

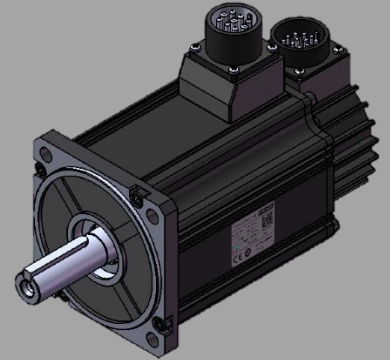
# BDHD2 PRHD2

## BDHD2 & PRHD2– High Performance Servo Drives and Motors Bundle



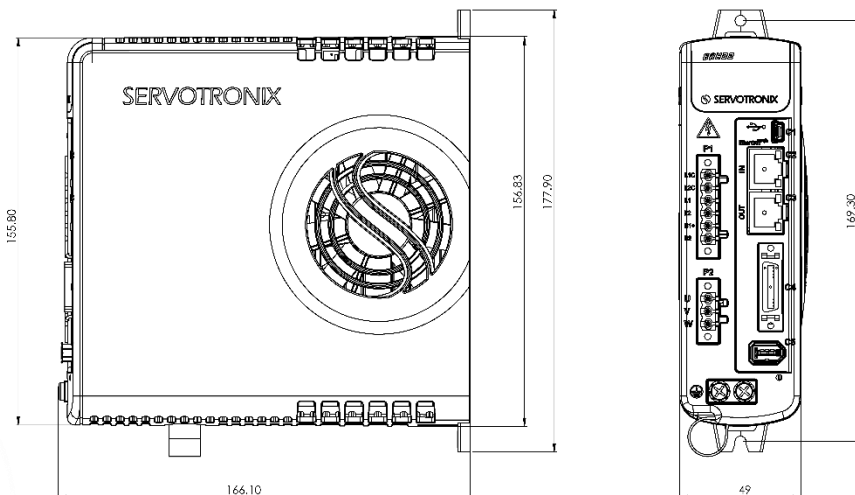
### Drive Ratings

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

<b>Motors</b>	Compatible with Servotronix PRHD2 and PRO2 motors series
<b>Operation Modes</b>	Selectable: Current (torque), Velocity, Position, HD Velocity or HD Position control
<b>Current (Torque) Control</b>	Update rate: 31.25 $\mu$ s (32 kHz), Output waveform sinusoidal
<b>Velocity Control</b>	Update rate: 125 $\mu$ s (8 kHz) Selectable velocity control loops: PI, PDFF, Pole Placement
<b>Position Control</b>	Update rate: 250 $\mu$ s (4 kHz) Control loop: PID and feed-forward
<b>Velocity or Position HD Control</b>	Velocity update rate: 62.5 $\mu$ s (16 kHz) Position update rate 125 $\mu$ s (8 kHz) Control loop: A proprietary control algorithm that surpasses typical servo control algorithms in achieving optimal performance
<b>Autotuning</b>	Automatic inertia load measurement, self-tuning and optimization; Minimizes error and settling time
<b>Brake</b>	Controlled stops: Dynamic Brake, Active Disable
<b>Electronic Gearing</b>	User-defined input signal ratio
<b>Software Tools</b>	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

<b>EtherCAT</b>	CANopen over EtherCAT (CoE) File Over EtherCAT (FoE) for firmware and parameters download. Minimal cycle time 250 $\mu$ s.
<b>USB</b>	ASCII-based, ServoStudio, HyperTerminal

## Motor Feedback

<b>Power from Drive</b>	5 VDC
<b>SSI Encoder</b>	sensAR, Tamagawa®

## Inputs/Outputs

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

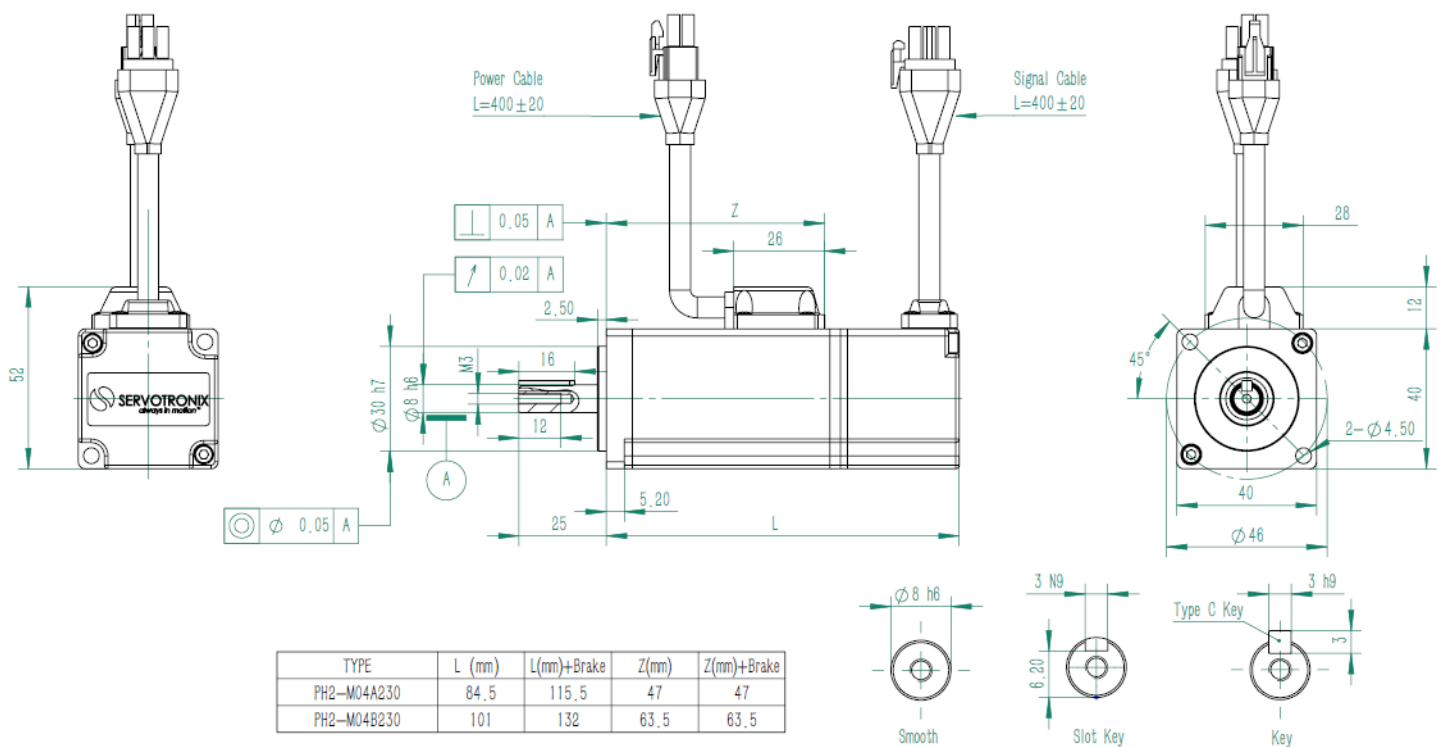
## Protection and Environmental

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

## Motors Spec & Drawings

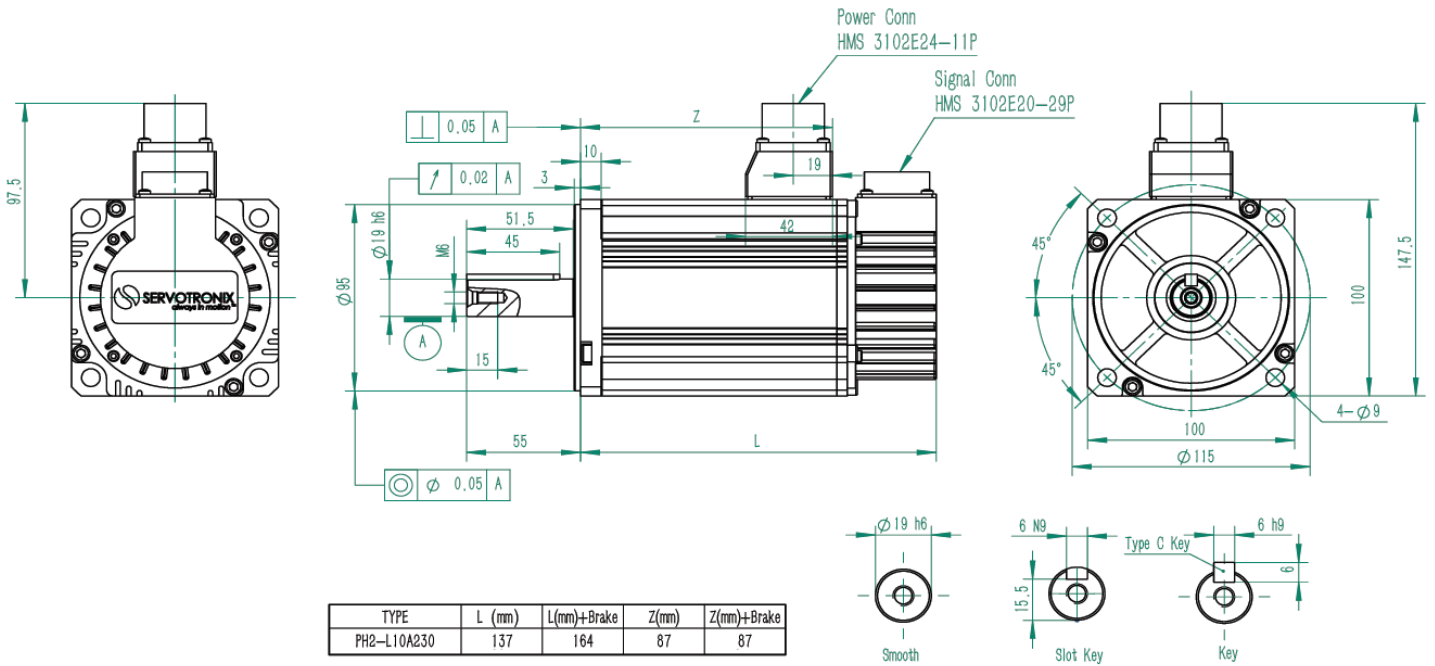
Motor Type	Nominal Power [W]	Nominal Torque [Nm]	Peak Torque [Nm]	Nominal Speed [RPM]	Moment of Inertia	Drive Type
PH2-M04A230	50	0.159	0.477	3000	Medium	BDHD2-1D52A
PH2-M04B230	100	0.318	0.954	3000	Medium	BDHD2-1D52A
PH2-M06A230	200	0.64	1.9	3000	Medium	BDHD2-1D52A
PH2-M06B230	400	1.27	3.8	3000	Medium	BDHD-0032A
PH2-M08A230	750	2.39	7.16	3000	Medium	BDHD-4D52A
PH2-L10A230	1000	3.18	9.54	3000	High	BDHD-0062A
PH2-M13A215	1000	6.37	19.1	1500	Medium	BDHD-0062A

### PH2-04

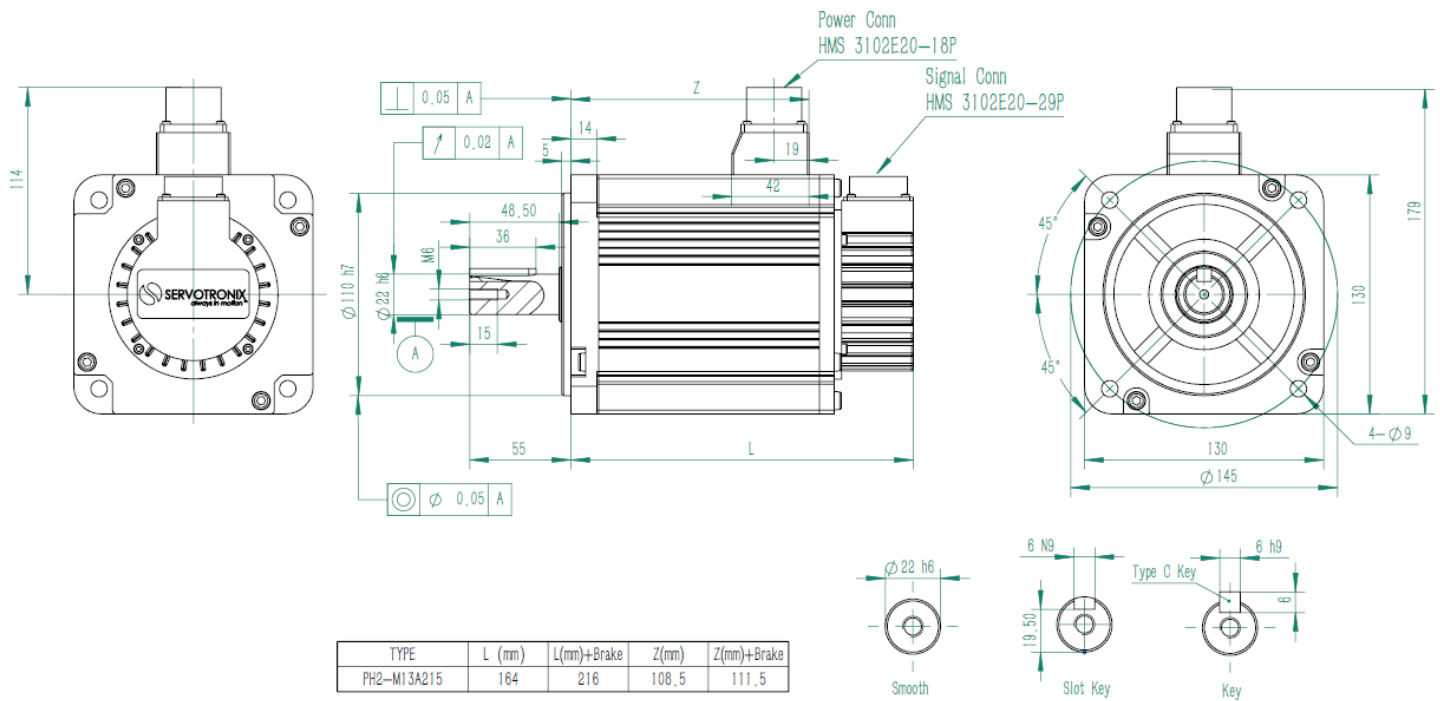




## PH2-10



## PH2-13



## 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 <sup>1</sup>	up to 20 Bit	up to 20 Bit	
Multi-turn counts		65,536 (16 Bits)	
Accuracy <sup>2</sup>	+/- 0.016° / 14,4 bit / 60"	+/- 0.016° / 14,4 bit / 60"	
Repeatability <sup>3</sup>	+/- 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 <sup>2</sup>		
Data storage EEPROM <sup>1</sup>	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 <sup>4</sup> (EN60 068-2-6)	30g (10-2000Hz)
Shock resistance <sup>4</sup> (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 <sup>-6</sup> kg·m <sup>2</sup>
Permissible shaft movement <sup>8</sup> (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 <sup>7</sup>	786,401 Hrs / 90 Years
Standby period at power-on	1500 ms
Maximum cable Length	80 m

Communication Interface		
Communication protocol	ServoSense <sup>5</sup>	BiSS / SSI <sup>6</sup>
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
<b>BDHD2 Bundle Drive – HD Series</b>									
<b>Rating</b>									
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						
<b>Input Power Supply</b>									
2A	Medium Voltage Input Power Supply								
	<ul style="list-style-type: none"> <li>• Single Phase 120 L-N VAC +10% -15% 50/60 Hz</li> <li>• Single Phase 240 L-N VAC +10% -15% 50/60 Hz</li> </ul>								
<b>Communication Interfaces</b>									
EC	EtherCAT, USB								
<b>Special Options</b>									
[blank]	Standard								

## Motors Ordering Information

		<b>PH2</b>	<b>-</b>	<b>M</b>	<b>04</b>	<b>A</b>	<b>2</b>	<b>30</b>	<b>0</b>	<b>5</b>	<b>S3</b>	<b>0</b>	<b>D</b>
<b>PRHD2 Servo Motor</b>													
<b>Inertia</b>													
<b>L</b>	Low inertia												
<b>M</b>	Medium inertia												
<b>H</b>	High inertia												
<b>Frame Size</b>													
<b>04</b>	40 mm												
<b>06</b>	60 mm												
<b>08</b>	80 mm												
<b>10</b>	100 mm												
<b>13</b>	130 mm												
<b>Winding Type</b>													
<b>A</b>	Type A												
<b>B</b>													
<b>C</b>													
<b>AC Bus Voltage</b>													
<b>2</b>	230 VAC												
<b>Rated Speed</b>													
<b>10</b>	1000 rpm												
<b>15</b>	1500 rpm												
<b>20</b>	2000 rpm												
<b>30</b>	3000 rpm												
<b>Shaft &amp; Oil seal</b>													
<b>0</b>	Smooth												
<b>1</b>	Smooth and oil seal												
<b>2</b>	Keyed												
<b>3</b>	Keyed and oil seal												
<b>IP Rating</b>													
<b>5</b>	IP65												
<b>Feedback Device</b>													
<b>S3</b>	sensAR single turn absolute encoder 20-bit												
<b>M3</b>	sensAR multi- absolute encoder 20-bit												
<b>T1</b>	Tamagawa single turn absolute encoder 17-bit												
<b>T2</b>	Tamagawa multi-turn absolute encoder 17-bit												
<b>T4</b>	Tamagawa multi-turn absolute encoder 23-bit												
<b>Brake</b>													
<b>0</b>	No brake												
<b>1</b>	With brake												
<b>Connector</b>													
<b>D</b>	Amp connector												
<b>A</b>	MIL connector												