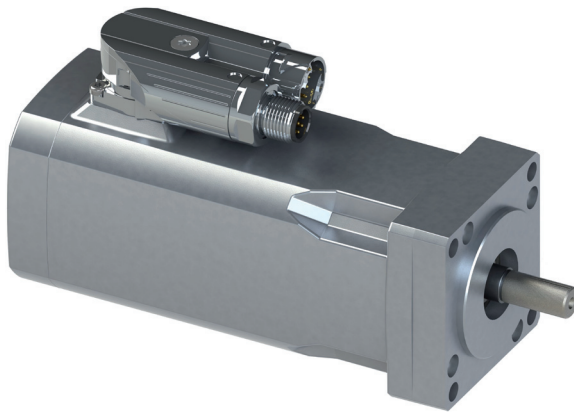


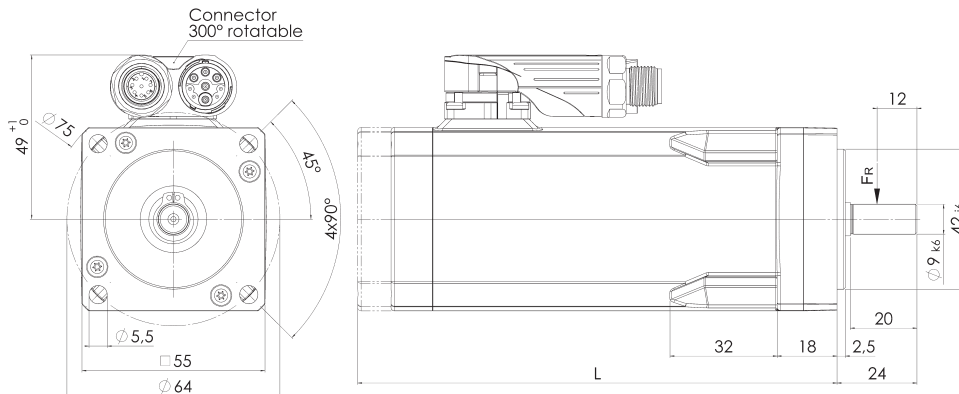
HBR 26

Synchronous Servo Motors

with permanent magnetic field



Motor series HBR 26
up to 320 Watts output power
with different angle encoder systems
with or without parking brake

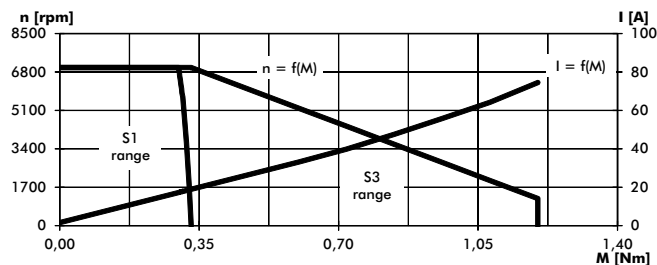


Motor type	Dimension L
HBR 2630-DS1	104
HBR 2630-DS1-B7.02	134
HBR 2660-DS1	134
HBR 2660-DS1-B7.02	164

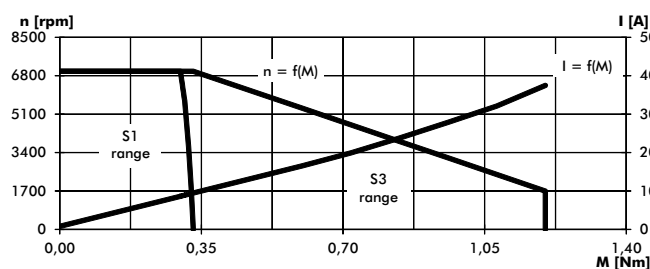
Operation characteristics:

Measured at servo-amplifier with 3-phase sinusoidal output

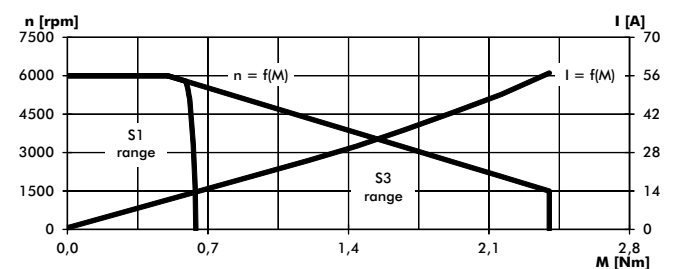
HBR 2630, 24V, 5500/7000rpm



HBR 2630, 48V, 5500/7000rpm



HBR 2660, 48V, 5000/6000rpm



Motor design:


The Synchronous Servo Motors of series HBR 26 are fitted with a 3-phase concentrated stator-winding system. The 6-pole rotor-magnet system is made of plastic-bonded Neodymium Iron Boron ring magnets.

The motors have a sinusoidal Back EMF. To avoid thermal overload a PTC resistor is embedded in the stator winding.

As standard, a hall-based singleturn angle encoder system with 12Bit resolution and pure digital interface (BiSS) is integrated.

The motors are also available with optical multiturn angle encoder (BiSS interface, dimension L will be 27mm longer, motor weight increases by 0,13kg), with brushless pancake-resolver (dimension L will be 10mm longer, motor weight increases by 0,08kg), with hall commutation sensor incl. incremental signals and/or with integrated parking brake (additional information see page 3).

Features:

- High efficiency through concentrated winding technology
- Cost-efficient design
- Constant torque development and lowest reluctance effects for best control properties
- The compact design allowing high power output out of small volume
- Robust mechanical structure with modern aluminium cast housing
- Versions for 320V bus voltage on request
-  Versions with UL approval as „recognized component“ available
- Customized versions on request

edition 05.18

type		HBR 2630		HBR 2660
series		-		-
max. speed	rpm	7000	7000	6000
bus voltage	V	24	48	48
nominal speed	rpm	5500	5500	5000
nominal current ^{1)**}	A	17,9	9	13,1
nominal current, rms	A	12,7	6,4	9,3
nominal power ²⁾	W	180	180	320
operation acc. to standards VDE 0530		S1		S1
protection acc. to standards VDE 0530		IP 54		IP 54
rotating direction		reversible		reversible
structural shape acc. standards VDE 0530		IM B5 - with end plate centering		IM B5 - with end plate centering
kind of connection		connectors (see below)		connectors (see below)
mechanical data:				
moment of inertia motor	kgm ²	0,01*10 ⁻³		0,018*10 ⁻³
nominal torque ²⁾	Nm	0,31	0,31	0,61
max. continous torque at stall ²⁾	Nm	0,33	0,33	0,64
peak torque	Nm	1,2	1,2	2,4
speed regulation constant	N ⁻¹ cm ⁻¹ rpm	34	32	12,1
mechanical time constant	ms	4,1	3,8	2,6
friction torque	Nm	0,03		0,03
rotor weight motor	kg	0,19		0,3
motor weight incl. singleturn angle encoder	kg	1,05		1,4
ball bearings	A/B-side	6000/608		6000/608
F _R (allowable radial shaft load) ³⁾	N	100		100
F _A (allowable axial shaft load)	N	40		40
electrical data:				
number of phases		3		3
number of poles		6		6
terminal resistance ⁴⁾	Ω	0,15	0,55	0,35
inductance ⁴⁾	mH	0,11	0,44	0,35
voltage constant ^{1)*}	V/1000 rpm	2,3	4,6	5,9
torque constant ^{1)*}	Nm/A	0,019	0,038	0,049
current at peak torque ^{1)**}	A	74,5	37,5	57
max. peak current ¹⁾⁵⁾	A	93	46	71
electrical time constant	ms	0,7	0,8	1
thermal data:				
max. ambient temperature	°C	40		40
isolation acc. to standards VDE 0530		F		F
thermal time constant	min	11		16
temperature-rise n.v.	K/W	1,3		1,1
parking brake:				
type		B 7.02		B 7.02
nominal voltage	V=	24		24
nominal current	A	0,5		0,5
static brake torque	Nm	2		2
mass moment of inertia	kgm ²	0,0068*10 ⁻³		0,0068*10 ⁻³
motor weight incl. encoder + parking brake	kg	1,35		1,7
connectors:				
angled connector, rotatable 300°		series 915/615 ytec (INTERCONTEC)		

*) Tolerance – 10 %

**) Tolerance + 10 %

1) Sinusoidal-peak

2) Values are for motor-assembling on a locating face of aluminium of at least 0,15 m² at a thickness of 10 mm or similar metal face.

3) Middle of the shaft-extension.

4) Measured between two phases.

5) The mentioned values are valid for operation in temperature-ranges from 0 up to +40 °C and it is not allowed to excess them, not even for a short-time, to avoid magnet-weakening.

design-changes reserved

HBR 26

options for angle encoder systems

DS1 singleturn angle encoder (standard encoder):

technology: linear hall system, digitized
 measuring range: 360° singleturn
 resolution: 12 bit (4096 steps) \cong 0,088°
 nonlinearity: max. 0,6°
 supply: V+ = 5,5 ... 12 VDC / max. 120 mA
 interface: BiSS, binary coded
 12 bit data, 2 bit status, 6 bit CRC
 RS422, $R_{T(MA)} = 100 \text{ Ohm}$
 connector: M12 connector 8-pol., A coded

M12 connector
 8-pol., A coded



connecting side
 of connector

pin assignment

- 1 - V+
- 2 - V-
- 3 - Thermo+
- 4 - MA-
- 5 - SL+
- 6 - MA+
- 7 - Thermo-
- 8 - SL-

recommended cable type: Cat.5e, SF/UTP, AWG24

cable length	max. MA frequency without ⁶⁾ / with line delay compensation
2 m	2,5 MHz / 10 MHz
5 m	2,2 MHz / 10 MHz
10 m	1,7 MHz / 10 MHz
25 m	1,0 MHz / 10 MHz

AD36 multiturn angle encoder:

technology: optical, multiturn, gear based
 measuring range: 360° x 4096 turns multiturn
 resolution: 17 bit singleturn + 12 bit multiturn
 nonlinearity: max. 0,01°
 supply: V+ = 7 ... 30 VDC / max. 150 mA
 alt. 5 VDC -5%/+10% / max. 150 mA
 interface: BiSS, binary coded
 29 bit data, 2 bit status, 6 bit CRC
 RS422, $R_{T(MA)} = 100 \text{ Ohm}$
 connector: M12 connector 8-pol., A coded

M12 connector
 8-pol., A coded



connecting side
 of connector

pin assignment

- 1 - V+
- 2 - V-
- 3 - Thermo+
- 4 - MA-
- 5 - SL+
- 6 - MA+
- 7 - Thermo-
- 8 - SL-

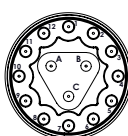
recommended cable type: Cat.5e, SF/UTP, AWG24

cable length	max. MA frequency without ⁶⁾ / with line delay compensation
2 m	2,5 MHz / 10 MHz
5 m	2,2 MHz / 10 MHz
10 m	1,7 MHz / 10 MHz
25 m	1,0 MHz / 10 MHz

RL6 commutation sensor with incremental signals:

technology: hall system
 measuring range: 360° singleturn
 resolution: 12 bit
 nonlinearity: max. 0,6°
 supply: V+ = 4,5 ... 12 VDC / max. 150 mA
 interface: open collector - H1, H2, H3 120° el
 (mac. 10 mA, max. 24 V)
 RS422 - channel A, B, Z
 connector: connector 15-pol., series 915

connector 15-pol.
 series 915



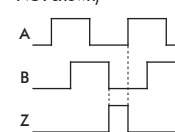
connecting side
 of connector

pin assignment

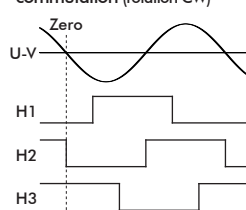
- 1 - V+
- 2 - Ch A
- 3 - Ch A invers
- 4 - Ch B
- 5 - Ch B invers
- 6 - Ch Z
- 7 - Ch Z invers
- 8 - free
- 9 - Hall 1
- 10 - Hall 2
- 11 - Hall 3
- 12 - GND
- A - Thermo+
- B - free
- C - Thermo-

signal assignment

incremental
 (complementary signals
 NOT shown)



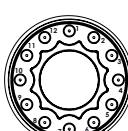
commutation (rotation CW)



R2.4 resolver:

technology: pancake resolver
 measuring range: 360°, 2 pole, singleturn
 transformation ratio: 0,5 \pm 5 %
 electrical error: max. \pm 10' el
 supply: 7 Veff 10 kHz / max. 65 mA
 connector: connector 12-pol., series 615

connector 12-pol.
 series 615



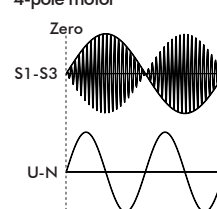
connecting side
 of connector

pin assignment

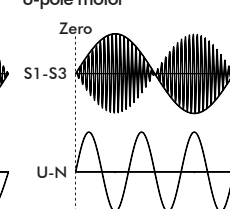
- 1 - S1
- 2 - S3
- 3 - S2
- 4 - S4
- 5 - R1
- 6 - R2
- 7 - Thermo+
- 8 - Thermo-
- 9 - free
- 10 - free
- 11 - free
- 12 - free

signal assignment (rotation CW)

4-pole motor



6-pole motor



pin assignment power connector

connector 9-pol.
 series 915



connecting side
 of connector

pin assignment

- A - U
- B - V
- C - W
- ⊕ - PE
- 1 - Brake+
- 2 - Brake-
- 3 - free
- 4 - free
- 5 - free

⁶⁾ Condition: Total propagation delay in the BiSS master device $t_{d(MA)} + t_{d(SL)} \leq 25 \text{ ns}$.