PRO Series

Rotary Brushless Servo Motors

Extensive versatility, superior servo performance

SERVOTRONIX
always in motion

PRO Series

The PRO Series Servo Solution

Extensive versatility, superior servo performance

Servotronix proudly presents the **PRO Series** - a family of precision servo motors coupled with CDHD servo drives. The product line offers a wide range of torque ratings and motor options, and features outstanding efficiency and reliability. These servo motors are particularly suitable for positioning tasks in machine automation with demanding requirements for dynamics and stability. The combination of PRO servo motors and CDHD servo drives delivers an optimal solution for high performance motion applications.

Table of Contents

Input Voltage AC 120/240 VAC, 400/480 VAC

CDHD Servo Drive

Current:
1.5 Arms - 24 Arms

PRO Servo Motor

Frame Size:
40 mm - 180 mm

Rated Output:
100 W to 8.3 kW, 0.32 N-m to 40 N-m

Product Lineup

Servo Drive									
	1.5A CDHD-1D5 2A	**3A** CDHD-003 2A	**4.5A** CDHD-4D5 2A	**6A** CDHD-006 2A	**8A** CDHD-008 2A	**10A** CDHD-010 2A	**13A** CDHD-013 2A	**20A** CDHD-020 2A	**24A** CDHD-024 2A
Servo Motor **110 VAC**									
	100W PR-40 0.32 07	**200W** PR-60 0.65 07		**370W** PR-60 1.3 07 **480W** PR-80 1.5 07 **800W** PR-80 2.8 13	**1068W** PR-80 4 13		**1650W** PR-115 7 13 **840W** PR-115 3 07	**1300W** PR-115 5.2 09 **2000W** PR-115 9.2 13 **2300W** PR-115 11 13 **2700W** PR-142 12 13	**3350W** PR-142 21 24
Servo Motor **230 VAC**									
	100W PR-40 0.32 21 **200W** PR-60 0.65 21	**370W** PR-60 1.3 21 **480W** PR-80 1.5 21	**1068W** PR-80 4 15	**800W** PR-80 2.8 21 **820W** PR-100 3.2 21 **840W** PR-115 3 21 **1650W** PR-115 7 15	**1300W** PR-115 5.2 14 **2000W** PR-115 9.2 15	**2300W** PR-115 11 15 **2700W** PR-142 12 15	**3500W** PR-142 16.5 15	**4100W** PR-142 21 15 **5000W** PR-142 25.5 15	

Servo Drive			
	3A CDHD-003 4D	**6A** CDHD-006 4D	**12A** CDHD-012 4D
Servo Motor **400 VAC**			
	370W PR-60 1.3 15 **480W** PR-80 1.5 15 **800W** PR-80 2.8 15 **1068W** PR-80 4 17 **820W** PR-100 3.2 15 **840W** PR-115 3 15	**1320W** PR-100 5.6 15 **1570W** PR-100 8 15 **1300W** PR-115 5.2 15 **1650W** PR-115 7 17 **2000W** PR-115 9.2 17 **2300W** PR-115 11 17 **2700W** PR-142 12 17	**3500W** PR-142 16.5 17 **4100W** PR-142 21 17 **5000W** PR-142 25.5 17 **4700W** PR-180 22.5 17

Features and Benefits

CDHD Servo Drive

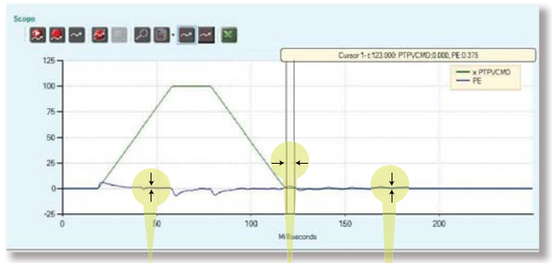
Innovative hardware and software design combine to deliver superior servo performance, advanced functionality, high power density, and seamless commissioning in a cost-effective package.

CDHD supports a wide range of application requirements:

- Current, velocity, and position control loops
- Safe-Torque-Off (STO)
- Analog commands, Pulse & Direction, CANopen® and EtherCAT®. PROFINET® coming soon
- All types of feedback devices and I/Os
- Easily modified to meet specific needs

CDHD current control loop has rapid sample rates and filtering options, resulting in maximum machine accuracy and throughput, and an industry leading frequency response of up to 3.0 KHz.

Advanced algorithms and intelligent autotuning achieve optimal configurations for superb performance.

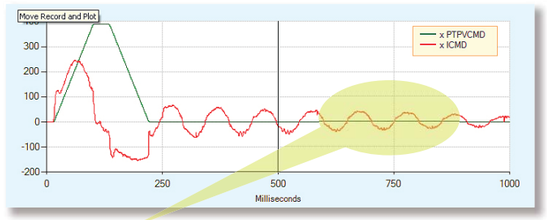


Minimum position error

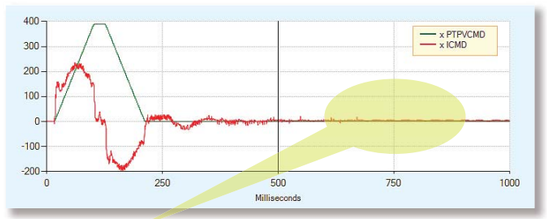
Settling time of almost zero

No oscillations at stand-still

Anti-vibration control algorithms eliminate mechanical resonance. Commissioning is easy, using just a few gain parameters.



Without Anti-Vibe Control



With Anti-Vibe Control

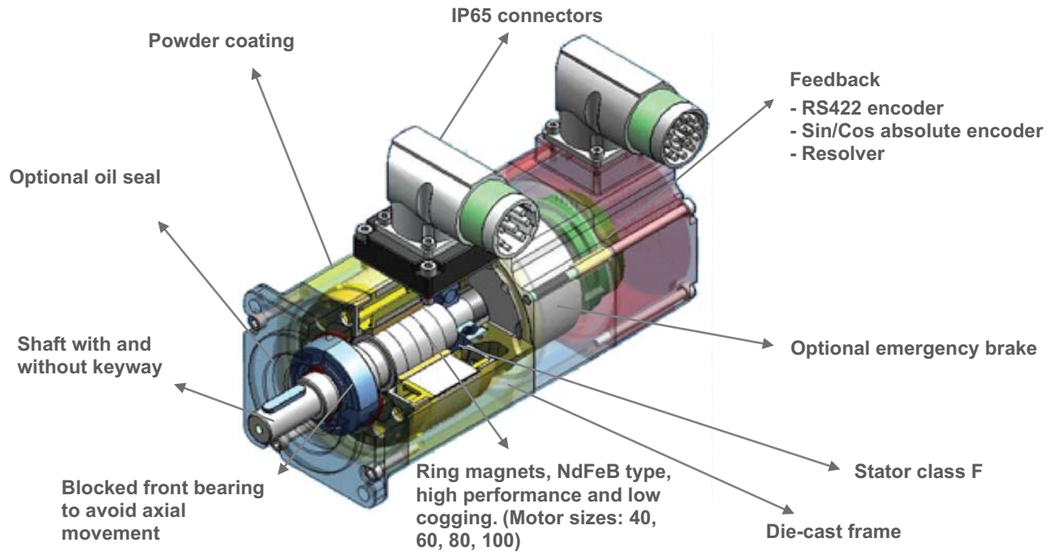
PRO Rotary Brushless Servo Motors

With outstanding efficiency, reliability, durability and electromagnetic immunity, PRO motors meet any application requirement.

- Rated output power from 100 W to 8.3 kW; rated output torque from 0.3 Nm to 40 Nm
- Winding options for 110, 220 and 400 VAC
- Standard feedback options include 2-pole resolver, 2000LPR RS422 encoder, and absolute multiturn encoder (Hiperface) with 128 sine/cosine per revolution
- Standard and high inertia options (motor sizes 115,142,180)
- Temperature protection by KTY84 (except PR-40)
- IP65 on motor body
- Powder coating on the motor body for a scratch-resistant surface
- Optional electromagnetic permanent-holding brake; zero backlash
- Cable flange with connectors (PR-40)
- 90° round turnable connectors, IP67 (except PR-40)
- Insulation system UL/CSA, Class F (155°C)

Customization Options

- IP67 sealing
- Extended temperature range rating
- Various connectors
- Various feedback devices
- Optimized motor winding
- Special motor housing (such as stainless steel)

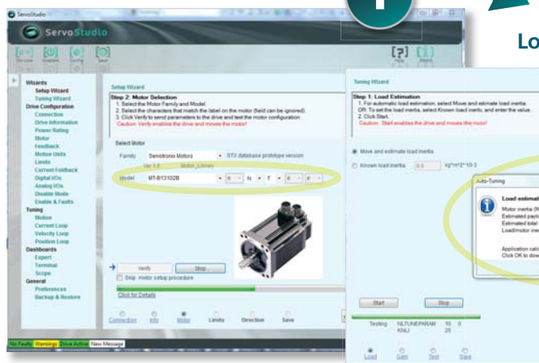


ServoStudio Wizard

User-friendly Servo Studio software provides step-by-step guidance through the setup and tuning process. Setup and testing are simplified thanks to auto-tuning functions and graphic representations of control loops.

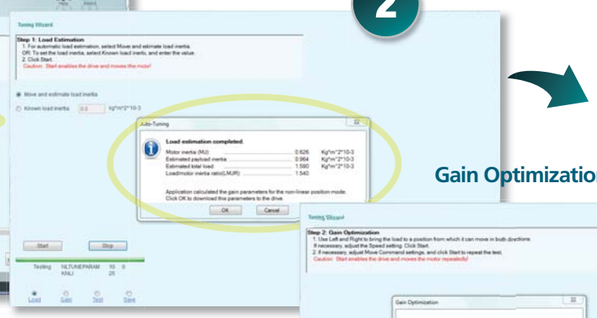
- Excellent results within minutes, even for novice users!
- Real-time data recording and plotting
- Easy integration of servo axes
- Plug-and-play motor and feedback wiring

Motor Selection 1



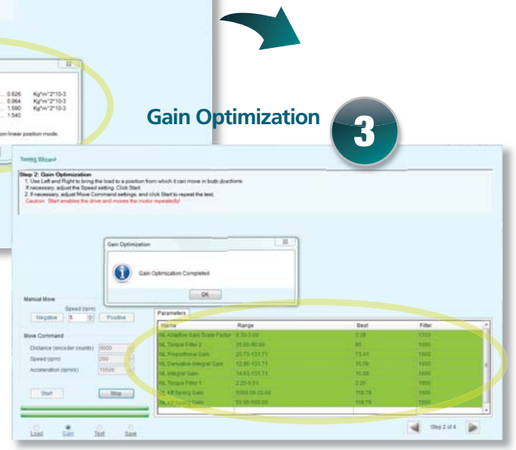
Default parameters are loaded from database as soon as motor is selected.

Load Estimation 2



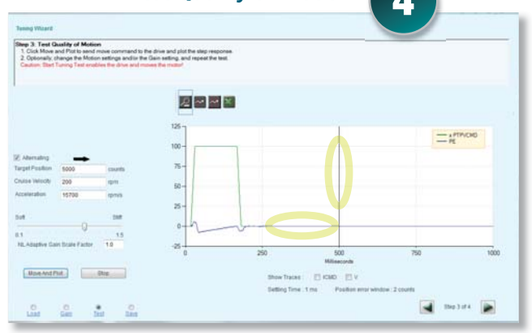
Machine load is automatically estimated.

Gain Optimization 3



All position control loop parameters are tuned automatically.

Test Quality of Motion 4



Motion is displayed graphically, with zero settling time and minimal position error clearly indicated.

Recommended Motor/Drive Systems

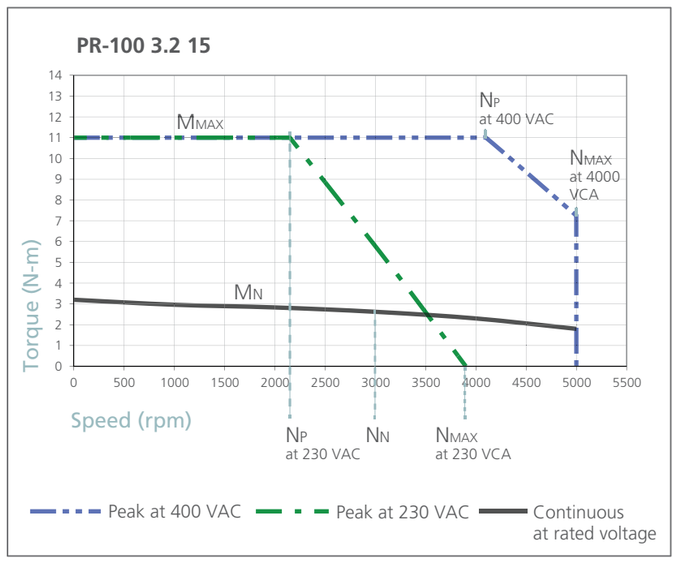
The motor torque-speed curves help you select the optimum motor for your application. Once you have selected the motor, the drive can be selected based on our recommended matched motor-drive sets.

The torque-speed curves are color-coded. They show rated (continuous operation) and intermittent (peak) operation. Some motor windings support one voltage, while others support more than one. In those cases, the continuous operation is the same for all winding, but the peak operation is different.

The following diagram shows a typical torque-speed curve, and illustrates the primary characteristics of these curves.

M_N - Rated torque
M_{MAX} - Peak torque
N_N - Rated speed (at the rated torque)
N_P - Peak torque at the knee of the peak operation envelope
N_{MAX} - Maximum motor speed (mechanical limitation)

All torque-speed curves are valid throghout the entire temperature range of 0 - 40ºC.



Recommended Motor/Drive Systems **110 VAC**

Motor Rated Power P_N [W]	Motor Model	Recommended Servo Drive	Motor Parameters								
			Frame Size [mm]	Peak Torque M_{MAX} [N-m]	Rated Torque M_N [N-m]	Rated Speed N_N [rpm]	Max Knee Speed N_P [rpm]	Max Speed N_{MAX} [rpm]	Rated Current I_N [Arms]	Peak Current I_{MAX} [Arms]	Rotor Inertia J [kg-cm²]
100	PR-40 0.32	CDHD-1D5 2A	40	0.96	0.32	3000	3590	5000	1.30	3.90	0.05
200	PR-60 0.65	CDHD-003 2A	60	1.95	0.60	3000	3790	5000	2.70	7.90	0.13
370	PR-60 1.3	CDHD-006 2A	60	3.90	1.20	3000	3790	5000	5.00	15.70	0.24
480	PR-80 1.5	CDHD-006 2A	80	4.50	1.50	3000	4890	5000	6.50	18.10	0.64
800	PR-80 2.8	CDHD-006 2A	80	8.40	2.50	3000	2540	3750	5.90	18.50	1.16
840	PR-115 3	CDHD-013 2A	115	9.00	2.70	3000	3100	5000	11.30	36.30	4.70
1068	PR-80 4	CDHD-008 2A	80	12.00	3.40	3000	2540	3750	7.80	26.40	1.58
1300	PR-115 5.2	CDHD-020 2A	115	15.60	4.10	3000	2490	5000	14.60	52.40	6.80
1650	PR-115 7	CDHD-013 2A	115	21.00	5.30	3000	2840	3750	12.12	46.16	8.80
2000	PR-115 9.2	CDHD-020 2A	115	27.60	6.40	3000	2890	3750	14.70	60.67	10.90
2300	PR-115 11	CDHD-020 2A	115	33.00	7.30	3000	2790	3750	16.90	72.54	13.00
2700	PR-142 12	CDHD-020 2A	142	31.00	8.60	3000	2848	3750	19.84	68.14	23.00
3500	PR-142 16.5	Future	142	42.00	11.14	3000	2980	3750	25.72	92.32	27.00
3350	PR-142 21	CDHD-024 2A	142	55.00	16.00	2000	1590	2150	21.16	69.27	36.10
3140	PR-142 25.5	Future	142	65.00	19.99	1500	1520	2150	26.44	81.86	40.50

Recommended Motor/Drive Systems **220 VAC**

Motor Rated Power P_N [W]	Motor Model	Recommended Servo Drive	Motor Parameters								
			Frame Size [mm]	Peak Torque M_{MAX} [N-m]	Rated Torque M_N [N-m]	Rated Speed N_N [rpm]	Max Knee Speed N_P [rpm]	Max Speed N_{MAX} [rpm]	Rated Current I_N [Arms]	Peak Current I_{MAX} [Arms]	Rotor Inertia J [kg-cm²]
100	PR-40 0.32 21	CDHD-1D5 2A	40	0.96	0.32	3000	3300	5000	0.62	1.82	0.05
200	PR-60 0.65 21	CDHD-1D5 2A	60	1.95	0.64	3000	3650	5000	1.25	3.71	0.13
370	PR-60 1.3 21	CDHD-003 2A	60	3.90	1.18	3000	3600	5000	2.31	7.41	0.24
480	PR-80 1.5 21	CDHD-003 2A	80	4.50	1.53	3000	4750	5000	2.99	8.55	0.64
800	PR-80 2.8 21	CDHD-006 2A	80	8.40	2.55	3000	4950	5000	4.99	15.97	1.16
1068	PR-80 4 15	CDHD-4D5 2A	80	12.00	3.40	3000	2490	3900	3.85	13.19	1.58
820	PR-100 3.2 21	CDHD-006 2A	100	11.00	2.61	3000	4050	5000	5.11	20.91	1.55
840	PR-115 3 21 0	CDHD-006 2A	115	9.00	2.67	3000	5000	5000	5.34	17.11	4.70
840	PR-115 3 21 4	CDHD-006 2A	115	9.00	2.67	3000	5000	5000	5.34	17.11	7.30
1300	PR-115 5.2 14 0	CDHD-008 2A	115	15.60	4.14	3000	5000	5000	7.30	26.20	6.80
1300	PR-115 5.2 14 4	CDHD-008 2A	115	15.60	4.14	3000	5000	5000	7.30	26.20	10.60
1650	PR-115 7 15 0	CDHD-006 2A	115	21.00	5.25	3000	2930	3900	6.06	23.08	8.80
1650	PR-115 7 15 4	CDHD-006 2A	115	21.00	5.25	3000	2930	3900	6.06	23.08	14.10
2000	PR-115 9.2 15 0	CDHD-008 2A	115	27.60	6.37	3000	3040	3900	7.35	30.34	10.90
2000	PR-115 9.2 15 4	CDHD-008 2A	115	27.60	6.37	3000	3040	3900	7.35	30.34	17.50
2300	PR-115 11 15 0	CDHD-010 2A	115	33.00	7.32	3000	2780	3900	8.45	36.27	13.00
2300	PR-115 11 15 4	CDHD-010 2A	115	33.00	7.32	3000	2780	3900	8.45	36.27	20.80
2700	PR-142 12 15 0	CDHD-010 2A	142	31.00	8.60	3000	3040	3900	9.92	34.07	23.00
2700	PR-142 12 15 4	CDHD-010 2A	142	31.00	8.60	3000	3040	3900	9.92	34.07	38.40
3500	PR-142 16.5 15 0	CDHD-013 2A	142	42.00	11.14	3000	3090	3900	12.86	46.16	27.00
3500	PR-142 16.5 15 4	CDHD-013 2A	142	42.00	11.14	3000	3090	3900	12.86	46.16	45.90
4100	PR-142 21 15 0	CDHD-020 2A	142	55.00	13.05	3000	3190	3900	15.06	60.45	36.10
4100	PR-142 21 15 4	CDHD-020 2A	142	55.00	13.05	3000	3190	3900	15.06	60.45	61.20
5000	PR-142 25.5 15 0	CDHD-020 2A	142	65.00	15.92	3000	3140	3900	18.37	71.44	40.50
5000	PR-142 25.5 15 4	CDHD-020 2A	142	65.00	15.92	3000	3140	3900	18.37	71.44	68.90

Recommended Motor/Drive Systems **400 VAC**

Motor Rated Power P_N [W]	Motor Model	Recommended Servo Drive	Motor Parameters								
			Frame Size [mm]	Peak Torque M_{MAX} [N-m]	Rated Torque M_N [N-m]	Rated Speed N_N [rpm]	Max Knee Speed N_P [rpm]	Max Speed N_{MAX} [rpm]	Rated Current I_N [Arms]	Peak Current I_{MAX} [Arms]	Rotor Inertia J [kg-cm²]
370	PR-60 1.3 15	CDHD-003 4D	60	3.90	1.18	3000	3700	5000	1.33	4.29	0.24
480	PR-80 1.5 15	CDHD-003 4D	80	4.50	1.53	3000	4800	5000	1.73	4.95	0.64
800	PR-80 2.8 15	CDHD-003 4D	80	8.40	2.55	3000	5000	5000	2.88	9.23	1.16
1068	PR-80 4 17	CDHD-003 4D	80	12.00	3.40	3000	2500	3900	2.19	7.50	1.58
820	PR-100 3.2 15	CDHD-003 4D	100	11.00	2.61	3000	4100	5000	2.96	12.09	1.55
1320	PR-100 5.6 15	CDHD-006 4D	100	22.00	4.20	3000	4300	5000	4.76	24.18	2.91
1570	PR-100 8 15	CDHD-006 4D	100	33.00	5.00	3000	4400	5000	5.66	36.27	4.10
840	PR-115 3 15 0	CDHD-003 4D	115	9.00	2.67	3000	5000	5000	3.09	9.89	4.70
840	PR-115 3 15 4	CDHD-003 4D	115	9.00	2.67	3000	5000	5000	3.09	9.89	7.30
1300	PR-115 5.2 15 0	CDHD-006 4D	115	15.60	4.14	3000	5000	5000	4.78	17.15	6.80
1300	PR-115 5.2 15 4	CDHD-006 4D	115	15.60	4.14	3000	5000	5000	4.78	17.15	10.60
1650	PR-115 7 17 0	CDHD-006 4D	115	21.00	5.25	3000	2950	3900	3.44	13.09	8.80
1650	PR-115 7 17 4	CDHD-006 4D	115	21.00	5.25	3000	2950	3900	3.44	13.09	14.10
2000	PR-115 9.2 17 0	CDHD-006 4D	115	27.60	6.37	3000	2900	3900	4.17	17.20	10.90
2000	PR-115 9.2 17 4	CDHD-006 4D	115	27.60	6.37	3000	2900	3900	4.17	17.20	17.50
2300	PR-115 11 17 0	CDHD-006 4D	115	33.00	7.32	3000	2800	3900	4.79	20.57	13.00
2300	PR-115 11 17 4	CDHD-006 4D	115	33.00	7.32	3000	2800	3900	4.79	20.57	20.80
2700	PR-142 12 17 0	CDHD-006 4D	142	31.00	8.60	3000	3150	3900	5.62	19.32	23.00
2700	PR-142 12 17 4	CDHD-006 4D	142	31.00	8.60	3000	3150	3900	5.62	19.32	38.40
3500	PR-142 16.5 17 0	CDHD-012 4D	142	42.00	11.14	3000	2900	3900	7.29	26.17	27.00
3500	PR-142 16.5 17 4	CDHD-012 4D	142	42.00	11.14	3000	2900	3900	7.29	26.17	45.90
4100	PR-142 21 17 0	CDHD-012 4D	142	55.00	13.05	3000	3200	3900	8.54	34.28	36.10
4100	PR-142 21 17 4	CDHD-012 4D	142	55.00	13.05	3000	3200	3900	8.54	34.28	61.20
5000	PR-142 25.5 17 0	CDHD-012 4D	142	65.00	15.92	3000	3050	3900	10.42	40.51	40.50
5000	PR-142 25.5 17 4	CDHD-012 4D	142	65.00	15.92	3000	3050	3900	10.42	40.51	68.90
4700	PR-180 22.5 17 0	CDHD-012 4D	180	63.00	14.96	3000	3000	3000	9.79	39.26	69.50
4700	PR-180 22.5 17 4	CDHD-012 4D	180	63.00	14.96	3000	3000	3000	9.79	39.26	95.00
6600	PR-180 35 17 0	Future	180	95.00	21.01	3000	3000	3000	13.75	59.20	102.50
6600	PR-180 35 17 4	Future	180	95.00	21.01	3000	3000	3000	13.75	59.20	141.00
8380	PR-180 47 17 0	Future	180	130.00	40.02	2000	3000	3000	26.19	81.02	135.50
8380	PR-180 47 17 4	Future	180	130.00	40.02	2000	3000	3000	26.19	81.02	186.70

Ordering Information

PRO Motor

PR – 115 9.2 15 0 R 1 F

Pro Series
Rotary Brushless

Model

Frame Size	
40	0.32
60	0.65
60	1.3
80	1.5
80	2.8
80	4
100	3.2
100	5.6
100	8
115	3
115	5.2
115	7
115	9.2
115	11
142	12
142	16.5
142	21
142	25.5
180	22.5
180	35
180	47

Winding
Refer to motor datasheet for specific windings available for each motor model

Shaft
0 - Shaft with key / without oil seal (front flange side IP 42)
1 - Shaft with key / with oil seal (front flange side IP 65)
2 - Shaft without key / without oil seal (front flange side IP 42)
3 - Shaft without key / with oil seal (front flange side IP 65)

4* - High inertia shaft with key / without oil seal (front flange side IP 42)
5* - High inertia shaft with key / with oil seal (front flange side IP 65)
6* - High inertia shaft without key / without oil seal (front flange side IP 42)
7* - High inertia shaft without key / with oil seal (front flange side IP 65)

*Available only for motor models 115, 142, 180

Feedback Device
E - Encoder TTL 2000ppr
R - Resolver 2p
A - Absolute Multiturn Encoder
SICK/Stegmann Hiperface SKM 36, 128 sine cycle
Contact factory for non-standard feedback options.

Brake
0 – Without brake
1 – With Brake
Refer to catalog for brake options

Connector
D – Connector for PR-40 only
F – Connector for all other models

Please contact us at info@servotronix.com for product availability.

CDHD Servo Drive

CDHD - 006 2A AP 1

CD Servo Drive
HD Series

Rating
For 120/240 VAC Cont/Peak [Arms]

1D5	1.5/4.5
003	3/9
4D5	4.5/18
006	6/18
008	8/28
010	10/28
013	13/28
020	20/48
024	24/48

For 400/480 VAC Cont/Peak [Arms]

003	3/9
006	6/18
012	12/24
024	24/48

AC and Controller Input Power Supply
2A- Input Single Phase 120 L-L VAC +10% -15% 50/60 Hz
Input Single Phase 240 L-L VAC +10% -15% 50/60 Hz
Input Three Phase 120-240 L-L VAC +10% -15% 50/60 Hz

4D- AC Input Power Supply
Input Three Phase 400 L-L VAC +10% -15% 50/60 Hz
Input Three Phase 480 L-L VAC +10% -15% 50/60 Hz

Interface Options
AP*- Analog Voltage, Pulse Train Ref, RS232
AF*- Analog Voltage, Pulse Train Ref, CANopen, USB, RS232
EC**- EtherCAT, USB, RS232
PN**- PROFINET, USB, RS232

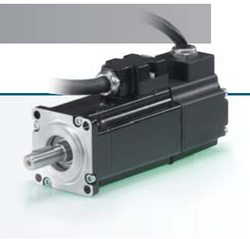
* Standard configuration with one analog input
** Standard configuration with two analog inputs

Analog Input
1- One Analog Input, 16 bit
2- Two Analog Inputs, 14 bit each

Please contact us at info@servotronix.com for product availability.

PRO Motor Performance Data

PRO Motor 40



Ratings and Specifications

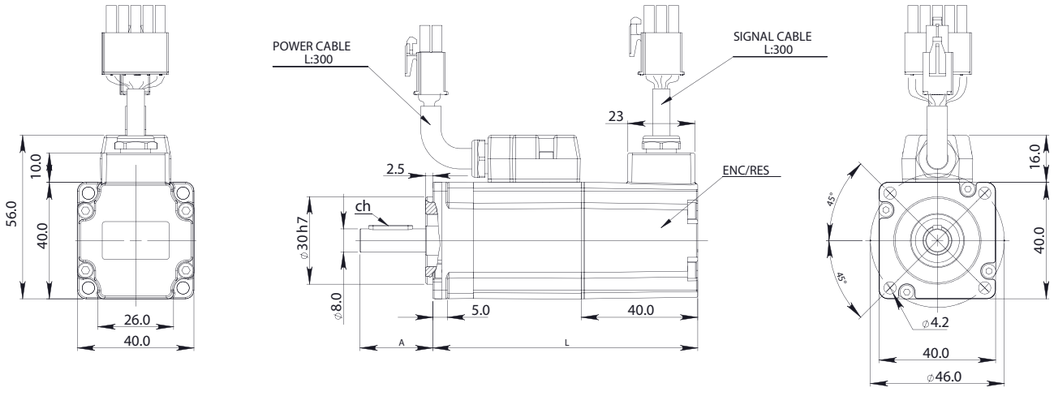
TIME RATING	Continuous	AMBIENT TEMPERATURE	0 to 40 °C
INSULATION CLASS	F	AMBIENT HUMIDITY	20 to 80% (non-condensing)
ENCLOSURE	Totally enclosed. Self-cooled	POLES	8
PROTECTION CLASS	IP 65 standard on the body	THERMAL PROTECTION	Not available
INSULATION SYSTEM UL /CSA	cURus, DV155J	CE certified	

		PR-40 0.32 07	PR-40 0.32 21
Stall Torque	Nm	0.34	0.34
Peak Torque	Nm	0.96	0.96
Rated Torque	Nm	0.32	0.32
Rated Voltage	Vac	110	230
Rated Output Power	W	100	100
Stall Current	Arms	1.37	0.65
Peak Current	Arms	3.87	1.82
Rated Current	Arms	1.35	0.62
Rated Speed	rpm	3000	3000
Maximum Speed 110VAC	rpm	5000	-
Maximum Speed 230VAC	rpm	-	5000
Torque Constant (± 5%)	Nm/Arms	0.25	0.526
Voltage Constant (± 5%)	Vrms/Krpm	15.0	31.8
Phase/phase resistance (±10%@25°C)	Ohm	7.46	36.2
Phase/phase inductance (±10%)	mH	9.88	44
Electrical time constant	ms	1.32	1.21
Thermal Resistance	°C/W	3.25	2.30
Mechanical time constant	ms	0.85	0.92
Rotor Inertia	Kg cm^2	0.05	0.05
Motor weight	Kg	0.54	0.54
Motor weight + Brake	Kg	0.68	0.68
Motor weight with absolute encoder	Kg	0.55	0.55
Motor weight with absolute encoder + Brake	Kg	0.75	0.75
Axial Load	N	30 (applied on the shaft's center)	
Radial Load	N	180 (applied on the shaft's center)	

Rated output with 250 x 250 x 6 mm metallic heat sink flange coupling - Derating must be considered if the oil seal is applied - IP 42 standard shaft bushing

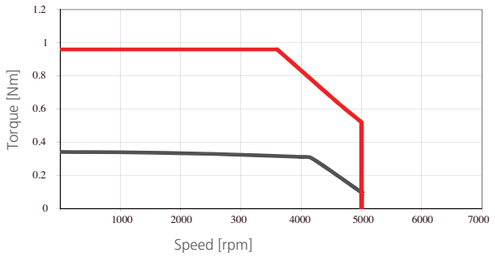
Dimensions

		PR-40 0.32 07	PR-40 0.32 21
L (Without Brake)	mm	109	109
L (With Brake)	mm	140	140
L (Absolute Encoder, Without Brake)	mm	119	119
L (Absolute Encoder, With Brake)	mm	150	150
A	mm	25	25
d	mm (tolerance)	8 (h6)	8 (h6)
ch	mm	3x3x15	3x3x15

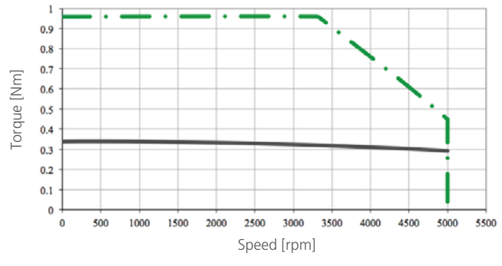


Torque/ Speed Charts

PRO Motor 40 0.32 07



PRO Motor 40 0.32 21



Peak at 110 VAC — Peak at 230 VAC — Peak at 400 VAC — Continuous at rated voltage

PRO Motor 60

Ratings and Specifications

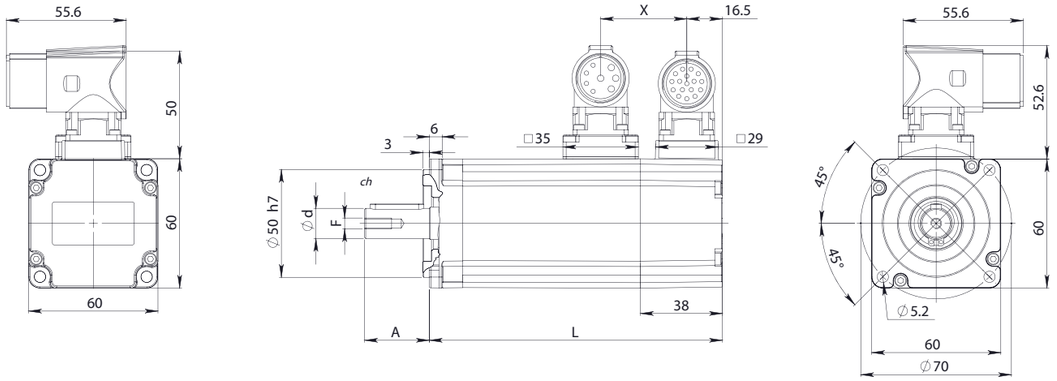
TIME RATING	Continuous	AMBIENT TEMPERATURE	0 to 40 °C
INSULATION CLASS	F	AMBIENT HUMIDITY	20 to 80% (non-condensing)
ENCLOSURE	Totally enclosed. Self-cooled	POLES	8
PROTECTION CLASS	IP 65 standard on the body	THERMAL PROTECTION	KTY 84
INSULATION SYSTEM UL /CSA	cURus , DV155J	CE certified	

		PR-60 0.65 07	PR-60 0.65 21	PR-60 1.3 07	PR-60 1.3 21	PR-60 1.3 15
Stall Torque	Nm	0.69	0.69	1.31	1.31	1.31
Peak Torque	Nm	1.95	1.95	3.90	3.9	3.9
Rated Torque	Nm	0.64	0.64	1.18	1.18	1.18
Rated Voltage	Vac	110	230	110	230	400
Rated Output Power	W	200	200	370	370	370
Stall Current	Arms	2.78	1.31	5.28	2.49	1.44
Peak Current	Arms	7.86	3.71	15.72	7.41	4.29
Rated Current	Arms	2.69	1.25	4.98	2.31	1.33
Rated Speed	rpm	3000	3000	3000	3000	3000
Maximum Speed 110VAC	rpm	5000	-	5000	-	-
Maximum Speed 230VAC	rpm	-	5000	-	5000	3900
Maximum Speed 400VAC	rpm	-	-	-	-	5000
Torque Constant (± 5%)	Nm/Arms	0.25	0.526	0.25	0.526	0.910
Voltage Constant (± 5%)	Vrms/Krpm	15.0	31.8	15.0	31.8	55.0
Phase/phase resistance (± 10%@25°C)	Ohm	2.37	12.9	0.97	4.2	14.4
Phase/phase inductance (± 10%)	mH	5.90	26.5	3.11	14.9	41.8
Electrical time constant	ms	2.49	2.05	3.21	3.55	2.90
Thermal Resistance	°C / W	2.48	1.89	1.68	1.41	1.41
Mechanical time constant	ms	0.75	0.91	0.57	0.55	0.63
Rotor Inertia	Kg cm^2	0.13	0.13	0.24	0.24	0.24
Motor Weight	Kg	0.85	1.1	1.25	1.5	1.5
Motor Weight + Brake	Kg	1.25	1.5	1.65	1.9	1.9
Axial Load	N		70 (applied on the shaft's center)			
Radial Load	N		220 (applied on the shaft's center)			

Rated output with 250 x 250 x 6 mm metallic heat sink flange coupling - Derating must be considered if the oil seal is applied - IP 42 standard shaft bushing

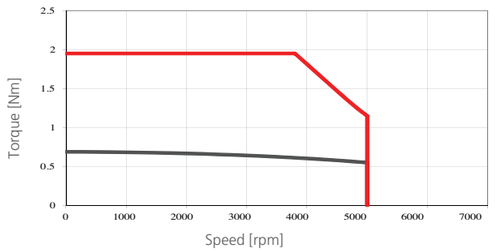
Dimensions

		PR-60 0.65 07	PR-60 0.65 21	PR-60 1.3 07	PR-60 1.3 21	PR-60 1.3 15
L (Without Brake)	mm	111	111	136	136	136
L (With Brake)	mm	148	148	173	173	173
A	mm	23	23	30	30	30
d	mm (tolerance)	11 (h6)	11 (h6)	14 (h6)	14 (h6)	14 (h6)
ch	mm	4x4x18	4x4x18	5x5x25	5x5x25	5x5x25
F	Tap Drill (mm)	M4x10	M4x10	M5x12.5	M5x12.5	M5x12.5
X (Without Brake)	mm	40	40	40	40	40
X (With Brake)	mm	77	77	77	77	77

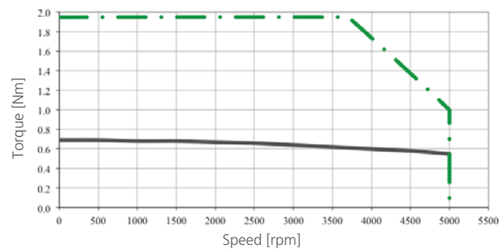


Torque/ Speed Charts

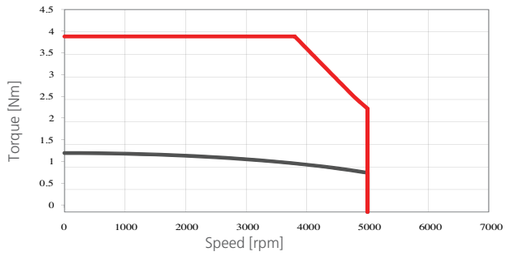
PRO Motor 60 0.65 07



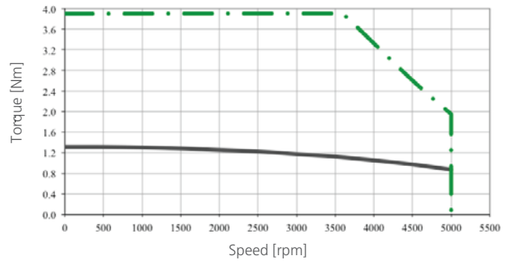
PRO Motor 60 0.65 21



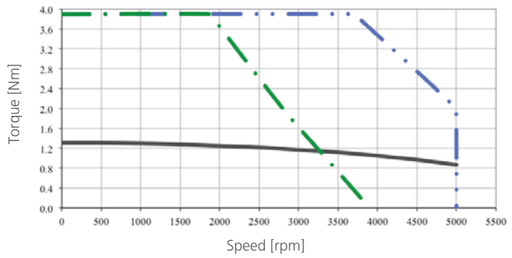
PRO Motor 60 1.3 07



PRO Motor 60 1.3 21



PRO Motor 60 1.3 15



Peak at 110 VAC — Peak at 230 VAC — Peak at 400 VAC — Continuous at rated voltage

PRO Motor 80 Sizes 1.5 - 2.8

Ratings and Specifications Sizes 1.5 - 2.8

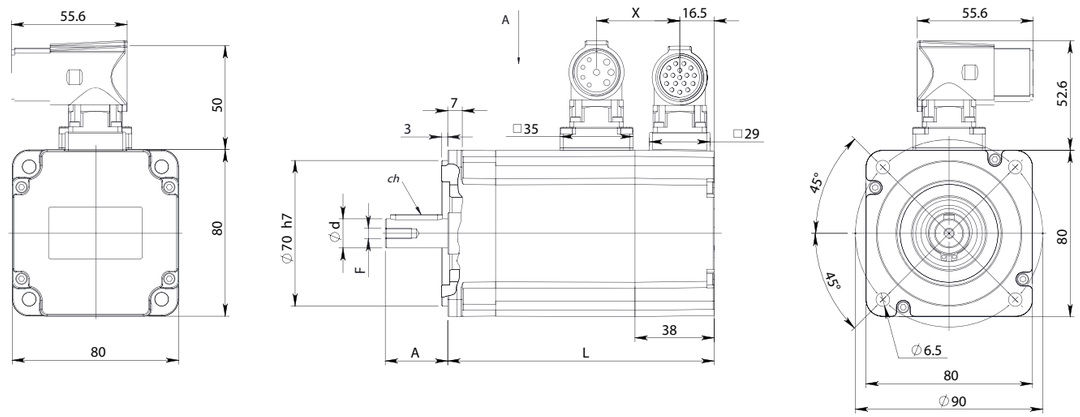
TIME RATING	Continuous	AMBIENT TE ERATURE	0 to 40 °C
INSULATION CLASS	F	AMBIENT HUMIDITY	20 to 80% (non-condensing)
ENCLOSURE	Totally enclosed. Self-cooled	POLES	8
PROTECTION CLASS	IP 65 standard on the body	THERMAL PROTECTION	KTY 84
INSULATION SYSTEM UL /CSA	cURus , DV155J	CE certified	

		PR-80 1.5 07	PR-80 1.5 15	PR-80 1.5 21	PR-80 2.8 13	PR-80 2.8 15	PR-80 2.8 21
Stall Torque	Nm	1.74	1.74	1.74	2.96	2.96	2.96
Peak Torque	Nm	4.50	4.5	4.5	8.40	8.4	8.4
Rated Torque	Nm	1.53	1.53	1.53	2.55	2.55	2.55
Rated Voltage	Vac	110	400	230	110	400	230
Rated Output Power	W	480	480	480	800	800	800
Stall Current	Arms	7.01	1.91	3.31	6.51	3.25	5.63
Peak Current	Arms	18.14	4.95	8.55	18.46	9.23	15.97
Rated Current	Arms	6.47	1.73	2.99	5.88	2.88	4.99
Rated Speed	rpm	3000	3000	3000	3000	3000	3000
Maximum Speed 110VAC	rpm	5000	-	-	3750	-	-
Maximum Speed 230VAC	rpm	-	3900	5000	-	3900	5000
Maximum Speed 400VAC	rpm	-	5000	-	-	5000	-
Torque Constant (± 5%)	Nm/Arms	0.25	0.910	0.526	0.45	0.910	0.526
Voltage Constant (± 5%)	Vrms/Krpm	15.00	55.0	31.8	27.50	55.0	31.8
Phase/phase resistance (± 10%@25°C)	Ohm	0.40	6.5	2.3	0.64	3.0	0.99
Phase/phase inductance (± 10%)	mH	1.76	22.2	7.4	2.90	13.2	4.4
Electrical time constant	ms	4.40	3.4	3.2	4.53	4.4	4.4
Thermal Resistance	°C / W	2.31	1.67	1.67	1.68	1.32	1.32
Mechanical time constant	ms	0.62	0.75	0.80	0.54	0.63	0.62
Rotor Inertia	Kg cm	0.64	0.64	0.64	1.16	1.16	1.16
Motor Weight	Kg	2.25	2.25	2.25	3.05	3.05	3.05
Motor Weight + Brake	Kg	2.97	2.97	2.97	3.77	3.77	3.77
Axial Load	N	110 (applied on the shaft's center)					
Radial Load	N	350 (applied on the shaft's center)					

Rated output with 250 x 250 x 6 mm metallic heat sink flange coupling - Derating must be considered if the oil seal is applied - IP 42 standard shaft bushing

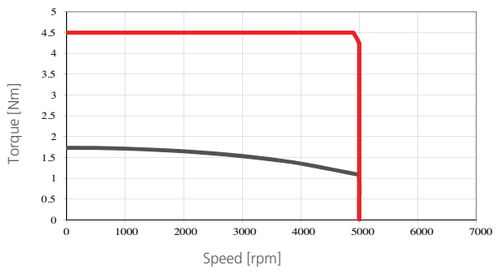
Dimensions Sizes 1.5 - 2.8

		PR-80 1.5 07	PR-80 1.5 15	PR-80 1.5 21	PR-80 2.8 13	PR-80 2.8 15	PR-80 2.8 21
L (Without Brake)	mm	128	128	128	153	153	153
L (With Brake)	mm	170	170	170	195	195	195
A	mm	30	30	30	40	40	40
d	mm (tolerance)	14 (h6)	14 (h6)	14 (h6)	19 (h6)	19 (h6)	19 (h6)
ch	mm	5x5x25	5x5x25	5x5x25	6x6x30	6x6x30	6x6x30
F	Tap Drill (mm)	M5x12.5	M5x12.5	M5x12.5	M6x16	M6x16	M6x16
X (Without Brake)	mm	40	40	40	40	40	40
X (With Brake)	mm	82	82	82	82	82	82

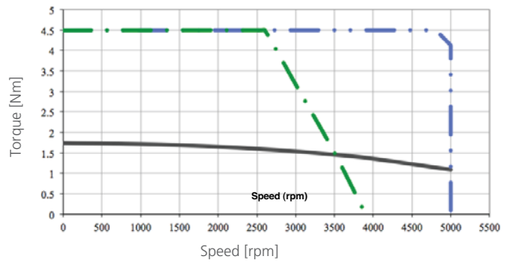


Torque/ Speed Charts Sizes 1.5 - 2.8

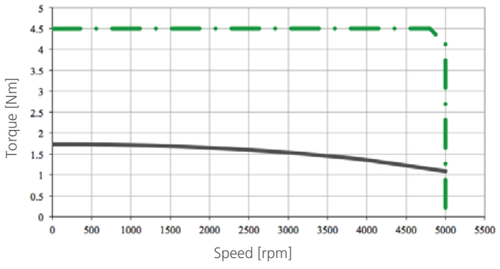
PRO Motor 80 1.5 07



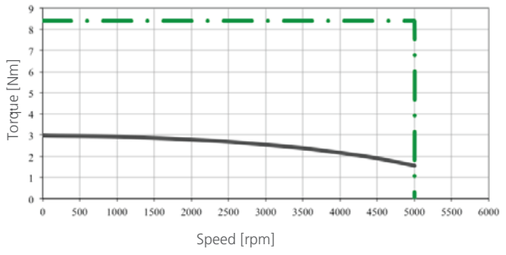
PRO Motor 80 1.5 15



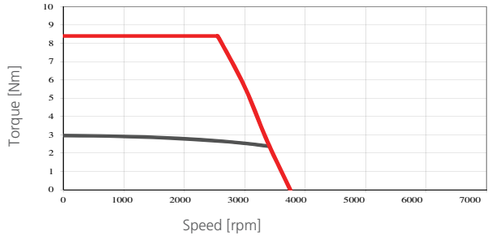
PRO Motor 80 1.5 21



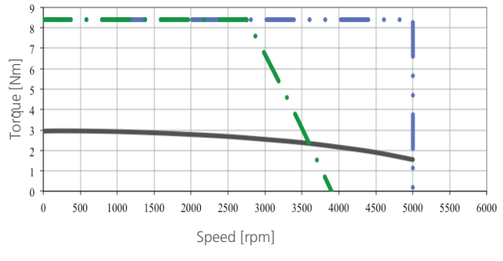
PRO Motor 80 2.8 21



PRO Motor 80 2.8 13



PRO Motor 80 2.8 15



Peak at 110 VAC — Peak at 230 VAC — Peak at 400 VAC — Continuous at rated voltage

PRO Motor 80 Size 4

Ratings and Specifications Size 4

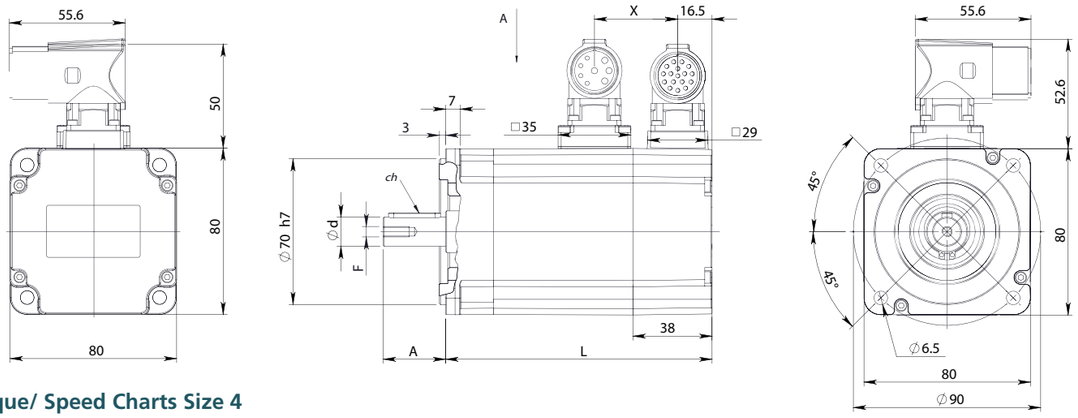
TIME RATING	Continuous	AMBIENT TEMPERATURE	0 to 40 °C
INSULATION CLASS	F	AMBIENT HUMIDITY	20 to 80% (non-condensing)
ENCLOSURE	Totally enclosed. Self-cooled	POLES	8
PROTECTION CLASS	IP 65 standard on the body	THERMAL PROTECTION	KTY 84
INSULATION SYSTEM UL /CSA	cURus , DV155J	CE certified	

		PR-80 4 13	PR-80 4 15	PR-80 4 17
Stall Torque	Nm	4.0	4.0	4.0
Peak Torque	Nm	12.0	12.0	12.0
Rated Torque	Nm	3.4	3.4	3.4
Rated Voltage	Vac	110	230	400
Rated Output Power	W	1068	1068	1068
Stall Current	Arms	8.79	4.40	2.50
Peak Current	Arms	26.38	13.19	7.50
Rated Current	Arms	7.85	3.85	2.19
Rated Speed	rpm	3000	3000	3000
Maximum Speed 110VAC	rpm	3750	-	-
Maximum Speed 230VAC	rpm	-	3900	-
Maximum Speed 400VAC	rpm	-	5000	3900
Torque Constant (± 5%)	Nm/Arms	0.45	0.910	1.600
Voltage Constant (± 5%)	Vrms/Krpm	27.50	55.0	96.0
Phase/phase resistance (± 10%@25°C)	Ohm	0.45	1.9	6.5
Phase/phase inductance (± 10%)	mH	2.22	8.9	28.6
Electrical time constant	ms	4.93	4.7	4.4
Thermal Resistance	°C / W	1.31	1.0	1.0
Mechanical time constant	ms	0.52	0.54	0.60
Rotor Inertia	Kg cm	1.58	1.58	1.58
Motor Weight	Kg	4.10	4.1	4.1
Motor Weight + Brake	Kg	4.82	4.82	4.82
Axial Load	N	110 (applied on the shaft's center)		
Radial Load	N	350 (applied on the shaft's center)		

Rated output with 250 x 250 x 6 mm metallic heat sink flange coupling - Derating must be considered if the oil seal is applied - IP 42 standard shaft bushing

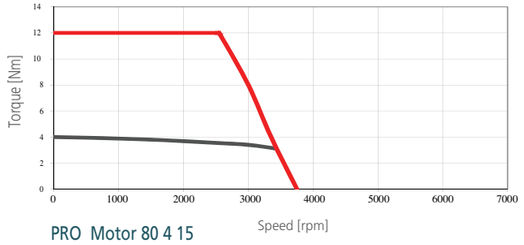
Dimensions Size 4

		PR-80 4 13	PR-80 4 15	PR-80 4 17
L (Without Brake)	mm	178	178	178
L (With Brake)	mm	220	220	220
A	mm	40	40	40
d	mm (tolerance)	19 (h6)	19 (h6)	19 (h6)
ch	mm	6x6x30	6x6x30	6x6x30
F	Tap Drill (mm)	M6x16	M6x16	M6x16
X (Without Brake)	mm	50	50	50
X (With Brake)	mm	92	92	92

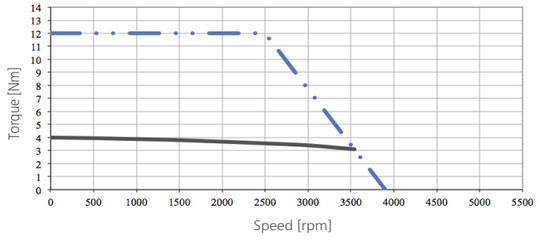


Torque/ Speed Charts Size 4

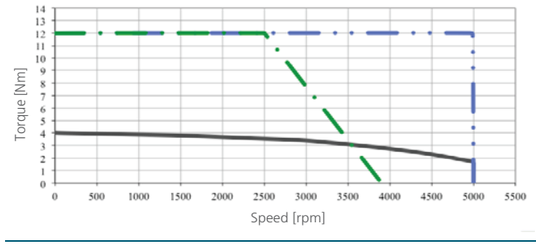
PRO Motor 80 4 13



PRO Motor 80 4 17



PRO Motor 80 4 15



Peak at 110 VAC
Peak at 230 VAC
Peak at 400 VAC
Continuous at rated voltage

PRO Motor 100

Ratings and Specifications

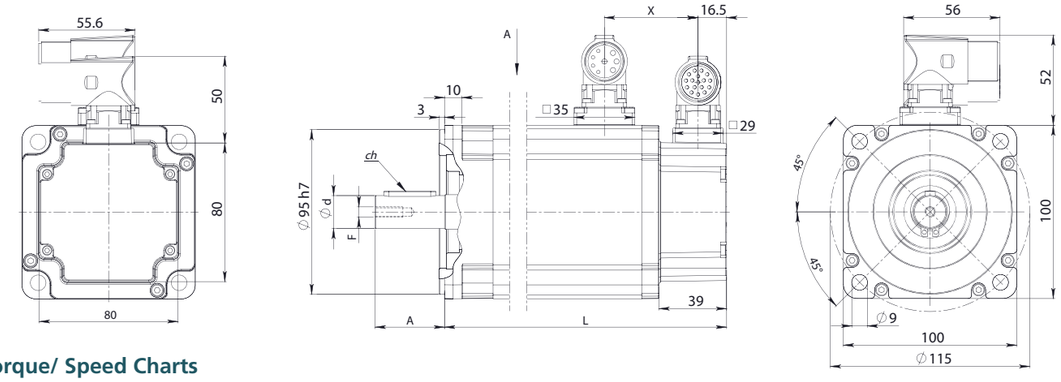
TIME RATING	Continuous	AMBIENT TEMPERATURE	0 to 40 °C
INSULATION CLASS	F	AMBIENT HUMIDITY	20 to 80% (non-condensing)
ENCLOSURE	Totally enclosed. Self-cooled	POLES	8
PROTECTION CLASS	IP 65 standard on the body	THERMAL PROTECTION	KTY 84
INSULATION SYSTEM UL /CSA	cURus , DV155J	CE certified	

		PR-100 3.2 15	PR-100 3.2 21	PR-100 5.6 15	PR-100 8 15
Stall Torque	Nm	3.2	3.2	5.6	8.0
Peak Torque	Nm	11.0	11.0	22.0	33.0
Rated Torque	Nm	2.61	2.61	4.2	5.0
Rated Voltage	Vac	400	230	400	400
Rated Output Power	W	820	820	1320	1570
Stall Current	Arms	3.52	6.08	6.15	8.79
Peak Current	Arms	12.09	20.91	24.18	36.27
Rated Current	Arms	2.96	5.11	4.76	5.66
Rated Speed	rpm	3000	3000	3000	3000
Maximum Speed 230VAC	rpm	3900	5000	3900	3900
Maximum Speed 400VAC	rpm	5000	-	5000	5000
Torque Constant (± 5%)	Nm/Arms	0.910	0.526	0.910	0.910
Voltage Constant (± 5%)	Vrms/Krpm	55.0	31.8	55.0	55.0
Phase/phase resistance (±10%@25°C)	Ohm	2.90	1.1	1.17	0.69
Phase/phase inductance (± 10%)	mH	13.28	4.44	6.33	4.22
Electrical time constant	ms	4.58	4.03	5.41	6.12
Thermal Resistance	°C/W	1.0	1.0	0.95	0.78
Mechanical time constant	ms	0.81	0.92	0.62	0.51
Rotor Inertia	Kg cm^2	1.55	1.55	2.91	4.1
Motor Weight	Kg	3.9	3.9	5.6	7.3
Motor Weight + Brake	Kg	5.2	5.2	6.9	8.6
Axial Load	N	225 (applied on the shaft's center)			
Radial Load	N	626 (applied on the shaft's center)			

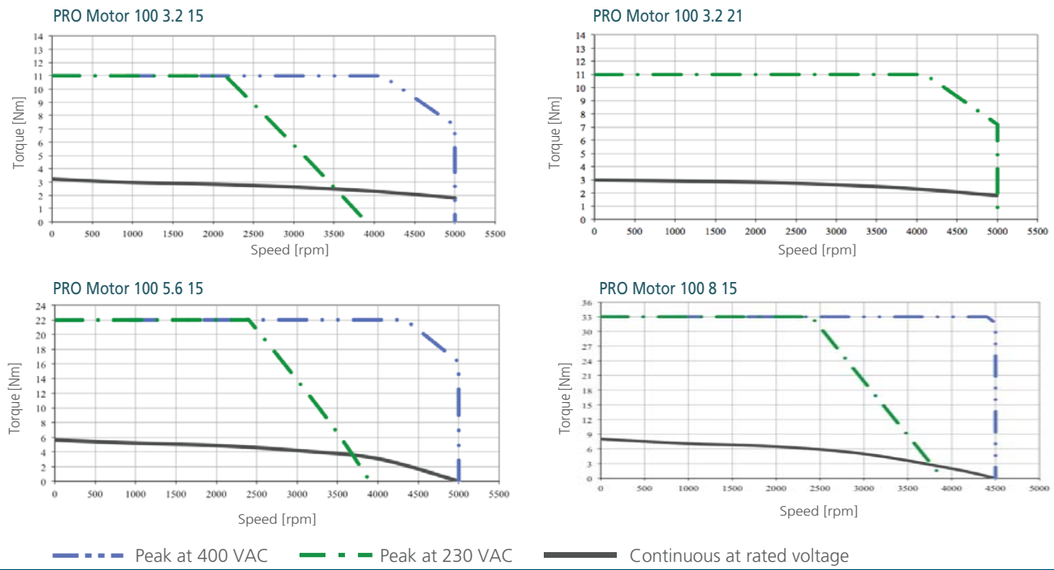
Rated output with 250 x 250 x 6 mm metallic heat sink flange coupling - Derating must be considered if the oil seal is applied - IP 42 standard shaft bushing

Dimensions

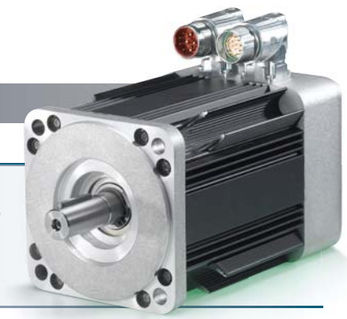
		PR-100 3.2 15	PR-100 3.2 21	PR-100 5.6 15	PR-100 8 15
L (Without Brake)	mm	145	145	175	205
L (With Brake)	mm	195	195	225	255
A	mm	40	40	40	40
d	mm (tolerance)	19 (h6)	19 (h6)	19 (h6)	19 (h6)
C	mm	6x6x30	6x6x30	6x6x30	6x6x30
F	Tap Drill (mm)	M6x16	M6x16	M6x16	M6x16
X (Without Brake)	mm	54	54	54	54
X (With Brake)	mm	104	104	104	104



Torque/ Speed Charts



PRO Motor 115 Sizes 3 - 5.2



Ratings and Specifications Sizes 3 - 5.2

TIME RATING	Continuous	AMBIENT TEMPERATURE	0 to 40 °C
INSULATION CLASS	F	AMBIENT HUMIDITY	20 to 80% (non-condensing)
ENCLOSURE	Totally enclosed. Self-cooled	POLES	6
PROTECTION CLASS	IP 65 standard on the body	THERMAL PROTECTION	KTY 84
INSULATION SYSTEM UL /CSA	cURus , DV155J	CE certified	

		PR-115 3 07	PR-115 3 15	PR-115 3 21	PR-115 5.2 09	PR-115 5.2 14	PR-115 5.2 15
Stall Torque	Nm	3.0	3.0	3.0	5.0	5.0	5.0
Peak Torque	Nm	9.0	9.0	9.0	15.6	15.6	15.6
Rated Torque	Nm	2.67	2.7	2.7	4.14	4.1	4.1
Rated Voltage	Vac	110	400	230	110	230	400
Rated Output Power	W	840	840	840	1300	1300	1300
Stall Current	Arms	12.09	3.3	5.7	16.79	8.4	5.5
Peak Current	Arms	36.27	9.9	17.1	52.39	26.2	17.1
Rated Current	Arms	11.32	3.1	5.3	14.59	7.3	4.8
Rated Speed	rpm	3000	3000	3000	3000	3000	3000
Maximum Speed 110VAC	rpm	5000	-	-	5000	-	-
Maximum Speed 230VAC	rpm	-	3900	5000	-	5000	3900
Maximum Speed 400VAC	rpm	-	5000	-	-	-	5000
Torque Constant (± 5%)	Nm/Arms	0.25	0.91	0.53	0.30	0.60	0.91
Voltage Constant (± 5%)	Vrms/Krpm	15	55	31.8	18	36	55
Phase/phase resistance (±10%@25°C)	Ohm	1.3	4.0	1.3	0.9	0.9	2.1
Phase/phase inductance (±10%)	mH	0.33	9.0	3.0	0.23	2.4	6.1
Electrical time constant	ms	0.25	2.3	2.3	0.25	2.7	2.9
Thermal Resistance	°C/W	0.24	1.05	1.08	0.18	0.72	0.72
Mechanical time constant H/L = high/low rotor inertia	ms	14.88	5.3/3.4	5.1/3.3	10.35	4.0/2.6	4.0/2.6
High Rotor Inertia (as an option)	Kg cm²	7.3	7.3	7.3	10.6	10.6	10.6
Low Rotor Inertia (standard)	Kg cm²	4.7	4.7	4.7	6.8	6.8	6.8
Motor Weight	Kg	4.7	4.7	4.7	6.2	6.2	6.2
Motor Weight + Brake	Kg	5.9	5.9	5.9	7.4	7.4	7.4
Axial Load	N	180 (applied on the shaft's center)					
Radial Load	N	600 (applied on the shaft's center)					

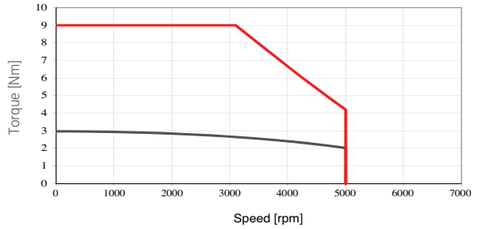
Rated output with 250 x 250 x 6 mm metallic heat sink flange coupling - Derating must be considered if the oil seal is applied - IP 42 standard shaft bushing

Dimensions Sizes 3 - 5.2

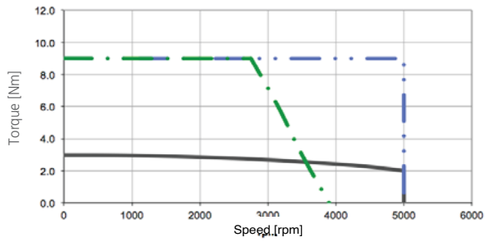
		PR-115 3 07	PR-115 3 15	PR-115 3 21	PR-115 5.2 09	PR-115 5.2 14	PR-115 5.2 15
L (Without Brake)	mm	164	164	164	189	189	189
L (With Brake)	mm	214	214	214	239	239	239
A	mm	30	30	30	40	40	40
d	mm (tolerance)	14 (j6)	14 (j6)	14 (j6)	19 (j6)	19 (j6)	19 (j6)
ch	mm	5x5x25	5x5x25	5x5x25	6x6x30	6x6x30	6x6x30
F	Tap Drill (mm)	M5x12.5	M5x12.5	M5x12.5	M6x15	M6x15	M6x15

Torque/ Speed Charts Sizes 3 - 5.2

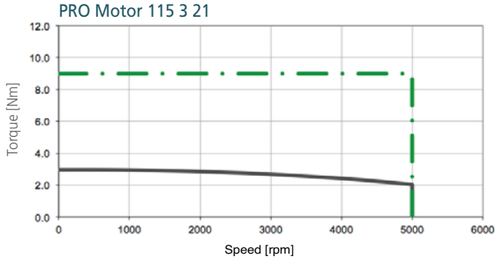
PRO Motor 115 3 07



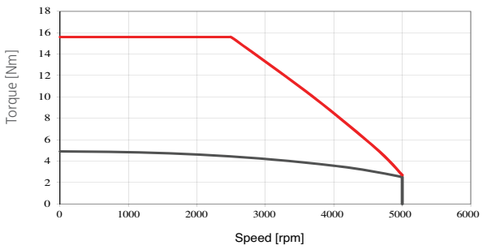
PRO Motor 115 3 15



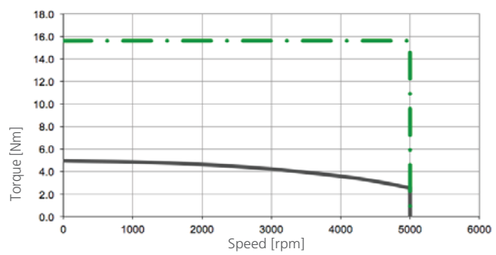
PRO Motor 115 3 21



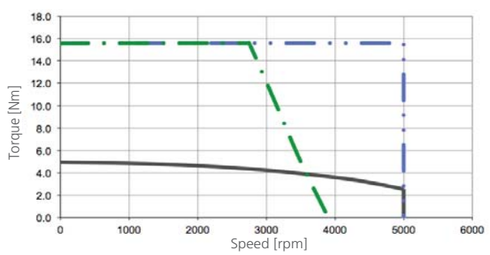
PRO Motor 115 5.2 09



PRO Motor 15 5.2 14

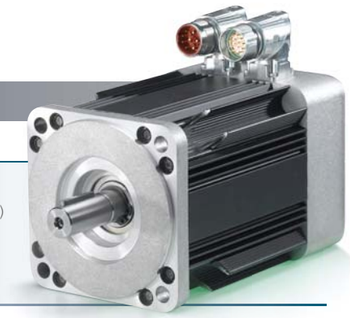


PRO Motor 115 5.2 15



Peak at 110 VAC — Peak at 230 VAC — Peak at 400 VAC — Continuous at rated voltage

PRO Motor 115 Size 7



Ratings and Specifications Size 7

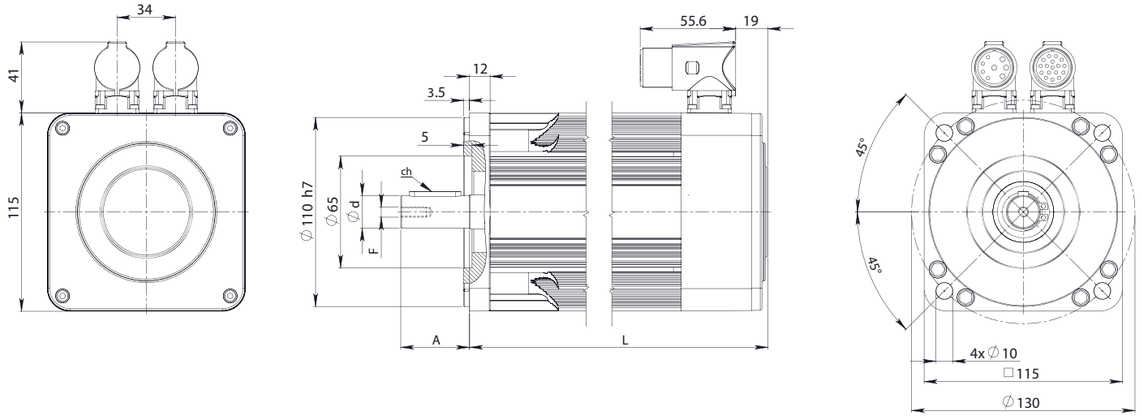
TIME RATING	Continuous	AMBIENT TEMPERATURE	0 to 40 °C
INSULATION CLASS	F	AMBIENT HUMIDITY	20 to 80% (non-condensing)
ENCLOSURE	Totally enclosed. Self-cooled	POLES	6
PROTECTION CLASS	IP 65 standard on the body	THERMAL PROTECTION	KTY 84
INSULATION SYSTEM UL /CSA	cURus , DV155J	CE certified	

		PR-115 7 13	PR-115 7 15	PR-115 7 17
Stall Torque	Nm	6.5	6.5	6.5
Peak Torque	Nm	21.0	21.0	21.0
Rated Torque	Nm	5.25	5.3	5.3
Rated Voltage	Vac	110	230	400
Rated Output Power	W	1650	1650	1650
Stall Current	Arms	14.29	7.1	4.1
Peak Current	Arms	46.16	23.1	13.1
Rated Current	Arms	12.12	6.1	3.4
Rated Speed	rpm	3000	3000	3000
Maximum Speed 110VAC	rpm	3750	-	-
Maximum Speed 230VAC	rpm	-	3900	2200
Maximum Speed 400VAC	rpm	-	4500	3900
Torque Constant (± 5%)	Nm/Arms	0.45	0.91	1.60
Voltage Constant (± 5%)	Vrms/Krpm	27.5	55	97
Phase/phase resistance (±10%@25°C)	Ohm	0.3	1.2	3.7
Phase/phase inductance (±10%)	mH	1.03	4.1	12.0
Electrical time constant	ms	3.42	3.4	3.2
Thermal Resistance	°C/W	0.74	0.74	0.75
Mechanical time constant H/L = high/low rotor inertia	ms	1.91	3.1/1.9	3/1.9
High Rotor Inertia (as an option)	Kg cm^2	14.1	14.1	14.1
Low Rotor Inertia (standard)	Kg cm^2	8.8	8.8	8.8
Motor Weight	Kg	7.5	7.5	7.5
Motor Weight + Brake	Kg	8.7	8.7	8.7
Axial Load	N	180 (applied on the shaft's center)		
Radial Load	N	600 (applied on the shaft's center)		

Rated output with 250 x 250 x 6 mm metallic heat sink flange coupling - Derating must be considered if the oil seal is applied - IP 42 standard shaft bushing

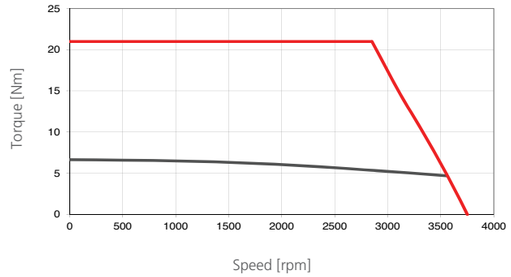
Dimensions Size 7

		PR-115 7 13	PR-115 7 15	PR-115 7 17
L (Without Brake)	mm	214	214	214
L (With Brake)	mm	264	264	264
A	mm	40	40	40
d	mm (tolerance)	19 (j6)	19 (j6)	19 (j6)
ch	mm	6x6x30	6x6x30	6x6x30
F	Tap Drill (mm)	M6x15	M6x15	M6x15

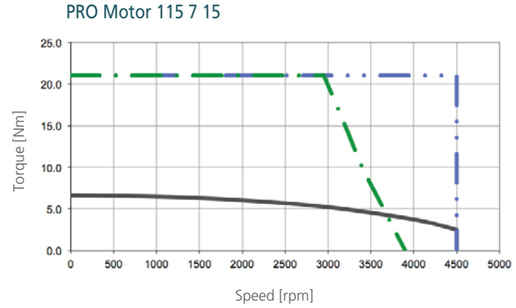


Torque/ Speed Charts Sizes 7

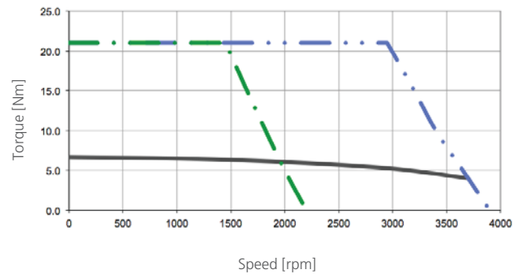
PRO Motor 115 7 13



PRO Motor 115 7 15



PRO Motor 115 7 17



Peak at 110 VAC — Peak at 230 VAC — Peak at 400 VAC — Continuous at rated voltage

PRO Motor 115 Sizes 9.2 - 11

Ratings and Specifications Sizes 9.2 - 11

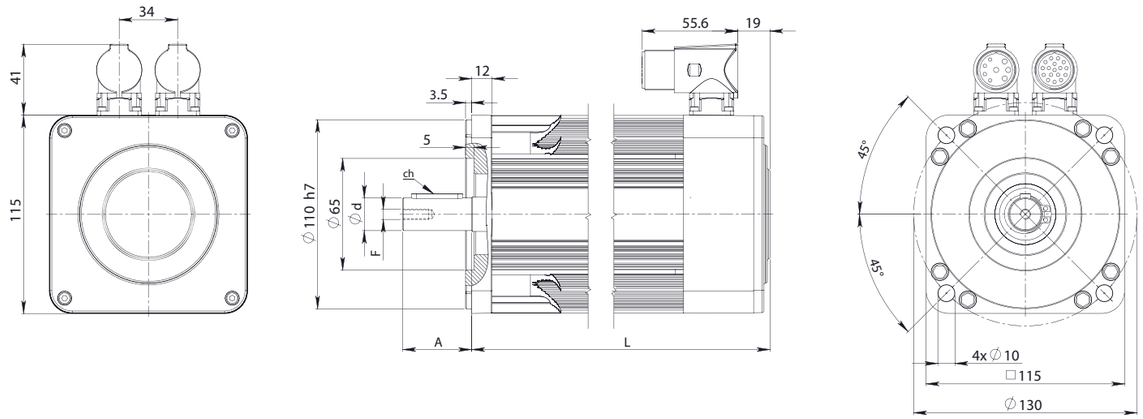
TIME RATING	Continuous	AMBIENT TEMPERATURE	0 to 40 °C
INSULATION CLASS	F	AMBIENT HUMIDITY	20 to 80% (non-condensing)
ENCLOSURE	Totally enclosed. Self-cooled	POLES	6
PROTECTION CLASS	IP 65 standard on the body	THERMAL PROTECTION	KTY 84
INSULATION SYSTEM UL /CSA	cURus , DV155J	CE certified	

		PR-115 9.2 13	PR-115 9.2 15	PR-115 9.2 17	PR-115 11 13	PR-115 11 15	PR-115 11 17
Stall Torque	Nm	8.5	8.5	8.5	9.50	9.5	9.5
Peak Torque	Nm	27.6	27.6	27.6	33.00	33.0	33.0
Rated Torque	Nm	6.37	6.4	6.4	7.32	7.3	7.3
Rated Voltage	Vac	110	230	400	110	230	400
Rated Output Power	W	2000	2000	2000	2300	2300	2300
Stall Current	Arms	18.68	9.3	5.3	20.88	10.4	5.9
Peak Current	Arms	60.67	30.3	17.2	72.54	36.3	20.6
Rated Current	Arms	14.70	7.3	4.2	16.90	8.5	4.8
Rated Speed	rpm	3000	3000	3000	3000	3000	3000
Maximum Speed 110 VAC	rpm	3750	-	-	3750	-	-
Maximum Speed 230 VAC	rpm	-	3900	2200	-	3900	2200
Maximum Speed 400 VAC	rpm	-	4500	3900	-	4500	3900
Torque Constant (± 5%)	Nm/Arms	0.45	0.91	1.60	0.45	0.91	1.60
Voltage Constant (± 5%)	Vrms/Krpm	27.5	55	97	27.50	55	97
Phase/phase resistance (±10%@25°C)	Ohm	0.23	0.9	2.8	0.23	0.9	2.8
Phase/phase inductance (± 10%)	mH	0.78	3.1	10.0	0.73	2.9	8.6
Electrical time constant	ms	3.44	3.4	3.6	3.15	3.2	3.1
Thermal Resistance	°C/W	0.58	0.58	0.58	0.45	0.45	0.46
Mechanical time constant H/L = high/low rotor inertia	ms	1.78	2.9/1.8	2.9/1.8	2.17	3.5/2.2	3.4/2.1
High Rotor Inertia (as an option)	Kg cm^2	17.5	17.5	17.5	20.8	20.8	20.8
Low Rotor Inertia (standard)	Kg cm^2	10.9	10.9	10.9	13.00	13	13
Motor Weight	Kg	8.80	8.8	8.8	9.90	9.9	9.9
Motor Weight + Brake	Kg	9.90	9.9	9.9	11.70	11.7	11.7
Axial Load	N			180 (applied on the shaft's center)			
Radial Load	N			600 (applied on the shaft's center)			

Rated output with 250 x 250 x 6 mm metallic heat sink flange coupling - Derating must be considered if the oil seal is applied - IP 42 standard shaft bushing

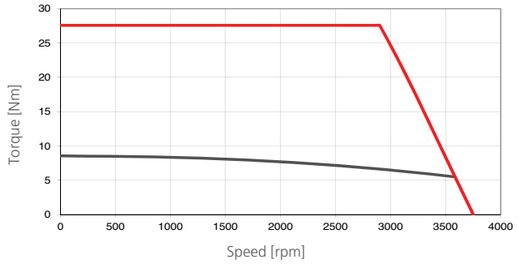
Dimensions Sizes 9.2 - 11

		PR-115 9.2 13	PR-115 9.2 15	PR-115 9.2 17	PR-115 11 13	PR-115 11 15	PR-115 11 17
L (Without Brake)	mm	239	239	239	264	264	264
L (With Brake)	mm	289	289	289	314	314	314
A	mm	40	40	40	40	40	40
d	mm (tolerance)	19 (j6)	19 (j6)	19 (j6)	19 (j6)	19 (j6)	19 (j6)
ch	mm	6x6x30	6x6x30	6x6x30	6x6x30	6x6x30	6x6x30
F	Tap Drill (mm)	M6x15	M6x15	M6x15	M6x15	M6x15	M6x15

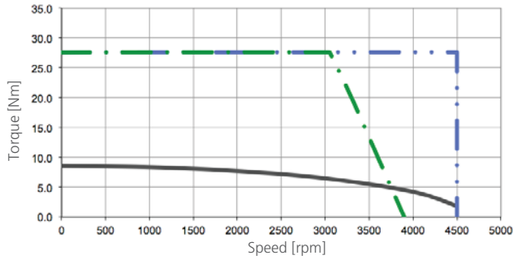


Torque/ Speed Charts Sizes 9.2 - 11

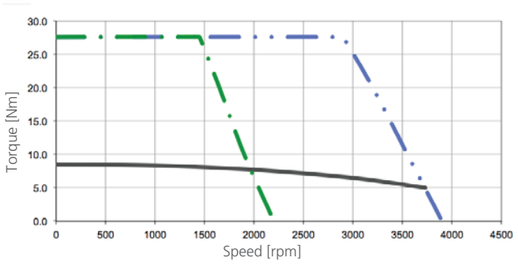
PRO Motor 115 9.2 13



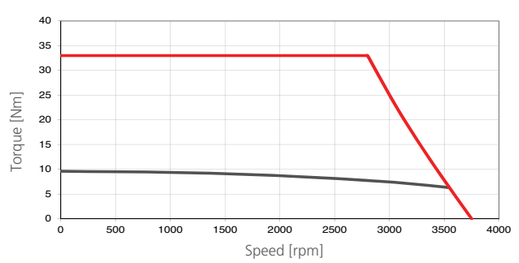
PRO Motor 115 9.2 15



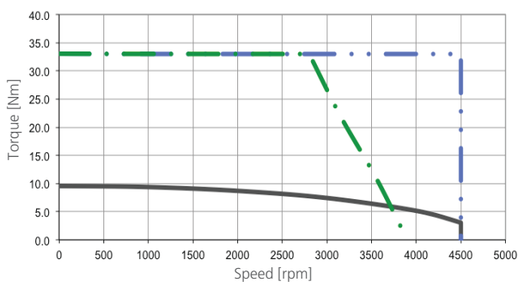
PRO Motor 80 115 9.2 17



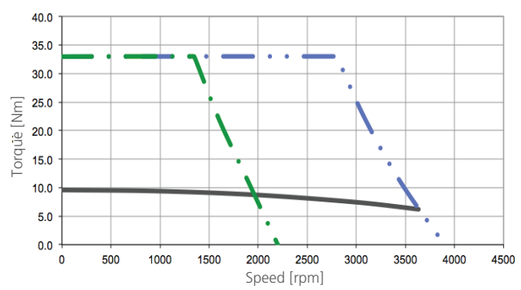
PRO Motor 115 11 13



PRO Motor 115 11 15



PRO Motor 115 11 17



Peak at 110 VAC — Peak at 230 VAC — Peak at 400 VAC — Continuous at rated voltage

PRO Motor 142 Sizes 12 - 16.5

Ratings and Specifications Sizes 12 - 16.5

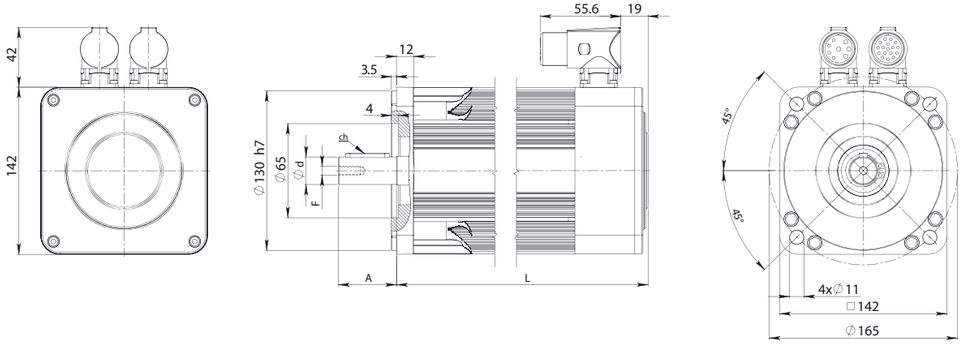
TIME RATING	Continuous	AMBIENT TEMPERATURE	0 to 40 °C
INSULATION CLASS	F	AMBIENT HUMIDITY	20 to 80% (non-condensing)
ENCLOSURE	Totally enclosed. Self-cooled	POLES	6
PROTECTION CLASS	IP 65 standard on the body	THERMAL PROTECTION	KTY 84
INSULATION SYSTEM UL /CSA	cURus , DV155J File nr.:E216686	CE certified	

		PR-142 12 13	PR-142 12 15	PR-142 12 17	PR-142 16.5 13	PR-142 16.5 15	PR-142 16.5 17
Stall Torque	Nm	11	11	11	14	14	14
Peak Torque	Nm	31	31	31	42	42	42
Ratedl Torque	Nm	8.60	8.6	8.6	11.14	11.1	11.1
Rated Voltage	Vac	110	230	400	110	230	400
Rated Output Power	W	2700	2700	2700	3500	3500	3500
Stall Current	Arms	24.18	12.1	6.9	30.77	15.4	8.7
Peak Current	Arms	68.14	34.1	19.3	92.32	46.2	26.2
Rated Current	Arms	19.84	9.9	5.6	25.72	12.9	7.3
Rated Speed	rpm	3000	3000	3000	3000	3000	3000
Maximum Speed 110 VAC	rpm	3750	-	-	3750	-	-
Maximum Speed 230 VAC	rpm	-	3900	2200	-	3900	2200
Maximum Speed 400 VAC	rpm	-	4800	3900	-	4600	3900
Torque Constant (± 5%)	Nm/Arms	0.45	0.91	1.60	0.45	0.91	1.60
Voltage Constant (± 5%)	Vrms/Krpm	27.5	55	97	27.5	55	97
Phase/phase resistance (±10%@25°C)	Ohm	0.15	0.6	1.6	0.1	0.4	1.3
Phase/phase inductance (±10%)	mH	0.69	2.8	7.9	0.53	2.1	6.9
Electrical time constant	ms	4.6	4.6	4.8	5.2	5.2	5.2
Thermal Resistance	°C/W	0.52	0.52	0.59	0.47	0.47	0.45
Mechanical time constant H/L = high/low rotor inertia	ms	2.5	4.2/2.5	3.7/2.2	2.01	3.4/2.0	3.5/2.1
High Rotor Inertia (as an option)	Kg cm^2	38.4	38.4	38.4	45.9	45.9	45.9
Low Rotor Inertia (standard)	Kg cm^2	23	23	23	27	27	27
Motor Weight	Kg	13.5	13.5	13.5	15.5	15.5	15.5
Motor Weight + Brake	Kg	15.7	15.7	15.7	17.7	17.7	17.7
Axial Load	N	240 (applied on the shaft's center)					
Radial Load	N	800 (applied on the shaft's center)					

Rated output with 250 x 250 x 6 mm metallic heat sink flange coupling - Derating must be considered if the oil seal is applied - IP 42 standard shaft bushing

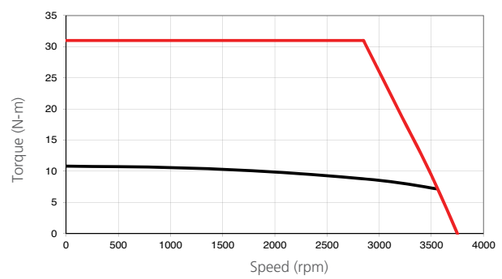
Dimensions Sizes 12 - 16.5

		PR-142 12 13	PR-142 12 15	PR-142 12 17	PR-142 16.5 13	PR-142 16.5 15	PR-142 16.5 17
L (Without Brake)	mm	245	245	245	275	275	275
L (With Brake)	mm	305	305	305	335	335	335
A	mm	50	50	50	50	50	50
d	mm (tolerance)	24 (j6)	24 (j6)	24 (j6)	24 (j6)	24 (j6)	24 (j6)
ch	mm	8x7x40	8x7x40	8x7x40	8x7x40	8x7x40	8x7x40
F	Tap Drill (mm)	M8x20	M8x20	M8x20	M8x20	M8x20	M8x20

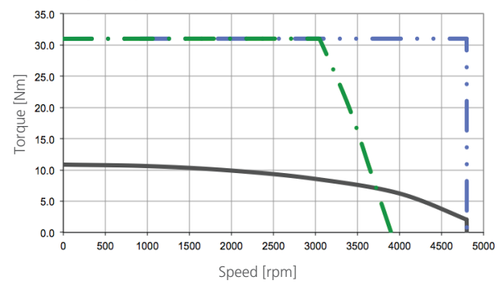


Torque/ Speed Charts Sizes 12 - 16.5

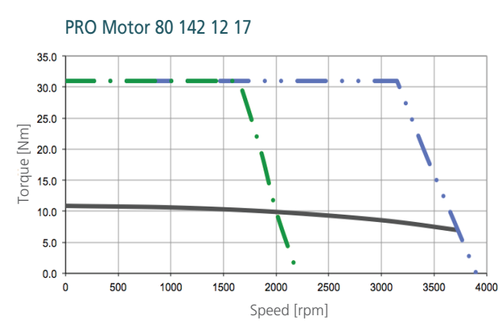
PR-142 12 13



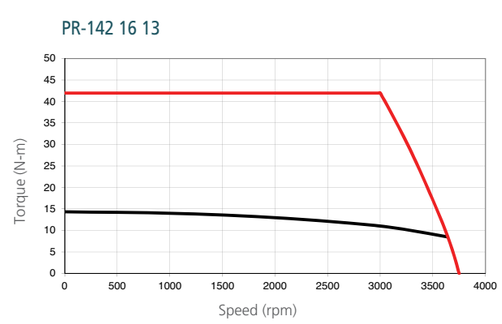
PRO Motor 142 12 15



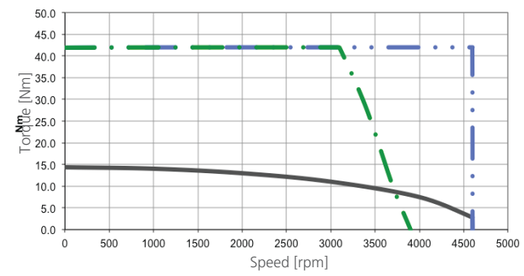
PRO Motor 80 142 12 17



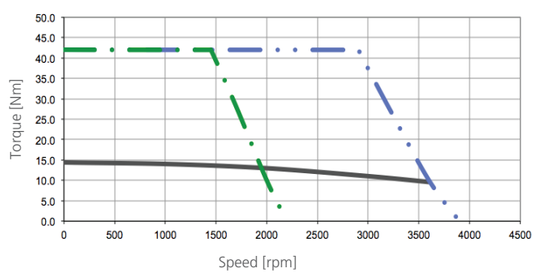
PR-142 16 13



PRO Motor 142 16.5 15



PRO Motor 142 16.5 17



Peak at 110 VAC — Peak at 230 VAC — Peak at 400 VAC — Continuous at rated voltage

PRO Motor 142 Sizes 21 - 25.5

Ratings and Specifications Sizes 21 - 25.5

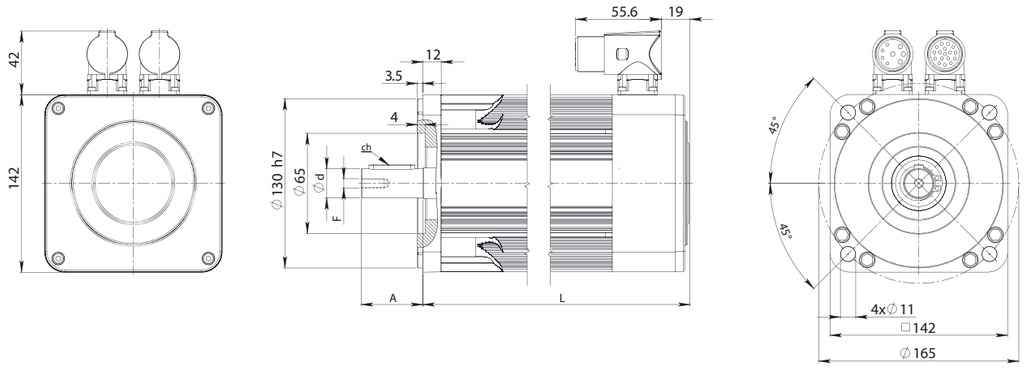
TIME RATING	Continuous	AMBIENT TEMPERATURE	0 to 40 °C
INSULATION CLASS	F	AMBIENT HUMIDITY	20 to 80% (non-condensing)
ENCLOSURE	Totally enclosed. Self-cooled	POLES	6
PROTECTION CLASS	IP 65 standard on the body	THERMAL PROTECTION	KTY 84
INSULATION SYSTEM UL /CSA	cURus , DV155J File nr.:E216686	CE certified	

		PR-142 21 15	PR-142 21 17	PR-142 21 24	PR-142 25.5 15	PR- 142 25.5 17	PR- 142 25.5 24
Stall Torque	Nm	18	18	18	21	21	21
Peak Torque	Nm	55	55	55	65	65	65
Rated Torque	Nm	13.1	13.1	16	15.9	15.9	19.99
Rated Voltage	Vac	230	400	110	230	400	110
Rated Output Power	W	4100	4100	3350	5000	5000	3140
Stall Current	Arms	19.8	11.2	22.67	23.1	13.1	26.45
Peak Current	Arms	60.5	34.3	69.27	71.4	40.5	81.86
Rated Current	Arms	15.1	8.5	21.16	18.4	10.4	26.44
Rated Speed	rpm	3000	3000	2000	3000	3000	1500
Maximum Speed 110 VAC	rpm	-	-	2150	-	-	2150
Maximum Speed 230 VAC	rpm	3900	2200	-	3900	2200	-
Maximum Speed 400 VAC	rpm	4400	3900	-	4400	3900	-
Torque Constant (± 5%)	Nm/Arms	0.91	1.60	0.79	0.91	1.60	0.79
Voltage Constant (± 5%)	Vrms/Krpm	55	97	48	55	97	48
Phase/phase resistance (± 10%@25°C)	Ohm	0.25	0.8	0.2	0.24	0.8	0.19
Phase/phase inductance (± 10%)	mH	1.4	4.5	1.13	1.3	4.2	1.05
Electrical time constant	ms	5.6	5.6	5.56	5.4	5.5	5.45
Thermal Resistance	°C/W	0.46	0.45	0.44	0.36	0.34	0.34
Mechanical time constant H/L = high/low rotor inertia	ms	2.8/1.6	2.9/1.7	1.74	3.0/1.8	3.1/1.8	1.85
High Rotor Inertia (as an option)	Kg cm^2	61.2	61.2	61.2	68.9	68.9	68.9
Low Rotor Inertia (standard)	Kg cm^2	36.1	36.1	36.1	40.5	40.5	40.5
Motor Weight	Kg	18.5	18.5	18.5	20.5	20.5	20.5
Motor Weight + Brake	Kg	20.7	20.7	20.7	22.7	22.7	22.7
Axial Load	N		240 (applied on the shaft's center)				
Radial Load	N		800 (applied on the shaft's center)				

Rated output with 250 x 250 x 6 mm metallic heat sink flange coupling - Derating must be considered if the oil seal is applied - IP 42 standard shaft bushing

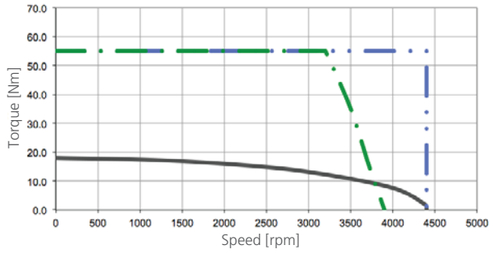
Dimensions Sizes 21 - 25.5

		PR-142 21 15	PR-142 21 17	PR-142 21 24	PR-142 25.5 15	PR-142 25.5 17	PR-142 25.5 24
L (Without Brake)	mm	305	305	305	335	335	335
L (With Brake)	mm	365	365	365	395	395	395
A	mm	50	50	50	50	50	50
d	mm (tolerance)	24 (j6)	24 (j6)	24 (j6)	24 (j6)	24 (j6)	24 (j6)
ch	mm	8x7x40	8x7x40	8x7x40	8x7x40	8x7x40	8x7x40
F	Tap Drill (mm)	M8x20	M8x20	M8x20	M8x20	M8x20	M8x20

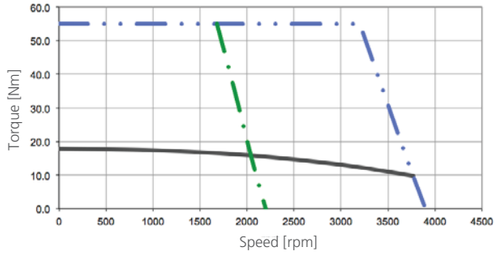


Torque/ Speed Charts Sizes 21 - 25.5

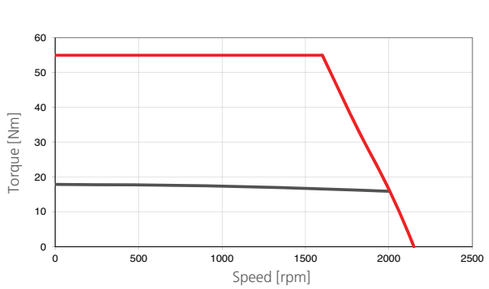
PRO Motor 142 21 15



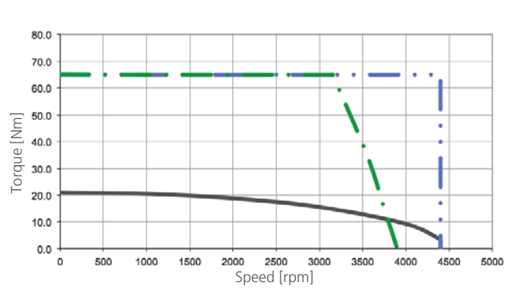
PRO Motor 142 21 17



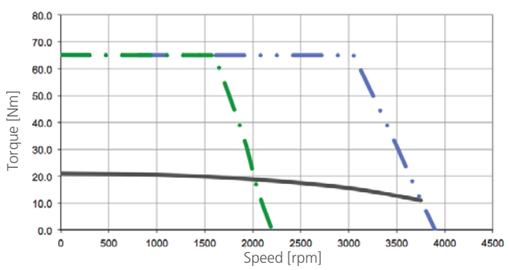
PRO Motor 142 21 24



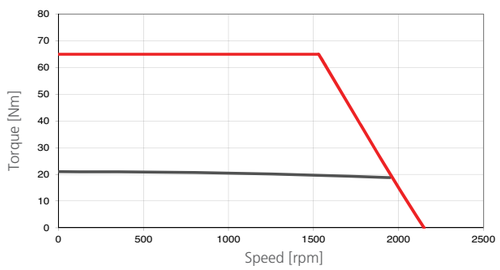
PRO Motor 142 25.5 15



PRO Motor 142 25.5 17



PRO Motor 142 25.5 24



Peak at 110 VAC — Peak at 230 VAC — Peak at 400 VAC — Continuous at rated voltage

PRO Motor 180

Ratings and Specifications

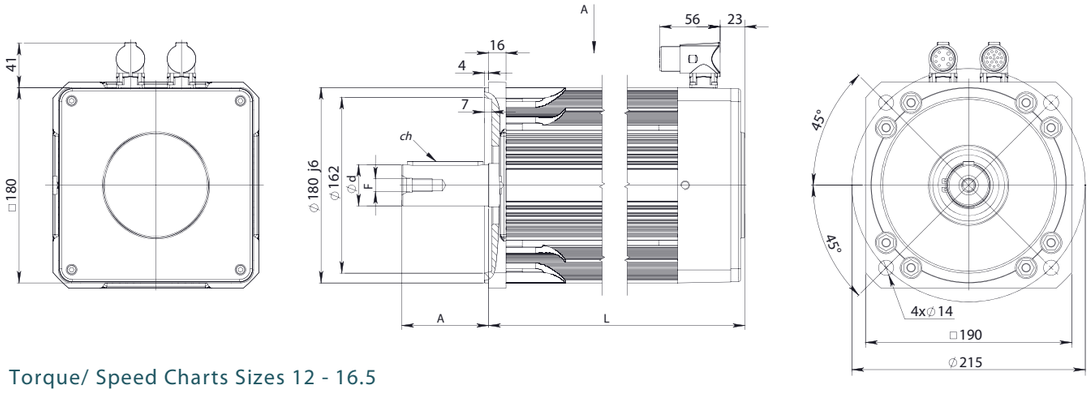
TIME RATING	Continuous	AMBIENT TEMPERATURE	0 to 40 °C
INSULATION CLASS	F	AMBIENT HUMIDITY	20 to 80% (non-condensing)
ENCLOSURE	Totally enclosed. Self-cooled	POLES	6
PROTECTION CLASS	IP 65 standard on the body	THERMAL PROTECTION	KTY 84
INSULATION SYSTEM UL /CSA	cURus , DV155J File nr.:E216686	CE certified	

		PR-180 22.5 17	PR-180 35 17	PR-180 47 17
Stall Torque	Nm	25	39	50
Peak Torque	Nm	63	95	130
Rated Torque	Nm	15.0	21.0	40.0
Rated Voltage	Vac	400	400	400
Rated Output Power	W	4700	6600	8380
Stall Current	Arms	15.6	24.3	31.2
Peak Current	Arms	39.3	59.2	81.0
Rated Current	Arms	9.8	13.7	26.2
Rated Speed	rpm	3000	3000	2000
Maximum Speed 230 VAC	rpm	2200	2200	2200
Maximum Speed 400 VAC	rpm	3000	3000	3000
Torque Constant (± 5%)	Nm/Arms	1.60	1.60	1.60
Voltage Constant (± 5%)	Vrms/Krpm	97	97	97
Phase/phase resistance (± 10%@25°C)	Ohm	0.59	0.29	0.19
Phase/phase inductance (± 10%)	mH	3.0	1.9	1.4
Electrical time constant	ms	5.1	6.6	7.4
Thermal Resistance	°C/W	0.32	0.27	0.25
Mechanical time constant H/L = high/low rotor inertia	ms	3.3/2.4	2. 4/1.7	2.1/1.5
High Rotor Inertia (as an option)	Kg cm^2	95	141	186.7
Low Rotor Inertia (standard)	Kg cm^2	69.5	102.5	135.5
Motor Weight	Kg	27.5	36	45
Motor Weight + Brake	Kg	33.5	42	51
Axial Load	N	510 (applied on the shaft's center)		
Radial Load	N	1700 (applied on the shaft's center)		

Rated output with 250 x 250 x 6 mm metallic heat sink flange coupling - Derating must be considered if the oil seal is applied - IP 42 standard shaft bushing

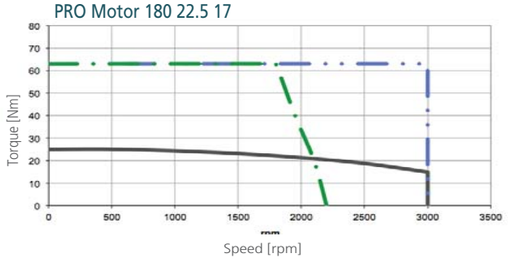
Dimensions

		PR-180 22.5 17	PR-180 35 17	PR-180 47 17
L (Without Brake)	mm	290	350	410
L (With Brake)	mm	350	410	470
A	mm	60	80	80
d	mm (tolerance)	28 (j6)	28 (j6)	28 (j6)
ch	mm	8x7x50	8x7x50	8x7x50
F	Tap Drill (mm)	M10x22	M12x28	M12x28

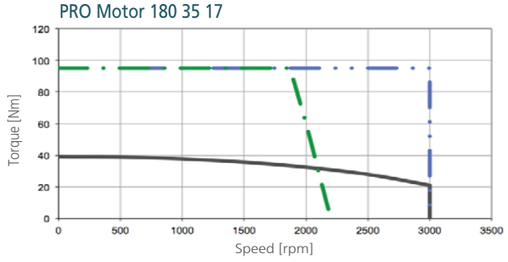


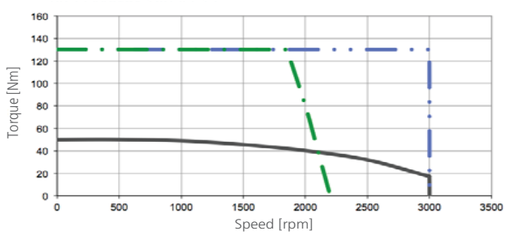
Torque/ Speed Charts Sizes 12 - 16.5

PRO Motor 180 22.5 17



PRO Motor 180 35 17





Peak at 110 VAC — Peak at 230 VAC — Peak at 400 VAC — Continuous at rated voltage

Brake Features

		PR-40	PR-60	PR-80	PR-100
Static Torque @20°C	Nm	0.4	2	4.5	9
Moment of Inertia	Kg cm^2	0.008	0.050	0.220	0.800
Rated Current	A	0.34	0.46	0.5	0.75
Input Power	W	8	11	12	18
Engaging Time	ms	6	6	7	7
Release Time	ms	10	25	35	40
Operating Voltage		24 Vdc +6% - 10% Stabilized			

		PR-115 3, PR-115 5.2, PR-115 7, PR-115 9.2
Static Torque @20°C	Nm	9
Moment of Inertia	Kg cm^2	0.800
Rated Current	A	0.75
Input Power	W	18
Engaging Time	ms	7
Release Time	ms	40
Operating Voltage		24 Vdc +6% - 10% Stabilized

		PR-115 11 PR-142 12 PR-142 16.5	PR-142 21 PR-142 25.5	PR-180 22.5, PR-180 35 PR-180 47
Static Torque @20°C	Nm	18	36	72
Moment of Inertia	Kg cm^2	1.9	6.21	15.3
Rated Current	A	1	1,08	1,66
Input Power	W	24	26	40
Engaging Time	ms	10	22	7
Release Time	ms	50	90	140
Operating Voltage		24 Vdc +6% - 10% Stabilized		

Feedback Features

E: RS422 ENCODER

Motor Model		PR-40, 60, 80	PR-100, PR-115, PR-142, PR-180
Nominal Voltage	V	5±5%	5±5%
Nominal current	mA	200	200
Max Frequency	Khz	200	200
Electronic type		LINE DRIVER AM 26 LS31	LINE DRIVER AM 26 LS31
Zero impulse		ONE AT A LAP	ONE AT A LAP
N° of pulses revolution	ppr	2000	2000
Resolution	cpr	8000	8000
N° of commutation signal		3 DIFFERENTIAL	3 DIFFERENTIAL
System accuracy	arc sec	± 50	± 50
Rotor inertia	Kg cm^2	0.01	0.065

Please note: for all motors Models PR- 40- all motors Model PR- 60 and for model PR100 8 15 with encoder TTL the maximum theoretical acceleration is 80.000 rad/s^2

R: RESOLVER 2 poles

Motor Model		PR-40	PR-60, PR-80	PR-100, PR-115, PR-142, PR-180
Nominal Voltage	Vrms	7±5%	7±5%	7±5%
Nominal current	mA	50	50	50
Phase shift		+5°	+3°	-5°
Minimum sin amplitude	mVrms	20	20	20
Frequency	kHz	10	10	10
Poles number		2	2	2
Trasformer ratio		0.5 ± 5%	0.5 ± 5%	0.5 ± 5%
Input impedance	ohm	160	130 + j280	110+j140
Output impedance	ohm	130	425 + j755	130+j240
System accuracy		± 10'	± 10'	± 10'
Rotor inertia	Kg cm^2	0.006	0.03	0.1

A: ABSOLUTE MULTITURN ENCODER

Motor Model		PR-40, PR-60, PR-80, PR-100, PR-115, PR-142, PR-180
Nominal Voltage	V	7 ÷ 12
Nominal current	mA	60
Max frequency fon Sin Cos signal	Khz	65
Interface type		Hiperface
N° absolute singleturn steps		4096 (12 Bits)
N° absolute multiturn steps		4096 (12 Bits)
N° of sin/cos periods per revolution		128
System accuracy	arc sec	± 320
Rotor inertia	Kg cm^2	0.0045

Other feedback options are available upon request

Thermal Protection Features

KTY84

General description

The temperature sensor KTY84 has a positive temperature coefficient of resistance and is suitable for use in measurement and control systems.

Features

- High accuracy and reliability
- Positive temperature coefficient; fail-safe behavior
- Temperature range -40 °C to +300 °C
- Long-term stability
- Virtually linear characteristics
- Nickel plated leads

Characteristics

T_{amb}= 100°C

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
R_{100}	sensor resistance	$I_{(cont)}$ = 2mA	970	-	1030	Ω
TC	temperature coefficient		-	0.61	-	%/K
R_{25}/R_{100}	resistance ratio	T_{amb}= 25°C and 100 °C	0.595	0.603	0.6011	

Ambient temperature

°C	Resistance (Ω)
0	498
10	538
20	581
25	603
30	626
40	672
50	722
60	773
70	826
80	882
90	940
100	1000
110	1062
120	1127
130	1194
140	1262
150	1334
160	1407

NB Data are subjected to 10% tolerance

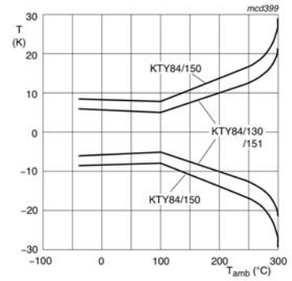


Fig 1. Maximum expected temperature error (ΔT)

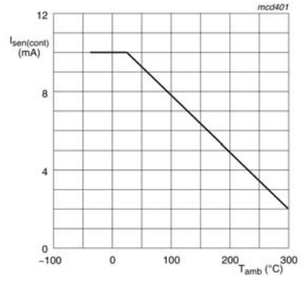


Fig 2. Maximum operating current for safe operation

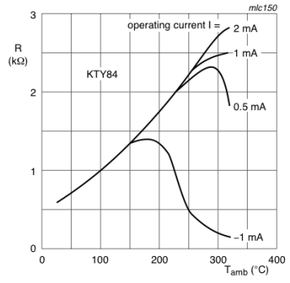


Fig 3. Sensor resistance as a function of ambient temperature and operating current

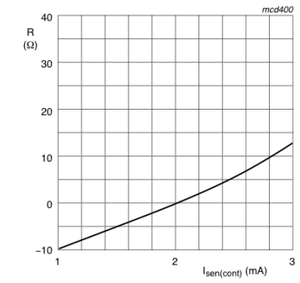


Fig 4. Deviation of sensor resistance as a function of operating current in still liquid

Wiring Motor Connections

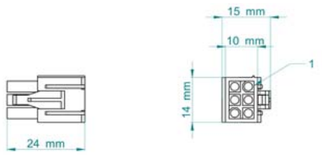
Power Connector for PR-40 Only

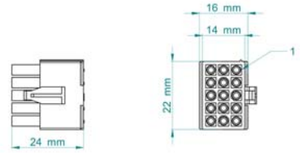
PIN	FUNCTION
1	Phase U
2	Phase V
3	Phase W
4	PE
5	Brake 24V (#)
6	Brake 0V (#)

(#) Optional

Feedback Connector for PR-40 Only

E TTL ENCODER		R RESOLVER		A ABSOLUTE ENCODER	
PIN	FEEDBACK FUNCTION	PIN	FEEDBACK FUNCTION	PIN	FEEDBACK FUNCTION
1	Ch A	1	Sin+	1	Sin
2	Ch /A	2	Sin-	2	/Sin
3	Ch B	3	Cos+	3	Cos
4	Ch /B	4	Cos-	4	/Cos
5	Ch Z	5	Ref+	5	DATA
6	Ch /Z	6	Ref-	6	/DATA
7	Hall U	7	-	7	-
8	Hall /U	8	-	8	-
9	Hall V	9	-	9	-
10	Hall /V	10	-	10	-
11	Hall W	11	-	11	-
12	Hall /W	12	-	12	-
13	5 Vdc	13	-	13	7-12 Vdc
14	0 Vdc	14	-	14	0 Vdc
15	Shield	15	Shield	15	Shield





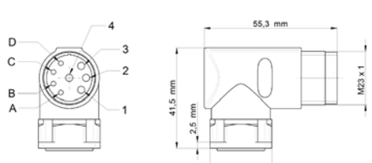
Power Connector for All Other Models

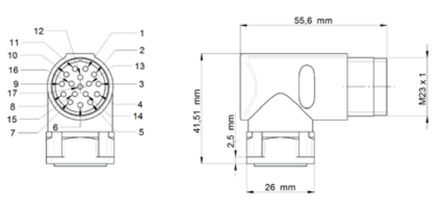
FOR OTHER MODELS	
PIN	FUNCTION
1	Phase U
2	PE
3	Phase W
4	Phase V
A	Brake 24V (#)
B	Brake 0V (#)
C	
D	

(#) Optional

Feedback Connector for All Other Models

E TTL ENCODER		R RESOLVER		A ABSOLUTE ENCODER	
RS422	FEEDBACK FUNCTION	PIN	FEEDBACK FUNCTION	PIN	FEEDBACK FUNCTION
1	Hall W	1	-	1	-
2	Hall U	2	-	2	-
3	0 Vdc	3	-	3	0 Vdc
4	5Vdc	4	-	4	7-12 Vdc
5	Ch /A	5	/Sin	5	/Sin
6	Ch A	6	Sin +	6	Sin
7	Ch /Z	7	/Ref	7	/DATA
8	Ch Z	8	Ref	8	DATA
9	Hall V	9	-	9	-
10	Shield	10	Shield	10	Shield
11	Ch /B	11	/Cos	11	/Cos
12	Ch B	12	Cos	12	Cos
13	Hall /W	13	-	13	-
14	Hall /V	14	-	14	-
15	Hall /U	15	-	15	-
16	KTY 84 (+)	16	KTY 84 (+)	16	KTY 84 (+)
17	KTY 84 (-)	17	KTY 84 (-)	17	KTY 84 (-)





Mating Connectors Specification

Flying Connectors AMP for PR-40 Only

Mating Connectors

Motor Power	Manufacturer	AMP	
	Housing P/N	172160-1	<http://www.te.com/catalog/pn/en/172160-1>
	Crimp Pin P/N (Need 6 pins)	171637-1	<http://www.te.com/catalog/pn/en/172163-1>
Motor Feedback	Manufacturer	AMP	
	Housing P/N	172163-1	<http://www.te.com/catalog/products/en?q=171637-1>
	Crimp Pin P/N (Number of pins needed varies according to Feedback type)	170361-1	<http://www.te.com/catalog/products/en?q=170361-1>

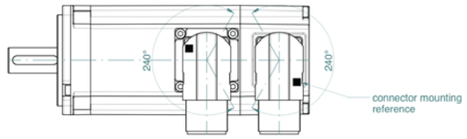
Flying Connectors m23 for All Other Models

Mating Connectors

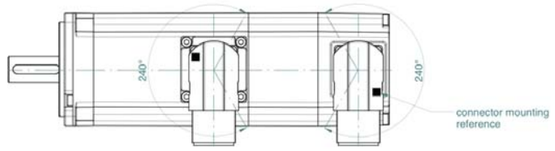
Motor Power	Manufacturer	INTERCONTEC
	Housing P/N	order code: B ST A 108 NN 00 42 0236 000
	Crimp Pin P/N (Need 2 pins)	crimping range 0.35–2.5mm2 - order code: 60.254.11
	Crimp Pin P/N (Need 2 pins)	slotted, crimping range 0.14– 1.0mm2 - order code: 60.011.11
Motor Feedback	Manufacturer	INTERCONTEC
	Housing P/N	order code: A ST A 014 NN 00 41 0235 000
	Crimp Pin P/N (Need 17 pins)	slotted, crimping range 0.14– 1.0mm2 - order code: 60.011.11

Connector Turning Angle Specification

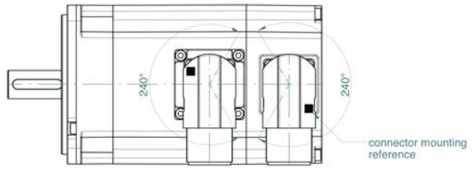
PRO Motor 60



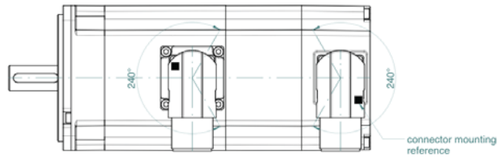
PRO Motor 60 WITH BRAKE



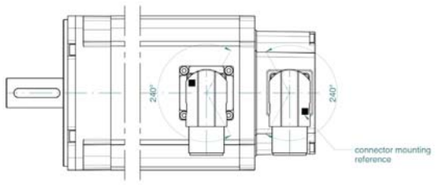
PRO Motor 80



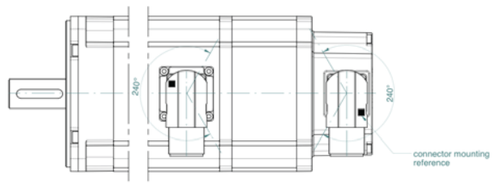
PRO Motor 80 WITH BRAKE



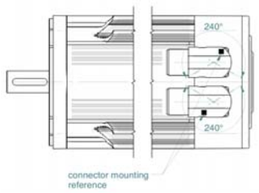
PRO Motor 100



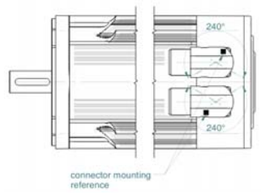
PRO Motor 100 WITH BRAKE



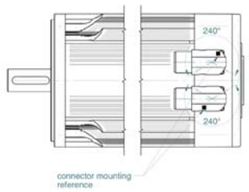
PRO Motor 115



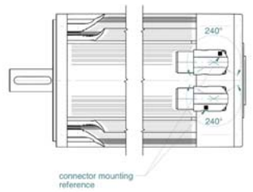
PRO Motor 115 WITH BRAKE



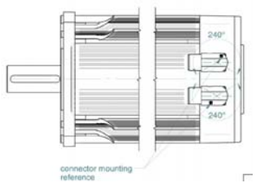
PRO Motor 142



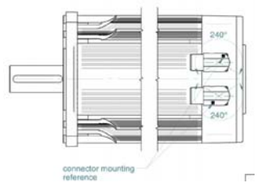
PRO Motor 142 WITH BRAKE



PRO Motor 180



PRO Motor 180 WITH BRAKE



CDHD Servo Drive Performance Data

Ratings	1D5	003	4D5	006	008	010	012	013	020	024
Input Power Main Circuit 120/240 VAC	1 Phase	1 Phase	1/3 Phase	1/3 Phase	1/3 Phase	1/3 Phase	-	3 Phase	3 Phase	3 Phase
Input Power Main Circuit 400/480 VAC	-	3 Phase	-	3 Phase	-	-	3 Phase	-	-	3 Phase
Continuous Current A rms	1.5	3	4.5	6	8	10	12	13	20	24
Peak Current A rms	4.5	9	18	18	28	28	24	28	48	48

Basic Specifications		
Motors	DC Brushless, DC Brush	Rotary servomotors, Linear servomotors
Current (Torque) Control	Performance	Update rate 31.25 µs (32 kHz), Output waveform sinusoidal
	Step Response Time	Actual current reaches command in two cycles- 62.5 µs (up to 3kHz)
	Control Loop	DQ, PI, Feed-forward
Velocity Control	Performance	Update rate 125 µs (8 kHz)
	Selectable Velocity Control Loops	PI, PDFF, Standard pole placement, Advance pole placement, Standard pole placement high frequency, Pole placement with active dumping
	Filters	First order low pass filter, Double first order low pass filter, Notch, High pass filter, Band pass filter, User defined polynomial filter
Position Control	Performance	Update rate 250 µs (4 kHz)
	Control loop	PID and feed-forward
HD Control	Performance	Update rate 250 µS (4 kHz)
(Position & Velocity or Velocity)	Control Loop	Non-linear control algorithm provides very low tracking error, zero or minimum settling time and smooth movement; includes an adaptive feed-forward feature that is applied at end of movement to achieve zero or minimum settling time
	Filters	One second order low pass, two notch filters, and other filters to handle flexible and resonant systems
Reference Command	Current/Velocity Command	Analog Voltage ±10 VDC, Serial RS232 or USB*, CANopen®*, EtherCAT®*, PROFINET®*
	Position Command	Pulse & Direction with electronic gearing, Serial RS232 or USB*, CANopen®*, EtherCAT®*, PROFINET®*
Auto Tuning	Method	Automatic self-configuration optimization of motor phasing, wires, current loop, HD loop, automatic inertia load measurement
Brake	Method	Control stops: several dynamic brake and active disable options
Display	Method	7-segment LED (green), display drive status
GUI	User Interface	ServoStudio Windows-based application, Setting, Drive, Motor, Feedback, I/O motion information selection/configuration, Fault history/display, Setup wizard, Expert view
Protective Functions	Under and over-voltage, over-current, drive and motor over-temperature, motor foldback, drive foldback, feedback lost, not configured and more	
Compliance Standard	UL - UL508c (compliance testing in progress by TUV), STO - Safe Torque Off (compliance testing in progress), RoHS	
	CE - EMC Directive 2004/108/EC, standard IEC61800-3, CE Low Voltage Directive 73/23/EEC IEC61800-5-1	
Environment	Ambient temperature: Operation 0-45°C, Storage 0-70°C, Humidity: 10-90% Altitude: < 1000m. If >1000m, derate 5% per 330m, Vibration: 0.5g	
Protection / Pollution	Protection class: IP20, pollution degree: 2 as per IEC 60664-1	

Communications	
CANopen®*	CANopen® – CiA 301 application layer and the CiA 402 device profile for drives and motion control, Baud rate 0.5M 1M bit/s
EtherCAT®*	CiA 301 application layer and the CiA 402 device profile for drives and motion control
PROFINET®*	PROFIdrive application layer over PROFINET IO RT
RS232	ASCII-based, ServoStudio, HyperTerminal, Baud rate 115200 bit/s
USB*	ASCII-based, ServoStudio, HyperTerminal, Baud rate 115200 bit/s
Daisy Chain	Up to 8 axes, Axis address setting from 0-99 using two Rotary switches

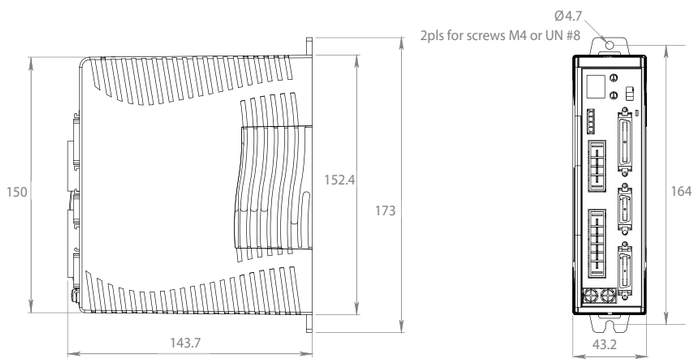
I/Os		
First Analog Input	Voltage Range	Analog ±10 VDC differential, Resolution 16 bit
Second Analog Input*	Voltage Range	Analog ±10 VDC differential, Resolution 14 bit (each first and second)
Pulse & Direction	Signal	RS 422, Max Input Frequency 4 MHz
Equivalent Encoder Output	Signal	A-quad-B and index differential, RS 422, Max Output Frequency 4 MHz
11x Digital Inputs	Signal	24 V, Configurable opto-isolated
6x Digital Outputs	Signal	24 V, Configurable open collector, opto-isolated
Analog Output	Signal	±10 V Resolution 8 bit, Configurable
Secondary Feedback	Signal	A-quad-B and index differential, RS 422, Max. Input frequency 4 MHz
Fault Output Relay	Signal	24 V, 1 A, Configurable dry contacts

Motor Feedback		
From Drive	Supply Voltage	5 VDC (7 VDC*)
Incremental Encoder	Signal	A-quad-B with or without index/Halls, Tamagawa, RS 422/485, Max Input Frequency 4 MHz
Hall Sensor	Signal	Open collector single-ended (optional differential-ended)
Resolver	Signal	Sine/Cosine differential, Transformation Ratio 0.45-1.6
Sine Encoder	Signal	Sine/Cosine differential, with or without Halls, 1 Vpp @ 2.5 V, EnDat® 2.1, Hiperface®
SSI Encoder	Signal	Data and clock, can be supported upon request EnDat 2.2, BiSS-C, other SSI
Motor Temperature	Signal	Thermal resistor PTC or NTC, User-defined fault threshold

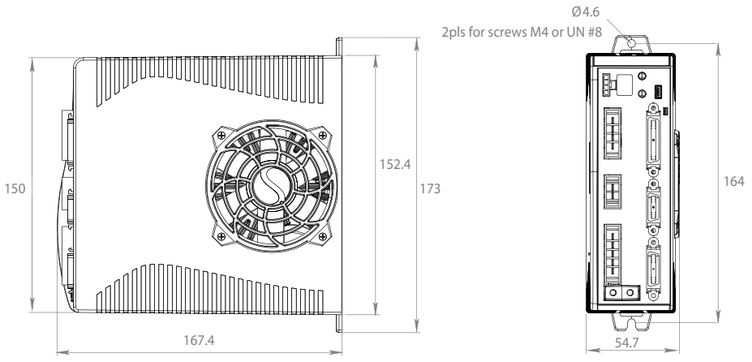
* Some features are not available on all models. Check the ordering information, or contact your distributor.

CDHD Servo Drive Dimensions (mm) **120/240 VAC**

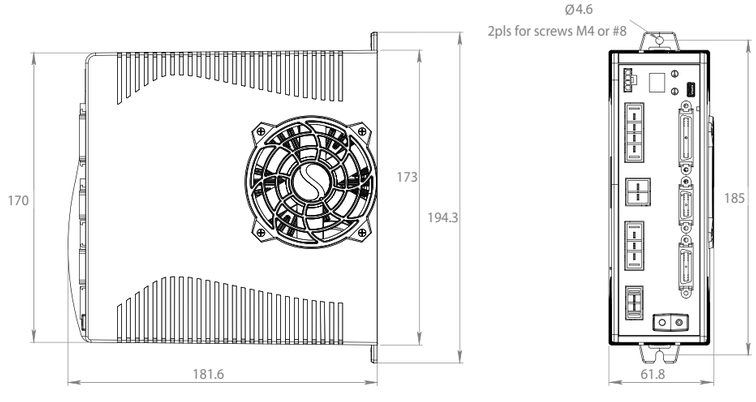
CDHD-1D5 (Without FAN), CDHD-003



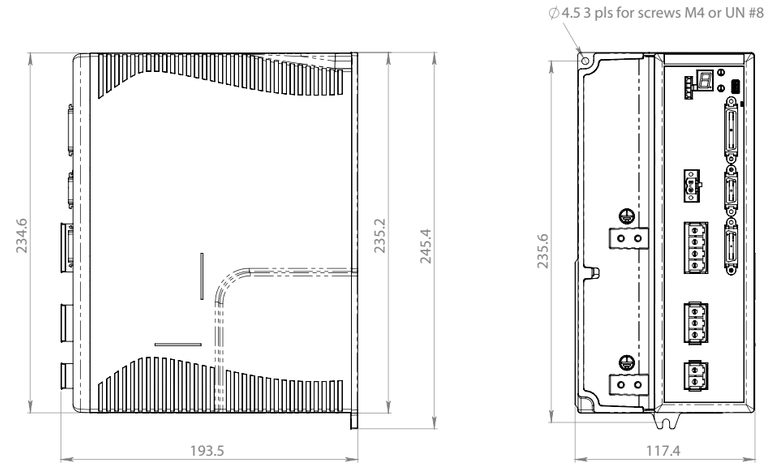
CDHD-4D5, CDHD-006



CDHD-008, CDHD-010, CDHD-013

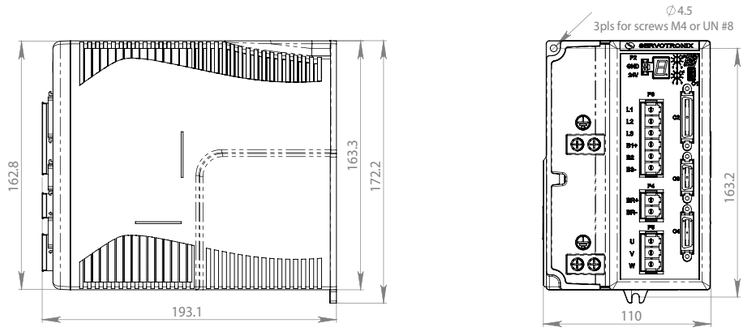


CDHD-020, CDHD-024

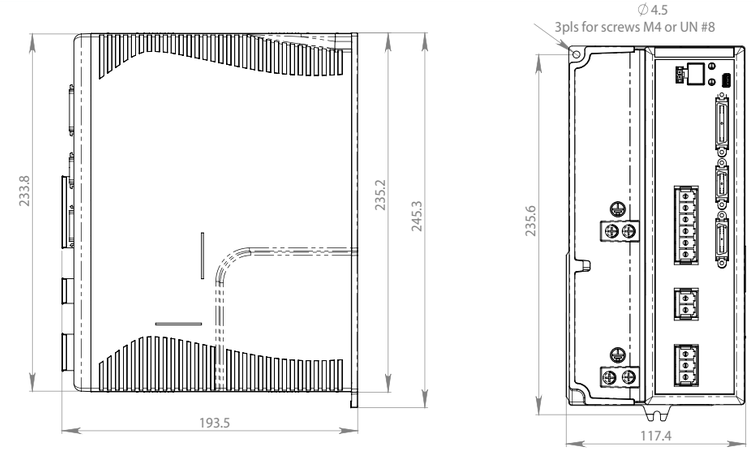


CDHD Servo Drive Dimensions (mm) **400/480 VAC**

CDHD-003, CDHD-006

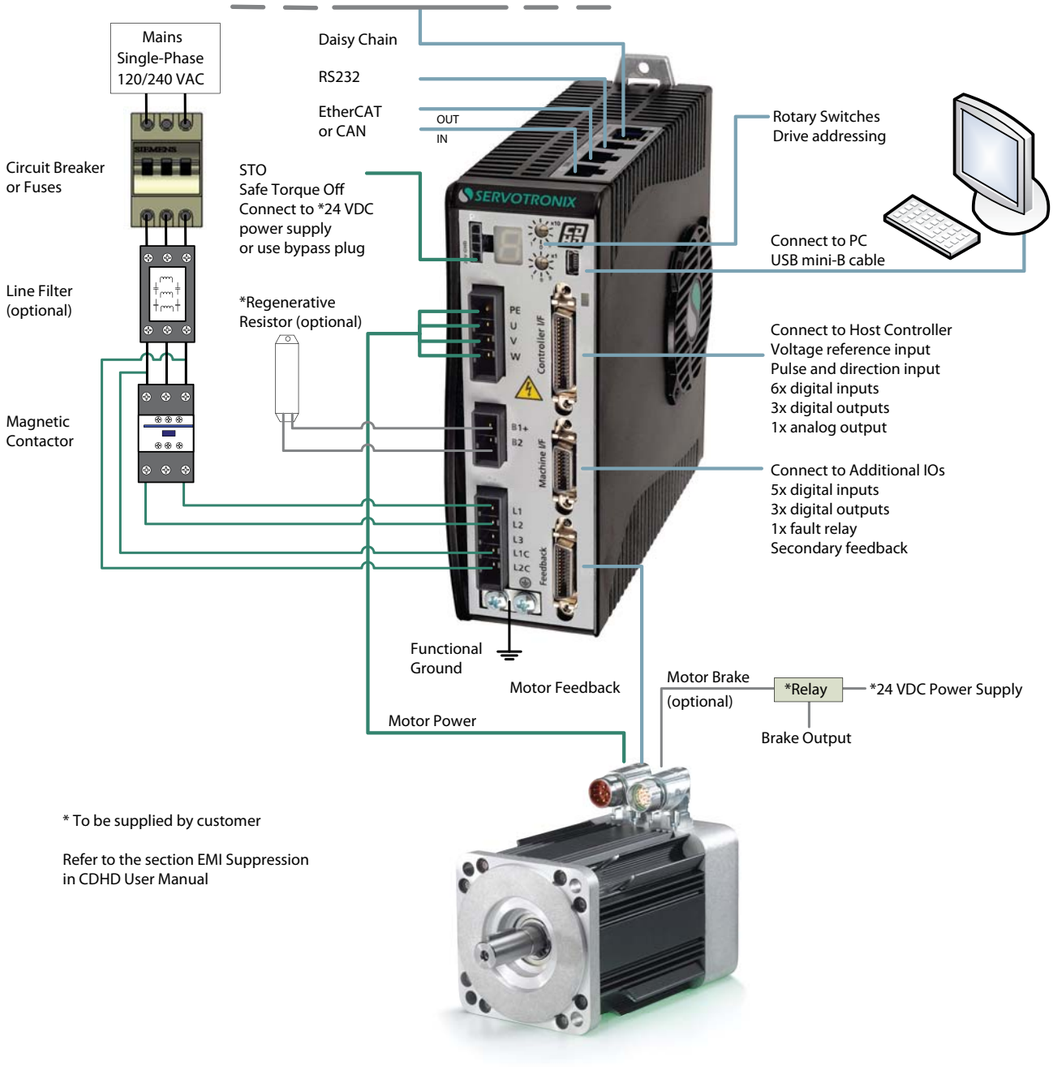


CDHD-012



Typical System Wiring Diagram

CDHD-4D5, CDHD-006

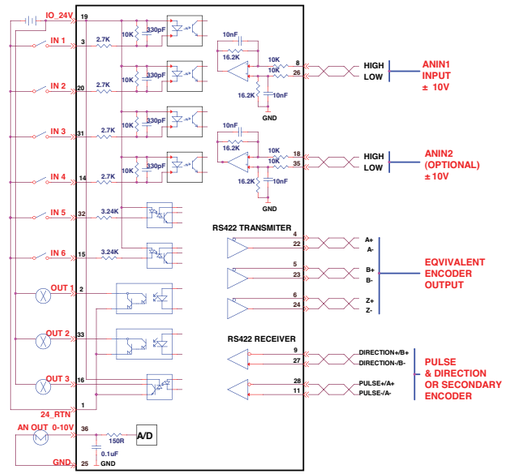


* To be supplied by customer

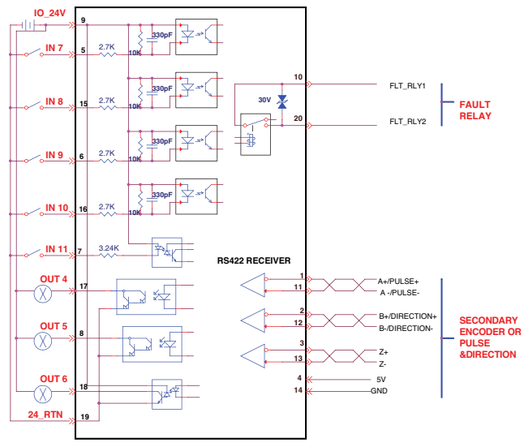
Refer to the section EMI Suppression in CDHD User Manual

I/O Connection Diagrams

Type Sink - Connector C2: Controller I/F

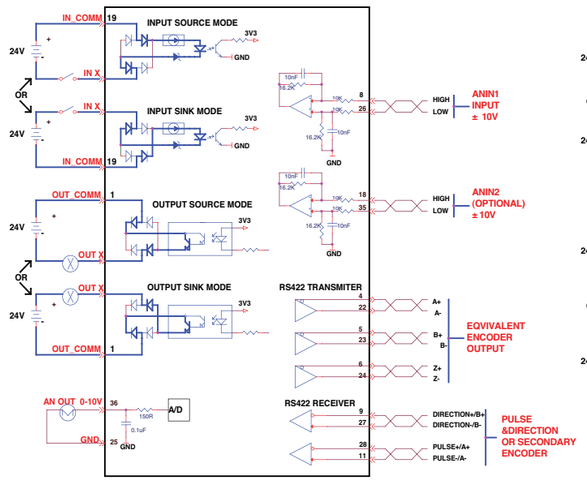


Type Sink - Connector C3: Machine I/F

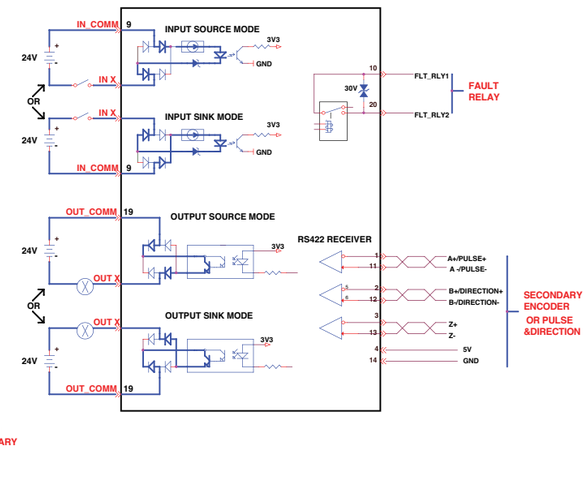


For EtherCAT interface option both Sink and Source types are available:

Type Sink/ Source- Connector C2: Controller I/F



Type Sink/ Source - Connector C3: Machine I/F



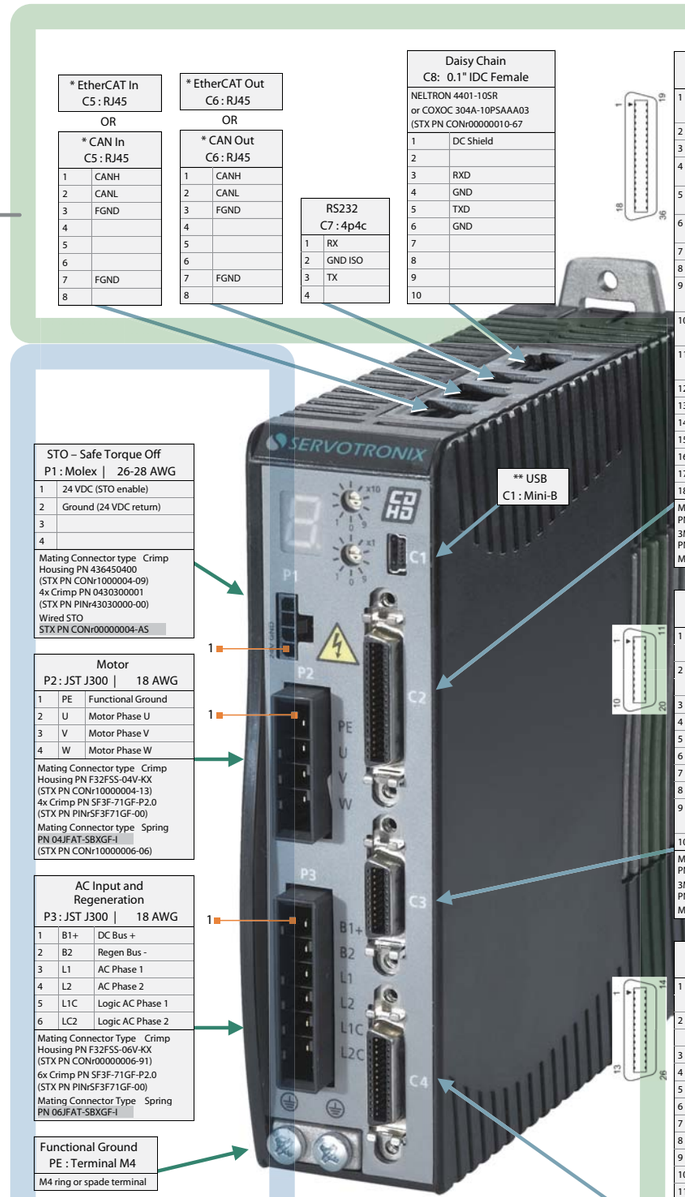
Notes:

1. **Controller I/F (C2) and Machine I/F (C3) OUT_COMM are connected internally**
2. **Controller I/F (C2) and Machine I/F (C3) IN_COMM are connected internally**
3. **User can connect outputs to be either type source OR sink**
4. **User can connect Inputs to be either type source OR sink**
5. **For the OUT X pin number refer to quick start guide table**
6. **For the IN X pin number refer to servo drive pin assignments**

CDHD Servo Drive Pin Assignments **120/240 VAC**

CDHD-1D5 CDHD-003

Standard CDHD Control Board



* EtherCAT In C5 : RJ45	
OR	
* CAN In C5 : RJ45	
1	CANH
2	CANL
3	FGND
4	
5	
6	
7	FGND
8	

* EtherCAT Out C6 : RJ45	
OR	
* CAN Out C6 : RJ45	
1	CANH
2	CANL
3	FGND
4	
5	
6	
7	FGND
8	

RS232 C7 : 4p4c	
1	RX
2	GND ISO
3	TX
4	

Daisy Chain C8: 0.1" IDC Female	
NELTRON 4401-10SR or COXOC 304A-10PSAAA03 (STX PN CONr00000010-67	
1	DC Shield
2	
3	RXD
4	GND
5	TXD
6	GND
7	
8	
9	
10	

Controller I/F C2 : MDR 36 Plug | 24-28 AWG			
1	24 VDC return	19	24 VDC
	*** Common output		*** Common input
2	Digital output 1	20	Digital input 2
3	Digital input 1	21	
4	Equivalent encoder output A-	22	Equivalent encoder output A+
5	Equivalent encoder output B-	23	Equivalent encoder output B+
6	Equivalent encoder output Z-	24	Equivalent encoder output Z+
7		25	Ground
8	Analog input 1+	26	Analog input 1-
9	Direction input+	27	Direction input-
	Secondary encoder B+		Secondary encoder B-
10	Ground	28	Pulse input+
			Secondary encoder A+
11	Pulse input-	29	Ground
	Secondary encoder A-		
12		30	
13	Ground	31	Digital input 3
14	Digital input 4	32	Digital input 5
15	Digital input 6	33	Digital output 2
16	Digital output 3	34	
17		35	* Analog input 2-
18	* Analog input 2+	36	Analog output

Mating Connector - 3M Solder Plug Connector
PN 10136-3000PE (STX PN CONr00000036-01)
3M Solder Plug Junction Shell
PN 10336-52F0-008 (STX PN HODr00000036-00)
Mating Cable (STX PN CBL-MDRFL-36-0x, x=1|2|3 meter)

STO – Safe Torque Off P1 : Molex | 26-28 AWG	
1	24 VDC (STO enable)
2	Ground (24 VDC return)
3	
4	

Mating Connector type Crimp
Housing PN 436450400
(STX PN CONr1000004-09)
4x Crimp PN 0430300001
(STX PN PINr43030000-00)
Wired STO
STX PN CONr00000004-AS

Machine I/F C3 : MDR 20 Plug | 24-28 AWG			
1	Secondary encoder A+	11	Secondary encoder A-
	Pulse input +		Pulse input -
2	Secondary encoder B+	12	Secondary encoder B-
	Direction input+		Direction input-
3	Secondary encoder Z+	13	Secondary encoder Z-
4	Secondary encoder 5V	14	Secondary encoder ground
5	Digital input 7	15	Digital input 8
6	Digital input 9	16	Digital input 10
7	Digital input 11	17	Digital output 4
8	Digital output 5	18	Digital output 6
9	24 VDC	19	24 VDC return
	*** Common output		*** Common input
10	Fault relay 1	20	Fault relay 2

Mating Connector - 3M Solder Plug Connector
PN 10120-3000PE (STX PN CONr00000020-38)
3M Solder Plug Junction Shell
PN 10320-52F0-008 (STX PN HODr00000020-00)
Mating Cable (STX PN CBL-MDRFL-20-0x, x=1|2|3 meter)

Motor P2 : JST J300 | 18 AWG		
1	PE	Functional Ground
2	U	Motor Phase U
3	V	Motor Phase V
4	W	Motor Phase W

Mating Connector type Crimp
Housing PN F32FSS-04V-KX
(STX PN CONr10000004-13)
4x Crimp PN SF3F-71GF-P2.0
(STX PN PINrSF3F71GF-00)
Mating Connector type Spring
PN 04JFAT-SBXGF-I
(STX PN CONr10000006-06)

AC Input and Regeneration P3 : JST J300 | 18 AWG		
1	B1+	DC Bus +
2	B2	Regen Bus -
3	L1	AC Phase 1
4	L2	AC Phase 2
5	L1C	Logic AC Phase 1
6	LC2	Logic AC Phase 2

Mating Connector Type Crimp
Housing PN F32FSS-06V-KX
(STX PN CONr00000006-91)
6x Crimp PN SF3F-71GF-P2.0
(STX PN PINrSF3F71GF-00)
Mating Connector Type Spring
PN 06JFAT-SBXGF-I

Functional Ground
PE : Terminal M4
M4 ring or spade terminal

Feedback C4 : MDR 26 Plug | 24-28 AWG			
1	Incremental encoder A +	14	Incremental encoder A -
	SSI encoder data +		SSI encoder data -
2	Incremental encoder B +	15	Incremental encoder B -
	SSI encoder clock +		SSI encoder clock -
3	Incremental encoder Z +	16	Incremental encoder Z -
4	Hall U +	17	Hall V+
5	Hall W +	18	** 8V supply
6	Resolver sine +	19	Resolver sine -
7	Resolver cosine +	20	Resolver cosine -
8	Resolver reference +	21	Resolver reference -
9	Sine encoder sine +	22	Sine encoder sine -
10	Sine encoder cosine +	23	Sine encoder cosine -
11	5V supply	24	Ground (5V/8V return)
12	Motor temperature sensor	25	Motor temperature sensor
13	5V supply	26	Shield

Mating Connector - 3M Solder Plug Connector
PN 10126-3000PE (STX PN CONr00000026-31)
3M Solder Plug Junction Shell
PN 10326-52F0-008 (STX PN HODr00000026-00)
Mating Cable (STX PN CBL-MDRFL-26-0x, x=1|2|3 meter)

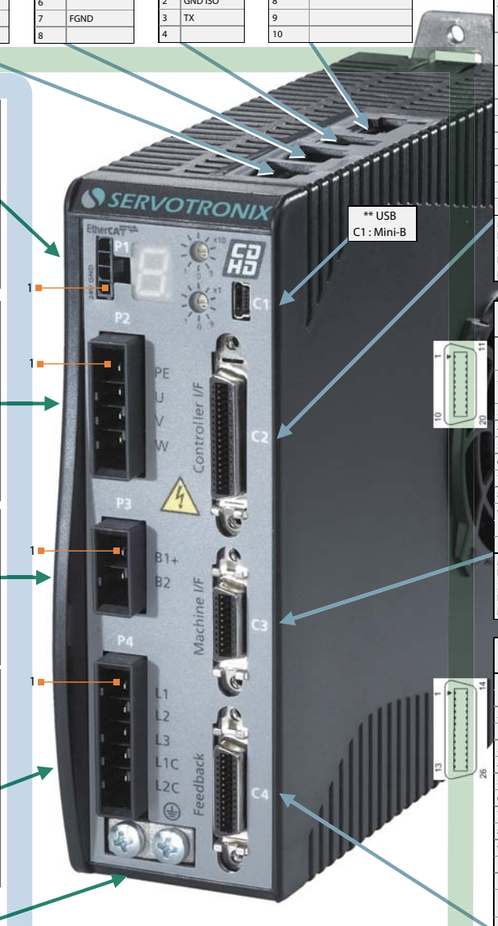
*	Refer to ordering information
**	CAN and EtherCAT models only
***	EtherCAT models only
STX	Servotronix
Highlighted PN	Supplied with CDHD

Crimping tool	Molex 0638190000 (P1)
Crimping tool	YRF-880 (P2, P3)
Extraction tool	EJ-JFAJ3 (P2, P3)
Key for spring connector	J-FAT-OT

4/40 insert threads on C2, C3, C4

CDHD-4D5. CDHD-006

Standard CDHD Control Board



* EtherCAT In C5 : RJ45	
OR	
* CAN In C5 : RJ45	
1	CANH
2	CANL
3	FGND
4	
5	
6	
7	FGND
8	

* EtherCAT Out C6 : RJ45	
OR	
* CAN Out C6 : RJ45	
1	CANH
2	CANL
3	FGND
4	
5	
6	
7	FGND
8	

RS232 C7 : 4p4c	
1	RX
2	GND ISO
3	TX
4	

Daisy Chain C8: 0.1" IDC Female	
NELTRON 4401-10SR or COXOC 304A-10PSAAA03 (STX PN CONr00000010-67	
1	DC Shield
2	
3	RXD
4	GND
5	TXD
6	GND
7	
8	
9	
10	

Controller I/F C2 : MDR 36 Plug | 24-28 AWG			
1	24 VDC return	19	24 VDC
	*** Common output		*** Common input
2	Digital output 1	20	Digital input 2
3	Digital input 1	21	
4	Equivalent encoder output A-	22	Equivalent encoder output A+
5	Equivalent encoder output B-	23	Equivalent encoder output B+
6	Equivalent encoder output Z-	24	Equivalent encoder output Z+
7		25	Ground
8	Analog input 1+	26	Analog input 1-
9	Direction input+	27	Direction input-
	Secondary encoder B+		Secondary encoder B-
10	Ground	28	Pulse input+
			Secondary encoder A+
11	Pulse input-	29	Ground
	Secondary encoder A-		
12		30	
13	Ground	31	Digital input 3
14	Digital input 4	32	Digital input 5
15	Digital input 6	33	Digital output 2
16	Digital output 3	34	
17		35	* Analog input 2-
18	* Analog input 2+	36	Analog output

Mating Connector - 3M Solder Plug Connector
PN 10136-3000PE (STX PN CONr00000036-01)
3M Solder Plug Junction Shell
PN 10336-52F0-008 (STX PN HODr00000036-00)
Mating Cable (STX PN CBL-MDRFL-36-0x, x=1|2|3 meter)

STO – Safe Torque Off P1 : Molex | 26-28 AWG	
1	24 VDC (STO enable)
2	Ground (24 VDC return)
3	
4	

Mating Connector type Crimp
Housing PN 436450400
(STX PN CONr1000004-09)
4x Crimp PN 0430300001
(STX PN PINr43030000-00)
Wired STO
STX PN CONr00000004-AS

Machine I/F C3 : MDR 20 Plug | 24-28 AWG			
1	Secondary encoder A+	11	Secondary encoder A-
	Pulse input +		Pulse input -
2	Secondary encoder B+	12	Secondary encoder B-
	Direction input+		Direction input-
3	Secondary encoder Z+	13	Secondary encoder Z-
4	Secondary encoder 5V	14	Secondary encoder ground
5	Digital input 7	15	Digital input 8
6	Digital input 9	16	Digital input 10
7	Digital input 11	17	Digital output 4
8	Digital output 5	18	Digital output 6
9	24 VDC	19	24 VDC return
	*** Common output		*** Common input
10	Fault relay 1	20	Fault relay 2

Mating Connector - 3M Solder Plug Connector
PN 10120-3000PE (STX PN CONr00000020-38)
3M Solder Plug Junction Shell
PN 10320-52F0-008 (STX PN HODr00000020-00)
Mating Cable (STX PN CBL-MDRFL-20-0x, x=1|2|3 meter)

Motor P2 : JST J300 | 16 AWG		
1	PE	Functional Ground
2	U	Motor Phase U
3	V	Motor Phase V
4	W	Motor Phase W

Mating Connector type Crimp
Housing PN F32FSS-04V-KX
(STX PN CONr10000004-13)
4x Crimp PN SF3F-71GF-P2.0
(STX PN PINrSF3F71GF-00)
Mating Connector type Spring
PN 04JFAT-SBXGF-I
(STX PN CONr10000006-06)

Regeneration P3 : JST J300 | 16 AWG		
1	B1+	DC Bus +
2	B2	Regen Bus -

Mating Connector Type Crimp
Housing PN F32FSS-02V-KX
(STX PN CONr10000002-10)
2x Crimp PN SF3F-71GF-P2.0
(STX PN PINrSF3F71GF-00)
Mating Connector Type Spring
Not available

AC Input P4 : JST J300 | 16 AWG		
1	L1	AC Phase 1
2	L2	AC Phase 2
3	L3	AC Phase 3
4	L1C	Logic AC Phase 1
5	LC2	Logic AC Phase 2

Mating Connector Type Crimp
Housing PN F32FSS-05V-KX
(STX PN CONr10000005-03)
5x Crimp PN SF3F-71GF-P2.0
(STX PN PINrSF3F71GF-00)
Mating Connector type Spring
PN 05JFAT-SBXGF-I
(STX PN CONr10000005-04)

Functional Ground
PE : Terminal M4
M4 ring or spade terminal

Feedback C4 : MDR 26 Plug | 24-28 AWG			
1	Incremental encoder A +	14	Incremental encoder A -
	SSI encoder data +		SSI encoder data -
2	Incremental encoder B +	15	Incremental encoder B -
	SSI encoder clock +		SSI encoder clock -
3	Incremental encoder Z +	16	Incremental encoder Z -
4	Hall U +	17	Hall V+
5	Hall W +	18	** 8V supply
6	Resolver sine +	19	Resolver sine -
7	Resolver cosine +	20	Resolver cosine -
8	Resolver reference +	21	Resolver reference -
9	Sine encoder sine +	22	Sine encoder sine -
10	Sine encoder cosine +	23	Sine encoder cosine -
11	5V supply	24	Ground (5V/8V return)
12	Motor temperature sensor	25	Motor temperature sensor
13	5V supply	26	Shield

Mating Connector - 3M Solder Plug Connector
PN 10126-3000PE (STX PN CONr00000026-31)
3M Solder Plug Junction Shell
PN 10326-52F0-008 (STX PN HODr00000026-00)
Mating Cable (STX PN CBL-MDRFL-26-0x, x=1|2|3 meter)

*	Refer to ordering information
**	CAN and EtherCAT models only
***	EtherCAT models only
STX	Servotronix
Highlighted PN	Supplied with CDHD

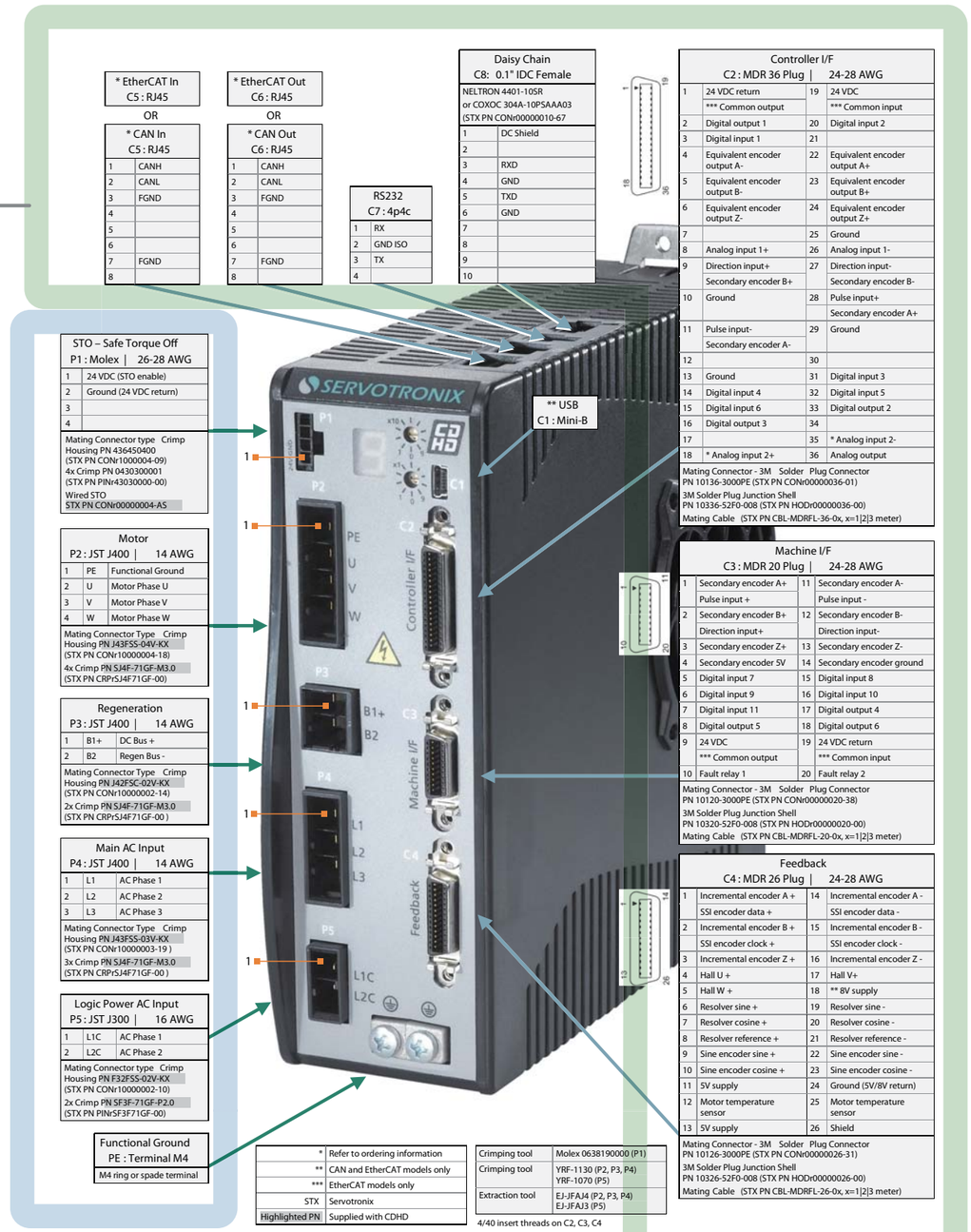
Crimping tool	Molex 0638190000 (P1)
Crimping tool	YRF-1070 (P2, P3, P4)
Extraction tool	EJ-JFAJ3
Key for spring connector	J-FAT-OT

4/40 insert threads on C2, C3, C4

CDHD Servo Drive Pin Assignments **120/240 VAC**

CDHD-008, CDHD-010, CDHD-013

Standard CDHD Control Board



* EtherCAT In C5 : RJ45	
OR	
* CAN In C5 : RJ45	
1	CANH
2	CANL
3	FGND
4	
5	
6	
7	FGND
8	

* EtherCAT Out C6 : RJ45	
OR	
* CAN Out C6 : RJ45	
1	CANH
2	CANL
3	FGND
4	
5	
6	
7	FGND
8	

RS232 C7 : 4p4c	
1	RX
2	GND ISO
3	TX
4	

Daisy Chain C8: 0.1" IDC Female	
NELTRON 4401-10SR or COXOC 304A-10PSAAA03 (STX PN CONr00000010-67	
1	DC Shield
2	
3	RXD
4	GND
5	TXD
6	GND
7	
8	
9	
10	

STO – Safe Torque Off P1 : Molex | 26-28 AWG	
1	24 VDC (STO enable)
2	Ground (24 VDC return)
3	
4	

Mating Connector type Crimp
Housing PN 436450400
(STX PN CONr1000004-09)
4x Crimp PN 0430300001
(STX PN PINr43030000-00)
Wired STO
STX PN CONr00000004-AS

Motor P2 : JST J400 | 14 AWG		
1	PE	Functional Ground
2	U	Motor Phase U
3	V	Motor Phase V
4	W	Motor Phase W

Mating Connector Type Crimp
Housing PN J43FSS-04V-KX
(STX PN CONr10000004-18)
4x Crimp PN SJ4F-71GF-M3.0
(STX PN CRPrSJ4F71GF-00)

Regeneration P3 : JST J400 | 14 AWG		
1	B1+	DC Bus +
2	B2	Regen Bus -

Mating Connector Type Crimp
Housing PN J42FSC-02V-KX
(STX PN CONr10000002-14)
2x Crimp PN SJ4F-71GF-M3.0
(STX PN CRPrSJ4F71GF-00)

Main AC Input P4 : JST J400 | 14 AWG		
1	L1	AC Phase 1
2	L2	AC Phase 2
3	L3	AC Phase 3

Mating Connector Type Crimp
Housing PN J43FSS-03V-KX
(STX PN CONr10000003-19)
3x Crimp PN SJ4F-71GF-M3.0
(STX PN CRPrSJ4F71GF-00)

Logic Power AC Input P5 : JST J300 | 16 AWG		
1	L1C	AC Phase 1
2	L2C	AC Phase 2

Mating Connector type Crimp
Housing PN F32FSS-02V-KX
(STX PN CONr10000002-10)
2x Crimp PN SF3F-71GF-P2.0
(STX PN PINrSF3F71GF-00)

Functional Ground PE : Terminal M4
M4 ring or spade terminal

Controller I/F C2 : MDR 36 Plug | 24-28 AWG			
1	24 VDC return	19	24 VDC
	*** Common output		*** Common input
2	Digital output 1	20	Digital input 2
3	Digital input 1	21	
4	Equivalent encoder output A-	22	Equivalent encoder output A+
5	Equivalent encoder output B-	23	Equivalent encoder output B+
6	Equivalent encoder output Z-	24	Equivalent encoder output Z+
7		25	Ground
8	Analog input 1+	26	Analog input 1-
9	Direction input+	27	Direction input-
	Secondary encoder B+		Secondary encoder B-
10	Ground	28	Pulse input+
			Secondary encoder A+
11	Pulse input-	29	Ground
	Secondary encoder A-		
12		30	
13	Ground	31	Digital input 3
14	Digital input 4	32	Digital input 5
15	Digital input 6	33	Digital output 2
16	Digital output 3	34	
17		35	* Analog input 2-
18	* Analog input 2+	36	Analog output

Mating Connector - 3M Solder Plug Connector
PN 10136-3000PE (STX PN CONr00000036-01)
3M Solder Plug Junction Shell
PN 10336-52F0-008 (STX PN HODr00000036-00)
Mating Cable (STX PN CBL-MDRFL-36-0x, x=1|2|3 meter)

Machine I/F C3 : MDR 20 Plug | 24-28 AWG			
1	Secondary encoder A+	11	Secondary encoder A-
	Pulse input +		Pulse input -
2	Secondary encoder B+	12	Secondary encoder B-
	Direction input+		Direction input-
3	Secondary encoder Z+	13	Secondary encoder Z-
4	Secondary encoder 5V	14	Secondary encoder ground
5	Digital input 7	15	Digital input 8
6	Digital input 9	16	Digital input 10
7	Digital input 11	17	Digital output 4
8	Digital output 5	18	Digital output 6
9	24 VDC	19	24 VDC return
	*** Common output		*** Common input
10	Fault relay 1	20	Fault relay 2

Mating Connector - 3M Solder Plug Connector
PN 10120-3000PE (STX PN CONr00000020-38)
3M Solder Plug Junction Shell
PN 10320-52F0-008 (STX PN HODr00000020-00)
Mating Cable (STX PN CBL-MDRFL-20-0x, x=1|2|3 meter)

Feedback C4 : MDR 26 Plug | 24-28 AWG			
1	Incremental encoder A +	14	Incremental encoder A -
	SSI encoder data +		SSI encoder data -
2	Incremental encoder B +	15	Incremental encoder B -
	SSI encoder clock +		SSI encoder clock -
3	Incremental encoder Z +	16	Incremental encoder Z -
4	Hall U +	17	Hall V+
5	Hall W +	18	** 8V supply
6	Resolver sine +	19	Resolver sine -
7	Resolver cosine +	20	Resolver cosine -
8	Resolver reference +	21	Resolver reference -
9	Sine encoder sine +	22	Sine encoder sine -
10	Sine encoder cosine +	23	Sine encoder cosine -
11	5V supply	24	Ground (5V/8V return)
12	Motor temperature sensor	25	Motor temperature sensor
13	5V supply	26	Shield

Mating Connector - 3M Solder Plug Connector
PN 10126-3000PE (STX PN CONr00000026-31)
3M Solder Plug Junction Shell
PN 10326-52F0-008 (STX PN HODr00000026-00)
Mating Cable (STX PN CBL-MDRFL-26-0x, x=1|2|3 meter)

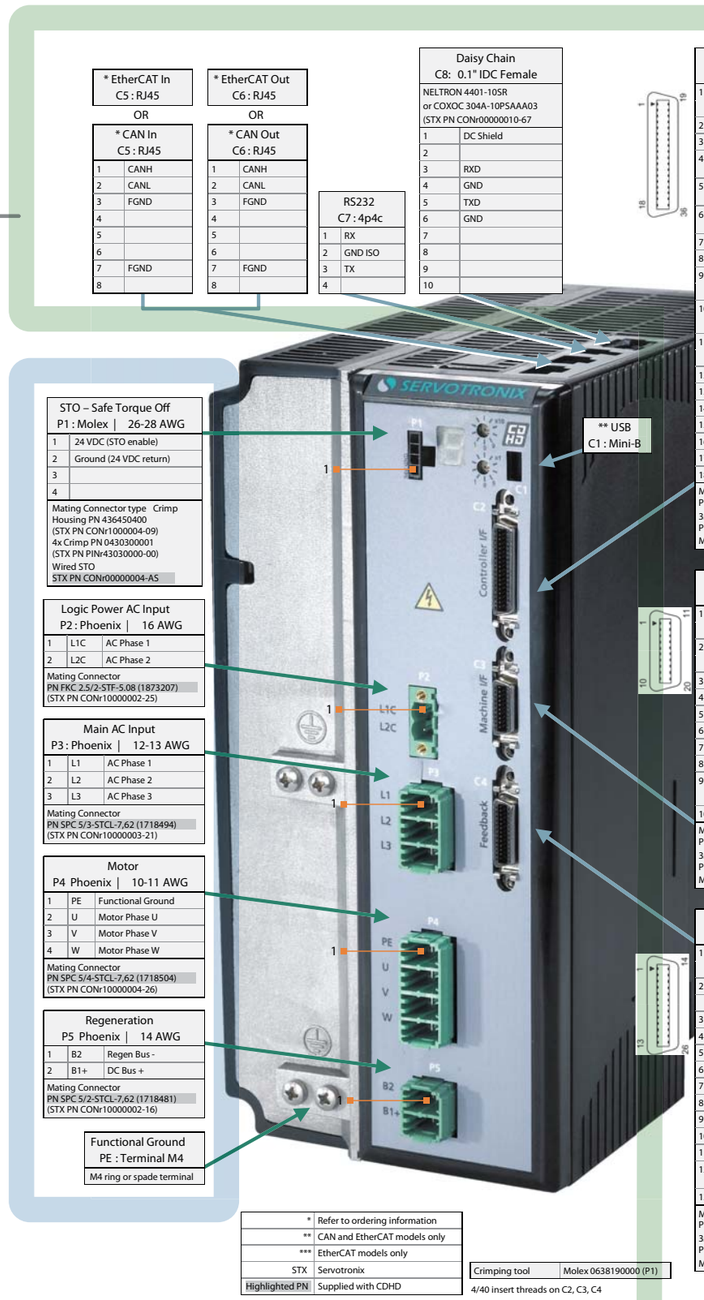
*	Refer to ordering information
**	CAN and EtherCAT models only
***	EtherCAT models only
STX	Servotronix
Highlighted PN	Supplied with CDHD

Crimping tool	Molex 0638190000 (P1)
Crimping tool	YRF-1130 (P2, P3, P4) YRF-1070 (P5)
Extraction tool	EJ-JFAJ4 (P2, P3, P4) EJ-JFAJ3 (P5)

4/40 insert threads on C2, C3, C4

CDHD-020 CDHD-024

Standard CDHD Control Board



* EtherCAT In C5 : RJ45	
OR	
* CAN In C5 : RJ45	
1	CANH
2	CANL
3	FGND
4	
5	
6	
7	FGND
8	

* EtherCAT Out C6 : RJ45	
OR	
* CAN Out C6 : RJ45	
1	CANH
2	CANL
3	FGND
4	
5	
6	
7	FGND
8	

RS232 C7 : 4p4c	
1	RX
2	GND ISO
3	TX
4	

Daisy Chain C8: 0.1" IDC Female	
NELTRON 4401-10SR or COXOC 304A-10PSAAA03 (STX PN CONr00000010-67	
1	DC Shield
2	
3	RXD
4	GND
5	TXD
6	GND
7	
8	
9	
10	

STO – Safe Torque Off P1 : Molex | 26-28 AWG	
1	24 VDC (STO enable)
2	Ground (24 VDC return)
3	
4	

Mating Connector type Crimp
Housing PN 436450400
(STX PN CONr1000004-09)
4x Crimp PN 0430300001
(STX PN PINr43030000-00)
Wired STO
STX PN CONr00000004-AS

Logic Power AC Input P2 : Phoenix | 16 AWG		
1	L1C	AC Phase 1
2	L2C	AC Phase 2

Mating Connector
PN FKC 2,5/2-STF-5,08 (1873207)
(STX PN CONr10000002-25)

Main AC Input P3 : Phoenix | 12-13 AWG		
1	L1	AC Phase 1
2	L2	AC Phase 2
3	L3	AC Phase 3

Mating Connector
PN SPC 5/3-STCL-7,62 (1718494)
(STX PN CONr10000003-21)

Motor P4 Phoenix | 10-11 AWG		
1	PE	Functional Ground
2	U	Motor Phase U
3	V	Motor Phase V
4	W	Motor Phase W

Mating Connector
PN SPC 5/4-STCL-7,62 (1718504)
(STX PN CONr10000004-26)

Regeneration P5 Phoenix | 14 AWG		
1	B2	Regen Bus -
2	B1+	DC Bus +

Mating Connector
PN SPC 5/2-STCL-7,62 (1718481)
(STX PN CONr10000002-16)

Functional Ground PE : Terminal M4
M4 ring or spade terminal

Controller I/F C2 : MDR 36 Plug | 24-28 AWG			
1	24 VDC return	19	24 VDC
	*** Common output		*** Common input
2	Digital output 1	20	Digital input 2
3	Digital input 1	21	
4	Equivalent encoder output A-	22	Equivalent encoder output A+
5	Equivalent encoder output B-	23	Equivalent encoder output B+
6	Equivalent encoder output Z-	24	Equivalent encoder output Z+
7		25	Ground
8	Analog input 1+	26	Analog input 1-
9	Direction input+	27	Direction input-
	Secondary encoder B+		Secondary encoder B-
10	Ground	28	Pulse input+
			Secondary encoder A+
11	Pulse input-	29	Ground
	Secondary encoder A-		
12		30	
13	Ground	31	Digital input 3
14	Digital input 4	32	Digital input 5
15	Digital input 6	33	Digital output 2
16	Digital output 3	34	
17		35	* Analog input 2-
18	* Analog input 2+	36	Analog output

Mating Connector - 3M Solder Plug Connector
PN 10136-3000PE (STX PN CONr00000036-01)
3M Solder Plug Junction Shell
PN 10336-52F0-008 (STX PN HODr00000036-00)
Mating Cable (STX PN CBL-MDRFL-36-0x, x=1|2|3 meter)

Machine I/F C3 : MDR 20 Plug | 24-28 AWG			
1	Secondary encoder A+	11	Secondary encoder A-
	Pulse input +		Pulse input -
2	Secondary encoder B+	12	Secondary encoder B-
	Direction input+		Direction input-
3	Secondary encoder Z+	13	Secondary encoder Z-
4	Secondary encoder 5V	14	Secondary encoder ground
5	Digital input 7	15	Digital input 8
6	Digital input 9	16	Digital input 10
7	Digital input 11	17	Digital output 4
8	Digital output 5	18	Digital output 6
9	24 VDC	19	24 VDC return
	*** Common output		*** Common input
10	Fault relay 1	20	Fault relay 2

Mating Connector - 3M Solder Plug Connector
PN 10120-3000PE (STX PN CONr00000020-38)
3M Solder Plug Junction Shell
PN 10320-52F0-008 (STX PN HODr00000020-00)
Mating Cable (STX PN CBL-MDRFL-20-0x, x=1|2|3 meter)

Feedback C4 : MDR 26 Plug | 24-28 AWG			
1	Incremental encoder A +	14	Incremental encoder A -
	SSI encoder data +		SSI encoder data -
2	Incremental encoder B +	15	Incremental encoder B -
	SSI encoder clock +		SSI encoder clock -
3	Incremental encoder Z +	16	Incremental encoder Z -
4	Hall U +	17	Hall V+
5	Hall W +	18	** 8V supply
6	Resolver sine +	19	Resolver sine -
7	Resolver cosine +	20	Resolver cosine -
8	Resolver reference +	21	Resolver reference -
9	Sine encoder sine +	22	Sine encoder sine -
10	Sine encoder cosine +	23	Sine encoder cosine -
11	5V supply	24	Ground (5V/8V return)
12	Motor temperature sensor	25	Motor temperature sensor
13	5V supply	26	Shield

Mating Connector - 3M Solder Plug Connector
PN 10126-3000PE (STX PN CONr00000026-31)
3M Solder Plug Junction Shell
PN 10326-52F0-008 (STX PN HODr00000026-00)
Mating Cable (STX PN CBL-MDRFL-26-0x, x=1|2|3 meter)

*	Refer to ordering information
**	CAN and EtherCAT models only
***	EtherCAT models only
STX	Servotronix
Highlighted PN	Supplied with CDHD

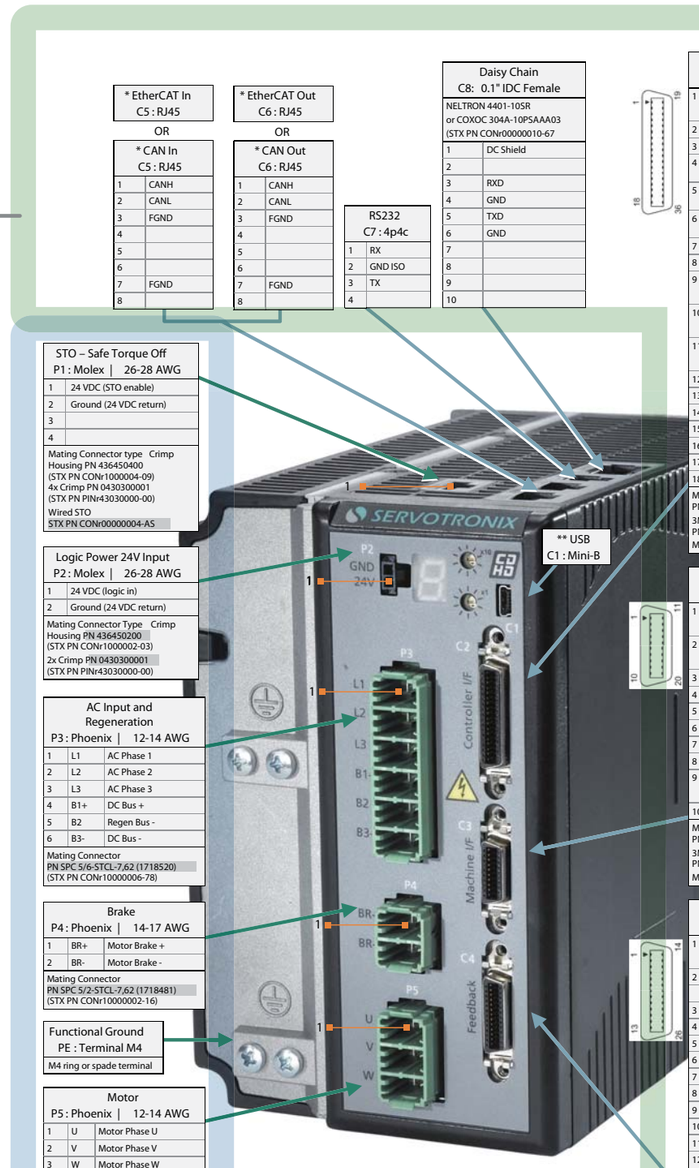
Crimping tool	Molex 0638190000 (P1)

4/40 insert threads on C2, C3, C4

CDHD Servo Drive Pin Assignments **400/480 VAC**

CDHD-003 CDHD-006

Standard CDHD Control Board



* EtherCAT In C5 : RJ45	
OR	
* CAN In C5 : RJ45	
1	CANH
2	CANL
3	FGND
4	
5	
6	
7	FGND
8	

* EtherCAT Out C6 : RJ45	
OR	
* CAN Out C6 : RJ45	
1	CANH
2	CANL
3	FGND
4	
5	
6	
7	FGND
8	

RS232 C7 : 4p4c	
1	RX
2	GND ISO
3	TX
4	

Daisy Chain C8: 0.1" IDC Female	
NELTRON 4401-10SR or COXOC 304A-10PSAAA03 (STX PN CONr00000010-67	
1	DC Shield
2	
3	RXD
4	GND
5	TXD
6	GND
7	
8	
9	
10	

Controller I/F C2 : MDR 36 Plug | 24-28 AWG			
1	24 VDC return	19	24 VDC
	*** Common output		*** Common input
2	Digital output 1	20	Digital input 2
3	Digital input 1	21	
4	Equivalent encoder output A-	22	Equivalent encoder output A+
5	Equivalent encoder output B-	23	Equivalent encoder output B+
6	Equivalent encoder output Z-	24	Equivalent encoder output Z+
7		25	Ground
8	Analog input 1+	26	Analog input 1-
9	Direction input+	27	Direction input-
	Secondary encoder B+		Secondary encoder B-
10	Ground	28	Pulse input+
			Secondary encoder A+
11	Pulse input-	29	Ground
	Secondary encoder A-		
12		30	
13	Ground	31	Digital input 3
14	Digital input 4	32	Digital input 5
15	Digital input 6	33	Digital output 2
16	Digital output 3	34	
17		35	* Analog input 2-
18	* Analog input 2+	36	Analog output

Mating Connector - 3M Solder Plug Connector
PN 10136-3000PE (STX PN CONr00000036-01)
3M Solder Plug Junction Shell
PN 10336-52F0-008 (STX PN HODr00000036-00)
Mating Cable (STX PN CBL-MDRFL-36-0x, x=1|2|3 meter)

STO – Safe Torque Off P1 : Molex | 26-28 AWG	
1	24 VDC (STO enable)
2	Ground (24 VDC return)
3	
4	

Mating Connector type Crimp
Housing PN 436450400
(STX PN CONr1000004-09)
4x Crimp PN 0430300001
(STX PN PINr43030000-00)
Wired STO
STX PN CONr00000004-AS

Logic Power 24V Input P2 : Molex | 26-28 AWG	
1	24 VDC (logic in)
2	Ground (24 VDC return)

Mating Connector Type Crimp
Housing PN 436450200
(STX PN CONr1000002-03)
2x Crimp PN 0430300001
(STX PN PINr43030000-00)

AC Input and Regeneration P3 : Phoenix | 12-14 AWG		
1	L1	AC Phase 1
2	L2	AC Phase 2
3	L3	AC Phase 3
4	B1+	DC Bus +
5	B2	Regen Bus -
6	B3-	DC Bus -

Mating Connector
PN SPC 5/6-STCL-7,62 (1718520)
(STX PN CONr10000006-78)

Brake P4 : Phoenix | 14-17 AWG		
1	BR+	Motor Brake +
2	BR-	Motor Brake -

Mating Connector
PN SPC 5/2-STCL-7,62 (1718481)
(STX PN CONr10000002-16)

Functional Ground PE : Terminal M4
M4 ring or spade terminal

Motor P5 : Phoenix | 12-14 AWG		
1	U	Motor Phase U
2	V	Motor Phase V
3	W	Motor Phase W

Mating Connector
PN SPC 5/3-STCL-7,62 (1718494)
(STX PN CONr10000003-21)

Machine I/F C3 : MDR 20 Plug | 24-28 AWG			
1	Secondary encoder A+	11	Secondary encoder A-
	Pulse input +		Pulse input -
2	Secondary encoder B+	12	Secondary encoder B-
	Direction input+		Direction input-
3	Secondary encoder Z+	13	Secondary encoder Z-
4	Secondary encoder 5V	14	Secondary encoder ground
5	Digital input 7	15	Digital input 8
6	Digital input 9	16	Digital input 10
7	Digital input 11	17	Digital output 4
8	Digital output 5	18	Digital output 6
9	24 VDC	19	24 VDC return
	*** Common output		*** Common input
10	Fault relay 1	20	Fault relay 2

Mating Connector - 3M Solder Plug Connector
PN 10120-3000PE (STX PN CONr00000020-38)
3M Solder Plug Junction Shell
PN 10320-52F0-008 (STX PN HODr00000020-00)
Mating Cable (STX PN CBL-MDRFL-20-0x, x=1|2|3 meter)

Feedback C4 : MDR 26 Plug | 24-28 AWG			
1	Incremental encoder A +	14	Incremental encoder A -
	SSI encoder data +		SSI encoder data -
2	Incremental encoder B +	15	Incremental encoder B -
	SSI encoder clock +		SSI encoder clock -
3	Incremental encoder Z +	16	Incremental encoder Z -
4	Hall U +	17	Hall V+
5	Hall W +	18	** 8V supply
6	Resolver sine +	19	Resolver sine -
7	Resolver cosine +	20	Resolver cosine -
8	Resolver reference +	21	Resolver reference -
9	Sine encoder sine +	22	Sine encoder sine -
10	Sine encoder cosine +	23	Sine encoder cosine -
11	5V supply	24	Ground (5V/8V return)
12	Motor temperature sensor	25	Motor temperature sensor
13	5V supply	26	Shield

Mating Connector - 3M Solder Plug Connector
PN 10126-3000PE (STX PN CONr00000026-31)
3M Solder Plug Junction Shell
PN 10326-52F0-008 (STX PN HODr00000026-00)
Mating Cable (STX PN CBL-MDRFL-26-0x, x=1|2|3 meter)

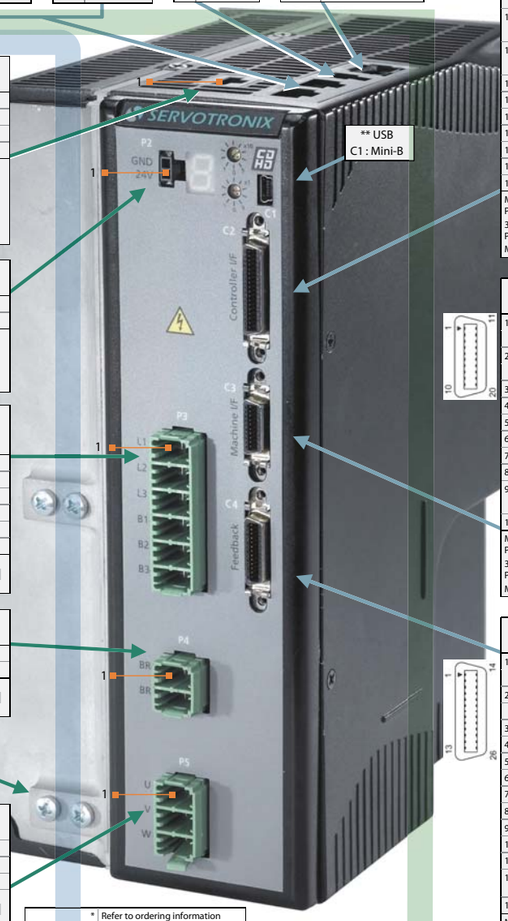
*	Refer to ordering information
**	CAN and EtherCAT models only
***	EtherCAT models only
STX	Servotronix
Highlighted PN	Supplied with CDHD

Crimping tool	Molex 0638190000 (P1, P2)

4/40 insert threads on C2, C3, C4

CDHD-012

Standard CDHD Control Board



* EtherCAT In C5 : RJ45	
OR	
* CAN In C5 : RJ45	
1	CANH
2	CANL
3	FGND
4	
5	
6	
7	FGND
8	

* EtherCAT Out C6 : RJ45	
OR	
* CAN Out C6 : RJ45	
1	CANH
2	CANL
3	FGND
4	
5	
6	
7	FGND
8	

RS232 C7 : 4p4c	
1	RX
2	GND ISO
3	TX
4	

Daisy Chain C8: 0.1" IDC Female	
NELTRON 4401-10SR or COXOC 304A-10PSAAA03 (STX PN CONr00000010-67	
1	DC Shield
2	
3	RXD
4	GND
5	TXD
6	GND
7	
8	
9	
10	

Controller I/F C2 : MDR 36 Plug | 24-28 AWG			
1	24 VDC return	19	24 VDC
	*** Common output		*** Common input
2	Digital output 1	20	Digital input 2
3	Digital input 1	21	
4	Equivalent encoder output A-	22	Equivalent encoder output A+
5	Equivalent encoder output B-	23	Equivalent encoder output B+
6	Equivalent encoder output Z-	24	Equivalent encoder output Z+
7		25	Ground
8	Analog input 1+	26	Analog input 1-
9	Direction input+	27	Direction input-
	Secondary encoder B+		Secondary encoder B-
10	Ground	28	Pulse input+
			Secondary encoder A+
11	Pulse input-	29	Ground
	Secondary encoder A-		
12		30	
13	Ground	31	Digital input 3
14	Digital input 4	32	Digital input 5
15	Digital input 6	33	Digital output 2
16	Digital output 3	34	
17		35	* Analog input 2-
18	* Analog input 2+	36	Analog output

Mating Connector - 3M Solder Plug Connector
PN 10136-3000PE (STX PN CONr00000036-01)
3M Solder Plug Junction Shell
PN 10336-52F0-008 (STX PN HODr00000036-00)
Mating Cable (STX PN CBL-MDRFL-36-0x, x=1|2|3 meter)

STO – Safe Torque Off P1 : Molex | 26-28 AWG	
1	24 VDC (STO enable)
2	Ground (24 VDC return)
3	
4	

Mating Connector type Crimp
Housing PN 436450400
(STX PN CONr1000004-09)
4x Crimp PN 0430300001
(STX PN PINr43030000-00)
Wired STO
STX PN CONr00000004-AS

Logic Power 24V Input P2 : Molex | 26-28 AWG	
1	24 VDC (logic in)
2	Ground (24 VDC return)

Mating Connector Type Crimp
Housing PN 436450200
(STX PN CONr1000002-03)
2x Crimp PN 0430300001
(STX PN PINr43030000-00)

AC Input and Regeneration P3 : Phoenix | 12-14 AWG		
1	L1	AC Phase 1
2	L2	AC Phase 2
3	L3	AC Phase 3
4	B1+	DC Bus +
5	B2	Regen Bus -
6	B3-	DC Bus -

Mating Connector
PN SPC 5/6-STCL-7,62 (1718520)
(STX PN CONr10000006-78)

Brake P4 : Phoenix | 14-17 AWG		
1	BR+	Motor Brake +
2	BR-	Motor Brake -

Mating Connector
PN SPC 5/2-STCL-7,62 (1718481)
(STX PN CONr10000002-16)

Functional Ground PE : Terminal M4
M4 ring or spade terminal

Motor P5 : Phoenix | 12-14 AWG		
1	U	Motor Phase U
2	V	Motor Phase V
3	W	Motor Phase W

Mating Connector
PN SPC 5/3-STCL-7,62 (1718494)
(STX PN CONr10000003-21)

Machine I/F C3 : MDR 20 Plug | 24-28 AWG			
1	Secondary encoder A+	11	Secondary encoder A-
	Pulse input +		Pulse input -
2	Secondary encoder B+	12	Secondary encoder B-
	Direction input+		Direction input-
3	Secondary encoder Z+	13	Secondary encoder Z-
4	Secondary encoder 5V	14	Secondary encoder ground
5	Digital input 7	15	Digital input 8
6	Digital input 9	16	Digital input 10
7	Digital input 11	17	Digital output 4
8	Digital output 5	18	Digital output 6
9	24 VDC	19	24 VDC return
	*** Common output		*** Common input
10	Fault relay 1	20	Fault relay 2

Mating Connector - 3M Solder Plug Connector
PN 10120-3000PE (STX PN CONr00000020-38)
3M Solder Plug Junction Shell
PN 10320-52F0-008 (STX PN HODr00000020-00)
Mating Cable (STX PN CBL-MDRFL-20-0x, x=1|2|3 meter)

Feedback C4 : MDR 26 Plug | 24-28 AWG			
1	Incremental encoder A +	14	Incremental encoder A -
	SSI encoder data +		SSI encoder data -
2	Incremental encoder B +	15	Incremental encoder B -
	SSI encoder clock +		SSI encoder clock -
3	Incremental encoder Z +	16	Incremental encoder Z -
4	Hall U +	17	Hall V+
5	Hall W +	18	** 8V supply
6	Resolver sine +	19	Resolver sine -
7	Resolver cosine +	20	Resolver cosine -
8	Resolver reference +	21	Resolver reference -
9	Sine encoder sine +	22	Sine encoder sine -
10	Sine encoder cosine +	23	Sine encoder cosine -
11	5V supply	24	Ground (5V/8V return)
12	Motor temperature sensor	25	Motor temperature sensor
13	5V supply	26	Shield

Mating Connector - 3M Solder Plug Connector
PN 10126-3000PE (STX PN CONr00000026-31)
3M Solder Plug Junction Shell
PN 10326-52F0-008 (STX PN HODr00000026-00)
Mating Cable (STX PN CBL-MDRFL-26-0x, x=1|2|3 meter)

*	Refer to ordering information
**	CAN and EtherCAT models only
***	EtherCAT models only
STX	Servotronix
Highlighted PN	Supplied with CDHD

Crimping tool	Molex 0638190000 (P1, P2)

4/40 insert threads on C2, C3, C4

Optional Accessories

Model	CDHD 120/240 VAC	Specifications
*KIT-2A-PWSPR-00	CDHD-1D5 CDHD-003	JST300 connectors type spring and key (P2 P3)
KIT-2A-POWER-00		JST300 housing and crimps (P2 P3)
*KIT-2B-PWSPR-00	CDHD-4D5 CDHD-006	JST300 connectors type spring and key (P2 P4) Type crimp and crimps (P3)
KIT-2B-POWER-00		JST300 housing and crimps (P2 P3 P4)
*KIT-2C-POWER-00	CDHD-008 CDHD-010 CDHD-013	JST300 JST400 housing and crimps (P2 P3 P4 P5), for mating model number see pin layout diagram

Model	CDHD 400/480 VAC	Specifications
*KIT-4A-POWER-00	CDHD-003 CDHD-006	Molex JST300 connectors and crimps (P1 P2 P3), for mating model number see pin layout diagram
*KIT-4B-POWER-00	CDHD-012	Molex JST300 connectors and crimps (P1 P2 P3 P4), for mating model number see pin layout diagram

*Included with the product when ordered.

Model	Specifications	Picture
KIT-USBRS232-00	Kit converter cable from CDHD (C7) RS232 port to USB type A connector	
CBLr0000USBA-00	USB A MALE TO MINI B MALE 1.5M black cable	
CONr00000004-AS STO	STO Bypass connector	
CONr10000004-09	STO 4 pin connector	
PINr43030000-00	Crimp for STO connector, 4 crimps are required	
ADPrCAN_D9-RJ45	CAN Adapter D9-RJ45	

PRO Series

PRO Series

Rotary Brushless Servo Motors

About Servotronix

Servotronix develops, manufactures, and markets customized and standard motion electronics solutions, with a focus on digital servo drives. The company has over 25 years of experience in the development of state-of-the-art servo drives for the industry's leading manufacturers. We provide optimized, cost-effective custom servo drives and servo control systems that are tailored to customers' applications and designed to meet customers' form, fit, functionality, and cost specifications. Servotronix supports some of the world's leading machine builders and automation system suppliers with quality products and solutions.

As a recognized ISO 9001:2008 organization, Servotronix proudly stands behind each of our products and solutions. Providing our customers with high-quality products, cost-effective solutions, and on-time delivery are the company's guiding principles.

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