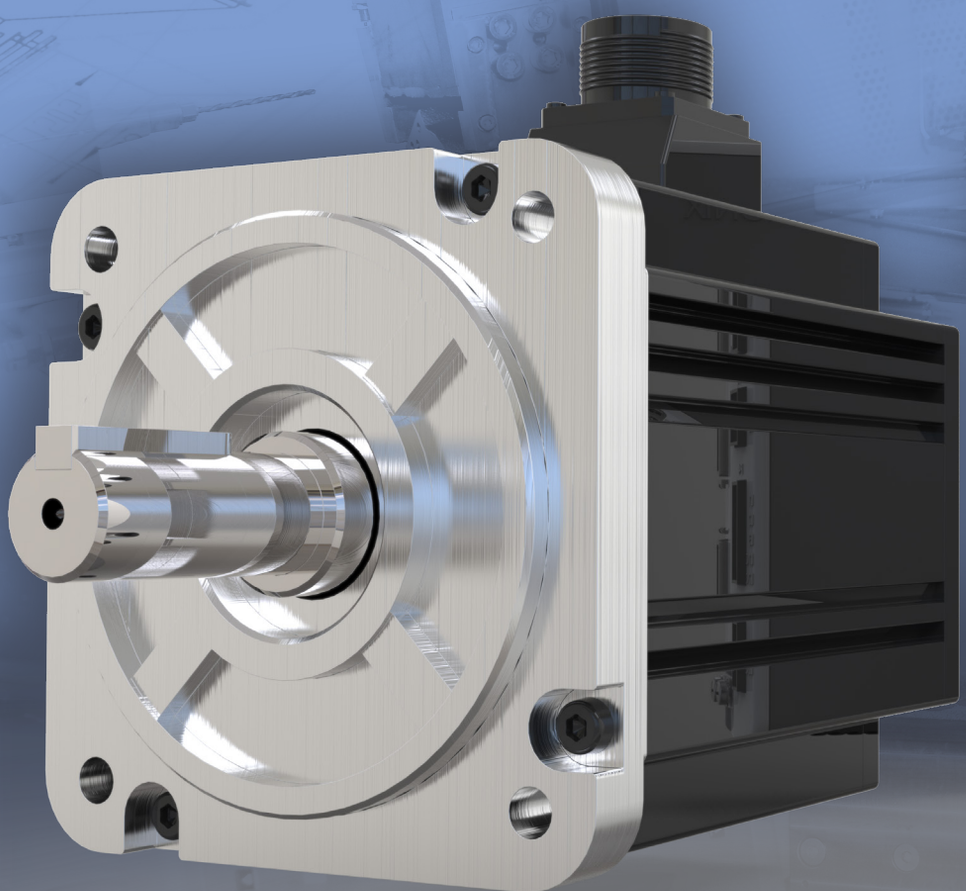
PRHD2 Series

PRHD2 Rotary Synchronous Servo Motors with CDHD2 Servo Drives

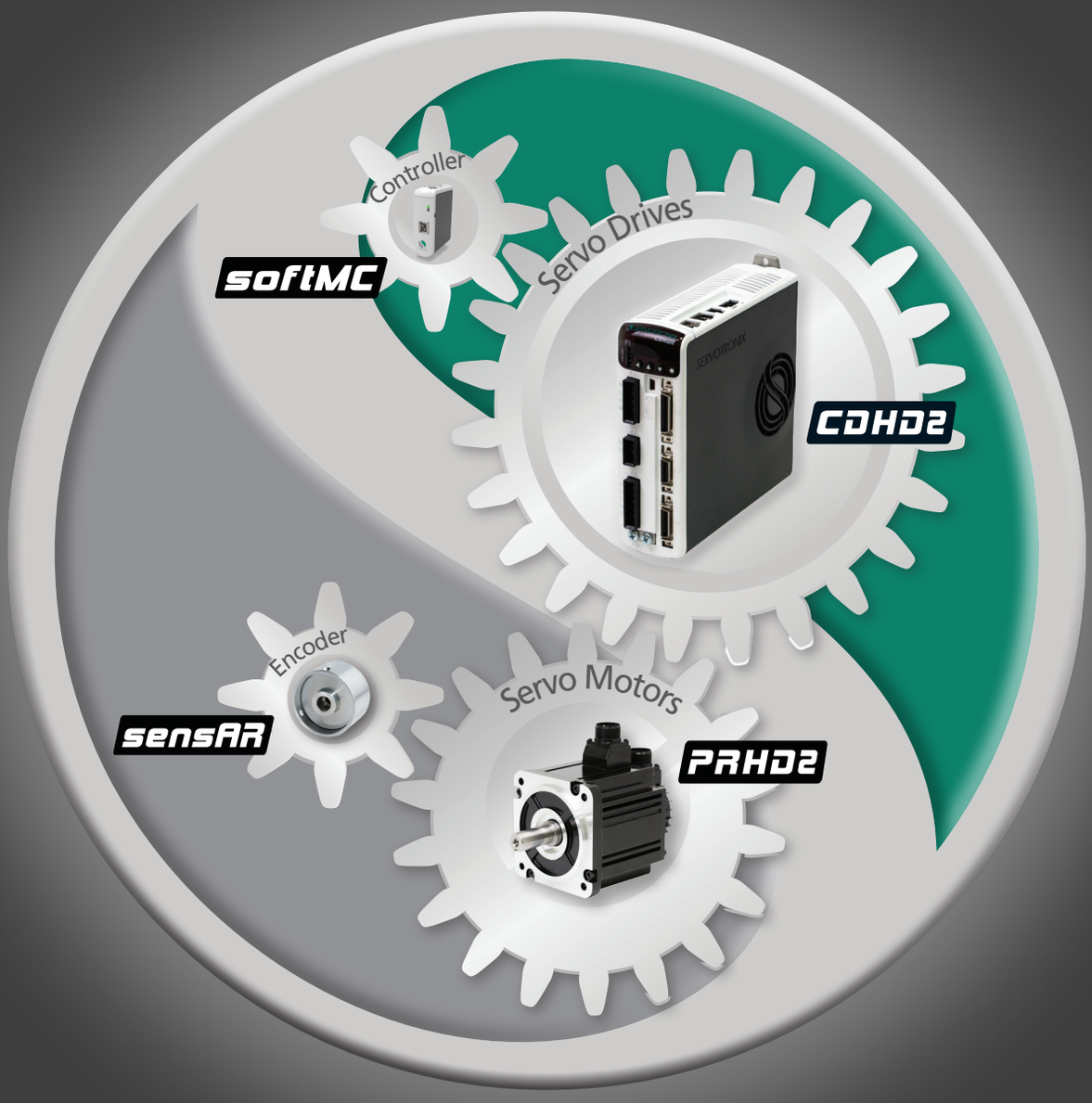
Optimized Servo Bundle





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The Perfect Match



PRHD2 with CDHD2 Servo Drives

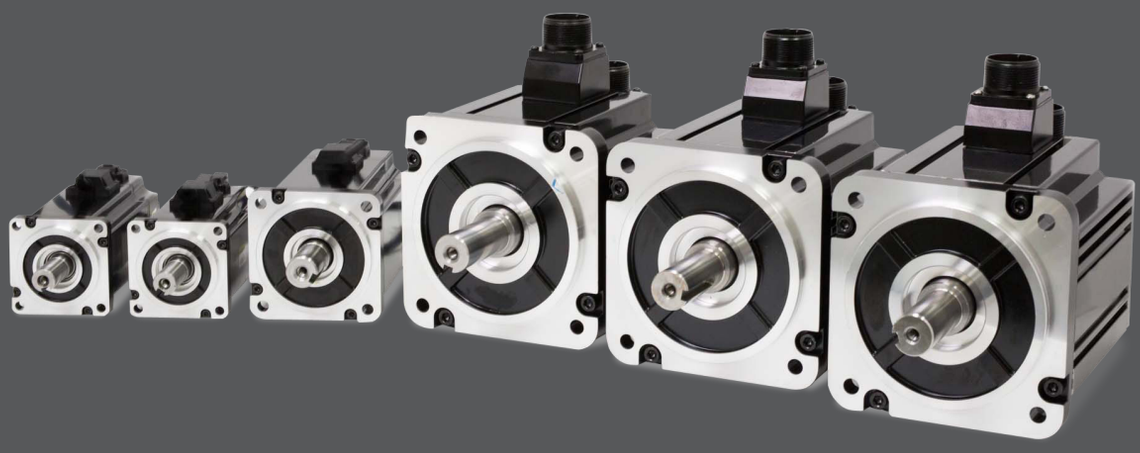
Servotronix Motion Control is proud to introduce the PRHD2, a new series of high performance brushless servo motors, designed to meet the demands of automation today and beyond.

PRHD2 motors are designed and manufactured in-house by Servotronix, and are optimized for use with the company's CDHD, CDHD2 and DDHD servo drives. The motor is offered with the sensAR 20-bit magnetic absolute encoder that features a compact and robust design along with high resolution and accuracy.

The PRHD2 electro-mechanical design features low speed and torque ripple, minimal temperature rise, high torque density, and high overload capacity

The combination of Servotronix motor, encoder and drive allows reliable, realtime monitoring of actual position, speed and temperature, along with dynamic responses. A complete PRHD2 servo package ensures the accuracy and smoothness of motion required for automated precision processes such as robotic manufacturing, machine tooling and electronics assembly.

Customers can easily and quickly commission a PRHD2 servo package, but are not limited to predefined options. The PRHD2 can be paired with drives or encoders selected by customers for their application needs.



PRHD2 Series

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PRHD2 FEATURES AND BENEFITS

Synchronous brushless servo motor, permanently excited
Flange dimensions: 40 - 60 - 80 - 100 - 130 - 180 mm
0.16 Nm to 44.6 Nm rated torque
50 W to 7.5 kW rated output power
Maximum servo motor speed up to 6000 rpm
Low cogging, less than 2% of norminal torque
Low temperature rise during operation
High motor overload capability
Built-in 20 bit proprietary absolute magnetic encoder
Tamagawa absolute encoder also available
Insulation class F (155 °C)
IP 67 (with oil seal)
Ambient operation temperature from - 10° C to + 40° C
Optional holding brake
Optional shaft sealing
Reach compliance

CE RoHS REACh ✓

PRHD2 WITH CDHD2 AND DDHD

Bundle Technical Info

Motor Type	Nominal Power [W]	Nominal Torque [Nm]	Peak Torque [Nm]	Drive Type - CDHD	Drive Type - DDHD
PH2-M04A230	50	0.159	0.477	CDHD2-1D52A	DDHD-1D81D8
PH2-M04B230	100	0.318	0.954	CDHD2-1D52A	DDHD-1D81D8
PH2-M06A230	200	0.64	1.9	CDHD2-1D52A	DDHD-1D81D8
PH2-M06B230	400	1.27	3.80	CDHD2-0032A	DDHD-3D43D4
PH2-M08A230	750	2.39	7.16	CDHD2-4D52A	DDHD-4D54D5
PH2-L10A230*	1000	3.18	9.54	CDHD2-0062A	DDHD-3D46D8
PH2-L10B230*	1500	4.78	14.34	CDHD2-0102A	N/A
PH2-L10C230*	2000	6.37	19.11	CDHD2-0132A	N/A
PH2-M13A215	1000	6.37	19.10	CDHD2-0062A	DDHD-3D46D8
PH2-M13B215	1500	9.55	28.65	CDHD2-0102A	N/A
PH2-M13B220	2000	9.55	28.65	CDHD2-0132A	N/A
PH2-M13C220*	1100	5.39	16.17	CDHD2-0082A	N/A
PH2-M13D220*	1750	8.34	25.02	CDHD2-0132A	N/A
PH2-M13E220*	2400	11.50	34.50	CDHD2-0202A	N/A
PH2-L13A230*	3000	9.55	28.60	CDHD2-0202A	N/A
PH2-L13B230*	4000	12.70	38.10	CDHD2-0242A	N/A
PH2-L13C230*	5000	15.90	47.70	CDHD2-0332A	N/A
PH2-M18A215	3000	19.10	54.00	CDHD2-0242A	N/A
PH2-M18B215	4500	28.60	72.00	CDHD2-0332A	N/A
PH2-M18C215	5500	35.00	102.00	CDHD2-0442A	N/A
PH2-M18D215	7500	48.00	119.00	CDHD2-0552A	N/A

* Upcoming

PRHD2 Synchronous Servo Motors

Ordering Information

	PH2	–	M	04	A	2	30	0	5	S3	0	D
PRHD2 Servo Motor												
Inertia												
L	Low inertia											
M	Medium inertia											
H	High inertia											
Frame Size												
04	40 mm											
06	60 mm											
08	80 mm											
10	100 mm											
13	130 mm											
18	180 mm											
Winding Type												
A	Type A											
B												
C												
AC Bus Voltage												
2	230 VAC											
4	400 VAC											
Rated Speed												
10	1000 rpm											
15	1500 rpm											
20	2000 rpm											
30	3000 rpm											
Shaft & Oil seal												
0	Smooth											
1	Smooth and oil seal											
2	Keyed											
3	Keyed and oil seal											
IP Rating												
5	IP65											
Feedback Device												
S3	sensAR single turn absolute encoder 20-bit											
M3	sensAR multi- absolute encoder 20-bit											
T1	Tamagawa single turn absolute encoder 17-bit											
T2	Tamagawa multi-turn absolute encoder 17-bit											
T4	Tamagawa multi-turn absolute encoder 23-bit											
Brake												
0	No brake											
1	With brake											
Connector												
D	Amp connector											
A	MIL connector											

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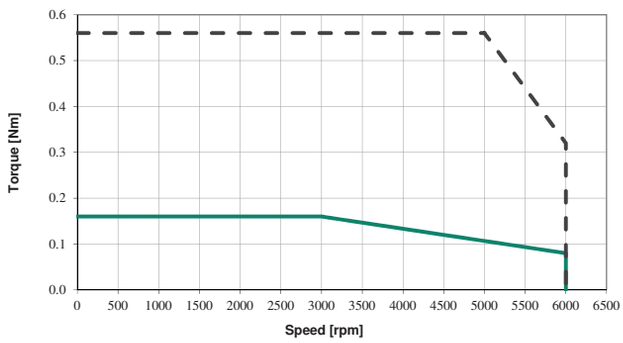
PRHD2 SIZE 40

TIME RATING	Continuous	AMBIENT TEMPERATURE	-10 ... + 40 °C
INSULATION CLASS	F	RELATIVE HUMIDITY	20 ... 80%
ENCLOSURE	Totally enclosed, Self cooled	POLES	10
PROTECTION CLASS	IP65	CERTIFICATION	CE

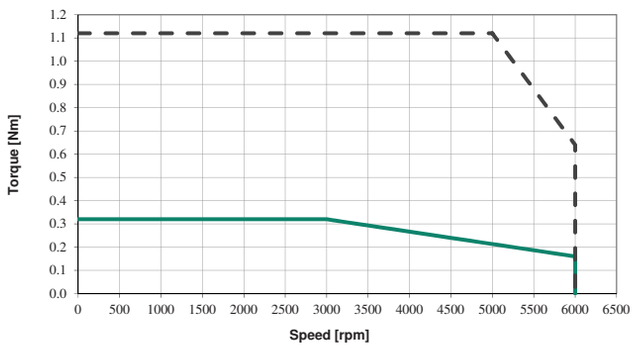
			PH2-M04A230	PH2-M04B230
Nominal torque	M_n	Nm	0.159	0.318
Peak torque	Tmax	Nm	0.48	0.96
Nominal speed of rotation	nN	min^{-1}	3000	3000
Maximum speed of rotation	n_{max}	min^{-1}	6000	6000
Nominal power	P_N	kW	0.05	0.10
Nominal current	I_N	A_{rms}	0.45	0.90
Maximum current	Imax	A_{rms}	1.35	2.70
Rated winding voltage	Un	V_{AC}	220	220
Maximum winding voltage	U_{max}	V_{DC}	340	340
Maximum voltage to ground		V_{AC}	240	240
Voltage constant	K_{eu-v}	V_{rms}/k_{rpm}	23.7	23.7
Torque constant	K_t	$N.m/A_{rms}$	0.37	0.37
Winding resistance	$R_{20\ u-v}$	Ohm	44.00	17.50
Winding inductance	L_{u-v}	mH	21.75	9.55
Rotor inertia without holding brake	J_M	$\times 10\text{-}4\ kg.m^2$	0.041	0.075
Rotor inertia with holding brake	J_M	$\times 10\text{-}4\ kg.m^2$	0.048	0.082
Mass without holding brake	m	Kg	0.45	0.55
Mass with holding brake	m	Kg	0.65	0.75
Thermal time constant		min-1	7	9
Maximum radial shaft load		N	78	78
Maximum axial shaft load		N	54	54

PRHD2 SIZE 40 TORQUE AND SPEED CHARTS

PH2-M04A230

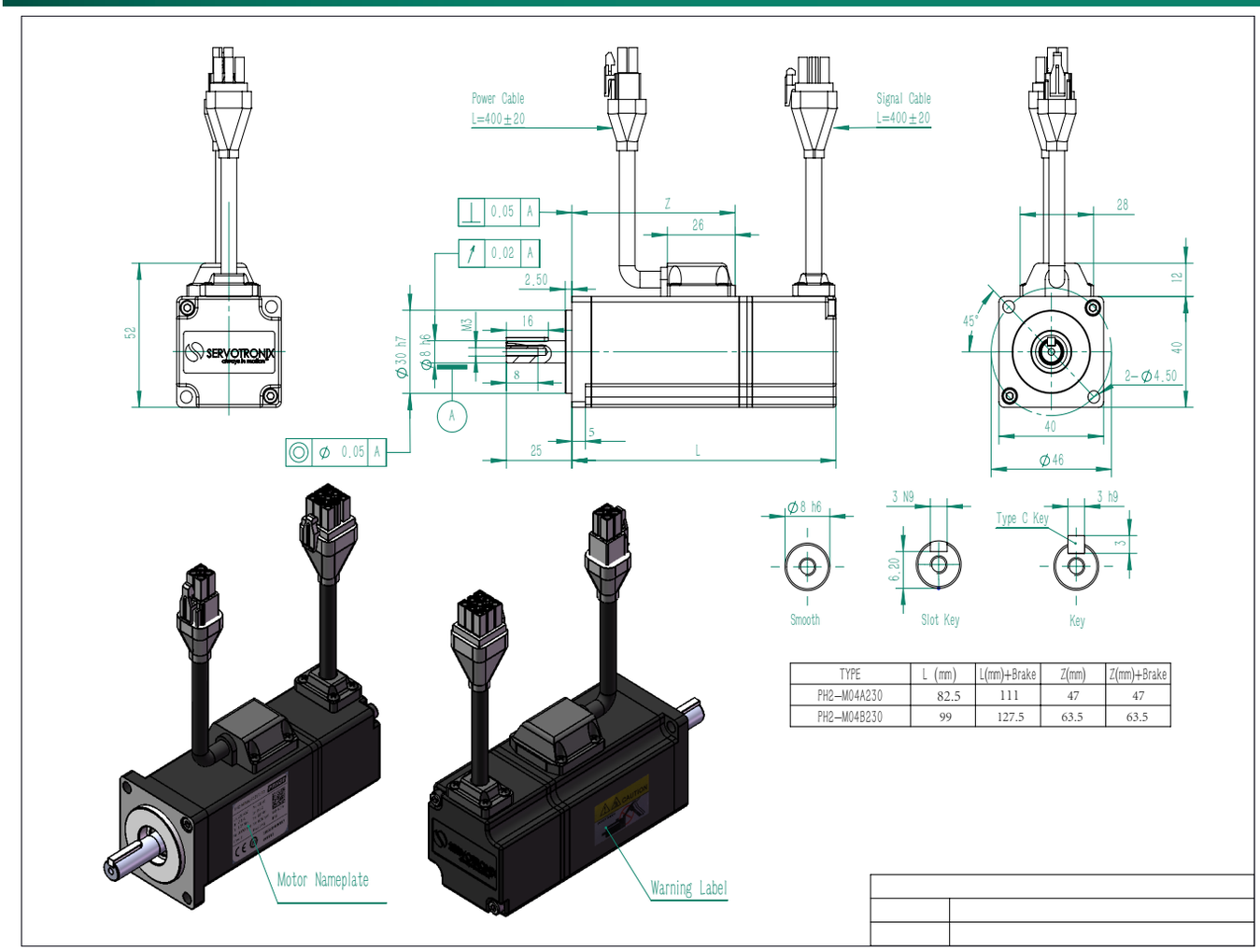


PH2-M04B230



Continuous torque
Peak operation

PRHD2 SIZE 40 DIMENSIONS



TYPE	L (mm)	L(mm)+Brake	Z(mm)	Z(mm)+Brake
PH2–M04A230	82.5	111	47	47
PH2–M04B230	99	127.5	63.5	63.5

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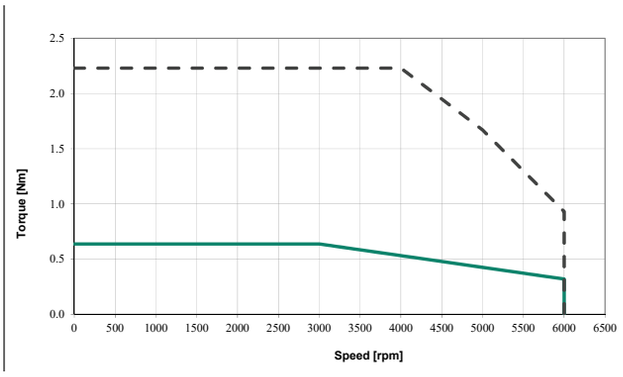
PRHD2 SIZE 60

TIME RATING	Continuous	AMBIENT TEMPERATURE	-10 ... + 40 °C
INSULATION CLASS	F	RELATIVE HUMIDITY	20 ... 80%
ENCLOSURE	Totally enclosed, Self cooled	POLES	10
PROTECTION CLASS	IP65	CERTIFICATION	CE

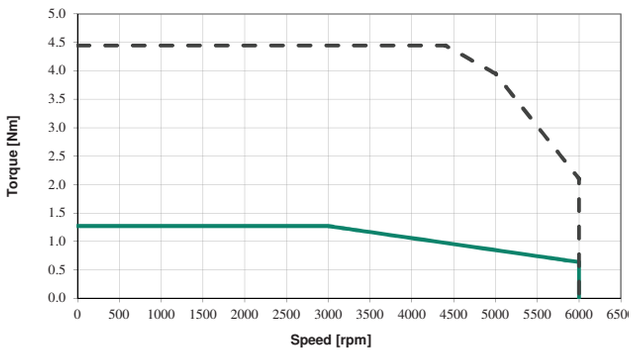
			PH2-M06A230	PH2-M06B230
Nominal torque	M_n	Nm	0.64	1.27
Peak torque	Tmax	Nm	1.9	3.8
Nominal speed of rotation	nN	min^{-1}	3000	3000
Maximum speed of rotation	n_{max}	min^{-1}	6000	6000
Nominal power	P_N	kW	0.2	0.4
Nominal current	I_N	A_{rms}	1.5	2.8
Maximum current	Imax	A_{rms}	4.5	8.4
Rated winding voltage	Un	V_{AC}	220	220
Maximum winding voltage	U_{max}	V_{DC}	340	340
Maximum voltage to ground		V_{AC}	240	240
Voltage constant	K_{eu-v}	V_{rms}/k_{rpm}	28.50	29.86
Torque constant	K_t	$N.m/A_{rms}$	0.43	0.454
Winding resistance	$R_{20\ u-v}$	Ohm	5.58	2.62
Winding inductance	L_{u-v}	mH	8.3	6.2
Rotor inertia without holding brake	J_M	$\times 10\text{-}4\ kg.m^2$	0.27	0.49
Rotor inertia with holding brake	J_M	$\times 10\text{-}4\ kg.m^2$	0.29	0.51
Mass without holding brake	m	Kg	1.1	1.6
Mass with holding brake	m	Kg	1.5	2.1
Thermal time constant		min^{-1}	8	10
Maximum radial shaft load		N	245	245
Maximum axial shaft load		N	75	75

PRHD2 SIZE 60 TORQUE AND SPEED CHARTS

PH2-M06A230

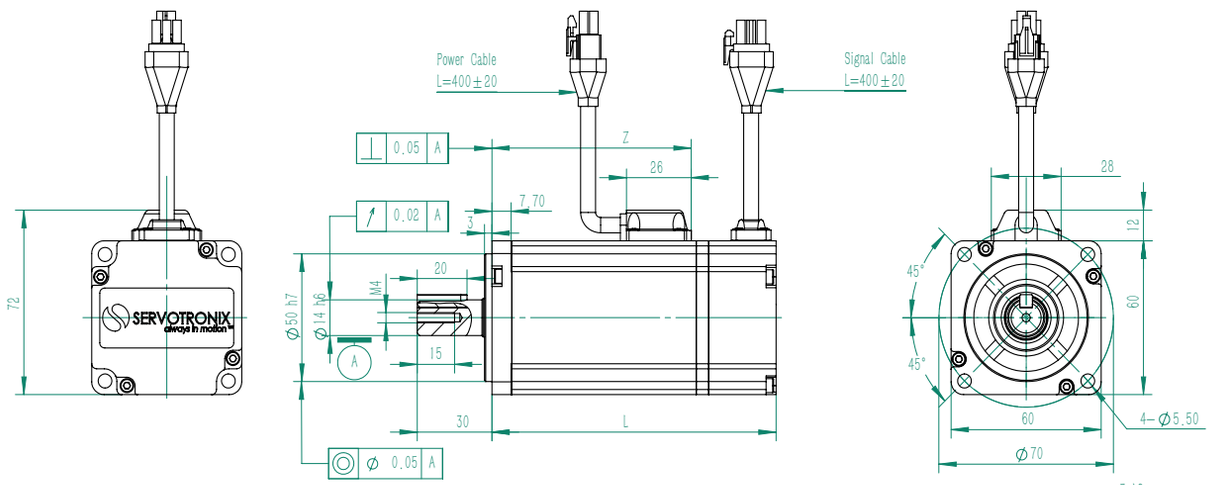


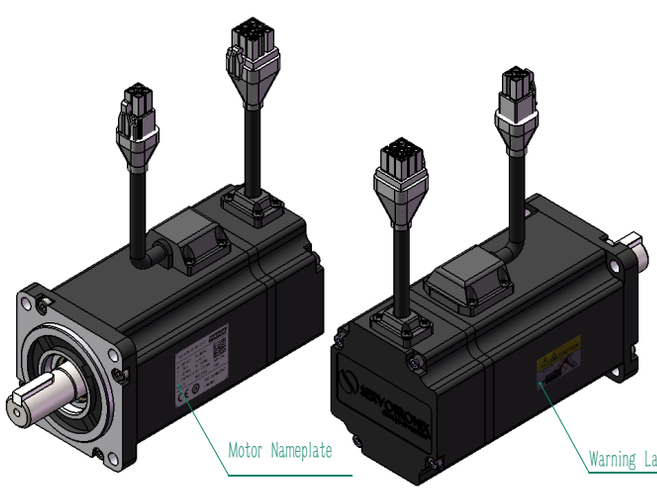
PH2-M06B230



Continuous torque
Peak operation

PRHD2 SIZE 60 DIMENSIONS





TYPE	L (mm)	L(mm)+Brake	Z(mm)	Z(mm)+Brake
PH2–M06A230	97	131	55	55
PH2–M06B230	120	154	78	78

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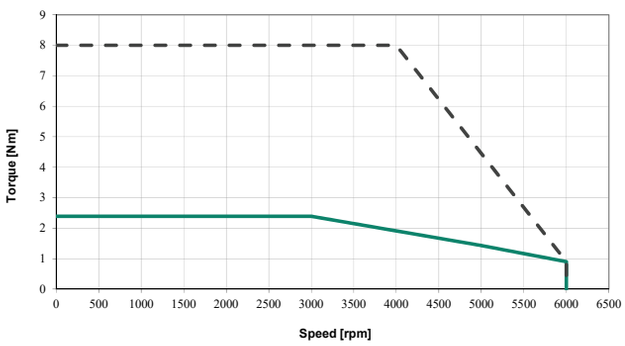
PRHD2 SIZE 80

TIME RATING	Continuous	AMBIENT TEMPERATURE -	10 ... + 40 °C
INSULATION CLASS	F	RELATIVE HUMIDITY	20 ... 80%
ENCLOSURE	Totally enclosed, Self cooled	POLES	10
PROTECTION CLASS	IP65	CERTIFICATION	CE

			PH2-M08A230
Nominal torque	M_n	Nm	2.39
Peak torque	Tmax	Nm	7.20
Nominal speed of rotation	nN	min^{-1}	3000
Maximum speed of rotation	n_{max}	min^{-1}	6000
Nominal power	P_N	kW	0.75
Nominal current	I_N	A_{rms}	4.5
Maximum current	Imax	A_{rms}	13.50
Rated winding voltage	Un	V_{AC}	220
Maximum winding voltage	U_{max}	V_{DC}	340
Maximum voltage to ground		V_{AC}	240
Voltage constant	K_{eu-v}	V_{rms}/k_{rpm}	34.10
Torque constant	K_t	$N.m/A_{rms}$	0.53
Winding resistance	$R_{20\ u-v}$	Ohm	0.99
Winding inductance	L_{u-v}	mH	3.4
Rotor inertia without holding brake	J_M	$\times 10\text{-}4\ kg.m^2$	1.61
Rotor inertia with holding brake	J_M	$\times 10\text{-}4\ kg.m^2$	1.65
Mass without holding brake	m	Kg	2.7
Mass with holding brake	m	Kg	3.3
Thermal time constant		min^{-1}	15
Maximum radial shaft load		N	392
Maximum axial shaft load		N	147

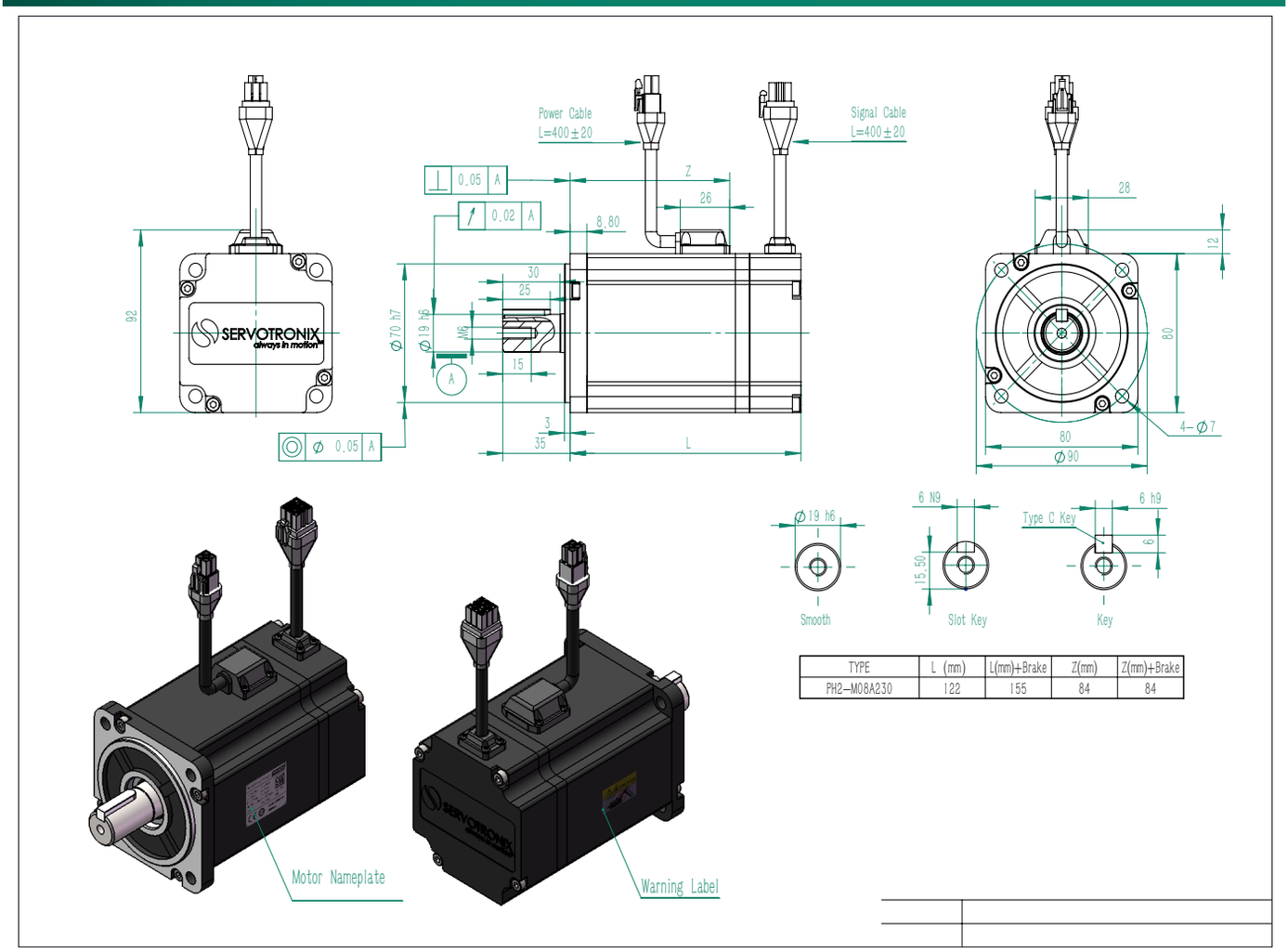
PRHD2 SIZE 80 TORQUE AND SPEED CHARTS

PH2-M08A230



Continuous torque
Peak operation

PRHD2 SIZE 80 DIMENSIONS



TYPE	L (mm)	L(mm)+Brake	Z(mm)	Z(mm)+Brake
PH2-M08A230	122	155	84	84

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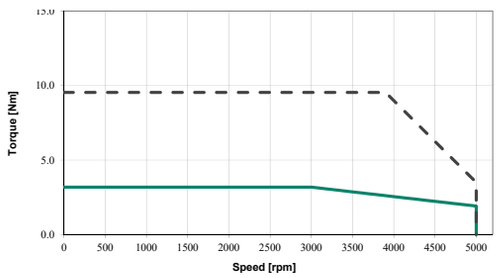
PRHD2 SIZE 100*

TIME RATING	Continuous	AMBIENT TEMPERATURE	-10 ... + 40 °C
INSULATION CLASS	F	RELATIVE HUMIDITY	20 ... 80%
ENCLOSURE	Totally enclosed, Self cooled	POLES	10
PROTECTION CLASS	IP65	CERTIFICATION	CE

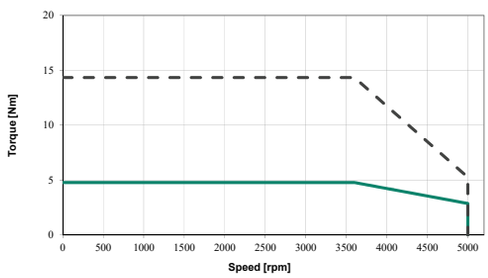
			PH2-L10A230	PH2-L10B230	PH2-L10C230
Nominal torque	M_n	Nm	3.18	4.78	6.37
Peak torque	Tmax	Nm	9.54	14.34	19.11
Nominal speed of rotation	nN	min^{-1}	3000	3000	3000
Maximum speed of rotation	n_{max}	min^{-1}	5000	5000	5000
Nominal power	P_N	kW	1.00	1.50	2.00
Nominal current	I_N	A_{rms}	6.00	9.40	12.00
Maximum current	Imax	A_{rms}	18.80	27.30	37.30
Rated winding voltage	Un	V_{AC}	220	220	220
Maximum winding voltage	U_{max}	V_{DC}	340	340	340
Maximum voltage to ground		V_{AC}	240	240	240
Voltage constant	K_{eu-v}	V_{rms}/k_{rpm}	36.50	34.90	36.50
Torque constant	K_t	$N.m/A_{rms}$	0.53	0.51	0.53
Winding resistance	$R_{20\ u-v}$	Ohm	0.684	0.38	0.296
Winding inductance	L_{u-v}	mH	4.98	3.02	2.47
Rotor inertia without holding brake	J_M	$\times 10\text{-}4\ kg.m^2$	2.0	3.0	4.0
Rotor inertia with holding brake	J_M	$\times 10\text{-}4\ kg.m^2$	2.4	3.4	4.4
Mass without holding brake	m	Kg	3.80	4.80	5.50
Mass with holding brake	m	Kg	4.80	5.80	6.50
Thermal time constant		min^{-1}	30.00	36.00	44.30
Maximum radial shaft load		N	490	490	490
Maximum axial shaft load		N	196	196	196

PRHD2 SIZE 100 TORQUE AND SPEED CHARTS

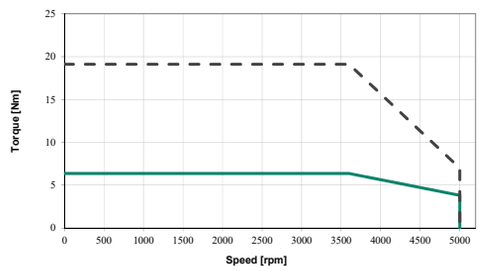
PH2-L10A230



PH2-L10B230

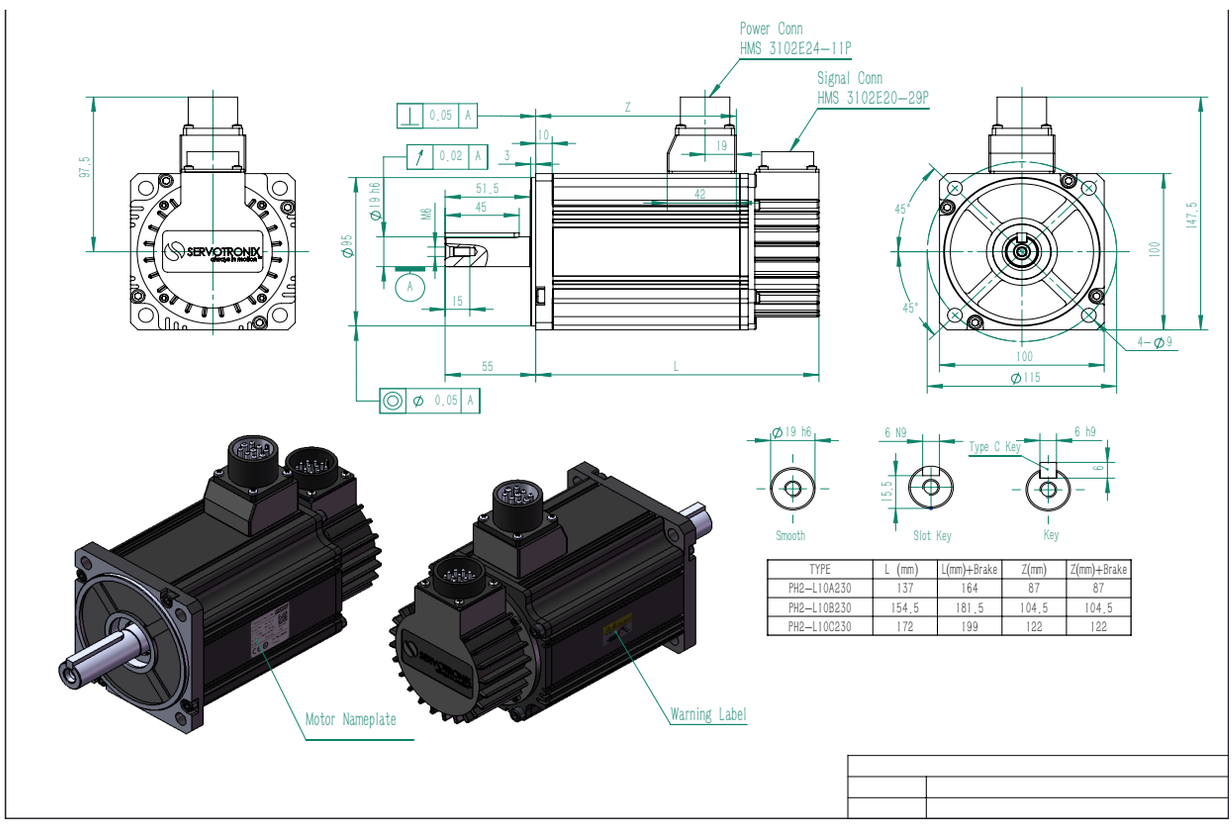


PH2-L10C230



Continuous torque
Peak operation

PRHD2 SIZE 100 DIMENSIONS



TYPE	L (mm)	L(mm)+Brake	Z(mm)	Z(mm)+Brake
PH2-L10A230	137	164	87	87
PH2-L10B230	154.5	181.5	104.5	104.5
PH2-L10C230	172	199	122	122

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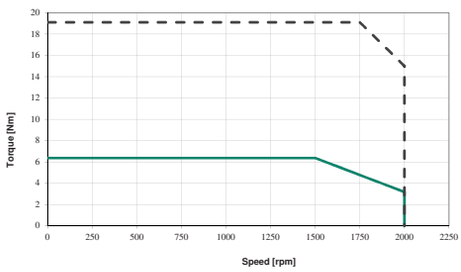
PRHD2 SIZE 130

TIME RATING	Continuous	AMBIENT TEMPERATURE	-10 ... + 40 °C
INSULATION CLASS	F	RELATIVE HUMIDITY	20 ... 80%
ENCLOSURE	Totally enclosed, Self cooled	POLES	10
PROTECTION CLASS	IP65	CERTIFICATION	CE

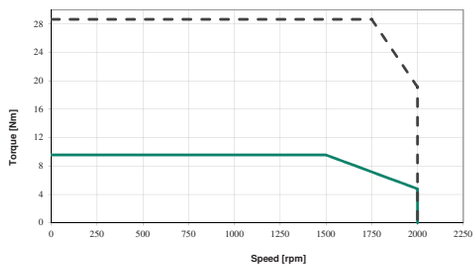
			PH2-M13A215	PH2-M13B215	PH2-M13B220
Nominal torque	M_n	Nm	6.37	9.55	9.55
Peak torque	Tmax	Nm	19.1	28.65	28.65
Nominal speed of rotation	nN	min^{-1}	1500	1500	2000
Maximum speed of rotation	n_{max}	min^{-1}	2000	2000	3000
Nominal power	P_N	kW	1	1.5	2
Nominal current	I_N	A_{rms}	5.6	8.7	12.7
Maximum current	Imax	A_{rms}	16.8	26.1	38.1
Rated winding voltage	Un	V_{AC}	220	220	220
Maximum winding voltage	U_{max}	V_{DC}	340	340	340
Maximum voltage to ground		V_{AC}	240	240	240
Voltage constant	K_{eu-v}	V_{rms}/k_{rpm}	74	74.38	54.5
Torque constant	K_t	$N.m/A_{rms}$	1.14	1.1	0.75
Winding resistance	$R_{20\ u-v}$	Ohm	0.89	0.59	0.28
Winding inductance	L_{u-v}	mH	9.9	7.1	3.6
Rotor inertia without holding brake	J_M	$\times 10\text{-}4\ kg.m^2$	8.45	12.32	12.97
Rotor inertia with holding brake	J_M	$\times 10\text{-}4\ kg.m^2$	8.6	12.5	13.16
Mass without holding brake	m	Kg	7.3	9.2	9.5
Mass with holding brake	m	Kg	10.1	11.5	11.9
Thermal time constant		min^{-1}	33	33	32
Maximum radial shaft load		N	686	686	686
Maximum axial shaft load		N	343	343	343

PRHD2 SIZE 130 TORQUE AND SPEED CHARTS

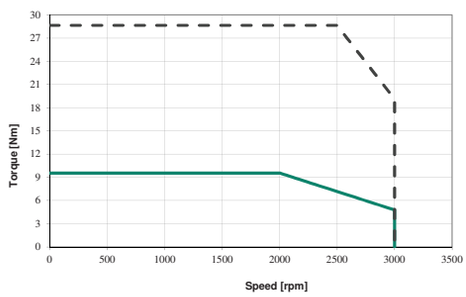
PH2-M13A215



PH2-M13B215

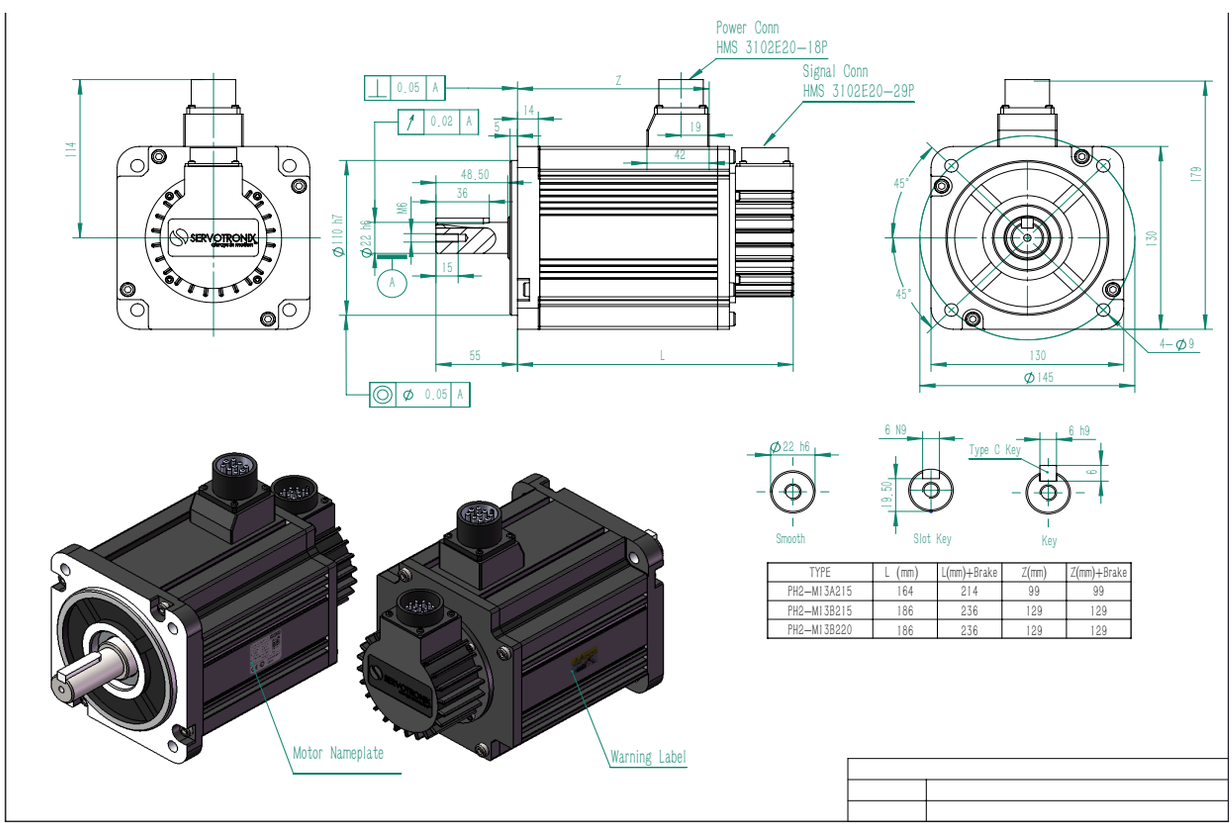


PH2-M13B220



Continuous torque
Peak operation

PRHD2 SIZE 130 DIMENSIONS



TYPE	L (mm)	L(mm)+Brake	Z(mm)	Z(mm)+Brake
PH2-M13A215	164	214	99	99
PH2-M13B215	186	236	129	129
PH2-M13B220	186	236	129	129

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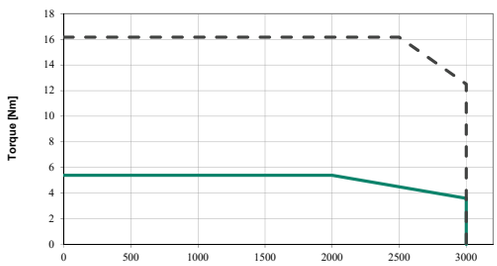
PRHD2 SIZE 130*

TIME RATING	Continuous	AMBIENT TEMPERATURE	-10 ... + 40 °C
INSULATION CLASS	F	RELATIVE HUMIDITY	20 ... 80%
ENCLOSURE	Totally enclosed, Self cooled	POLES	10
PROTECTION CLASS	IP65	CERTIFICATION	CE

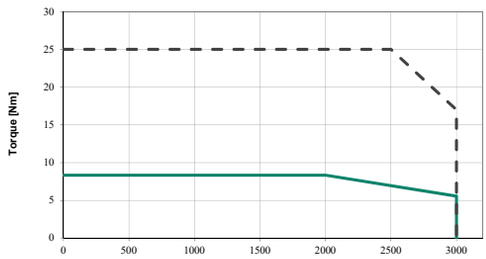
			PH2-M13C220	PH2-M13D220	PH2-M13E220
Nominal torque	M_n	Nm	5.39	8.34	11.50
Peak torque	Tmax	Nm	16.70	25.02	34.50
Nominal speed of rotation	nN	min^{-1}	2000	2000	2000
Maximum speed of rotation	n_{max}	min^{-1}	3000	3000	3000
Nominal power	P_N	kW	1.1	1.75	2.4
Nominal current	I_N	A_{rms}	7.5	11.6	15.6
Maximum current	Imax	A_{rms}	21.00	33.30	45.30
Rated winding voltage	Un	V_{AC}	220	220	220
Maximum winding voltage	U_{max}	V_{DC}	340	340	340
Maximum voltage to ground		V_{AC}	240	240	240
Voltage constant	K_{eu-v}	V_{rms}/k_{rpm}	54.60	55.00	53.00
Torque constant	K_t	$N.m/A_{rms}$	0.856	0.86	0.829
Winding resistance	$R_{20\ u-v}$	Ohm	0.818	0.488	0.31
Winding inductance	L_{u-v}	mH	5.48	3.68	2.54
Rotor inertia without holding brake	J_M	$\times 10\text{-}4\ kg.m^2$	12.5	18.50	24.2
Rotor inertia with holding brake	J_M	$\times 10\text{-}4\ kg.m^2$	14.5	20.5	26.2
Mass without holding brake	m	Kg	6.10	7.60	9.30
Mass with holding brake	m	Kg	8.10	9.70	11.40
Thermal time constant		min^{-1}	23	29	36
Maximum radial shaft load		N	490	686	980
Maximum axial shaft load		N	98	343	392

PRHD2 SIZE 130 TORQUE AND SPEED CHARTS

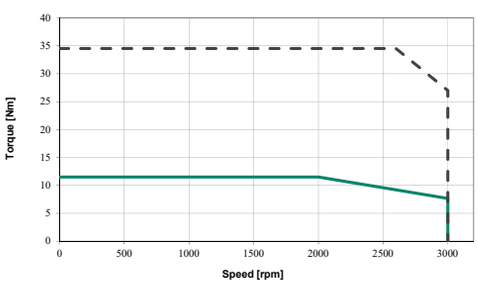
PH2-M13C220



PH2-M13D220

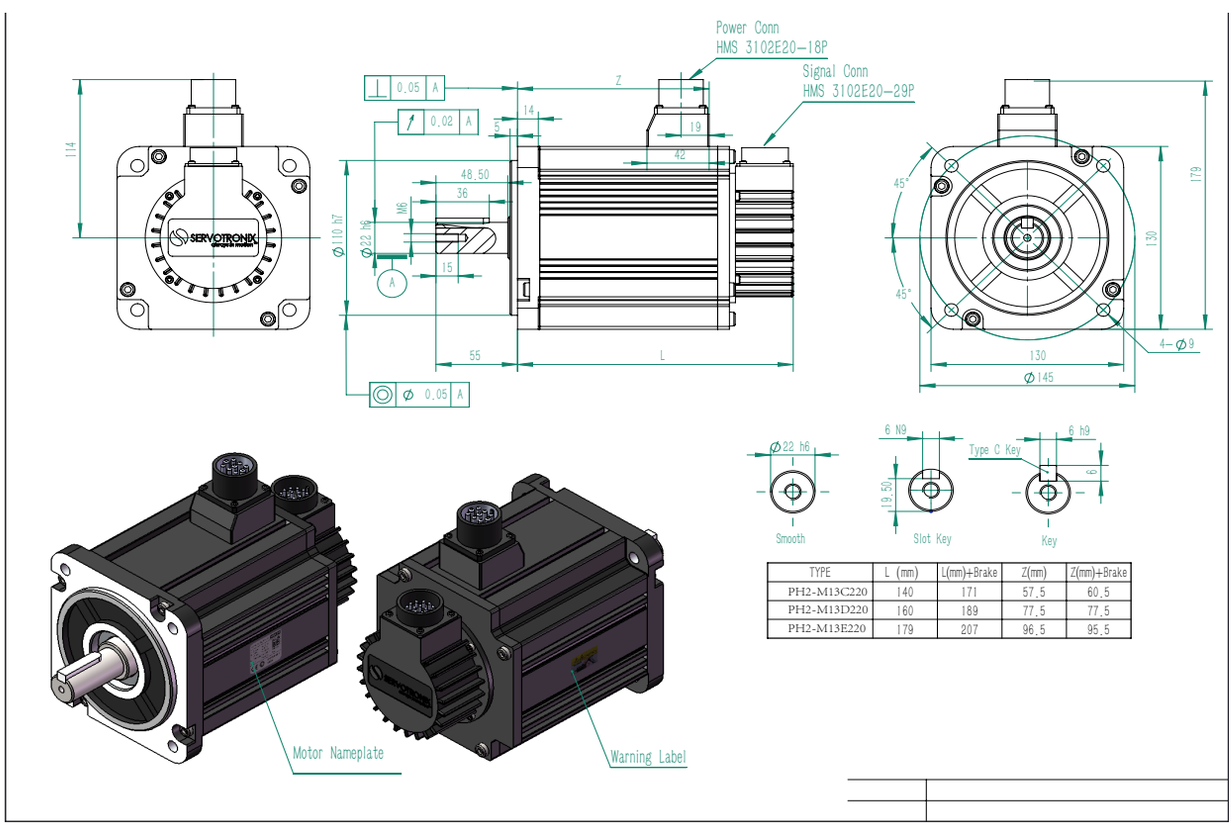


PH2-M13E220



Continuous torque
Peak operation

PRHD2 SIZE 130 DIMENSIONS



TYPE	L (mm)	L(mm)+Brake	Z(mm)	Z(mm)+Brake
PH2-M13C220	140	171	57.5	60.5
PH2-M13D220	160	189	77.5	77.5
PH2-M13E220	179	207	96.5	95.5

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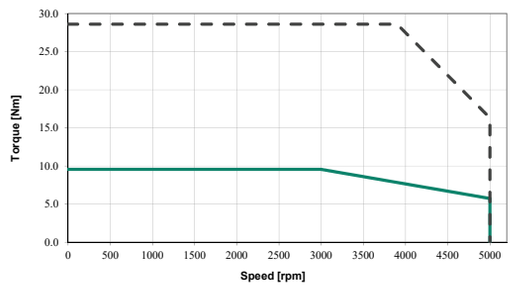
PRHD2 SIZE 130*

TIME RATING	Continuous	AMBIENT TEMPERATURE	-10 ... + 40 °C
INSULATION CLASS	F	RELATIVE HUMIDITY	20 ... 80%
ENCLOSURE	Totally enclosed, Self cooled	POLES	10
PROTECTION CLASS	IP65	CERTIFICATION	CE

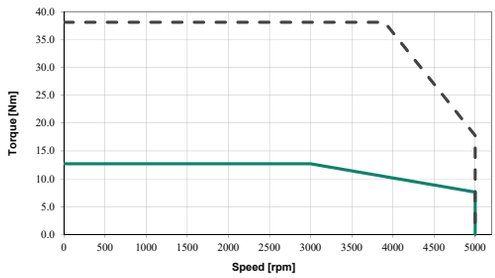
			PH2-L13A230	PH2-L13B230	PH2-L13C230
Nominal torque	M_n	Nm	9.55	12.70	15.90
Peak torque	Tmax	Nm	28.60	38.10	47.70
Nominal speed of rotation	nN	min^{-1}	3000	3000	3000
Maximum speed of rotation	n_{max}	min^{-1}	5000	5000	5000
Nominal power	P_N	kW	3.00	4.00	5.00
Nominal current	I_N	A_{rms}	18.50	23.60	29.00
Maximum current	Imax	A_{rms}	57.20	73.00	90.00
Rated winding voltage	Un	V_{AC}	220	220	220
Maximum winding voltage	U_{max}	V_{DC}	340	340	340
Maximum voltage to ground		V_{AC}	240	240	240
Voltage constant	K_{eu-v}	V_{rms}/k_{rpm}	35.80	39.00	39.00
Torque constant	K_t	$N.m/A_{rms}$	0.59	0.64	0.72
Winding resistance	$R_{20\ u-v}$	Ohm	0.153	0.068	0.054
Winding inductance	L_{u-v}	mH	1.68	1.22	0.96
Rotor inertia without holding brake	J_M	$\times 10\text{-}4\ kg.m^2$	9.61	12.00	14.68
Rotor inertia with holding brake	J_M	$\times 10\text{-}4\ kg.m^2$	10.60	13.80	16.60
Mass without holding brake	m	Kg	10.70	12.20	14.50
Mass with holding brake	m	Kg	12.50	14.00	16.10
Thermal time constant		min^{-1}	30	36	44.30
Maximum radial shaft load		N	784	784	784
Maximum axial shaft load		N	343	343	343

PRHD2 SIZE 130 TORQUE AND SPEED CHARTS

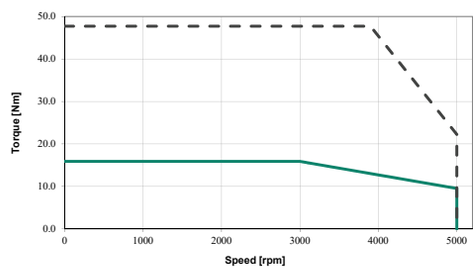
PH2-L13A230



PH2-L13B230

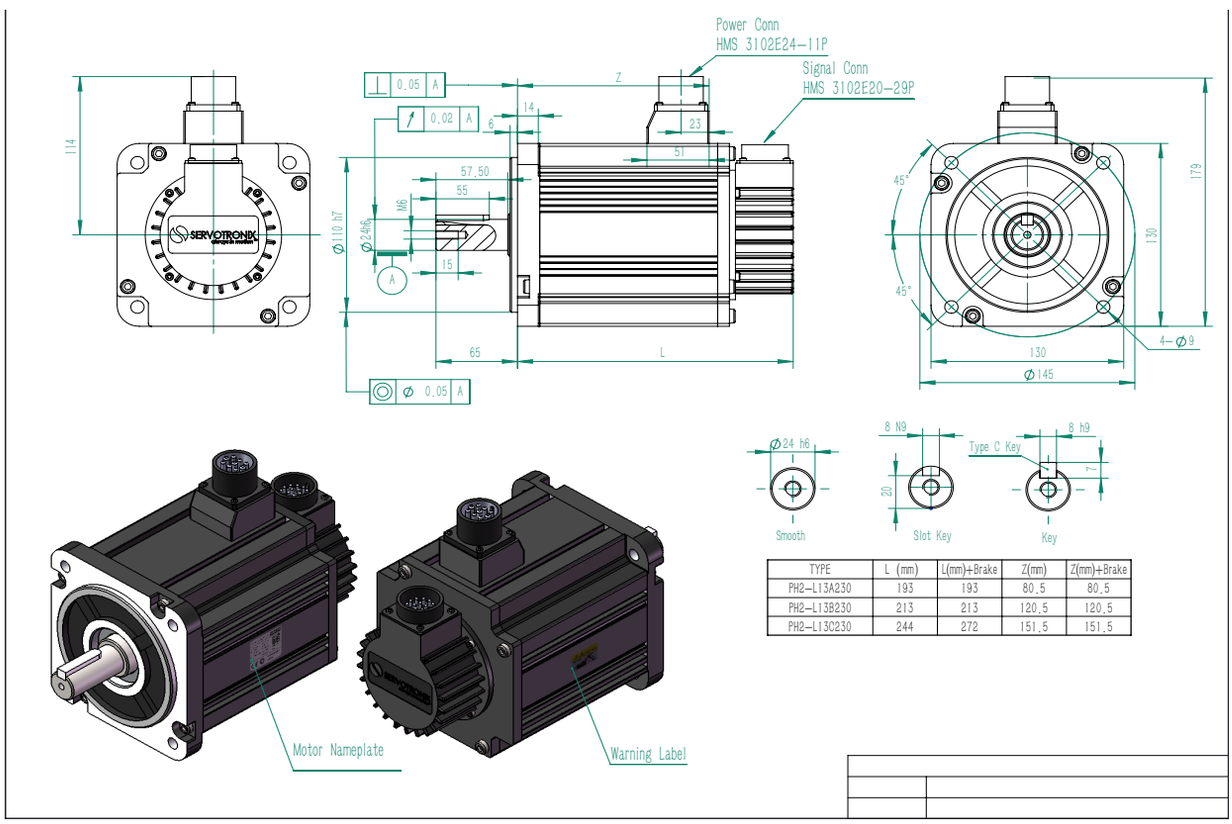


PH2-L13C230



Continuous torque
Peak operation

PRHD2 SIZE 130 DIMENSIONS



TYPE	L (mm)	L(mm)+Brake	Z(mm)	Z(mm)+Brake
PH2-L13A230	193	193	80.5	80.5
PH2-L13B230	213	213	120.5	120.5
PH2-L13C230	244	272	151.5	151.5

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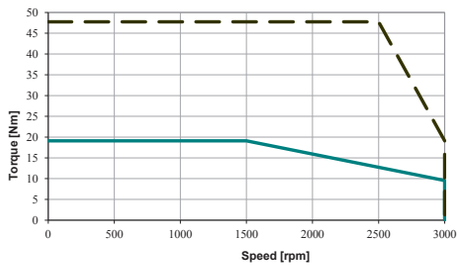
PRHD2 SIZE 180

TIME RATING	Continuous	AMBIENT TEMPERATURE	-10 ... + 40 °C
INSULATION CLASS	F	RELATIVE HUMIDITY	20 ... 80%
ENCLOSURE	Totally enclosed, Self cooled	POLES	10
PROTECTION CLASS	IP65	CERTIFICATION	CE

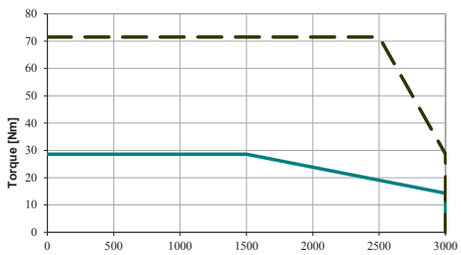
			PH2-M18A215	PH2-M18B215	PH2-M18C215	PH2-M18D215
Nominal torque	M_n	Nm	19.1	28.6	35	48
Peak torque	Tmax	Nm	47.75	71.5	87.5	120
Nominal speed of rotation	nN	min^{-1}	1500	1500	1500	1500
Maximum speed of rotation	n_{max}	min^{-1}	3000	3000	3000	3000
Nominal power	P_N	kW	3	4.5	5.5	7.5
Nominal current	I_N	A_{rms}	21.9	32.2	41	55.1
Maximum current	Imax	A_{rms}	55.87	82.14	104.59	140.56
Rated winding voltage	Un	V_{AC}	220	220	220	220
Maximum winding voltage	U_{max}	V_{DC}	340	340	340	340
Maximum voltage to ground		V_{AC}	240	240	240	240
Voltage constant	K_{eu-v}	V_{rms}/k_{rpm}	55.53	56.73	55.00	55.87
Torque constant	K_t	$N.m/A_{rms}$	0.872	0.888	0.854	0.871
Winding resistance	$R_{20\ u-v}$	Ohm	0.118	0.074	0.049	0.038
Winding inductance	L_{u-v}	mH	2.4	1.5	0.6	0.48
Rotor inertia without holding brake	J_M	$\times 10\text{-}4\ kg.m^2$	42.40	62.30	84.10	122
Rotor inertia with holding brake	J_M	$\times 10\text{-}4\ kg.m^2$	49.4	69.30	91.1	129
Mass without holding brake	m	Kg	18	24	30	36
Mass with holding brake	m	Kg	23	29	35	41
Thermal time constant		min^{-1}	37	48	55	65
Maximum radial shaft load		N	1470	1470	1764	1764
Maximum axial shaft load		N	490	490	588	588

PRHD2 SIZE 180 TORQUE AND SPEED CHARTS

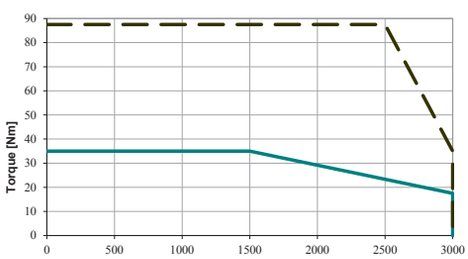
PH2-M18A215



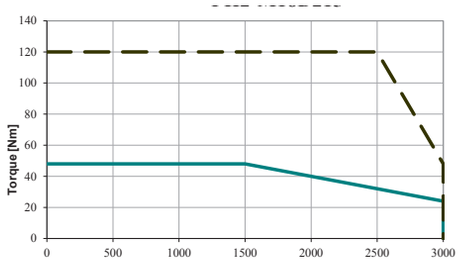
PH2-M18B215



PH2-M18C215



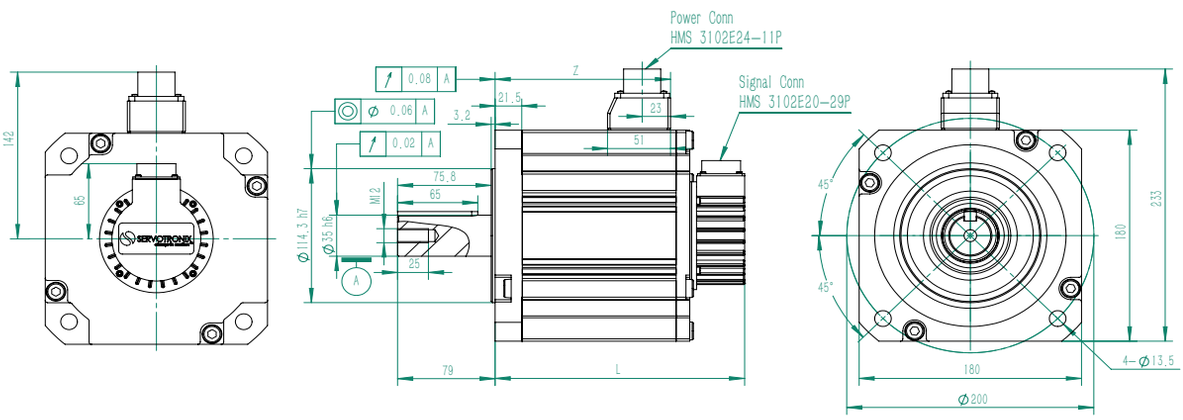
PH2-M18D215

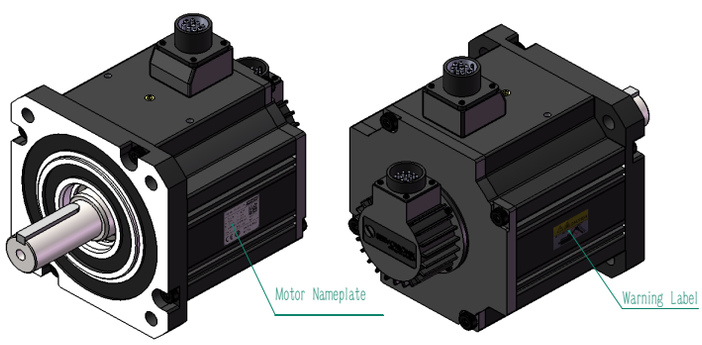


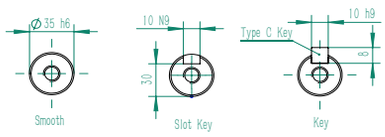
Continuous torque
Peak operation

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PRHD2 SIZE 180 AB DIMENSIONS

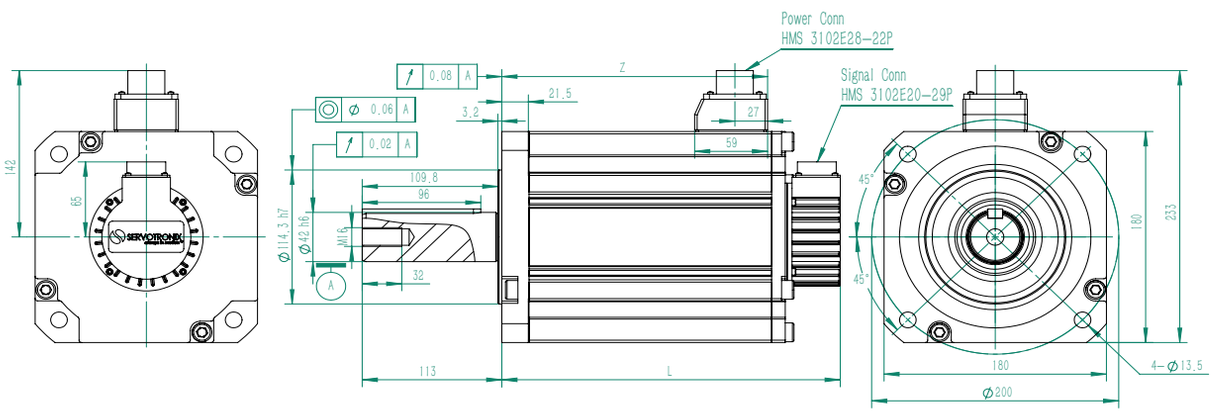


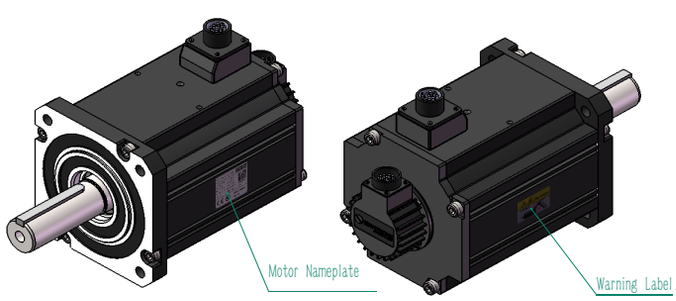


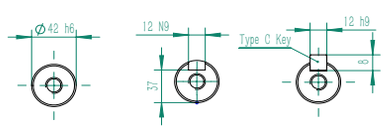


TYPE	L (mm)	L(mm)+Brake	Z(mm)	Z(mm)+Brake
PH2-M18A215	202	251	142	142
PH2-M18B215	235	284	175	175

PRHD2 SIZE 180 CD DIMENSIONS







TYPE	L (mm)	L(mm)+Brake	Z(mm)	Z(mm)+Brake
PH2-M18C215	274	317	215	209
PH2-M18D215	329	355	250	247

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ABSOLUTE MOTOR FEEDBACK SYSTEM



The reduced mechanical complexity of the sensAR™ rotary encoder improves compactness and durability, while ensuring high resolution and accuracy.

Simplicity

The sensAR™ magnetic absolute encoder features a simple mechanical design that allows the same level of resolution and accuracy as optical absolute encoders without the complexity.

Single track magnetic system

The Gray code is obtained on a single track, while other encoders tend to use at least two tracks (absolute and incremental) and an array of sensors.

The sensAR™ offers a 20 bit resolution

The sensAR™ offers a resolution of up to 20 bit and an accuracy of up to ±72 arc/sec. Advanced signal processing applies a unique patented method, where a digital position code is associated with a set of analog signals that represents a high resolution and accurate absolute angular position.

Robustness

Featuring only few mechanical components and no optical elements, sensAR™ is less sensitive to contamination, shock, vibration and mechanical tolerance deviations. It is also more durable (e.g. no component degradation over time), in particular when compared to optical encoders. Furthermore, lifetime expectancy of the encoder is higher due to the elimination of both optical components and bearings.

Key benefits

- Simple and compact mechanical design
- Operating temperature range of 20...125°C
- Robustness to contamination, shock and vibration
- Less sensitive to mechanical deviation
- Position / velocity feedback
- Four wire serial communication interface
- Electronic type-plate
- Fully digital
- Built-In thermal sensor
- Complete in-house technology

BRAKE FEATURES

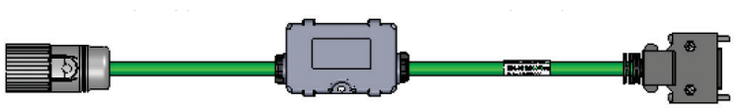
		PH2-x04	PH2-x06	PH2-x08	PH2-x10	PH2-x13	PH2-x18
Operating motor temperature	°C	-20 …+120	-20 …+120	-20 …+120	-20 …+120	-20 …+120	-20 …+120
External ambient temperature	°C	-20 …+40	-20 …+40	-20 …+40	-20 …+40	-20 …+40	-20 …+40
Standard brake duty		Stationary	Stationary	Stationary	Stationary	Stationary	Stationary
Min. dry stat. torque (@-20..120°C)	Nm	0.32	1.3	2.5	6.5	9.6	48
Nominal operation voltage	Vdc	24±10%	24±10%	24±10%	24±10%	24±10%	24±10%
Power consumption (@20°)	W	4.35±7%	11.2±7%	10.2±7%	10.4±7%	19.7±7%	49.6±7%
Release time	ms	22	58	46	49	71	120
Brake release time (pull in)	ms	77	25	58	30	39	37
Backlash (max)	degree	1.2	1.2	1.2	1.2	1.2	1.2

BATTERY COMPARTMENT FOR SENSAR ENCODER

The sensAR™ magnetic absolute rotary encoder requires an external backup battery to maintain the multi-turn position when 5V from the main power supply to the encoder is disconnected or disrupted.

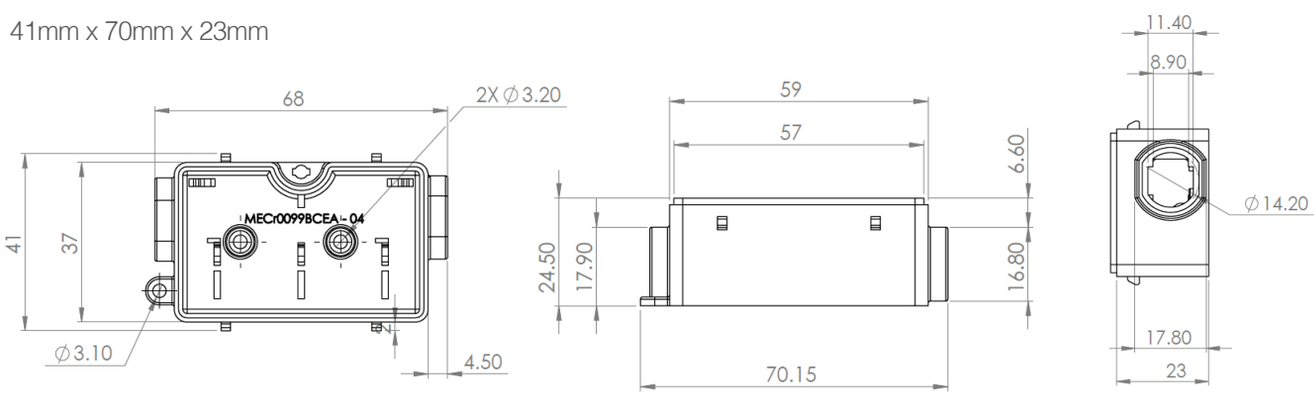
The BCM-M3 is a battery compartment for sensAR™ encoder models SE36E-M34 and SE36E-M36. It is designed for installation on the encoder feedback cable. The battery compartment comprises an enclosure and an electronic board whose function is to regulate the power supply to the encoder.

Example of feedback cable with BCM-M3 battery compartment

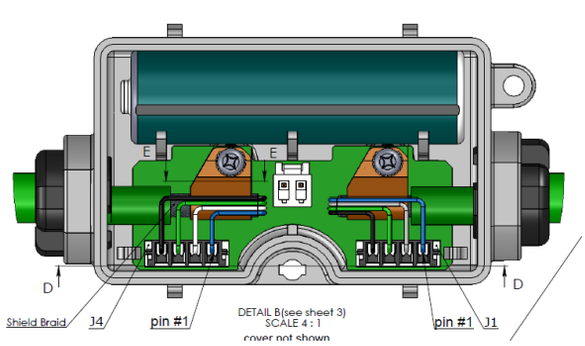


Dimensions

41mm x 70mm x 23mm



Connectors



Pin	Function	Notes
1	5V	J1 and J4 havethe same pinout. J1 must be connected to the drive. J4 must be connected to the encoder.
2	GND	
3	Data+	
4	Data-	

Specification

Battery	
Dimensions	50.1 mm x 14.5 mm
Lifetime	5–7 years
Nominal capacity	2.4Ah
Nominal voltage	3.6V
Operating temperature	-55 to +85°C
Cable	
Wires and Gauge	Twisted pairs, AWG 24 (0.21mm^2)
Cable Jacket Diameter	∅ 6.5–7.3mm
Overall Shield	Tinned copper braid; coverage > 85%

Ordering Information

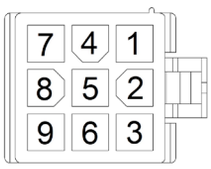
Part Number	Description
BCM-M300	Compartment and backup battery for sensAR Magnetic AbsoluteMulti-Turn Encoders. MOQ 10 units.
KITr99BCB00A-00	Backup battery

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WIRING MOTOR CONNECTIONS

D type, AMP

P/N: AMP-172169-1
P/N: Pin 770835-1



Motors: PH2-M04 ,PH2-M06, PH2-M08

Feedback type: S3 and M3 (sensAR)

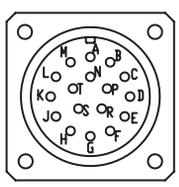
Motor Connector	Signal Name	Drive Connector	Twisted Pair
1	DATA +	1	T/P
2	DATA -	14	
3	N.C.		
4	N.C.		
5	N.C.		
6	5V	11	T/P
7	GND	24	
8	Shield	26	
9	N.C.		

Feedback type: T1, T2, T4 (Tamagawa)

Motor Connector	Signal Name	Drive Connector	Twisted Pair
1	DATA +	1	T/P
2	DATA -	14	
3	N.C.		
4	VB		
5	GND		
6	5V	11	T/P
7	GND	24	
8	Shield	26	
9	N.C.		

A type MIL

P/N: HMS3102E20-29P



Motors: PH2-L10, PH2-L13, PH2-M18

Feedback type: S3 and M3 (sensAR)

Motor Connector	Signal Name	Drive Connector	Twisted Pair
A, B, C, D	N.C.		
E	DATA +	1	T/P
F	DATA -	14	
G	GND	24	T/P
H	5V	11	
J	Shield	26	
K, L, M, N, P, R, S, T,	N.C.		

Feedback type: T1, T2, T4 (Tamagawa)

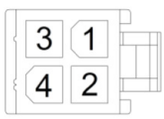
Motor Connector	Signal Name	Drive Connector	Twisted Pair
A, B, C, D	N.C.		
E	DATA +	1	T/P
F	DATA -	14	
G	GND	24	T/P
H	5V	11	
J	Shield	26	
K, L, M, N, P, R	N.C.		
S	GND		
T	VB		

WIRING MOTOR CONNECTIONS

Motor power connector without brake

D type AMP 4 poles

P/N: AMP-172167-1
P/N: Pin 770903-1



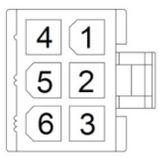
Motors: PH2-M04, PH2-M06, PH2-M08

Motor Connector	Signal Name
1	U
2	V
3	W
4	PE

Motor power connector with brake

D type AMP 6 poles

P/N: AMP-172168-1
P/N: Pin 770903-1



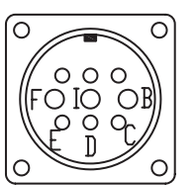
Motors: PH2-M04, PH2-M06, PH2-M08

Motor Connector	Signal Name
1	U
2	V
4	W
5	PE
3	Brake_24V
6	Brake_0V

Motor power connector without brake

A type MIL

P/N: HMS3102E20-18P



Motors: PH2-M13, PH2-L10,

Motor Connector	Signal Name
E	PE
F	U
I	V
B	W
C	N/A
D	N/A

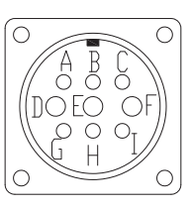
Motor power connector with brake

Motor Connector	Signal Name
E	PE
F	U
I	V
B	W
C	Brake_24V
D	Brake_0V

Motor power connector without brake

A type MIL

P/N: HMS3102E243-11P



Motors: PH2-M18A, PH2-M18B,

Motor Connector	Signal Name
F	U
E	V
D	W
G	PE
H	N/A
I	N/A

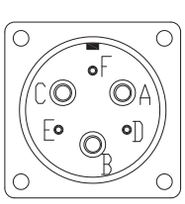
Motor power connector with brake

Motor Connector	Signal Name
F	U
E	V
D	W
G	PE
H	Brake_24V
I	Brake_0V

Motor power connector without brake

A type MIL

P/N: HMS3102E28-22P



Motors: PH2-M18C, PH2-M18D,

Motor Connector	Signal Name
A	U
B	V
C	W
D	PE
E	N/A
F	N/A

Motor power connector with brake

Motor Connector	Signal Name
F	U
E	V
D	W
G	PE
H	Brake_24V
I	Brake_0V

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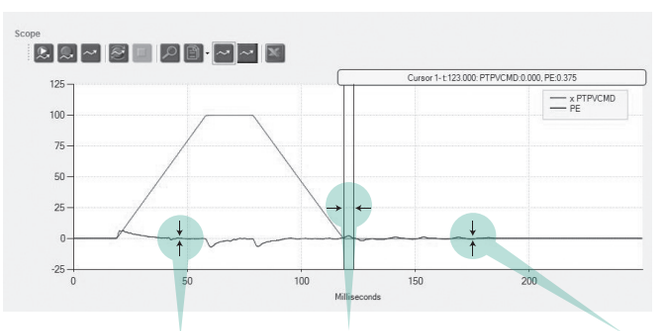
CDHD2 High-Performance Servo Drives

CDHD2 is the second generation of the CDHD servo drive family. It features ease of use and advanced control algorithms. The comprehensive feature set of the CDHD2 allows to build more accurate and more efficient machines.



HD control loop optimizing servo control

An adaptive non-linear control algorithm was developed to optimize servo performance in high precision motion applications. This proprietary algorithm uses a parallel configuration, in which position and velocity branches are on the same level and executed in each sampling period. A variable gain parameter is introduced and automatically optimized for high gain and stability. As a result, position error and settling time are minimized to levels far superior to those of other controllers.



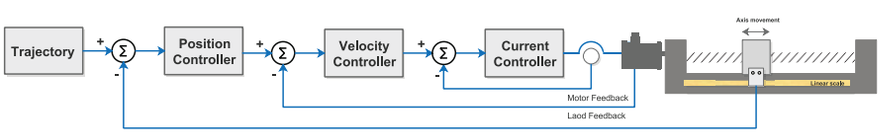
Minimum position error **Settling time of almost zero** **No oscillations at stand-still**

High bandwidth current loop achieves and industry-leading frequency response

The current loop design achieves an outstanding frequency response of 3-5 kHz. High sampling rates and flexible filtering options provide a faster response, and ensure maximum machine accuracy and throughput.

Dual loop control to eliminate mechanical errors and increase system stability

A dual loop position and velocity controller is used to improve the performance of the complete motion system. CDHD2 supports linear and rotary secondary encoders, both incremental and absolute. The dual loop control is an integral feature of the CDHD2 family and does not require an additional add-on option card.



Position compare output to synchronize motor position to sensors and other triggering devices

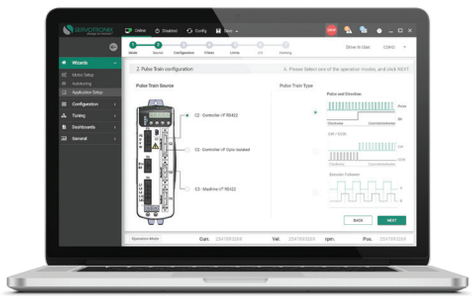
Position compare output allows fast synchronization of an actual position to the machine process. Operation of triggering devices such as cameras, barcode readers, printing heads, laser guns can be controlled directly by the drive. This ensures a precise synchronization to the actual motor position, even at full speed. The propagation delay is less that 1 µs, which allows to significantly increase the throughput of the machine.

KEY BENEFITS

- High performance control of all synchronous servo motors
- Interfaces multiple feedback devices
- Secondary encoder interface for closed dual loop control
- Built in operator panel for drive configuration and diagnostics
- Position compare output module
- Advanced control algorithms achieve maximum machine accuracy and throughput
- High power density in a small footprint
- Safe Torque Off (STO)
- Simple commissioning with new ServoStudio™ 2.0 GUI along with comprehensive parameterization options for optimal configuration
- Competitive price
- 30-month warranty
- Input voltage support: 20 V up to 480 V

ServoStudio™ wizard for simple commissioning

- Step-by-step guidance through the motor setup, application configuration and tuning process
- Innovative and self explanatory user interface
- Excellent results for novice users within minutes
- Real-time data recording and plotting
- Easy integration of servo axes
- Plug-and-play motor library



Rating and dimensions

Model	Input Voltage	Input Power Main Circuit	Continuous Current (A_{rms})	Peak Current (A_{rms})	Width (mm)	Height (mm)	Depth (mm)
CDHD2-003	20–90 VDC	1 phase	3	9	36	167	104
CDHD2-006	20–90 VDC	1 phase	6	18	36	167	104
CDHD2-012	20–90 VDC	1 phase	12	24	36	167	104
CDHD2-1D5	120/240 VAC	1 phase	1.5	4.5	43.2	150	143.7
CDHD2-003	120/240 VAC	1 phase	3	9	43.2	150	143.7
CDHD2-4D5	120/240 VAC	1/3 phase	4.5	18	54.7	150	167.4
CDHD2-006	120/240 VAC	1/3 phase	6	18	54.7	150	167.4
CDHD2-008	120/240 VAC	1/3 phase	8	28	61.8	170	181.6
CDHD2-010	120/240 VAC	1/3 phase	10	28	61.8	170	181.6
CDHD2-013	120/240 VAC	3 phase	13	28	61.8	170	181.6
CDHD2-020	120/240 VAC	3 phase	20	60	117.4	233.8	193.5
CDHD2-024	120/240 VAC	3 phase	24	72	117.4	233.8	193.5
CDHD2-033	120/240 VAC	3 phase	33	130	157.6	304.3	220.4
CDHD2-044	120/240 VAC	3 phase	44	130	157.6	304.3	220.4
CDHD2-055	120/240 VAC	3 phase	55	130	157.6	304.3	220.4

Communication:

CANopen®*
EtherCAT®*
USB*
RS232
Daisy Chain

Motor feedback:

sensAR Absolute Encoder
Incremental Encoder
Hall Sensors
Resolver*
Sine Encoder (e.g., EnDat®, HIPERFACE®)
SSI Encoder (e.g., EnDat®, Nikon®, Tamagawa®)
Motor Temperature

I/Os:*

Digital: 11 x Input, 6 x Output
Analog: 1 x Input or 2 x Input*, 1 x Output
Pulse & Direction
Equivalent Encoder Output
Secondary Feedback
Fault Output Relay

*Some features are not available on all models.



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Ordering Information

		CDHD2	–	006		2A		AP1	–	RO		000
	CDHD2 Servo Drive – HD Series											

Rating

	120 / 240 VAC (MV)		20–48 / 90 VDC (LV)	
	Cont. [A rms]	Peak [A rms]	Cont. [A rms]	Peak [A rms]
1D5	1.5	4.5		
003	3	9	3	9
4D5	4.5	18		
006	6	18	6	18
008	8	28		
010	10	28		
012			12	24
013	13	28		
015			15	30
020	20	60		
024	24	72		
033	33	130		
044	44	130		
055	55	130		

	Input Power Supply
1D	Low Voltage Input Power Supply • 20–90 VDC for motor power (for 3A–12A models) • 20–48 VDC for motor power (for 15A model) • 20–48 VDC (optional) for logic power
2A	Medium Voltage Input Power Supply • Single Phase 120 L-N VAC +10% -15% 50/60 Hz • Single Phase 240 L-N VAC +10% -15% 50/60 Hz • Three Phase 120-240 L-L VAC +10% -15% 50/60 Hz

	Communication Interfaces	**Analog Inputs**
APx	Analog Voltage, Pulse Train, RS232.	1* or 2
AFx	CANopen, Analog Voltage, Pulse Train, USB, RS232	1* or 2
ECx	EtherCAT, Analog Voltage, Pulse Train, USB, RS232	1 or 2*
EB2	EtherCAT, USB.	2
	x = 1: One analog input, 16 bit x = 2: Two analog inputs, 14 bit each	* Standard configuration
	AF1 and EC2 options only for LV and MV-33/44/55 models	

	Motor Type
[*blank*]	Rotary and linear servo motors
RO	Rotary servo motors. Available in Asia market only.

	Special Options
[*blank*]	Standard

CDHD2



Supports a wide range of applications and requirements

CDHD2 supports a wide range of applications, covering a variety of industries.
It can be coupled with any servo motor type, including rotary and linear
brushless DC motors, as well as DC brush motors.
Connectivity to controller is available through Analog Command,
Pulse & Direction, CANopen® and EtherCAT®.

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DDHD High-Performance Dual Axis Servo Drive

Superior servo performance and compact footprint make the DDHD dual axis drive the ideal cost-saving solution for low and medium voltage applications.



Powerful performance while reducing system costs

Evolved from Servotronix successful CDHD servo drive, the DDHD dual axis servo drive is designed on the same platform and utilizes the same powerful HD control algorithms. Shared components and optimized wiring reduce costs by 20% per axis as compared to systems with two independent drives.

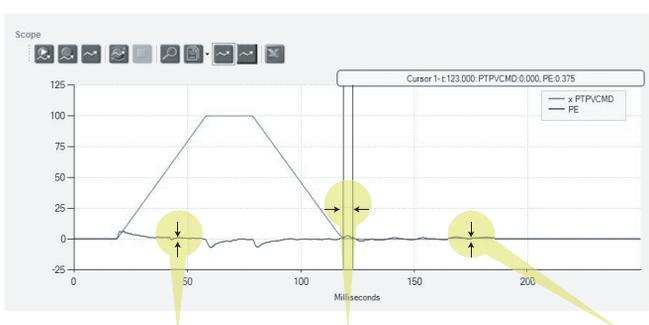


Maximum machine accuracy and throughput

New current loop design achieves an industry-leading Frequency response of 3-5 kHz.

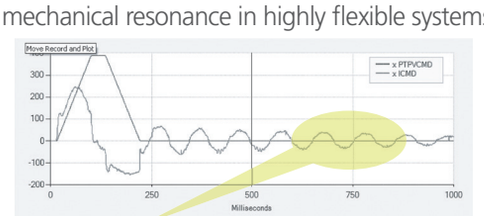


Advanced autotuning minimizes position error and settling time to almost zero.

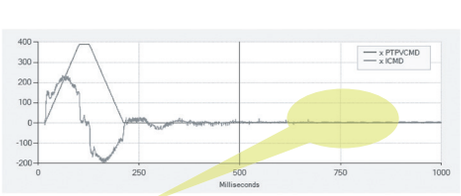


Minimum position error **Settling time of almost zero** **No oscillations at stand-still**

Active non-linear anti-vibration control algorithm eliminates mechanical resonance in highly flexible systems.



Without anti-vibe control



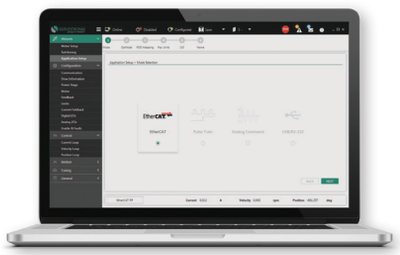
With anti-vibe control

KEY BENEFITS

- Up to 20% lower cost per axis due to shared components and less wiring
- High performance control of synchronous servo motors
- Reference command: EtherCAT, CANopen, Analog, Pulse train
- I/O programming
- Interfaces multiple feedback devices
- Share AC input and regeneration, for energy efficiency
- Simple commissioning using ServoStudio™ GUI
- Exclusive 30-month warranty

ServoStudio™ wizard for simple commissioning

- Step-by-step guidance through setup and tuning process
- Excellent results for novice users within minutes
- Real-time data recording and plotting
- Easy integration of servo axes
- Plug-and-play motor and feedback wiring



Model	Input Voltage (VAC)	Input Current Main Circuit	Continuous Current (Arms)	Peak Current (Arms)	120 VAC Typical Motor Output (W)	240 VAC Typical Motor Output (W)	Width (mm)	Height (mm)	Depth (mm)
DDHD-1D81D8	120/240	1 Phase	1.8/1.8	6.5/6.5	100/100	200/200	83.5	175.5	169.4
DDHD-3D43D4	120/240	1 Phase	3.4/3.4	12.3/12.3	200/200	400/400	83.5	175.5	169.4
DDHD-4D54D5	120/240	1 Phase	4.5/4.5	13.5/13.5	350/350	750/750	83.5	175.5	169.4
DDHD-3D46D8	120/240	1/3 Phase	6.8/3.4	18/12.3	250/500	500/1000	83.5	175.5	169.4

Communication:
EtherCAT
CANopen
RS232
Daisy Chain

Motor feedback:
Incremental Encoder
Hall Sensors
SSI Encoder (e.g. EnDat®, Nikon®, Tamagawa®)
Motor Temperature

I/Os:
Digital: 8 x Input, 10 x Output
Analog : 2 x Input
2 x Pulse & Direction
2 x Equivalent Encoder Output

Ordering information

	DDHD	–	3D46D8		AP	–	RO

DDHD Servo Drive – HD Series

Rating

	Axis 1		Axis 2	
	Cont. [A rms]	Peak [A rms]	Cont. [A rms]	Peak [A rms]
1D81D8	1.8	6.5	1.8	6.5
3D43D4	3.4	12.3	3.4	12.3
4D54D5	4.5	13.5	4.5	13.5
3D46D8	6.8	18.0	3.4	12.3

Communication Interfaces

AP	Analog Voltage, Pulse Train References, RS232
AF	CANopen, Analog Voltage, Pulse Train, RS232
EC	EtherCAT, Analog Voltage, Pulse Train, RS232, USB

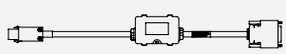
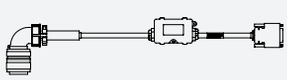
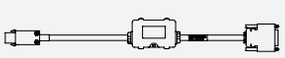
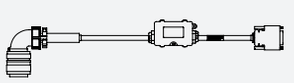
Motor Type

[*blank*]	Rotary and linear servo motors
-RO	Rotary servo motors. *Available in Asia market only.*



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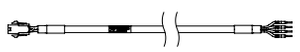
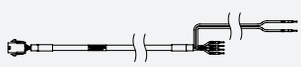
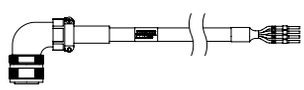
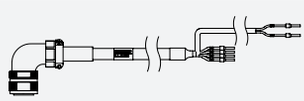
Feedback cables I PUR flexible cables

Cable P/N	Encoder	Con.	Motors	Drives	Drawing
CBL-FBPH21S300D0xx	sensAR single turn	AMP	PRHD2 Size 40, 60, 80	All CDHD2/ DDHD	
CBL-FBPH21M300D0xx	sensAR multi turn	AMP	PRHD2 Size 40, 60, 80	All CDHD2/ DDHD	
CBL-FBPH21S300A0xx	sensAR single turn	MIL	PRHD2 Size 100, 130, 180	All CDHD2/ DDHD	
CBL-FBPH21M300A0xx	sensAR multi turn	MIL	PRHD2 Size 100, 130, 180	All CDHD2/ DDHD	
CBL-FBPH21T100D0xx	Tamagawa single turn	AMP	PRHD2 Size 40, 60, 80	All CDHD2/ DDHD	
CBL-FBPH21T200D0xx	Tamagawa multi turn	AMP	PRHD2 Size 40, 60, 80	All CDHD2/ DDHD	
CBL-FBPH21T100A0xx	Tamagawa single turn	MIL	PRHD2 Size 100, 130, 180	All CDHD2/ DDHD	
CBL-FBPH21T200A0xx	Tamagawa multi turn	MIL	PRHD2 Size 100, 130, 180	All CDHD2/ DDHD	

xx- cable length available at 3, 5, 10, 15 m

Power cables I PUR flexible cables

Flying Leads

Cable P/N	Brake	Con.	Motors	Drives	Drawing
CBL-PWPH210000D0xx	No brake	AMP	PRHD2 Size 40, 60, 80	All CDHD2/ DDHD	
CBL-PWPH210001D0xx	With brake	AMP	PRHD2 Size 40, 60, 80	All CDHD2/ DDHD	
CBL-PWPH210000A0xx	No brake	MIL	PRHD2 Size 100,130,	All CDHD2/ DDHD	
CBL-PWPH210001A0xx	With brake	MIL	PRHD2 Size 130	All CDHD2/ DDHD	

xx- cable length available at 3, 5, 10, 15 m

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PRHD2 Series

PRHD2 Rotary Synchronous Servo Motors with CDHD2 Servo Drives

About Servotronix

Servotronix Motion Control develops and manufactures standard and customized automation solutions with a focus on motion control. Over decades, the company has developed generations of high-performance servo drive families and motion-control solutions tailored to customer needs and designed to meet the form, fit, functionality, and cost specifications of a wide range of applications and industries. With a global customer base of leading machine builders and automation system suppliers, Servotronix's guiding principles are to provide its customers with high-quality products, cost-effective solutions, and on-time deliveries.



PRHD2-CAT-ENV 0.1

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