

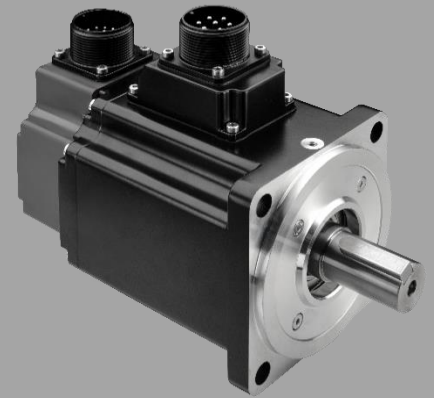
BDHD2 PRO2

BDHD2 & PRO2– High Performance Servo Drives and Motors Bundle



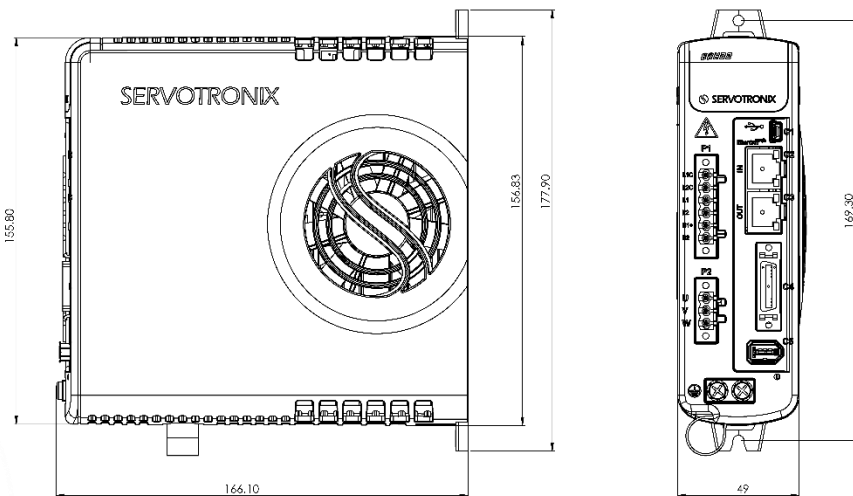
Drive Ratings

BDHD2	Units	Model 1.5A	Model 3A	Model 4.5A	Model 6A
Input Voltage Nominal +/- 10%	VAC	240, 1 phase			
Control Input Power +/- 10%	VAC	240, 1 phase			
Line Frequency (Hz)	Hz	50/60			
Nominal Output Current	Arms	1.5	3	4.5	6
Peak Output Current	Arms	4.5	9	13.5	18
Peak Current Duration	seconds	2			
PWM Frequency	Hz	16 KHz			
Operational Temperature	°C	55			
Under-Voltage Trip (nominal)	VDC	User-defined			
Over-Voltage Trip	VDC	420			



Drive Dimensions

Height: 169 mm
 Width: 49 mm
 Length: 166 mm



Note: fan is available only in models BDHD2-4D5 and BDHD2-006.

Control

Motors	Compatible with Servotronics PRHD2 and PRO2 motors series
Operation Modes	Selectable: Current (torque), Velocity, Position, HD Velocity or HD Position control
Current (Torque) Control	Update rate: 31.25 μ s (32 kHz), Output waveform sinusoidal
Velocity Control	Update rate: 125 μ s (8 kHz) Selectable velocity control loops: PI, PDFF, Pole Placement
Position Control	Update rate: 250 μ s (4 kHz) Control loop: PID and feed-forward
Velocity or Position HD Control	Velocity update rate: 62.5 μ s (16 kHz) Position update rate 125 μ s (8 kHz) Control loop: A proprietary control algorithm that surpasses typical servo control algorithms in achieving optimal performance
Autotuning	Automatic inertia load measurement, self-tuning and optimization; Minimizes error and settling time
Brake	Controlled stops: Dynamic Brake, Active Disable
Electronic Gearing	User-defined input signal ratio
Software Tools	Windows-based application; drive, motor I/O and feedback parameter settings and commissioning Motor Setup Wizard, Automatic setup and tuning, Scope, Motion settings; Fault history/display; Scope, Terminal, and Expert views

Communication

EtherCAT	CANopen over EtherCAT (CoE) File Over EtherCAT (FoE) for firmware and parameters download. Minimal cycle time 250 μ s.
USB	ASCII-based, ServoStudio, HyperTerminal

Motor Feedback

Power from Drive	5 VDC
SSI Encoder	sensAR, Tamagawa®

Inputs/Outputs

Pulse & Direction	RS422 line receiver: 5 mHz max. input frequency
4 Digital Inputs	Configurable opto-isolated; Compatible with sink/source output; 24V; 6 mA 12.5 mA max. input current
2 Digital Outputs	Configurable open collector, opto-isolated; Compatible with sink/source input; 24V; 50 mA max. input current

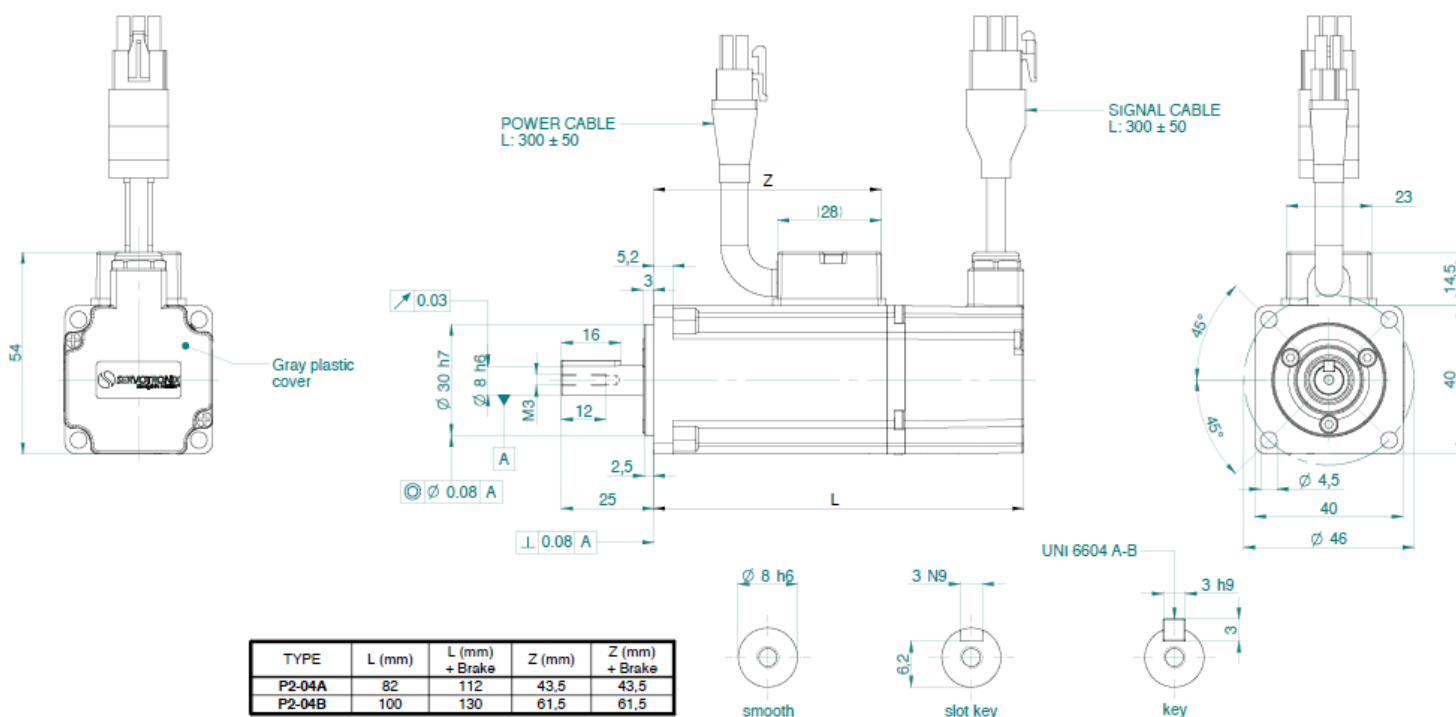
Protection and Environmental

Protective Functions	Under- and over-voltage, Over-current, Drive and motor over-temperature, Motor foldback, Drive foldback, Feedback lost, STO, Circuit failure
Standards	CE – EMC Directive 2004/108/EC, Standard IEC61800-3 CE – Low Voltage Directive 2006/95/EC, Standard IEC61800-5-1 REACH RoHS
Environment	Ambient temperature: Operation 0-55°C Storage 0-70°C Humidity: 10-90% Altitude: < 1000m. If >1000m, derate 5% per 330m Vibration: 1.0g
Operating Conditions	Pollution degree: 2 Protection class: IP20

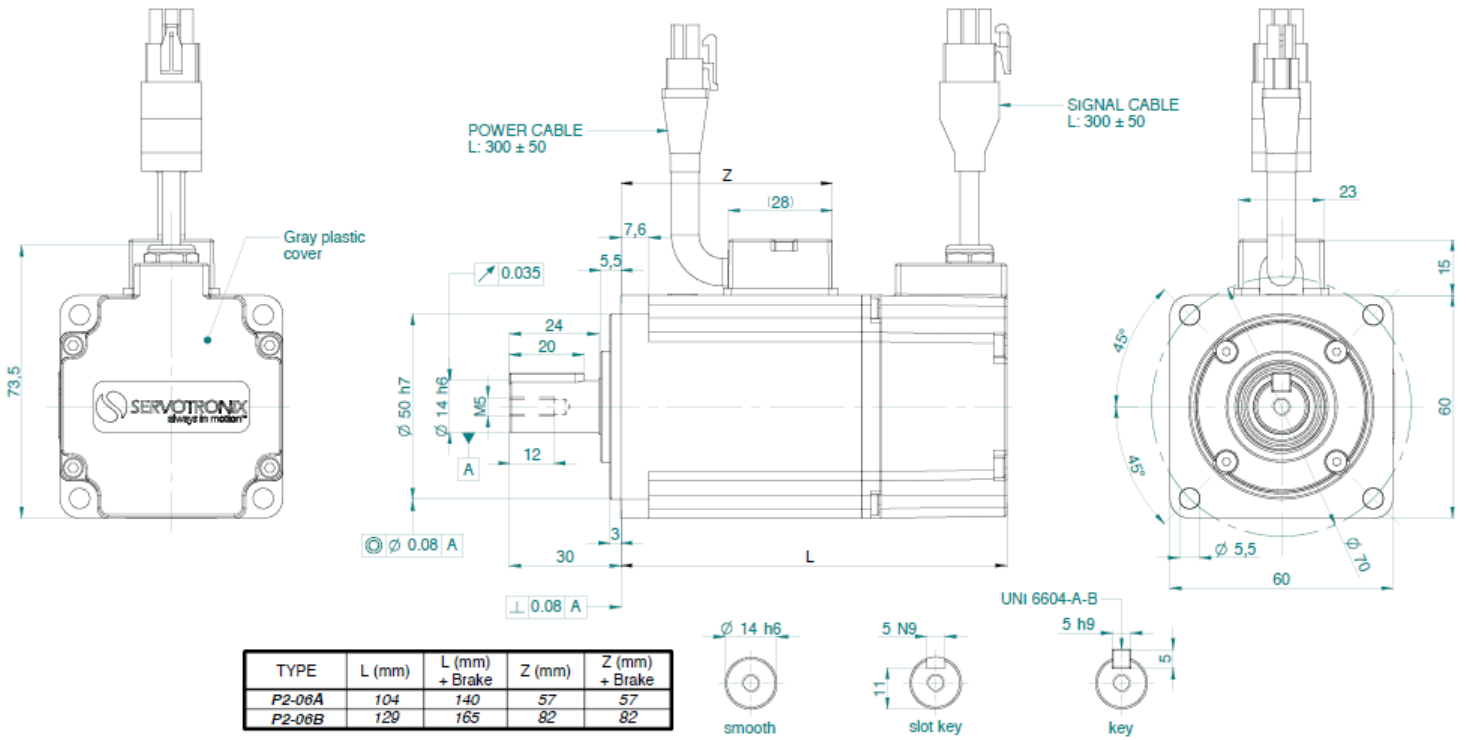
Motors Spec & Drawings

Motor Type	Nominal Power [W]	Nominal Torque [Nm]	Peak Torque [Nm]	Nominal Speed [RPM]	Moment of Inertia	Drive Type
P2-04A230	50	0.16	0.48	3000	Medium	BDHD2-1D52A
P2-04B230	100	0.32	0.96	3000	Medium	BDHD2-1D52A
P2-06A230	200	0.64	1.92	3000	Low	BDHD2-1D52A
P2-06B230	400	1.27	3.81	3000	Low	BDHD-0032A
P2-08A230	400	1.27	3.81	3000	Low	BDHD-0032A
P2-08B230	750	2.39	7.16	3000	Low/Medium	BDHD-4D52A
P2-10A230	900	3.18	9.54	3000	Low	BDHD-0062A
P2-13A220	460 500	2.39	7.16	2000	Medium	BDHD-0032A BDHD-4D52A
P2-13B210	300	2.86	8.59	1000	Medium	BDHD-0032A
P2-13C220	950	4.77	14.3	2000	Medium/High	BDHD-0062A
P2-13D215	810	5.39	13.8	1500	Medium	BDHD-0062A
P2-13E210	600	5.73	17.19	1000	Medium	BDHD-4D52A
P2-13F210	875	8.59	25.77	1000	Medium	BDHD-0062A
P2-13G220	1330	7.16	21.48	2000	Medium	BDHD-0062A

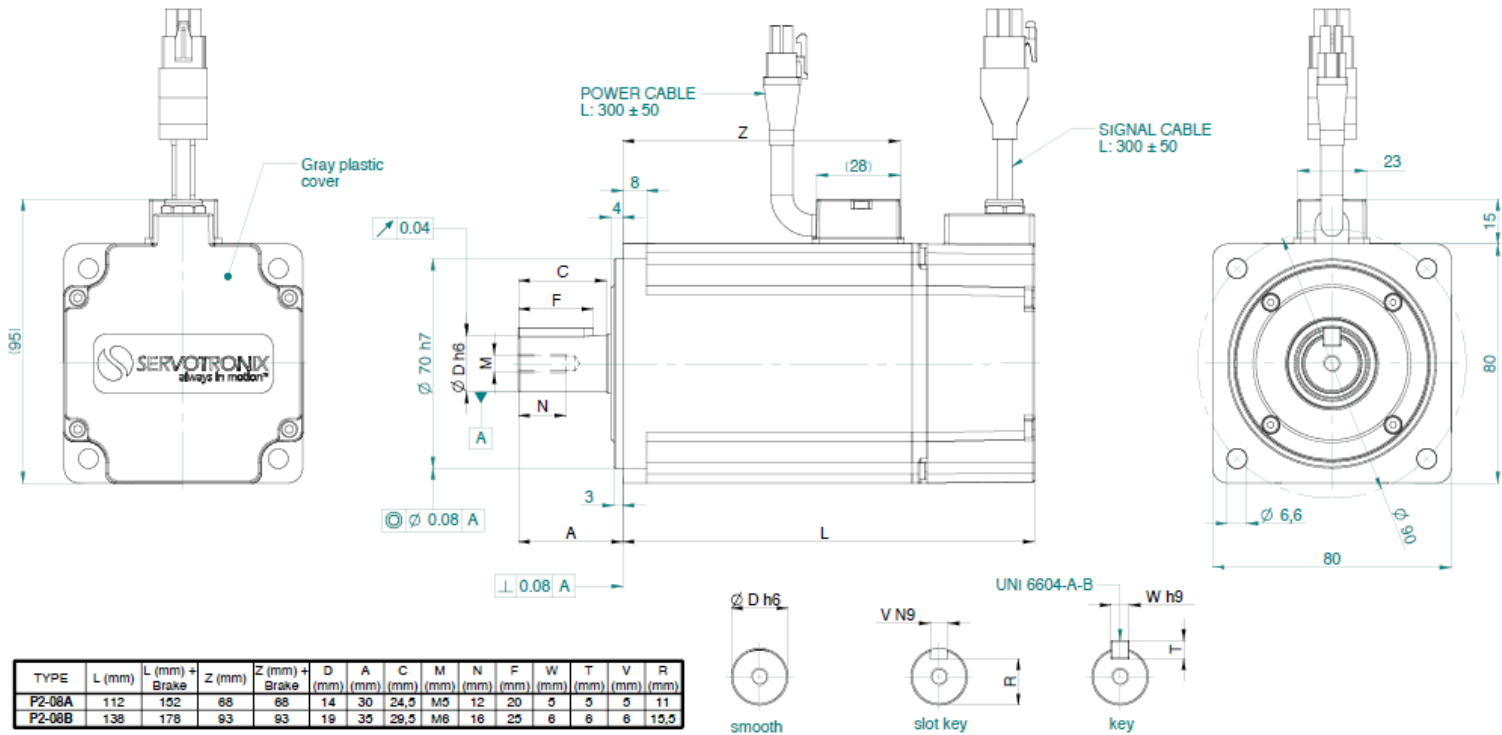
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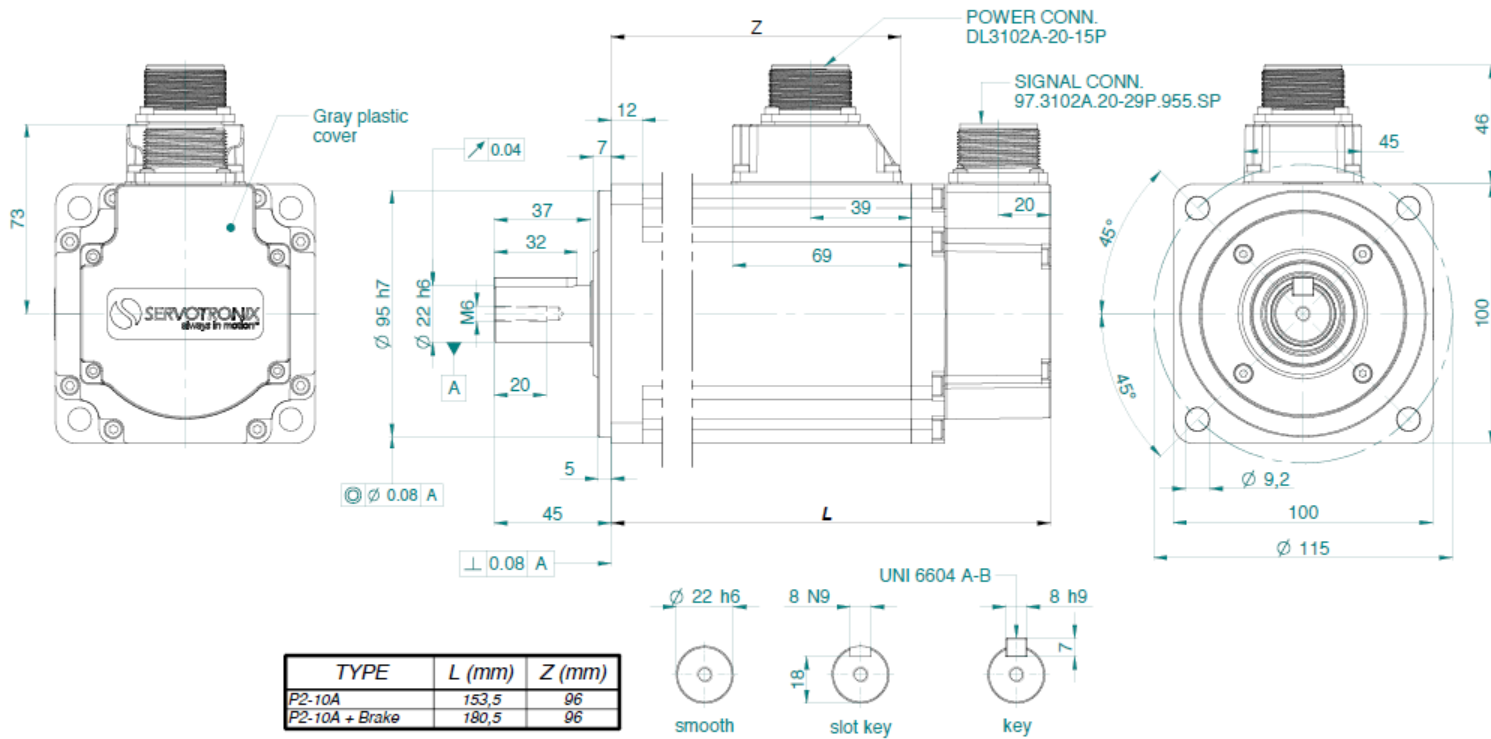
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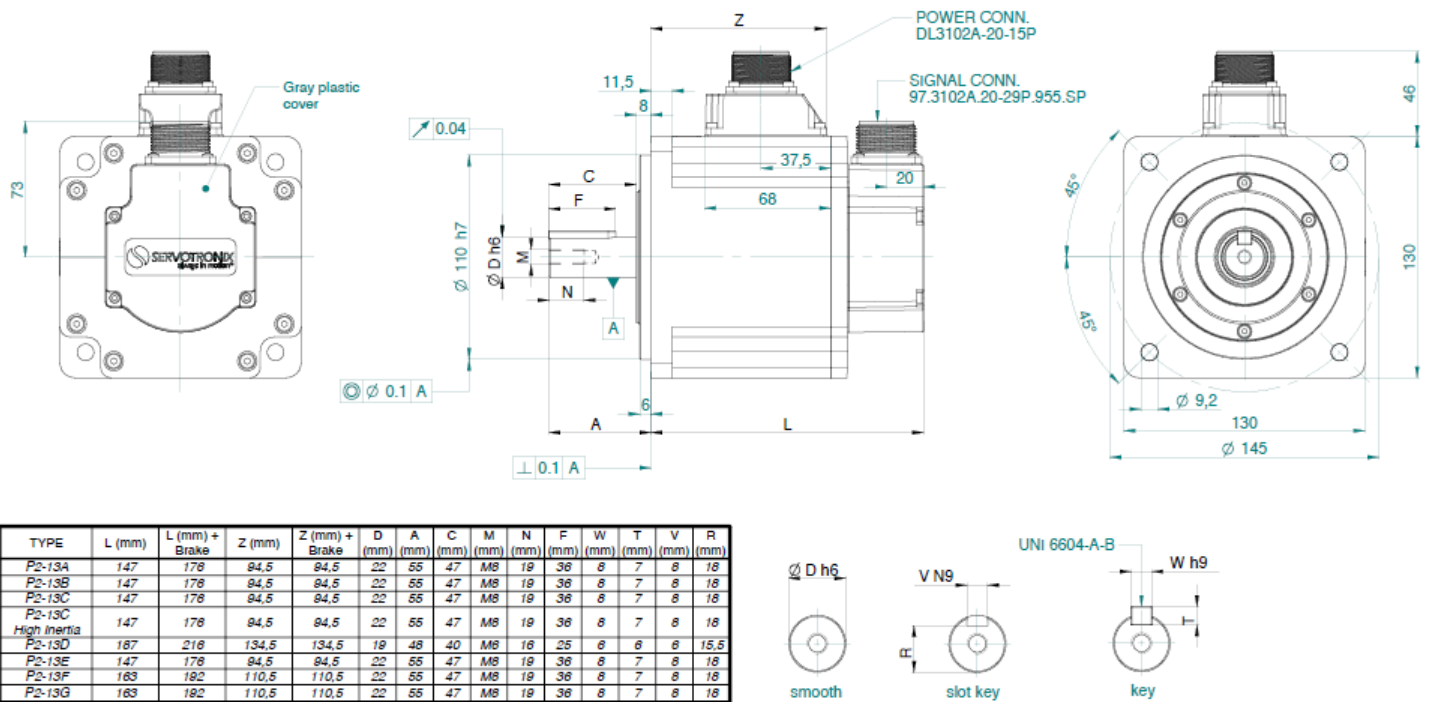
P2-08



P2-10



P2-13



sensAR spec

The innovative sensAR™ magnetic absolute encoder combines high resolution and accuracy with robustness, durability and compact size, all at a competitive price.

Technical Data

Primary Encoder Specifications	SE36E-S20	SE36E-M36	
Resolution single-turn ¹	up to 20 Bit	up to 20 Bit	
Multi-turn counts		65,536 (16 Bits)	
Accuracy ²	+/- 0.016° / 14,4 bit /60"	+/- 0.016° / 14,4 bit /60"	
Repeatability ³	+/- 0.015° / 14,5 bit /54"	+/- 0.015° / 14,5 bit /54"	
Maximum rotational speed	12,000 rpm		
Maximum angular acceleration	100,000 rad/s ²		
Data storage EEPROM ¹	up to 2040 bytes		

Ambient Conditions	
Operating temperature range	-20 to +120°C
Storage temperature range	-30 to +120°C
Humidity	90% RH
Vibration resistance ⁴ (EN60 068-2-6)	30g (10-2000Hz)
Shock resistance ⁴ (EN60 068-2-27)	200g (6ms)

Mechanical Specifications	
Dimensions	Diameter: 36 mm Height: 20.6 mm
Mass	57 g
Moment of inertia	2.3 x 10 ⁻⁶ kg·m ²
Permissible shaft movement ⁸ (mounting)	axial ±0.7 mm, radial ±0.1 mm
Protection	IP20 (after encoder assembly)

Electrical Specifications	
Nominal voltage	4.25 - 5.25 VDC
Current consumption	80 mA
Insulation resistance	Greater than 1 MΩ
Lifetime ⁷	786,401 Hrs / 90 Years
Standby period at power-on	1500 ms
Maximum cable Length	80 m

Communication Interface		
Communication protocol	ServoSense ⁵	BiSS / SSI ⁶
Electrical interface	RS485 (UART)	RS422
Transmission rate	2.5 Mbps, 1/2 duplex	500kbps
Access rate and synchronization	<16 kHz	<16 kHz
Data availability	Bi-directional, real-time	Unidirectional
Number of Wires (Total)	4	6



Drive Ordering Information

			BDHD2	-	006	2A	EC	-	000
BDHD2 Bundle Drive – HD Series									
Rating									
120/240 VAC									
	Cont.	Peak							
	[A rms]	[A rms]							
1D5	1.5	4.5							
003	3	9							
4D5	4.5	13.5							
006	6	18							
Input Power Supply									
2A	Medium Voltage Input Power Supply								
	<ul style="list-style-type: none"> • Single Phase 120 L-N VAC +10% -15% 50/60 Hz • Single Phase 240 L-N VAC +10% -15% 50/60 Hz 								
Communication Interfaces									
EC	EtherCAT, USB								
Special Options									
[blank]	Standard								

Motors Ordering Information

		P2	-	04	A	2	30	0	5	S3	0	D	000
PRO2 Series Synchronous Servo Motors													
Frame Size													
04	40 mm												
06	60 mm												
08	80 mm												
10	100 mm												
13	130 mm												
Length													
A	Shortest												
B													
C													
D													
E													
F													
G													
<i>Relative sizes. Refer to motor catalog for available motor lengths.</i>													
AC Bus Voltage													
2	230 VAC												
Rated Speed													
10	1000 rpm												
15	1500 rpm												
20	2000 rpm												
30	3000 rpm												
<i>According to motor catalog.</i>													
Shaft													
0	Smooth shaft												
1	Smooth shaft and oil seal												
2	Shaft with key												
3	Shaft with key and oil seal												
4 *	High inertia smooth shaft												
5 *	High inertia smooth shaft and oil seal												
6 *	High inertia shaft with key												
7 *	High inertia shaft with key and oil seal												
<i>* Available for frames sizes/lengths: 08B, 13C, 18A</i>													
IP Rating of Motor Housing (Without Shaft)													
5	IP 65												
Feedback													
S3	sensAR Single turn absolute encoder 20 bit												
M3	sensAR Multi-turn absolute encoder 20 bit												
Brake													
0	No brake												
1	With brake												
Connector													
D	300 mm cable with AMP connectors <i>Available for frames sizes: 04, 06, 08</i>												
A	MIL connectors <i>Available for frame sizes: 10, 13</i>												
Future options													