.0 |
| Current peak | I_{max} [A] | 11 | 18.9 | 39.0 | 54.0 |
| EMF constant | K_E [V/1000min ⁻¹] | 33 | 50.0 | 49.5 | 50.0 |
| Torque constant | K_T [Nm/A] | 0.55 | 0.83 | 0.82 | 0.83 |
| Rated power | P_n [W] | 280 | 720 | 1440 | 2010 |
| Phase to phase stator resistance | R_{pp} [Ω] | 13.5 | 3.6 | 1.66 | 0.87 |
| Phase to phase stator inductance | L_{pp} [mH] | 25.7 | 15.9 | 9.8 | 5.6 |
| Rotor inertia | J_m [kgcm ²] | 0.79 | 1.9 | 2.7 | 4.2 |
| Electrical time constant | τ_{el} [ms] | 1.9 | 4.4 | 5.9 | 6.4 |
| Thermal time constant | τ_{th} [min] | 45 | 60 | 64 | 66 |
| Mechanical time constant | τ_{mec} [ms] | 6.2 | 1.7 | 1.1 | 0.9 |
| Weight without brake | m_M [kg] | 2.7 | 4.5 | 5.6 | 7.7 |
| Weight with brake | m_{MF} [kg] | 3.52 | 5.32 | 6.42 | 8.52 |

All motor characteristics are referred to following conditions:

- T_{amb} = 40 °C (ambient temperature)
- ΔT = 105 °C (winding heating temperature)
- S1 curve = for continuous duty
- S3 curve = for intermittent duty

Torque-speed characteristic: ambient temperature 40°C



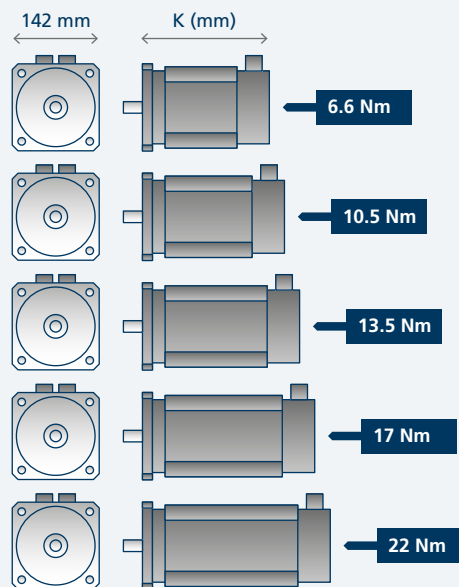
BCR5 - 6.6 ÷ 22 Nm

All BCR servomotors belonging to size 5 are equipped by the same geometrical flange, whereas the are differentiated by the length (K) correlated to torque capacity.

The basic motor configuration does not provide the electromechanical brake which is an option. When the brake is installed the motor length is increased.

The motor size BCR5 is structured on five torque levels corresponding to different five motor lengths with nominal speed equal to 3000 min⁻¹. The motor is available with power supply both 3ph x 400VAC and 3ph x 230VAC, keeping the same mechanical performances.

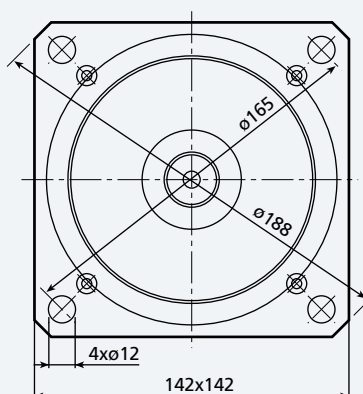
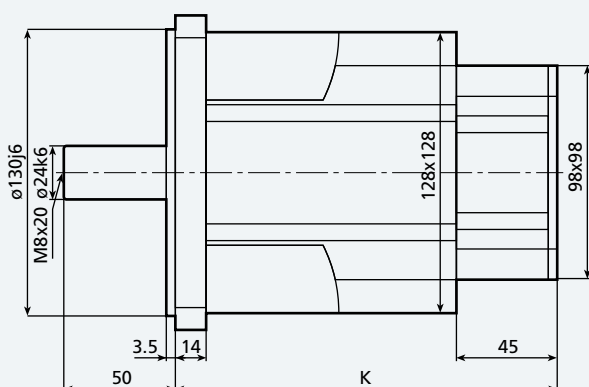
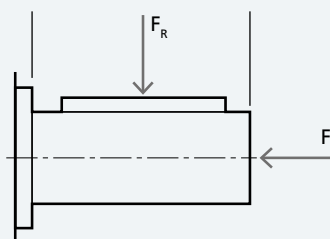
On standard motor both power and control connectors are installed for electrical connection to the inverter. On demand, several connectors orientation can be supplied.



| Motor | Stall torque | Rated speed | Flange | Length K* | |
|-----------|--------------|-------------|--------|----------------------|---------------|
| | [Nm] | | | [min ⁻¹] | Without brake |
| BCR5-0660 | 6.6 | 3000 | 142 | 185 | 228 |
| BCR5-1050 | 10.5 | | | 219 | 262 |
| BCR5-1350 | 13.5 | | | 236 | 279 |
| BCR5-1700 | 17 | | | 270 | 313 |
| BCR5-2200 | 22 | | | 304 | 347 |

(*) With reference to motors equipped with resolver.

| Motor | Max load on shaft (N) | |
|-----------|-----------------------|----------------------|
| | Radial F _R | Axial F _A |
| BCR5-0660 | 693 | 132 |
| BCR5-1050 | 733 | 139 |
| BCR5-1350 | 748 | 142 |
| BCR5-1700 | 772 | 147 |
| BCR5-2200 | 790 | 150 |



BCR5 400V

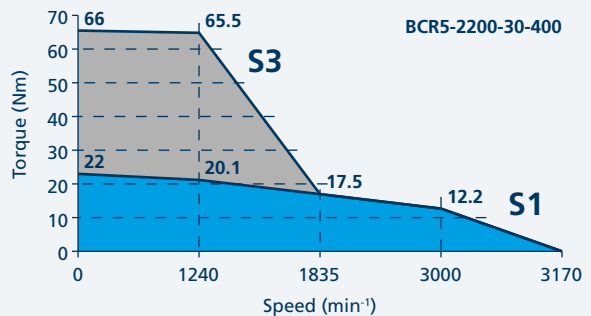
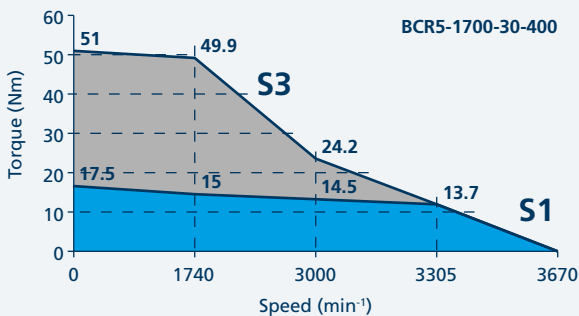
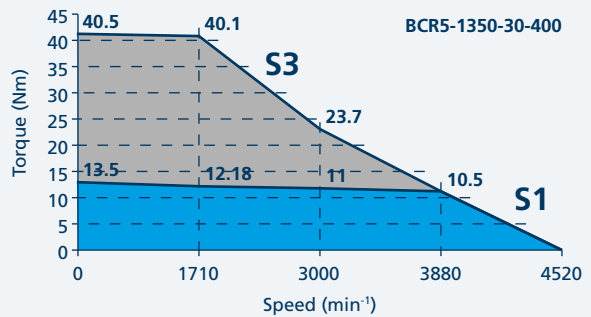
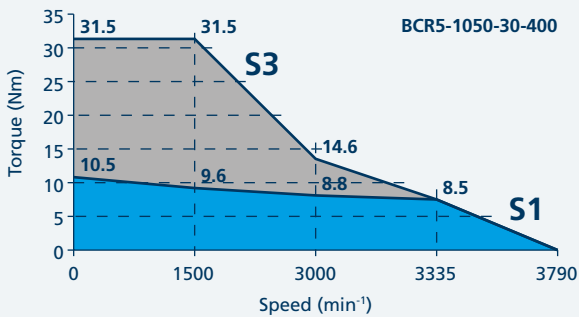
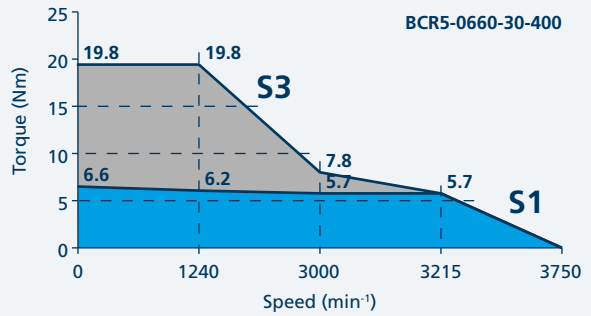
Motor BCR5-0660-30-400 BCR5-1050-30-400 BCR5-1350-30-400 BCR5-1700-30-400 BCR5-2200-30-400

| | | | | | | |
|----------------------------------|----------------------------------|------|------|------|------|-------|
| Stall torque | M_o [Nm] | 6.6 | 10.5 | 13.5 | 17.0 | 22.0 |
| Rated speed | n_n [min ⁻¹] | 3000 | 3000 | 3000 | 3000 | 3000 |
| Inverter DC-bus | V_{dc} [V] | 560 | 560 | 560 | 560 | 560 |
| Rated AC motor voltage | V_n [V] | 330 | 330 | 330 | 330 | 330 |
| Motor poles number | p_{mot} | 6 | 6 | 6 | 6 | 6 |
| Resolver poles number | p_{res} | 2 | 2 | 2 | 2 | 2 |
| Rated torque | M_n [Nm] | 5.7 | 8.8 | 11.0 | 14.5 | 17.5 |
| Rated AC current | I_n [A] | 4.0 | 6.3 | 9.5 | 10.0 | 10.5 |
| Stall AC current | I_o [A] | 4.5 | 7.3 | 11.2 | 11.4 | 12.8 |
| Torque peak | M_{max} [Nm] | 19.8 | 32.0 | 41.0 | 51.0 | 66.0 |
| Current peak | I_{max} [A] | 23 | 36 | 56 | 57 | 64 |
| EMF constant | K_E [V/1000min ⁻¹] | 88.0 | 87.0 | 73.0 | 90.0 | 104.0 |
| Torque constant | K_T [Nm/A] | 1.46 | 1.44 | 1.21 | 1.49 | 1.72 |
| Rated power | P_n [W] | 1790 | 2760 | 3450 | 4550 | 5500 |
| Phase to phase stator resistance | R_{pp} [Ω] | 4.2 | 1.70 | 0.95 | 0.95 | 0.95 |
| Phase to phase stator inductance | L_{pp} [mH] | 27.8 | 15.2 | 9.0 | 10.0 | 10.5 |
| Rotor inertia | J_m [kgcm ²] | 4.0 | 6.2 | 7.3 | 9.5 | 11.7 |
| Electrical time constant | τ_{el} [ms] | 6.7 | 9.0 | 9.5 | 10.6 | 11.1 |
| Thermal time constant | τ_{th} [min] | 45 | 50 | 55 | 60 | 75 |
| Mechanical time constant | τ_{mech} [ms] | 1.4 | 0.9 | 0.8 | 0.7 | 0.7 |
| Weight without brake | m_M [kg] | 7.5 | 10.0 | 11.2 | 13.7 | 16.2 |
| Weight with brake | m_{MB} [kg] | 9.3 | 11.8 | 13.0 | 15.5 | 18.0 |

All motor characteristics are referred to following conditions:

- T_{amb} = 40 °C (ambient temperature)
- ΔT = 105 °C (winding heating temperature)
- S1 curve = for continuous duty
- S3 curve = for intermittent duty

Torque-speed characteristic: ambient temperature 40°C



BCR5 230V

Motor

BCR5-0660-30-230 BCR5-1050-30-230 BCR5-1350-30-230 BCR5-1700-30-230 BCR5-2200-30-230

| | | | | | | |
|----------------------------------|----------------------------------|------|------|------|------|------|
| Stall torque | M_0 [Nm] | 6.6 | 10.5 | 13.5 | 17.0 | 22.0 |
| Rated speed | n_n [min ⁻¹] | 3000 | 3000 | 3000 | 3000 | 3000 |
| Inverter DC-bus | V_{dc} [V] | 320 | 320 | 320 | 320 | 320 |
| Rated AC motor voltage | V_n [V] | 200 | 200 | 200 | 200 | 200 |
| Motor poles number | p_{mot} | 6 | 6 | 6 | 6 | 6 |
| Resolver poles number | p_{res} | 2 | 2 | 2 | 2 | 2 |
| Rated torque | M_n [Nm] | 5.7 | 8.8 | 11.0 | 14.5 | 17.5 |
| Rated AC current | I_n [A] | 6.8 | 11.5 | 14.5 | 16.0 | 20.2 |
| Stall AC current | I_0 [A] | 7.7 | 13.4 | 17.4 | 18.4 | 25.6 |
| Torque peak | M_{max} [Nm] | 19.8 | 32.0 | 41.0 | 51.0 | 66.0 |
| Current peak | I_{max} [A] | 38 | 67 | 87 | 91 | 127 |
| EMF constant | K_E [V/1000min ⁻¹] | 52.0 | 47.5 | 47.0 | 56.0 | 52.0 |
| Torque constant | K_T [Nm/A] | 0.86 | 0.79 | 0.78 | 0.93 | 0.86 |
| Rated power | P_n [W] | 1790 | 2760 | 3450 | 4550 | 5500 |
| Phase to phase stator resistance | R_{pp} [Ω] | 1.44 | 0.51 | 0.38 | 0.36 | 0.24 |
| Phase to phase stator inductance | L_{pp} [mH] | 9.6 | 4.6 | 3.6 | 3.8 | 2.6 |
| Rotor inertia | J_m [kgcm ²] | 4.0 | 6.2 | 7.3 | 9.5 | 11.7 |
| Electrical time constant | τ_{el} [ms] | 6.7 | 9.0 | 9.5 | 10.6 | 10.8 |
| Thermal time constant | τ_{th} [min] | 45 | 50 | 55 | 60 | 75 |
| Mechanical time constant | τ_{mec} [ms] | 1.3 | 0.9 | 0.8 | 0.7 | 0.7 |
| Weight without brake | m_M [kg] | 7.5 | 10.0 | 11.2 | 13.7 | 16.2 |
| Weight with brake | m_{MF} [kg] | 9.3 | 11.8 | 13.0 | 15.5 | 18.0 |

All motor characteristics are referred to following conditions:

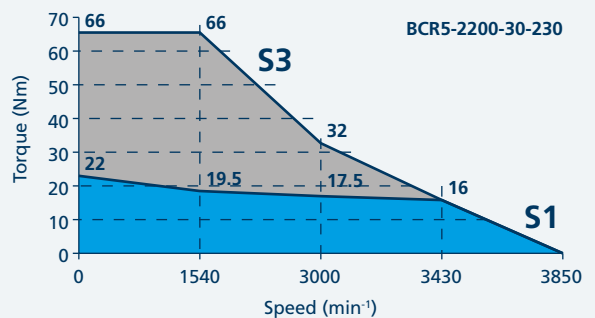
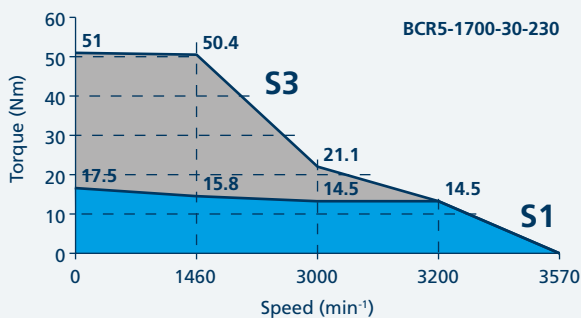
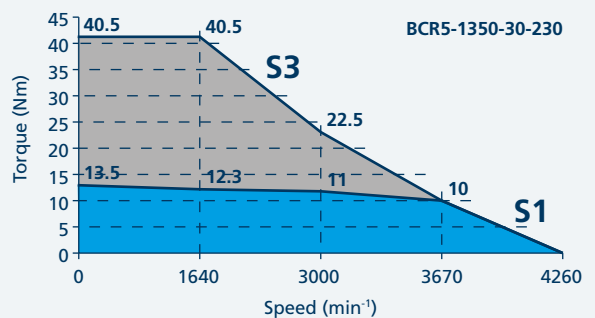
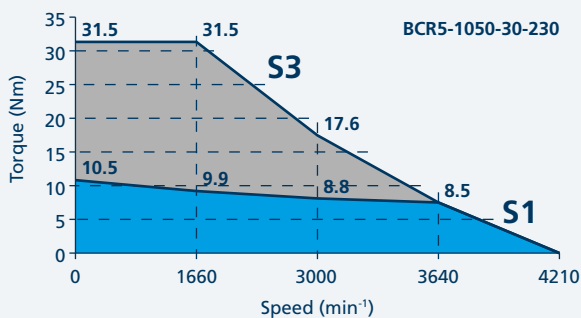
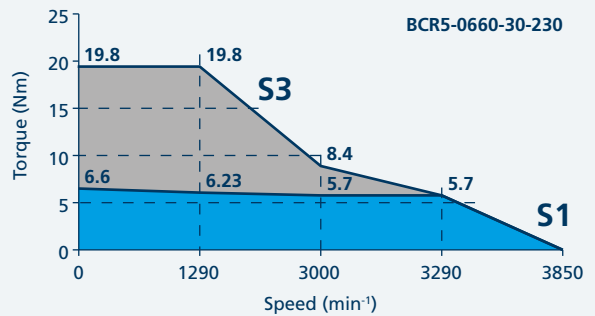
$T_{amb} = 40\text{ °C}$ (ambient temperature)

$\Delta T = 105\text{ °C}$ (winding heating temperature)

S1 curve = for continuous duty

S3 curve = for intermittent duty

Torque-speed characteristic: ambient temperature 40°C

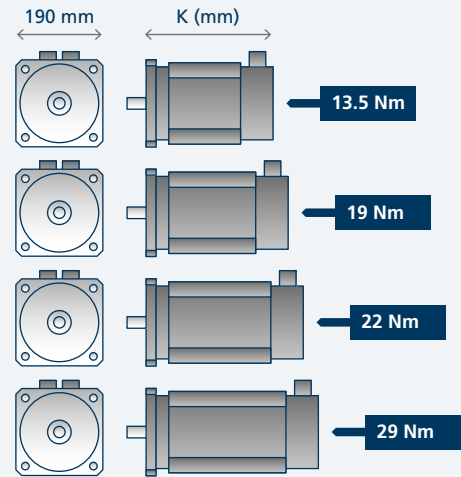


BCR6 - 13.5 ÷ 29 Nm

All BCR servomotors belonging to size 6 are equipped by the same geometrical flange, whereas they are differentiated by the length (K) correlated to torque capacity.

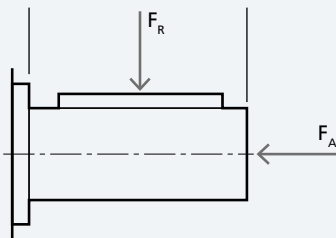
The basic motor configuration does not provide the electromechanical brake which is an option. When the brake is installed the motor length is increased.

The motor size BCR6 is structured on four torque levels corresponding to different four motor lengths with nominal speed equal to 3000 min⁻¹. The motor is available with power supply both 3ph x 400VAC and 3ph x 230VAC, keeping the same mechanical performances. On standard motor both power and control connectors are installed for electrical connection to the inverter. On demand, several connectors orientation can be supplied.

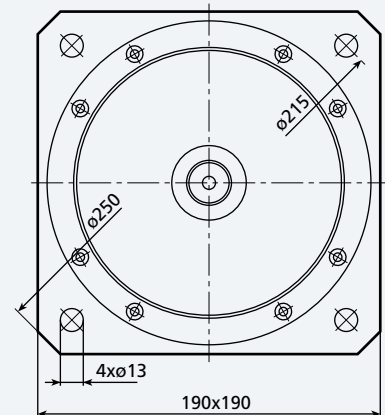
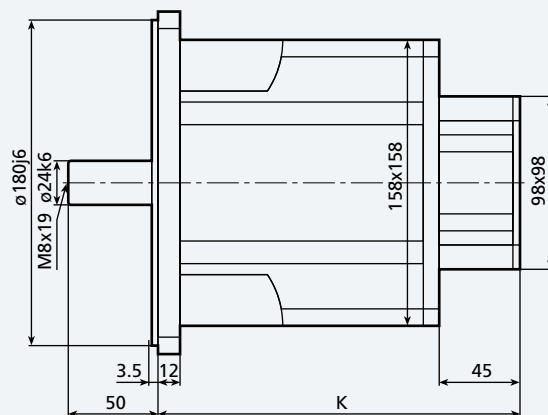


| Motor | Stall torque | Rated speed | Flange | Length K* | |
|-----------|--------------|-------------|--------|----------------------|------|
| | [Nm] | | | [min ⁻¹] | [mm] |
| BCR6-1350 | 13.5 | 3000 | 190 | 201 | 254 |
| BCR6-1900 | 19 | | | 235 | 288 |
| BCR6-2200 | 22 | | | 250 | 303 |
| BCR6-2900 | 29 | | | 310 | 363 |

(*) With reference to motors equipped with resolver.



| Motor | Max load on shaft (N) | |
|-----------|-----------------------|----------------------|
| | Radial F _R | Axial F _A |
| BCR6-1350 | 708 | 135 |
| BCR6-1900 | 743 | 141 |
| BCR6-2200 | 756 | 144 |
| BCR6-2900 | 794 | 151 |



BCR6 400V

Motor

BCR6-1350-30-400 BCR6-1900-30-400 BCR6-2200-30-400 BCR6-2900-30-400

| | | | | | |
|----------------------------------|----------------------------------|-------|-------|-------|-------|
| Stall torque | M_o [Nm] | 13.5 | 19 | 22 | 29 |
| Rated speed | n_n [min ⁻¹] | 3000 | 3000 | 3000 | 3000 |
| Inverter DC-bus | V_{dc} [V] | 560 | 560 | 560 | 560 |
| Rated AC motor voltage | V_n [V] | 330 | 330 | 330 | 330 |
| Motor poles number | p_{mot} | 6 | 6 | 6 | 6 |
| Resolver poles number | p_{res} | 2 | 2 | 2 | 2 |
| Rated torque | M_n [Nm] | 13.0 | 17.0 | 19.0 | 24.0 |
| Rated AC current | I_n [A] | 8.2 | 12.8 | 13.1 | 14.7 |
| Stall AC current | I_o [A] | 8.2 | 13.8 | 14.6 | 17.2 |
| Torque peak | M_{max} [Nm] | 41.0 | 57.0 | 66.0 | 87.0 |
| Current peak | I_{max} [A] | 35 | 59 | 62 | 73 |
| EMF constant | K_e [V/1000min ⁻¹] | 100.0 | 83.0 | 91.0 | 102.0 |
| Torque constant | K_T [Nm/A] | 1.65 | 1.37 | 1.51 | 1.69 |
| Rated power | P_n [W] | 4080 | 5340 | 5970 | 7540 |
| Phase to phase stator resistance | R_{pp} [Ω] | 1.10 | 0.42 | 0.41 | 0.31 |
| Phase to phase stator inductance | L_{pp} [mH] | 13.5 | 6.3 | 6.4 | 5.6 |
| Rotor inertia | J_m [kgcm ²] | 13.1 | 18.7 | 22.0 | 33.0 |
| Electrical time constant | τ_{el} [ms] | 12.3 | 15.0 | 15.6 | 18.1 |
| Thermal time constant | τ_{th} [min] | 45 | 53 | 60 | 70 |
| Mechanical time constant | τ_{mec} [ms] | 0.9 | 0.7 | 0.7 | 0.6 |
| Weight without brake | m_M [kg] | 13.9 | 18.2 | 20.3 | 26.7 |
| Weight with brake | m_{MF} [kg] | 16.76 | 21.06 | 23.16 | 29.56 |

All motor characteristics are referred to following conditions:

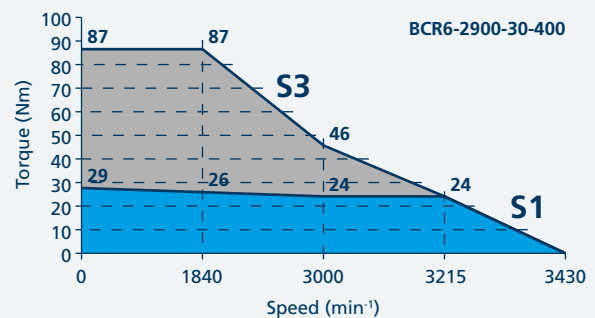
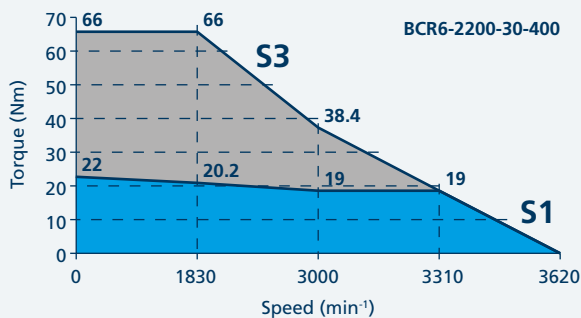
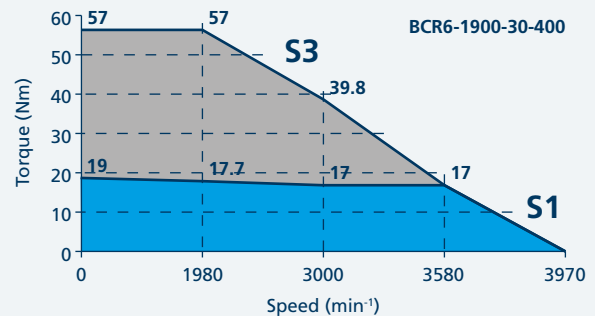
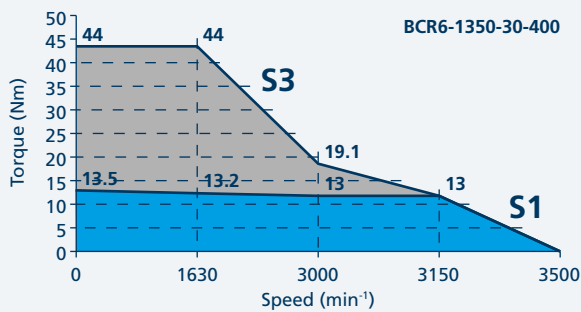
T_{amb} = 40 °C (ambient temperature)

ΔT = 105 °C (winding heating temperature)

S1 curve = for continuous duty

S3 curve = for intermittent duty

Torque-speed characteristic: ambient temperature 40°C



BCR6 230V

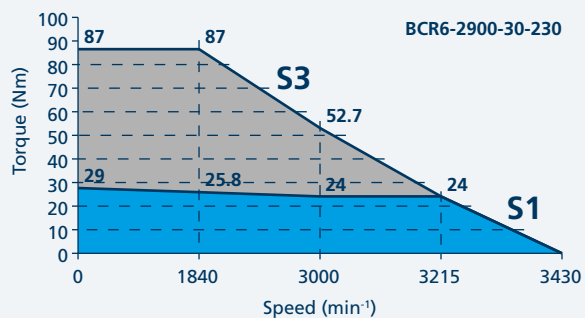
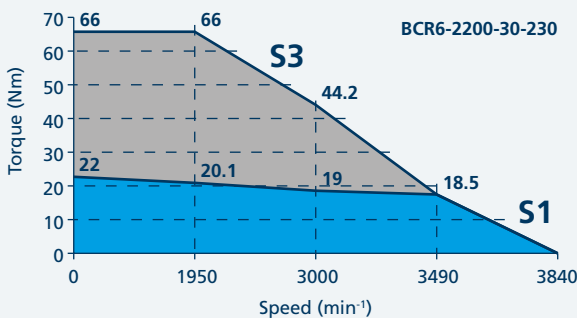
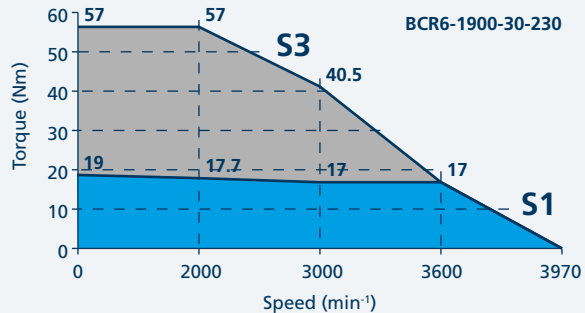
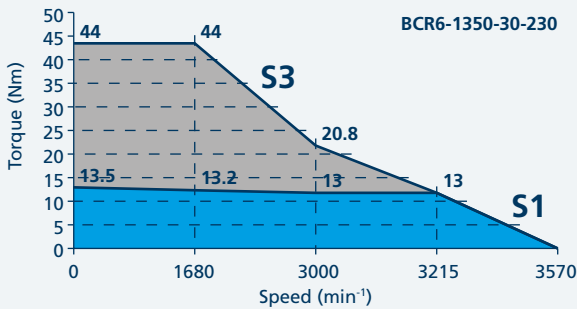
Motor **BCR6-1350-30-230** **BCR6-1900-30-230** **BCR6-2200-30-230** **BCR6-2900-30-230**

| | | | | | |
|----------------------------------|----------------------------------|-------|-------|-------|-------|
| Stall torque | M_o [Nm] | 13.5 | 19 | 22 | 29 |
| Rated speed | n_n [min ⁻¹] | 3000 | 3000 | 3000 | 3000 |
| Inverter DC-bus | V_{dc} [V] | 320 | 320 | 320 | 320 |
| Rated AC motor voltage | V_n [V] | 200 | 200 | 200 | 200 |
| Motor poles number | p_{mot} | 6 | 6 | 6 | 6 |
| Resolver poles number | p_{res} | 2 | 2 | 2 | 2 |
| Rated torque | M_n [Nm] | 13.0 | 17.0 | 19.0 | 24.0 |
| Rated AC current | I_n [A] | 14.6 | 21.3 | 22.9 | 26.8 |
| Stall AC current | I_o [A] | 14.6 | 23.0 | 25.6 | 31.3 |
| Torque peak | M_{max} [Nm] | 41.0 | 57.0 | 66.0 | 87.0 |
| Current peak | I_{max} [A] | 62 | 97 | 108 | 132 |
| EMF constant | K_E [V/1000min ⁻¹] | 56.0 | 50.0 | 52.0 | 56.0 |
| Torque constant | K_T [Nm/A] | 0.93 | 0.83 | 0.86 | 0.93 |
| Rated power | P_n [W] | 4080 | 5340 | 5970 | 7540 |
| Phase to phase stator resistance | R_{pp} [Ω] | 0.34 | 0.15 | 0.13 | 0.09 |
| Phase to phase stator inductance | L_{pp} [mH] | 4.2 | 2.3 | 2.1 | 1.7 |
| Rotor inertia | J_m [kgcm ²] | 13.1 | 18.7 | 22.0 | 33.0 |
| Electrical time constant | τ_{el} [ms] | 12.4 | 15.3 | 16.2 | 18.9 |
| Thermal time constant | τ_{th} [min] | 45 | 53 | 60 | 70 |
| Mechanical time constant | τ_{mec} [ms] | 0.9 | 0.7 | 0.7 | 0.6 |
| Weight without brake | m_M [kg] | 13.9 | 18.2 | 20.3 | 26.7 |
| Weight with brake | m_{MF} [kg] | 16.76 | 21.06 | 23.16 | 29.56 |

All motor characteristics are referred to following conditions:

- T_{amb} = 40 °C (ambient temperature)
- ΔT = 105 °C (winding heating temperature)
- S1 curve = for continuous duty
- S3 curve = for intermittent duty

Torque-speed characteristic: ambient temperature 40°C

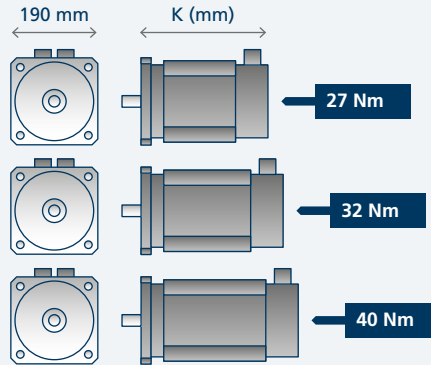


BCR7 - 27 ÷ 40 Nm

All BCR servomotors belonging to size 7 are equipped by the same geometrical flange, whereas the are differentiated by the length (K) correlated to torque capacity.

The basic motor configuration does not provide the electromechanical brake which is an option. When the brake is installed the motor length is increased.

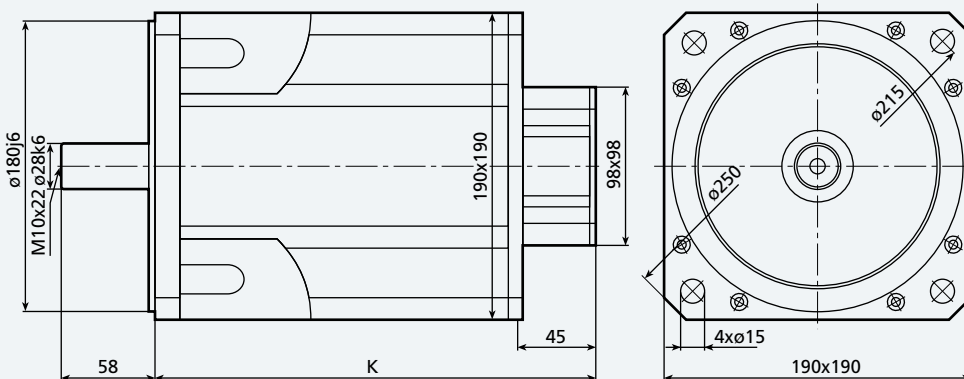
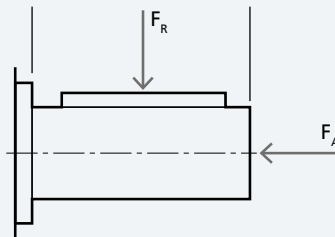
The motor size BCR7 is structured on three torque levels corresponding to different three motor lengths with nominal speed equal to 3000 min⁻¹. The motor is available with power supply both 3ph x 400VAC and 3ph x 230VAC, keeping the same mechanical performances. On standard motor both power and control connectors are installed for electrical connection to the inverter. On demand, several connectors orientation can be supplied.



| Motor | Stall torque | Rated speed | Flange | Length K * | |
|-----------|--------------|----------------------|--------|---------------|------------|
| | [Nm] | [min ⁻¹] | | Without brake | With brake |
| BCR7-2700 | 27 | 3000 | 190 | 242 | 296 |
| BCR7-3200 | 32 | | | 257 | 311 |
| BCR7-4000 | 40 | | | 287 | 341 |

(*) With reference to motors equipped with resolver.

| Motor | Max load on shaft (N) | |
|-----------|-----------------------|----------------------|
| | Radial F _R | Axial F _A |
| BCR7-2700 | 1348 | 256 |
| BCR7-3200 | 1370 | 260 |
| BCR7-4000 | 1406 | 267 |



BCR7 400V

| Motor | BCR7-2700-30-400 | BCR7-3200-30-400 | BCR7-4000-30-400 |
|-------|------------------|------------------|------------------|
|-------|------------------|------------------|------------------|

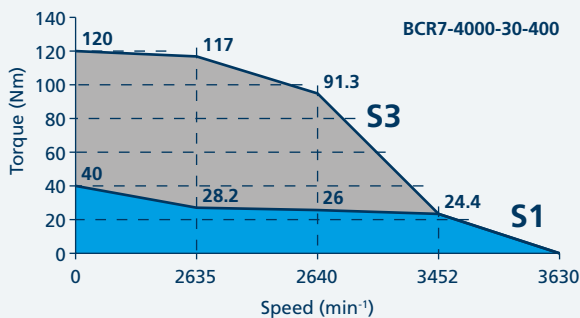
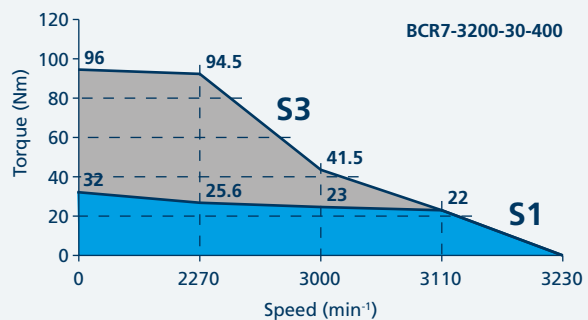
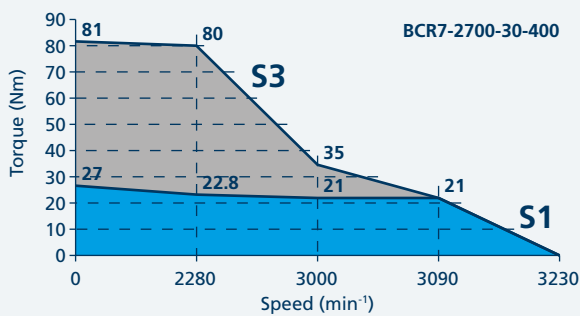
| | | | | |
|----------------------------------|----------------------------------|-------|-------|-------|
| Stall torque | M_o [Nm] | 27 | 32 | 40 |
| Rated speed | n_n [min ⁻¹] | 3000 | 3000 | 3000 |
| Inverter DC-bus | V_{dc} [V] | 560 | 560 | 560 |
| Rated AC motor voltage | V_n [V] | 330 | 330 | 330 |
| Motor poles number | p_{mot} | 6 | 6 | 6 |
| Resolver poles number | p_{res} | 2 | 2 | 2 |
| Rated torque | M_n [Nm] | 21.0 | 23.0 | 26.0 |
| Rated AC current | I_n [A] | 13.5 | 15.0 | 17.9 |
| Stall AC current | I_o [A] | 16.0 | 19.0 | 24.7 |
| Torque peak | M_{max} [Nm] | 81.0 | 96.0 | 120.0 |
| Current peak | I_{max} [A] | 62 | 74 | 96 |
| EMF constant | K_E [V/1000min ⁻¹] | 102 | 102 | 98 |
| Torque constant | K_T [Nm/A] | 1.69 | 1.69 | 1.62 |
| Rated power | P_n [W] | 6600 | 7160 | 8170 |
| Phase to phase stator resistance | R_{pp} [Ω] | 0.43 | 0.35 | 0.23 |
| Phase to phase stator inductance | L_{pp} [mH] | 4.4 | 3.8 | 2.7 |
| Rotor inertia | J_m [kgcm ²] | 36.1 | 39.0 | 45.5 |
| Electrical time constant | τ_{el} [ms] | 10.2 | 10.8 | 11.7 |
| Thermal time constant | τ_{th} [min] | 60 | 67 | 72 |
| Mechanical time constant | τ_{mec} [ms] | 0.9 | 0.8 | 0.7 |
| Weight without brake | m_M [kg] | 23.5 | 26.0 | 31.5 |
| Weight with brake | m_{MF} [kg] | 26.75 | 29.25 | 34.4 |

All motor characteristics are referred to following conditions:

T_{amb} = 40 °C (ambient temperature)
 ΔT = 105 °C (winding heating temperature)

S1 curve = for continuous duty
 S3 curve = for intermittent duty

Torque-speed characteristic: ambient temperature 40°C



BCR7 230V

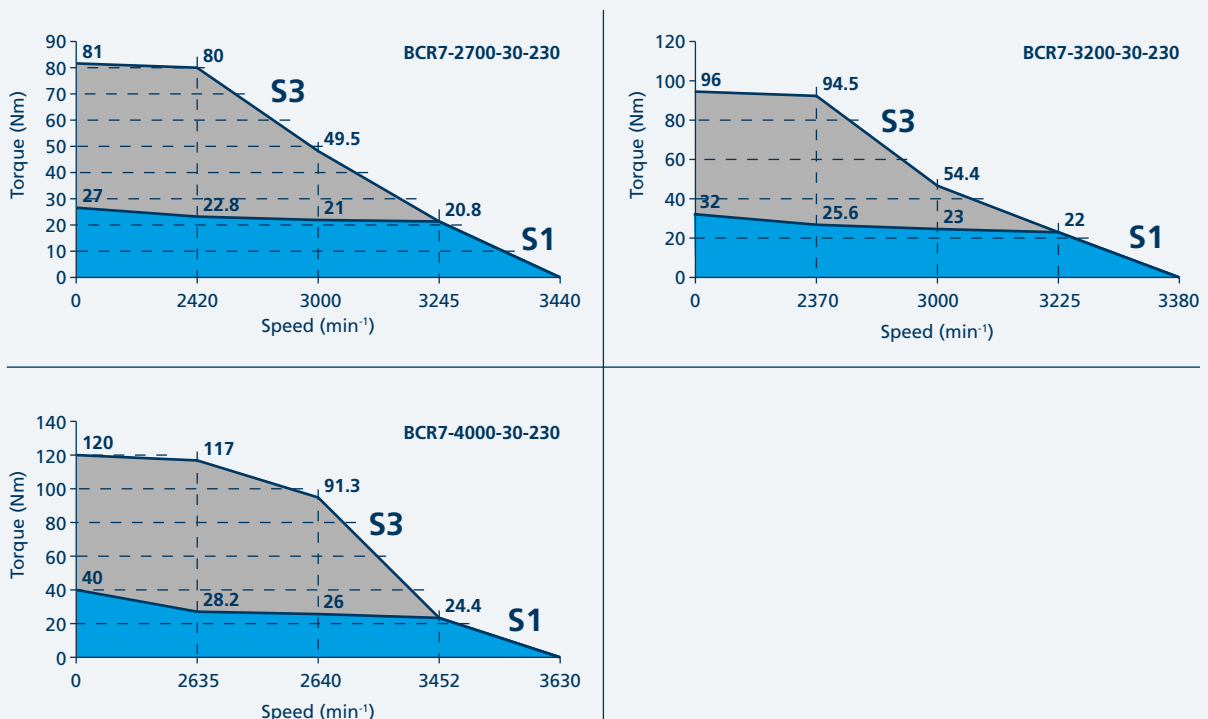
| Motor | BCR7-2700-30-230 | BCR7-3200-30-230 | BCR7-4000-30-230 |
|-------|------------------|------------------|------------------|
|-------|------------------|------------------|------------------|

| Parameter | Symbol | BCR7-2700-30-230 | BCR7-3200-30-230 | BCR7-4000-30-230 |
|----------------------------------|----------------------------------|------------------|------------------|------------------|
| Stall torque | M_o [Nm] | 27 | 32 | 40 |
| Rated speed | n_n [min ⁻¹] | 3000 | 3000 | 3000 |
| Inverter DC-bus | V_{dc} [V] | 320 | 320 | 320 |
| Rated AC motor voltage | V_n [V] | 200 | 200 | 200 |
| Motor poles number | p_{mot} | 6 | 6 | 6 |
| Resolver poles number | p_{res} | 2 | 2 | 2 |
| Rated torque | M_n [Nm] | 21.0 | 23.0 | 26.0 |
| Rated AC current | I_n [A] | 23.7 | 25.9 | 31.8 |
| Stall AC current | I_o [A] | 28.2 | 32.8 | 44.0 |
| Torque peak | M_{max} [Nm] | 81.0 | 96.0 | 120.0 |
| Current peak | I_{max} [A] | 110 | 128 | 172 |
| EMF constant | K_e [V/1000min ⁻¹] | 58 | 59 | 55 |
| Torque constant | K_T [Nm/A] | 0.96 | 0.98 | 0.91 |
| Rated power | P_n [W] | 6600 | 7160 | 8170 |
| Phase to phase stator resistance | R_{pp} [Ω] | 0.15 | 0.12 | 0.07 |
| Phase to phase stator inductance | L_{pp} [mH] | 2.2 | 3.0 | 0.8 |
| Rotor inertia | J_m [kgcm ²] | 36.1 | 39.0 | 45.5 |
| Electrical time constant | τ_{el} [ms] | 14.7 | 10.8 | 11.4 |
| Thermal time constant | τ_{th} [min] | 60 | 67 | 72 |
| Mechanical time constant | τ_{mec} [ms] | 1.0 | 0.9 | 0.7 |
| Weight without brake | m_M [kg] | 23.5 | 26.0 | 31.5 |
| Weight with brake | m_{MF} [kg] | 26.75 | 29.25 | 34.4 |

All motor characteristics are referred to following conditions:

- T_{amb} = 40 °C (ambient temperature)
- ΔT = 105 °C (winding heating temperature)
- S1 curve = for continuous duty
- S3 curve = for intermittent duty

Torque-speed characteristic: ambient temperature 40°C

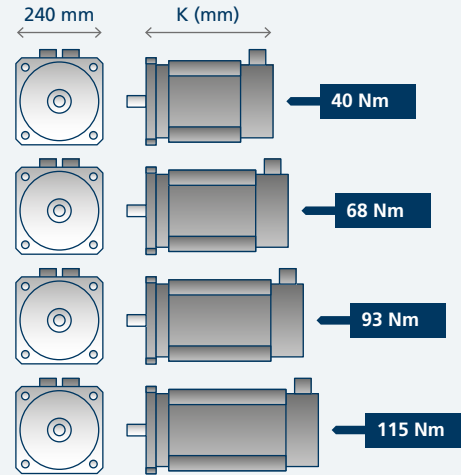


BCR8 - 40 ÷ 115 Nm

All BCR servomotors belonging to size 8 are equipped by the same geometrical flange, whereas they are differentiated by the length (K) correlated to torque capacity.

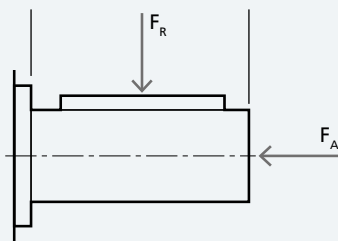
The basic motor configuration does not provide the electromechanical brake which is an option. When the brake is installed the motor length is increased.

The motor size BCR8 is structured on four torque levels corresponding to different four motor lengths with nominal speed equal to 2000/3000 min⁻¹. The motor is available with power supply both 3ph x 400VAC and 3ph x 230VAC, keeping the same mechanical performances. On standard motor both power and control connectors are installed for electrical connection to the inverter. On demand, several connectors orientation can be supplied.

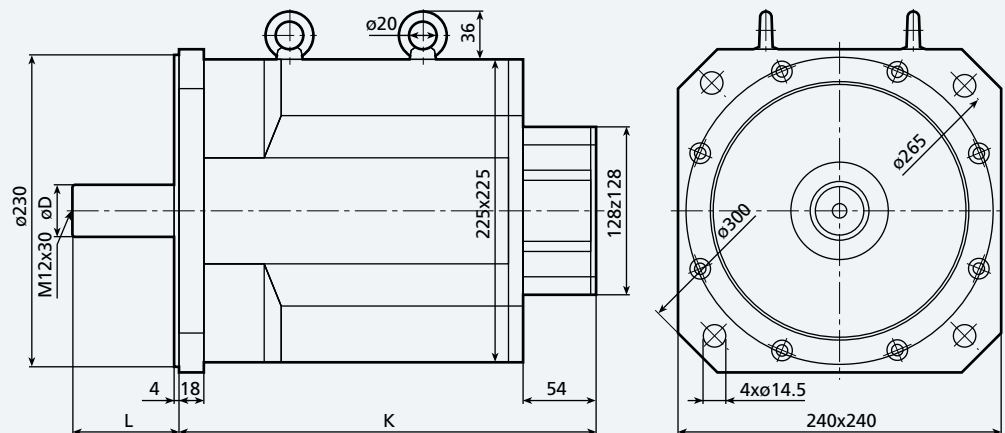


| Motor | Stall torque | Rated speed | Shaft | | Flange | Length K* | |
|-----------|--------------|----------------------|------------|----------|--------|---------------|------------|
| | [Nm] | [min ⁻¹] | Diameter ø | Length L | [mm] | Without brake | With brake |
| BCR8-0400 | 40 | 3000 | 38 | 80 | 240 | 311 | 379 |
| BCR8-0680 | 68 | 2000 | 38 | 80 | | 379 | 447 |
| BCR8-0930 | 93 | 2000 | 42 | 110 | | 447 | 515 |
| BCR8-1150 | 115 | 2000 | 42 | 110 | | 515 | 583 |

(*) With reference to motors equipped with resolver.



| Motor | Max load on shaft (N) | |
|-----------|-----------------------|----------------------|
| | Radial F _R | Axial F _A |
| BCR8-0400 | 1702 | 323 |
| BCR8-0680 | 1785 | 339 |
| BCR8-0930 | 1775 | 337 |
| BCR8-1150 | 1823 | 346 |



BCR8 400V

Motor

BCR8-0400-30-400 BCR8-0680-20-400 BCR8-0930-20-400 BCR8-1150-20-400

| | | | | | |
|----------------------------------|----------------------------------|------|-------|-------|-------|
| Stall torque | M_o [Nm] | 40 | 68 | 93 | 115 |
| Rated speed | n_n [min ⁻¹] | 3000 | 2000 | 2000 | 2000 |
| Inverter DC-bus | V_{dc} [V] | 560 | 560 | 560 | 560 |
| Rated AC motor voltage | V_n [V] | 350 | 350 | 350 | 350 |
| Motor poles number | p_{mot} | 6 | 6 | 6 | 6 |
| Resolver poles number | p_{res} | 2 | 2 | 2 | 2 |
| Rated torque | M_n [Nm] | 30.0 | 56.0 | 70.0 | 85.0 |
| Rated AC current | I_n [A] | 17.8 | 22.0 | 25.3 | 32.4 |
| Stall AC current | I_o [A] | 21.8 | 25.4 | 33.1 | 42.1 |
| Torque peak | M_{max} [Nm] | 120 | 204 | 279 | 345 |
| Current peak | I_{max} [A] | 85 | 99 | 129 | 164 |
| EMF constant | K_e [V/1000min ⁻¹] | 111 | 162 | 170 | 165 |
| Torque constant | K_T [Nm/A] | 1.84 | 2.7 | 2.8 | 2.7 |
| Rated power | P_n [W] | 9420 | 11730 | 14660 | 17800 |
| Phase to phase stator resistance | R_{pp} [Ω] | 0.25 | 0.24 | 0.15 | 0.11 |
| Phase to phase stator inductance | L_{pp} [mH] | 5.7 | 6.3 | 4.8 | 3.4 |
| Rotor inertia | J_m [kgcm ²] | 76 | 114 | 153 | 190 |
| Electrical time constant | τ_{el} [ms] | 23 | 26 | 32 | 31 |
| Thermal time constant | τ_{th} [min] | 47 | 65 | 79 | 90 |
| Mechanical time constant | τ_{mec} [ms] | 1.0 | 0.7 | 0.5 | 0.5 |
| Weight without brake | m_M [kg] | 41 | 56 | 73 | 89 |
| Weight with brake | m_{MF} [kg] | 50.5 | 65.5 | 92.5 | 98.5 |

All motor characteristics are referred to following conditions:

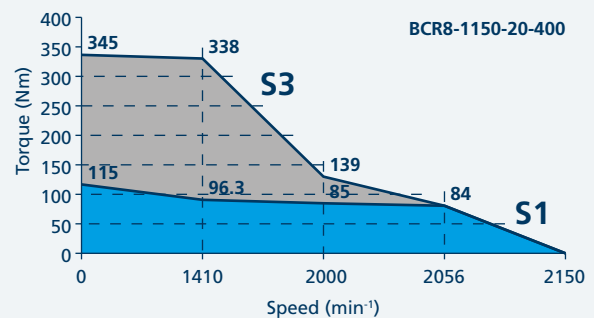
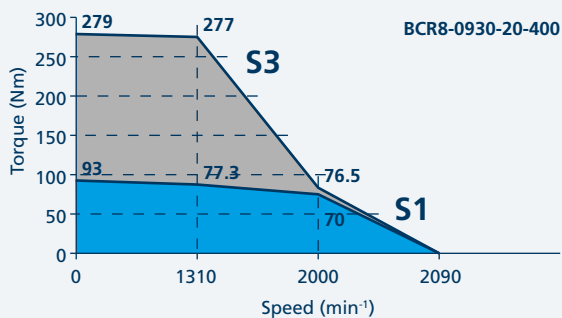
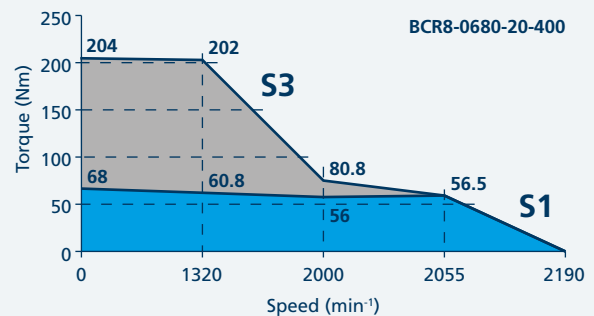
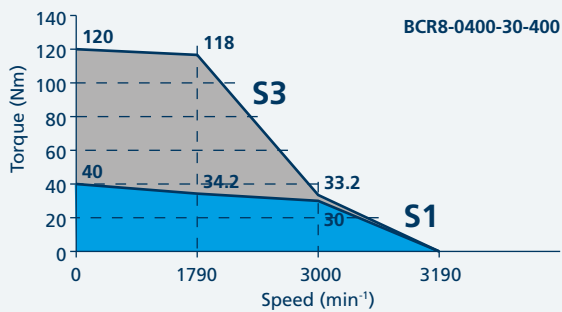
T_{amb} = 40 °C (ambient temperature)

ΔT = 105 °C (winding heating temperature)

S1 curve = for continuous duty

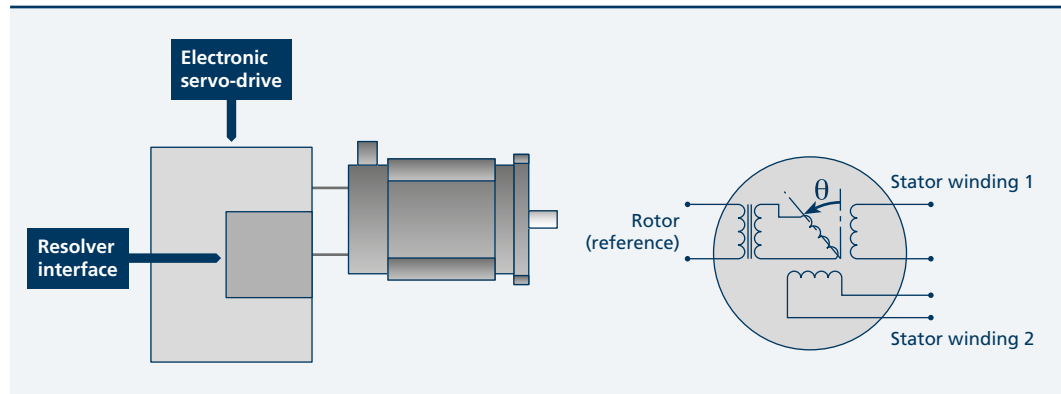
S3 curve = for intermittent duty

Torque-speed characteristic: ambient temperature 40°C

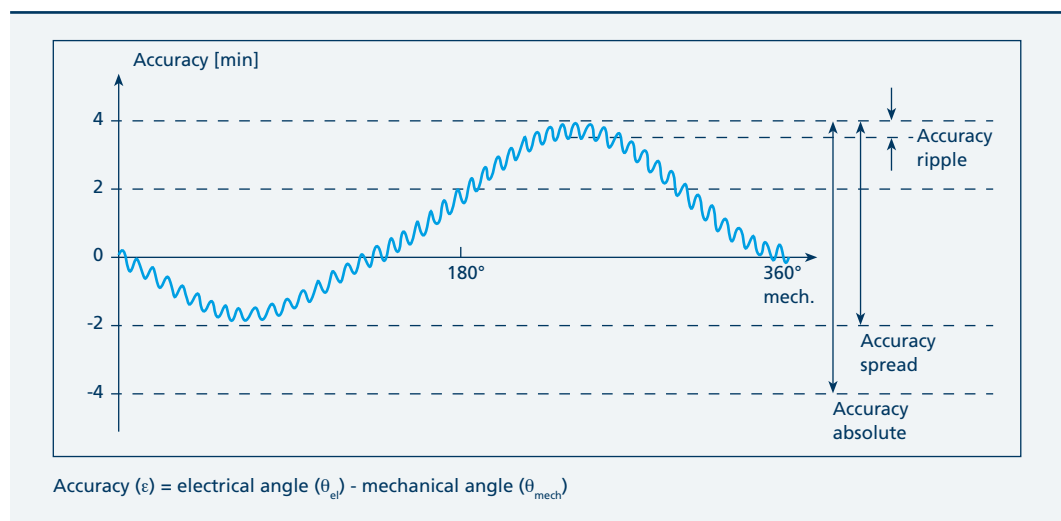


Feedback resolver

All servomotors in the Bonfiglioli BCR and BTB Series use a two - pole feedback resolver as standard to achieve a level of accuracy of 1' of ripple at the motor shaft.



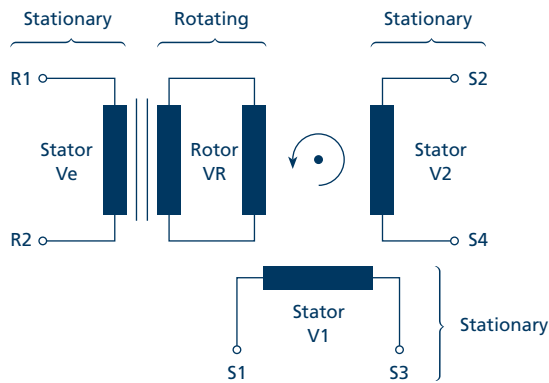
Use of this type of transducer guarantees an absolute accuracy of $\pm 4'$ at the motor shaft as well as a maximum ripple of 1'.



Frequency inverters from the Bonfiglioli Vectron ACTIVE series use a sophisticated electronic interface to acquire drive signals. Use of BCR and BTB servomotors with these frequency inverters dramatically reduces the effects of harmonic distortion on the sinusoidal signals and significantly improves both absolute and ripple accuracy.

On request, BCR and BTB servomotors can be fitted with absolute and sin/cos encoders. Contact the Bonfiglioli Drives Service Centre for further information.

Resolver data sheet



| Item | Value |
|-------------------------------|--|
| Poles number | 2 |
| Transformation ratio | 0.5±0.05 |
| Input voltage | 7 V _{rms} |
| Input current | 58 mA |
| Input frequency | 5 kHz |
| Phase shift | 8° |
| Null voltage | 30 mV max |
| Impedance Z _{ro} (Ω) | 75 j 98 |
| Impedance Z _{rs} (Ω) | 70 j 85 |
| Impedance Z _{so} (Ω) | 180 j 230 |
| Impedance Z _{ss} (Ω) | 170 j 200 |
| DC resistance (±10%) Rotor | 40 Ω |
| DC resistance (±10%) Stator | 102 Ω |
| Accuracy | ±10' |
| Accuracy ripple | 1' max |
| Operatine temperature | -55°C...+155°C |
| Max Speed | 20,000 min ⁻¹ |
| Shock (11ms) | £ 100 m/s ² |
| Vibration (10 to 500 Hz) | £ 500 m/s ² |
| Weight Rotor | 25 g |
| Weight Stator | 60 g |
| Rotor Inertia | 0.02 x 10 ⁻⁴ kgm ² |
| Insulation Housing/Winding | 500 V min. |
| Insulation Winding/Winding | 250 V min. |
| Rotor technology | Completely impregnated |
| Stator technology | Completely impregnated |
| Stator length | 16.1 mm |

Encoder feedback

Bonfiglioli BTD/BCR servomotors feature as well encoders and absolute encoder feedbacks. Following encoder can be selected.

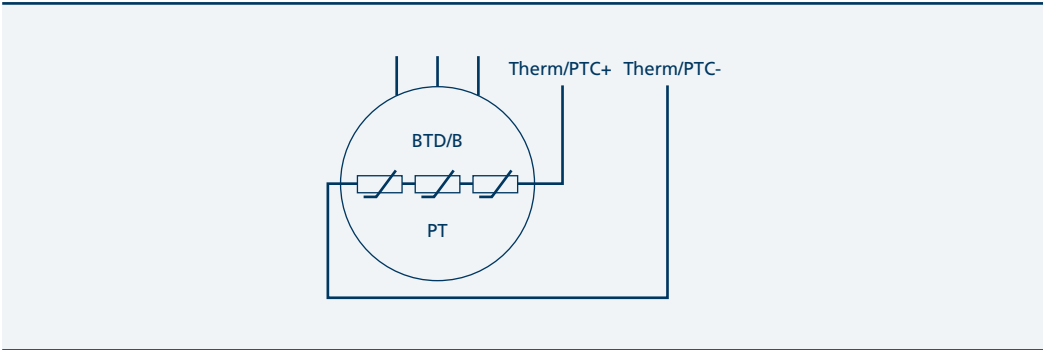
| Bonfiglioli designation | Manufacturer | Manufacturer designation | Amplitudes | System |
|-------------------------|---------------|--------------------------|------------|--------------------|
| S1 | Heidenhain | ERN 1387 | 2048 | SinCos |
| S2 | Heidenhain | ERN 1185 | 512 | SinCos |
| S3 | Heidenhain | ERN 1185 | 2048 | SinCos |
| D1 | Heidenhain | ECI 1319 | 32 | SinCos + EnDat 2.1 |
| D2 | Heidenhain | EQI 1331 | 32 | SinCos + EnDat 2.1 |
| D3 | Heidenhain | ECN 1113 | 512 | SinCos + EnDat 2.1 |
| D4 | Heidenhain | EQN 1125 | 512 | SinCos + EnDat 2.1 |
| H1 | Sick-Stegmann | SRS 50 | 1024 | SinCos + Hiperface |
| H2 | Sick-Stegmann | SRM 50 | 1024 | SinCos + Hiperface |
| H3 | Sick-Stegmann | SKS 36 | 128 | SinCos + Hiperface |
| H4 | Sick-Stegmann | SKM 36 | 128 | SinCos + Hiperface |
| H5 | Sick-Stegmann | SEL 37 | 16 | SinCos + Hiperface |
| H6 | Sick-Stegmann | SEK 37 | 16 | SinCos + Hiperface |
| H7 | Sick-Stegmann | SEL 52 | 16 | SinCos + Hiperface |
| H8 | Sick-Stegmann | SEK 52 | 16 | SinCos + Hiperface |

Other feedbacks as available on request.

PTC thermal protection

All motors in the BCR and BTD Series are equipped with an integrated PTC temperature sensor to protect the windings against overtemperatures exceeding the capacity of the motor's class F insulation.

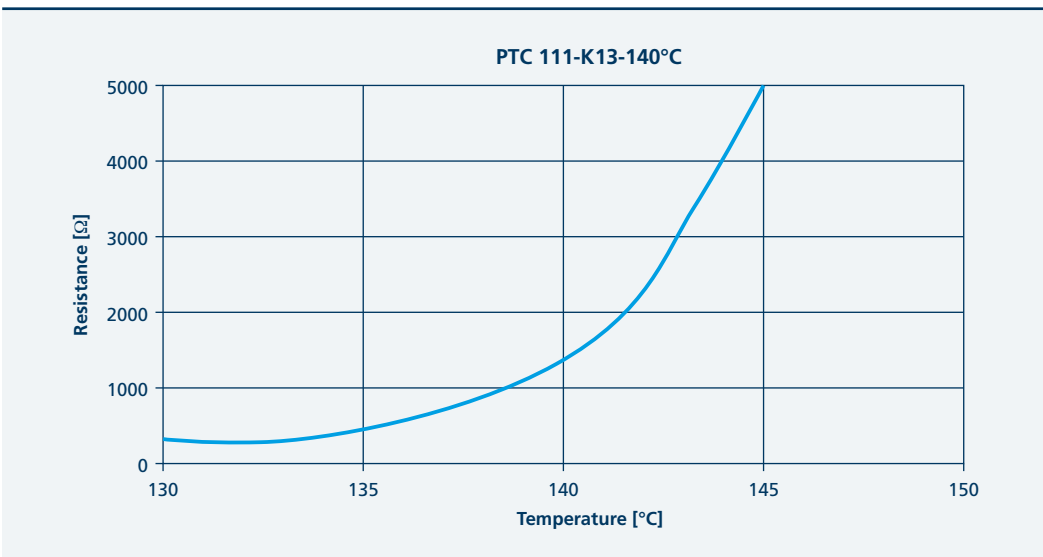
These sensors are not options but standard equipment on all Bonfiglioli servomotors, in conformity to DIN standard 44081.



The PTC sensor integrated in the BCR and BTD servomotors uses double insulation technology to ensure conformity to EN61800-5-1 safety standards when the motors are connected to a frequency inverter.

The PTC temperature sensor consists of a special ceramic resistor whose Ohmic value varies with the temperature of the electrical winding with which

it is held on close contact. Each temperature value generates a known resistance, so that provided the resistor is fed at a constant voltage, the output current can be used to determine the corresponding temperature. If temperature reaches an established limit, the circuit monitoring the signal trips the necessary cutout to disconnect power to the motor and prevent damage.



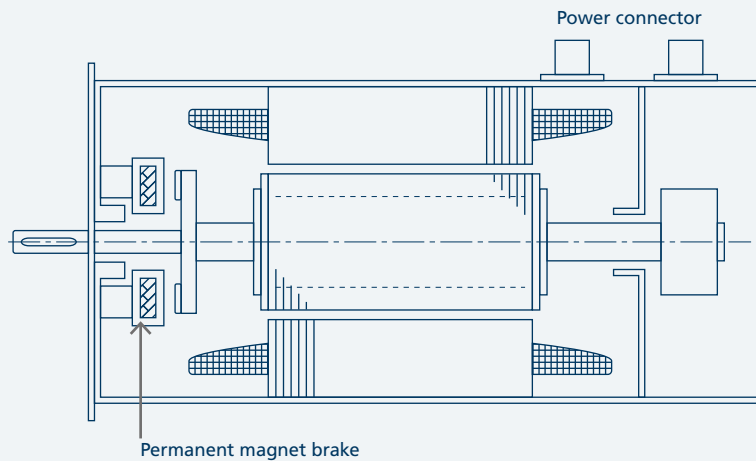
The output signal from the PTC sensor passes through the motor 12 - pin signal connector, on pins 2 (PTC+) and 6 (PTC-), together with the resolver signals.

Electromechanical holding brake (option)

BTD and BCR are used as four-quadrant actuators then they are designed to offer positive torque when they are running as motors, as well negative torque when they are running as generator. Therefore both are able to brake dynamically and statically (standstill torque) the mechanical load in every work-point consistent with corresponding motor curve. Anyway when an enduring downtime is required to the motor, an optional parking brake is available in order to save energy.

The brake option can be ordered by using the value 'FD24' into corresponding position of the servomotor designation (see page 8 and 9 of this catalogue). When the motor is delivered without brake, the brake fitting is not possible.

The brake coil power supply must be 24V DC-voltage. The brake option is responsible of an increment of the motor length (see K dimension in each motor drawing) When the brake is installed, its wires are linked to power connector together motor winding.



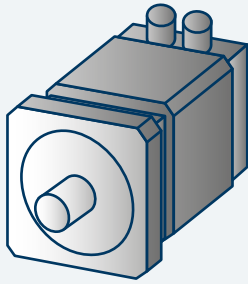
For each motor size, a suitable electromechanical brake is fitted with different braking torque in function of motor features.

| Brake data | Unit | BT2 | BT3 | BT4 | BT5 | BCR2 | BCR3 | BCR4 | BCR5 | BCR6 | BCR7 | BCR8 |
|-------------------|-------------------|-----------------|-------|-------|-------|-------|------|-------|-------|-------|-------|-------|
| Torque | Nm | 2 | 4.5 | 9 | 18 | 2.0 | 4.5 | 9.0 | 18.0 | 36.0 | 36.0 | 145.0 |
| Power supply | VDC | 24 (+ 6% - 10%) | | | | | | | | | | |
| Nominal power | W | 11 | 12 | 18 | 24 | 11 | 12 | 18 | 24 | 26 | 26 | 50 |
| Moment of inertia | Kgcm ² | 0.068 | 0.18 | 0.54 | 1.66 | 0.068 | 0.18 | 0.54 | 1.66 | 5.56 | 5.56 | 53.0 |
| Weight | Kg | 0.440 | 0.590 | 0.820 | 1.080 | 0.15 | 0.47 | 0.650 | 1.350 | 2.860 | 3.250 | 9.500 |

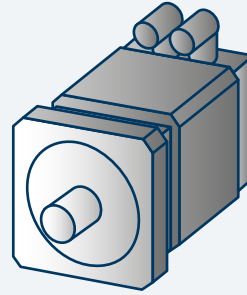
Electrical connectors

Even in their basic configurations, BTD and BCR Series servomotors come complete with all the necessary power and signal connectors. These are located at the top rear of the motor where they are easily accessible to cables. Connectors come with vertically oriented pins as

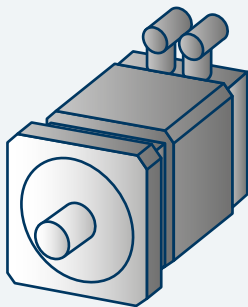
default, but are also available with horizontal pins either facing the flange (types PA and CA) or facing in the opposite direction (types PB and CB). Connectors can also be horizontally oriented but able to rotate about an axis perpendicular to the surface of the motor casing (types PT and CT).



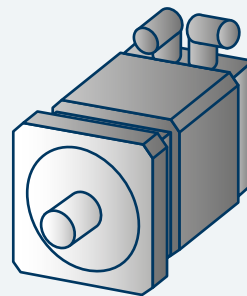
Vertical orientation (default)



Orientation facing flange
PAxx and CAxx



Orientation opposite to flange
PBxx and CBxx



Variable orientation (rotating)
PTxx and CTxx

All motor connectors are male and fully compatible with the corresponding female connectors on the accessory cables.

Power connectors

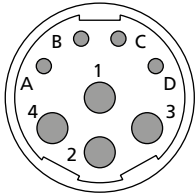
The connectors are integral part of servomotors BTD and BCR. Although the side picture is referred to vertical case, the functional layout of electrical contacts internally housed does not depend on orientation of connector.

Power connector (motor + brake)

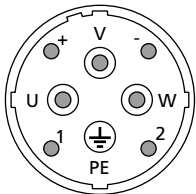
The power connectors include the pins for motor supply but also the ones for brake supply even if the brake is not installed.

That allows to unify the visual representation of functions relevant to each contact assembled into connector housing.

Power connector (male) - BTD2-BTD5 / BCR2-BCR7

| Intercontec type B, dim. 1, 4+4 poles | PIN | Description |
|--|-----|---------------|
|  | 1 | Phase U |
| | 4 | Phase V |
| | 3 | Phase W |
| | 2 | Earth / SL |
| | C | Brake + |
| | D | Brake - |
| | A | nc / reserved |
| | B | nc / reserved |

Power connector (male) - BCR8

| Intercontec type B, dim. 1.5, 4+4 poles | PIN | Description |
|---|-----|---------------|
|  | U | Phase U |
| | V | Phase V |
| | W | Phase W |
| | PE | Earth / SL |
| | + | Brake + |
| | - | Brake - |
| | 1 | nc / reserved |
| | 2 | nc / reserved |

Signal connectors

Signal connector (feedback + PTC)

The signal connectors are in charge of electrical link among resolver or encoder housed into servomotor and inverter assigned to reception of him.

In the same connector are also included the PTC terminals coming from motor winding where they are always installed for motor thermal protection. The pins layout is independent on motor series and motor size.

Resolver connector + PTC (male)

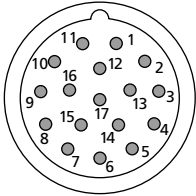
| Intercontec type A, 12 poles | PIN | Description |
|------------------------------|-----|---------------|
| | 3 | Cos + (S4) |
| | 7 | Cos - (S2) |
| | 4 | Sin + (S1) |
| | 8 | Sin - (S3) |
| | 5 | Ref + (R2) |
| | 9 | Ref - (R1) |
| | 2 | Therm / PTC + |
| | 6 | Therm / PTC - |

SinCos connector (male)

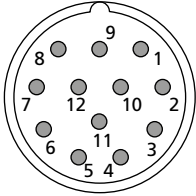
| Intercontec type B, dim. 1.5, 4+4 poles | PIN | Description |
|---|-----|--------------------|
| | 8 | TM _{PTC+} |
| | 9 | TM _{PTC-} |
| | 1 | Sin+ |
| | 2 | Sin- |
| | 11 | Cos+ |
| | 12 | Cos- |
| | 5 | C+ |
| | 6 | C- |
| | 14 | D+ |
| | 4 | D- |
| | 3 | R+ |
| | 13 | R- |
| | 10 | V _{ENCS} |
| | 16 | V _{ENC} |
| | 7 | OVL Sensor |
| 15 | OVL | |

Signal connectors

EnDat 2.1 connector (male)

| Intercontec type B, dim. 1.5, 4+4 poles | PIN | Description |
|---|-----|--------------------|
|  | 8 | TM _{PTC+} |
| | 9 | TM _{PTC-} |
| | 1 | A+ |
| | 2 | A- |
| | 11 | B+ |
| | 12 | B- |
| | 5 | Data+ |
| | 6 | Data- |
| | 14 | Clock+ |
| | 4 | Clock- |
| | 3 | n.c. |
| | 13 | n.c. |
| | 10 | V _{ENCS} |
| | 16 | V _{ENC} |
| | 7 | OVL Sensor |
| | 15 | OVL |

Hiperface connector (male)

| Intercontec type B, dim. 1.5, 4+4 poles | PIN | Description |
|---|-----|--------------------|
|  | 11 | TM _{PTC+} |
| | 12 | TM _{PTC-} |
| | 3 | A+ |
| | 4 | A- |
| | 5 | B+ |
| | 6 | B- |
| | 8 | Data+ |
| | 7 | Data- |
| | 10 | V _{ENC} |
| | 9 | GND |

Servocables

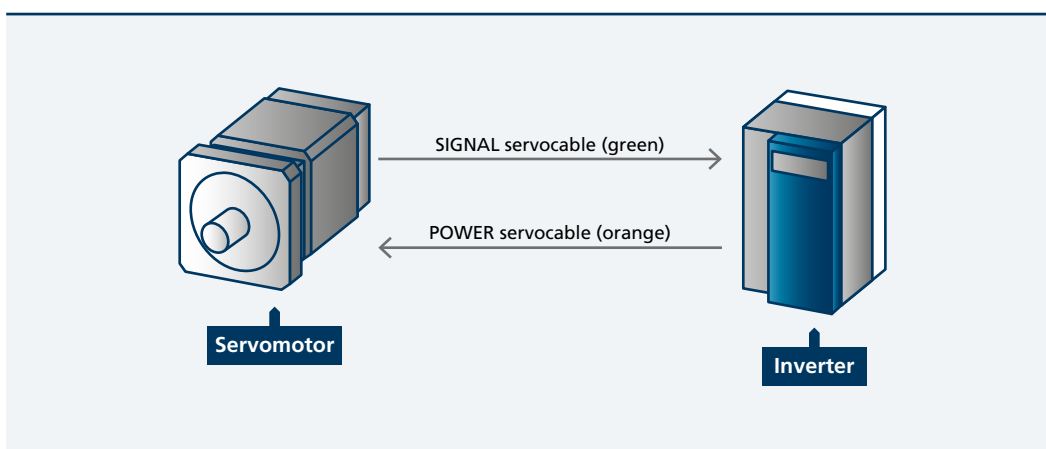
The word servocable is referred to electrical cable connecting Bonfiglioli servomotor to respective inverter.

For both BCR and BTD servomotors a servocables selection is available for power supply and sensor feed-back, justifying the distinction between power cables and signal cables.

The power cable besides providing energy to motor, also supports the brake feed-in when it is present on board as option.

The signal cables instead are in charge of transmission of electrical signals generated by feed-back equipment installed on motor. The same cable is also oriented to convey the PTC signals always installed inside the motor.

All servocables are available in three different and fixed lengths (3 meters, 5 m, 10 m) offering to user an exhaustive proposal to numerous needs of configuration.



Signal servocables (green)

Signal cables are recognized by the green colour according to Desina standard. The conductors number, their cross-section and their terminal type depend on transducer typology supported by the cable. Currently the cable is in charge of resolver connection.

Both cable ends are executed with two different terminations:

- on motor side the cable is equipped with metal circular connector in which twelve female contact are

assembled in order to favour an easy and sure plug-in with respective male connector present on motor;

- on inverter side, instead, the cable terminates with DB9 male standard connector for easy and sure plug-in with corresponding DB9 female present on EMRES-03 interface of inverter Active Cube Bonfiglioli. The cable is also available in a second version implemented with ferrules for connection to screw terminals on the inverter.



Inverter side

Motor side

The ordering codes of the signal cables are described in the following table:

| Feedback device | Cable type | | | Notes | |
|-----------------------|------------|-----------|-----------|-----------------------------------|---------------------------|
| | 3 meters | 5 meters | 10 meters | Motor side termination | Inverter side termination |
| Resolver | 8RTC0325 | 8RTC0525 | 8RTC1025 | Circular connector 12 pins female | SUB-D9 |
| Resolver | 8RTC0325L | 8RTC0525L | 8RTC1025L | Circular connector 12 pins female | 8 flying leads |
| Absolute SinCos/EnDat | 17ETC0301 | 17ETC0501 | 17ETC1001 | Circular connector 17 pins female | SUB-D15 |
| Absolute Hiperface | 12HTC0301 | 12HTC0501 | 12HTC1001 | Circular connector 12 pins female | SUB-D15 |

The signal cables fulfil the following technical requirement

| | |
|--------------------|--|
| Compliance | DESINA (ISO 23570), UL/CSA, ROHS |
| Shielding | Tinned copper netting with > 85 % covering |
| External insulator | PUR green color |
| Conductors | Copper strand tinned |
| Bend radius | 10 x outer diameter N° max bending cycles = 10 millions |
| Acceleration | Max. 4 m/s ² |
| Temperature | Stocking -30°C +80°C / Running 0°C +60°C |

Power servocables (orange)

Both cable ends of the power cable are executed with two different termination typology:

- on motor side the cable is equipped with metal circular connector in which eight female contacts are assembled in order to favour an easy and sure plug-in
- with respective male connector present on the motor;
- on inverter side, instead, the cable terminates with flying leads covered by ferrules for plug-in into screw terminal of the inverter



Inverter side

Motor side

All described power cables fulfil the following technical features

| | |
|---------------------------|--|
| Compliance | DESINA (ISO 23570), UL/CSA, ROHS |
| Shielding | Tinned copper netting with > 85 % covering |
| External insulator | PUR orange color |
| Conductors | Copper strand tinned consistent with DIN VDE 95 KI.6 |
| Bend radius | Not moved = 7 x outer diameter Moved = 12 x outer diameter N° max bending cycles = 10 millions |
| Acceleration | Max. 4 m/s ² |
| Temperature | Stocking -30°C +80°C / Running 0°C +60°C |

Power servocables (orange)

In order to face different current level absorbed by different motor sizes, the power cables are executed with four conductors cross sections (1.5 mm², 2.5 mm², 4.0 mm², 10.0 mm²) alternative among them. For user

helping during servomotor-cable match selection, the following tables are proposed where side to each motor the optimized cable is suggested.

The cable ordering code is structured in the following mode:

42MBCxxyy

where the field xxyy changes in function of cable length and conductors cross section (see side table)

| Servomotor BTD | Power cable types | | |
|-------------------|-------------------|-----------|-----------|
| | 3 meters | 5 meters | 10 meters |
| BTD 2 0026 45 400 | 42MBC0315 | 42MBC0515 | 42MBC1015 |
| BTD 2 0053 45 400 | | | |
| BTD 2 0074 45 400 | | | |
| BTD 2 0095 45 400 | | | |
| BTD 2 0026 45 230 | | | |
| BTD 2 0053 45 230 | | | |
| BTD 2 0074 45 230 | | | |
| BTD 2 0095 45 230 | | | |
| BTD 3 0095 30 400 | | | |
| BTD 3 0190 30 400 | | | |
| BTD 3 0325 30 400 | | | |
| BTD 3 0420 30 400 | | | |
| BTD 3 0095 30 230 | | | |
| BTD 3 0190 30 230 | | | |
| BTD 3 0325 30 230 | | | |
| BTD 3 0420 30 230 | | | |
| BTD 4 0410 30 400 | | | |
| BTD 4 0630 30 400 | | | |
| BTD 4 0860 30 400 | | | |
| BTD 4 0410 30 230 | | | |
| BTD 4 0630 30 230 | | | |
| BTD 4 0860 30 230 | | | |
| BTD 5 1160 30 400 | 42MBC0325 | 42MBC0525 | 42MBC1025 |
| BTD 5 1490 30 400 | | | |
| BTD 5 1870 30 400 | | | |
| BTD 5 2730 30 400 | | | |
| BTD 5 1160 30 230 | 42MBC0340 | 42MBC0540 | 42MBC1040 |
| BTD 5 1490 30 230 | | | |
| BTD 5 1870 30 230 | | | |
| BTD 5 2730 30 230 | | | |

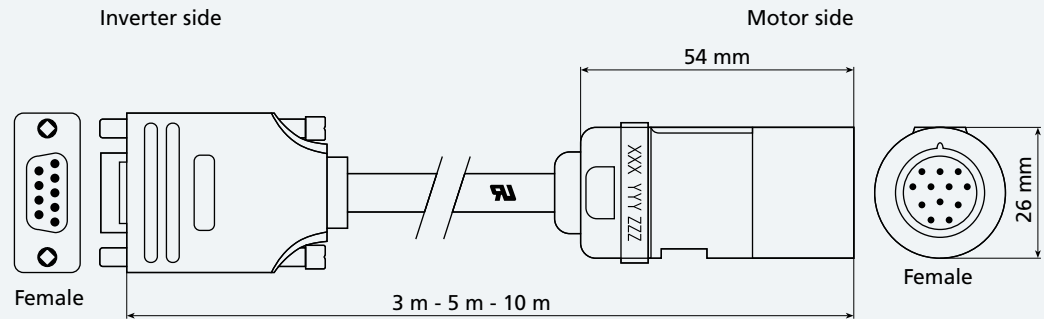
Power servocables (orange)

| Servomotor BCR | Power cable types | | |
|-------------------|-------------------|-----------|-----------|
| | 3 meters | 5 meters | 10 meters |
| BCR 2 0020 45 400 | 42MBC0315 | 42MBC0515 | 42MBC1015 |
| BCR 2 0040 45 400 | | | |
| BCR 2 0060 45 400 | | | |
| BCR 2 0080 45 400 | | | |
| BCR 2 0020 45 230 | | | |
| BCR 2 0040 45 230 | | | |
| BCR 2 0060 45 230 | | | |
| BCR 2 0080 45 230 | | | |
| BCR 3 0065 45 400 | | | |
| BCR 3 0130 45 400 | | | |
| BCR 3 0250 45 400 | | | |
| BCR 3 0300 45 400 | | | |
| BCR 3 0065 45 230 | | | |
| BCR 3 0130 45 230 | | | |
| BCR 3 0250 45 230 | | | |
| BCR 3 0300 45 230 | | | |
| BCR 4 0100 30 400 | | | |
| BCR 4 0260 30 400 | | | |
| BCR 4 0530 30 400 | | | |
| BCR 4 0750 30 400 | | | |
| BCR 4 0100 30 230 | | | |
| BCR 4 0260 30 230 | | | |
| BCR 4 0530 30 230 | | | |
| BCR 4 0750 30 230 | | | |
| BCR 5 0660 30 400 | | | |
| BCR 5 1050 30 400 | | | |
| BCR 5 1350 30 400 | | | |
| BCR 5 1700 30 400 | | | |
| BCR 5 2200 30 400 | | | |
| BCR 5 0660 30 230 | | | |
| BCR 5 1050 30 230 | | | |
| BCR 5 1350 30 230 | | | |
| BCR 5 1700 30 230 | | | |
| BCR 5 2200 30 230 | | | |
| BCR 6 1350 30 400 | | | |
| BCR 6 1900 30 400 | | | |
| BCR 6 2200 30 400 | | | |
| BCR 6 2900 30 400 | | | |
| BCR 6 1350 30 230 | | | |
| BCR 6 1900 30 230 | | | |
| BCR 6 2200 30 230 | | | |
| BCR 6 2900 30 230 | | | |
| BCR 7 2700 30 400 | | | |
| BCR 7 3200 30 400 | | | |
| BCR 7 4000 30 400 | | | |
| BCR 7 2700 30 230 | | | |
| BCR 7 3200 30 230 | | | |
| BCR 7 4000 30 230 | | | |
| BCR 8 0400 30 400 | | | |
| BCR 8 0680 20 400 | | | |
| BCR 8 0930 20 400 | | | |
| BCR 8 1150 20 400 | | | |

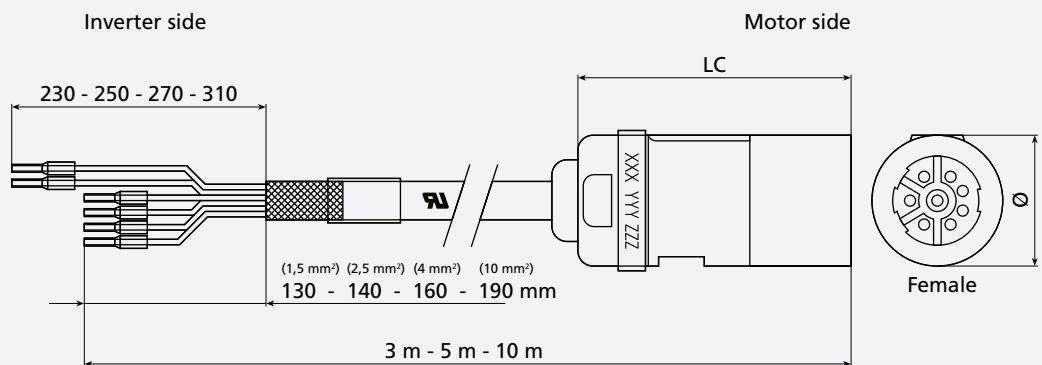
The cable ordering code is structured in the following mode:

42MBCxxyy
 where the field xxyy changes in function of cable length and conductors cross section (see side table)

Signal cable (type 8RTCxyyy)



Power cable (type 42MBCxyyy)



| Cable type | LC | Ø |
|------------|------|------|
| | (mm) | (mm) |
| 42MBCXX15 | 75 | 28 |
| 42MBCXX25 | | |
| 42MBCXX40 | 95 | 45.8 |
| 42MBCXX100 | | |

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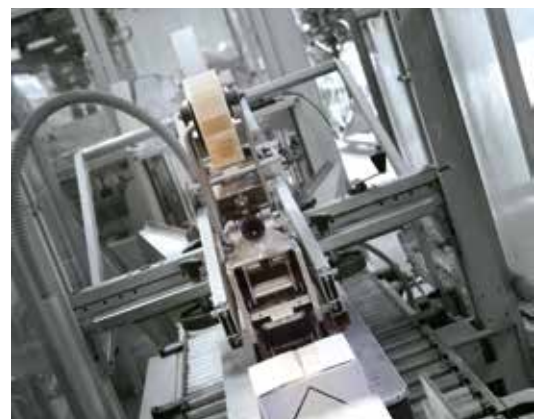
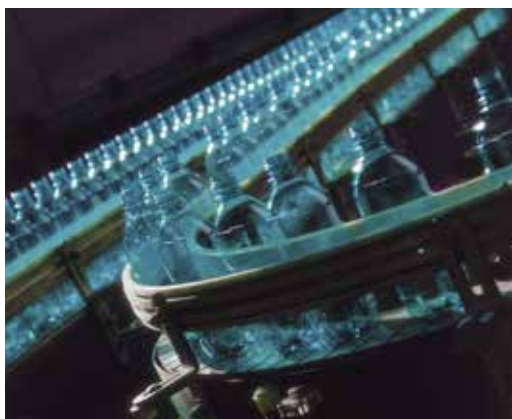
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