

OCTO SERIES

MULTI-HEAD LINEAR ACTUATOR

PBA
SYSTEMS

www.pbasystems.com.sg

OCTO
MULTI-HEAD LINEAR ACTUATOR



Multi-Headed Linear Positioning Enclosed Stage

PBA Systems introduces OCTO, a multi-headed linear positioning enclosed stage ideal for applications that require independent control of multiple axes travelling on the same directional vector/plane. For Further versatility, OCTO actuators provide two independent travel paths/lanes which allow for carriages on different lanes to “overtake each other without risk of collision.

Powered by the DX series of ironless motors, the independent carriages are guided by linear encoders and precision recirculation linear ball bearing blocks on a single rail.

Each carriage has its own encoder readhead (Digital and analogue options available) and has a resolution of up to 80nm resolution when analogue encoder option is selected and used in tandem with PBA Maxtune drives.---- This allows for extremely precise independent control of individual carriages.

- Multiple motors on single travel path
- Dual lane operations to allow for overtaking
- Custom strokes, and feedback resolution configurations
- Effective stroke – Up to 4m (Enclosed version : 2m Max)
- Cable carrier attachment

Application

- Sorting
- Pick & place
- Inspection
- Scanning
- Parts transfer
- Clean room
- Hi speed automated assembly lines

PART NUMBERING SYSTEM

■ Coil Assembly

OCTO - L44 - D3 - C1 - S - TM - 1.0 - FC - HC - E1.0 - 1250 - 00

CARRIAGE PER LANE	
L11	
L12	
L13	
L14	
L22	
L23	
L24	
L33	
L34	
L44	

MOTOR MODEL	
D3	DX30B

MOTOR SIZE	
C1	

CONNECTION TYPE	
S	Series
P	Parallel

THERMAL PROTECTION	
TC*	PT 100 Sensor
TM**	Thermostat

CABLE LENGTH***	
0.5	0.5m
1.0	1.0m
2.0	2.0m
3.0	3.0m
4.0	4.0m
5.0	5.0m

DESIGN VERSIONS	
00	Standard
01	Customized Version
:	

EFFECTIVE STROKE (mm)	
350	
650	
950	
1250	
1550	
1850	
2150	
2450	

ENCODER RESOLUTION	
EA	Analog
E0.5	0.5um
E1.0	1.0um

HALL SENSOR CONNECTOR OPTIONS	
H	Flying Leads (No Connector)
HC	9 pins D Sub Male Connector
CHC	5 pins Circular Quick Lock Male Connector

POWER CABLE OPTIONS	
NF	No Ferrite Core (Flying Leads)
FC	Ferrite Core (Recommended)
9NF	No Ferrite Core, D Sub 9 pins Female Connector
CNF	No Ferrite Core, Circular Quick Lock 6 pins Male Connector

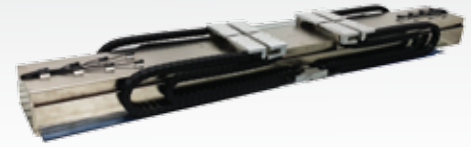
* TC - Sensor output to temperature controller

** TM - On/Off switch, triggers at 100°C

*** Encoder, power & hall cable

PBA OCTO ACTUATOR

- Multi-axis Actuator
- Peak force to 145N, Continuous force to 29N

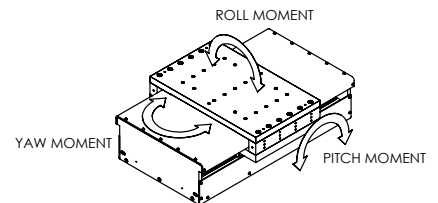


OCTO SERIES MULTI-AXIS ACTUATOR

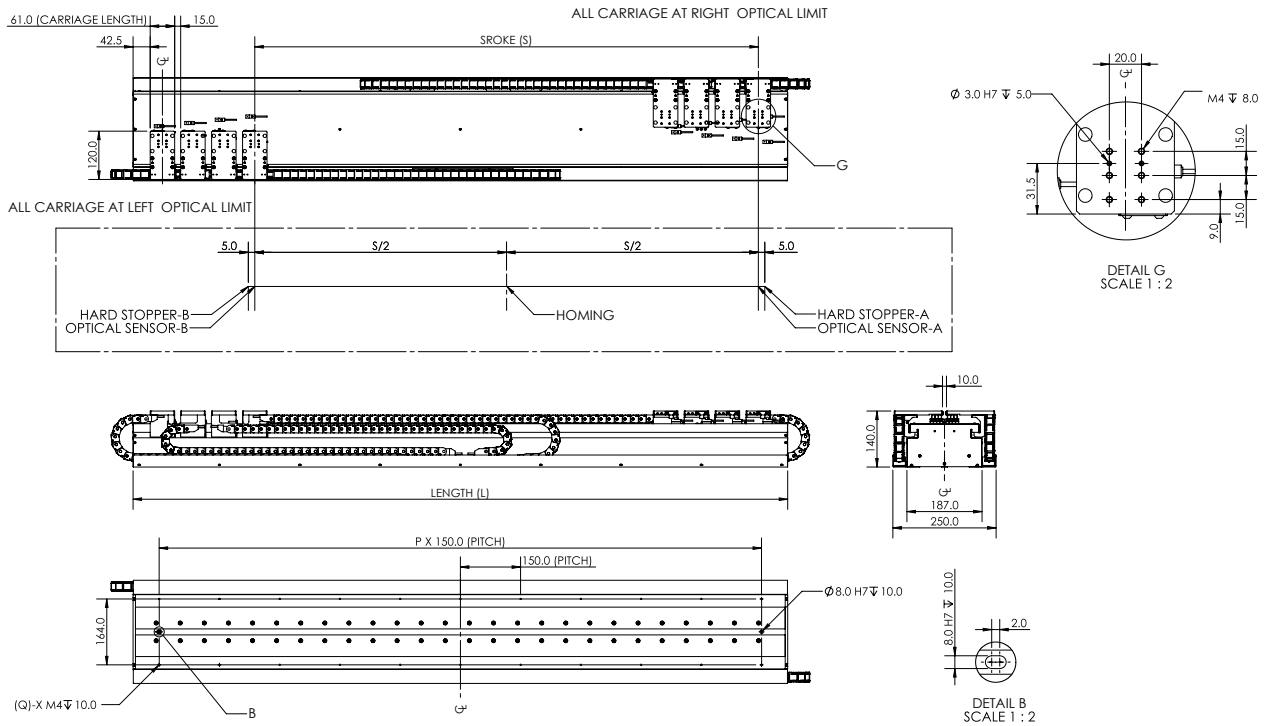
SPECIFICATION		MODEL	
		OCTO-LXX-D3-C1	
Motor Parameters	Unit	S	P
Peak Force	N		145
Continuous Force @ 120°C*	N		29
Peak Power @ 120°C	W		695
Continuous Power @ 120°C*	W		28
Peak Current	A ^{pk}	11.81	23.63
Continuous Current @ 120°C*	A ^{pk}	2.36	4.73
Continuous Stall Current @ 120°C*	Arms	1.75	3.50
Force Constant	N/A ^{pk}	12.3	6.1
Back EMF Constant	V ^{pk} /m/s	14.1	7
Coil Resistance L-L @ 25°C	Ohm	4.8	1.2
Coil Resistance L-L @ 120°C*	Ohm	6.6	1.7
Inductance L-L @ 1kHz	mH	3.00	0.75
Motor Constant @ 25°C*	N/√W		6.46
Motor Constant @ 120°C*	N/√W		5.49
Max. Terminal Voltage	Vdc		400
Thermal Resistance @ 120°C*	°C/W		3.42
Max. Coil Temperature	°C		120
Electrical Cycle Length	mm		60
Specifications			
Repeatability**	um		±2.0
Accuracy***	um		±30um/300mm
Straightness***	um		±10um/200mm
Flatness***	um		±10um/200mm
Linear Guide Rated Load and Static Moment			
Model Code			LM Guide
Block Quantity			1
Maximum bearing load	N		4,800
Pitch moment	Nm		15.2
Yaw moment	Nm		8.1
Roll moment	Nm		28.1

Notes:

1. $A^{pk} = 1.414 * Arms$; $V^{pk} = 1.414 * Vrms$.
2. * Ambient temperature 25°C, heat dissipation by natural convection, without heat sink attached.
3. Specifications tolerance – inductance +/-30%, all others +/-10% (for motor parameters).
4. ** Depend on encoder resolution.
5. Peak force and current - 1 second duration.
6. *** Specific accuracy, straightness and flatness requirement, contact PBA for more information.
7. For customized stroke length, contact PBA.
8. For different motor models, contact PBA.



PBA OCTO ACTUATOR

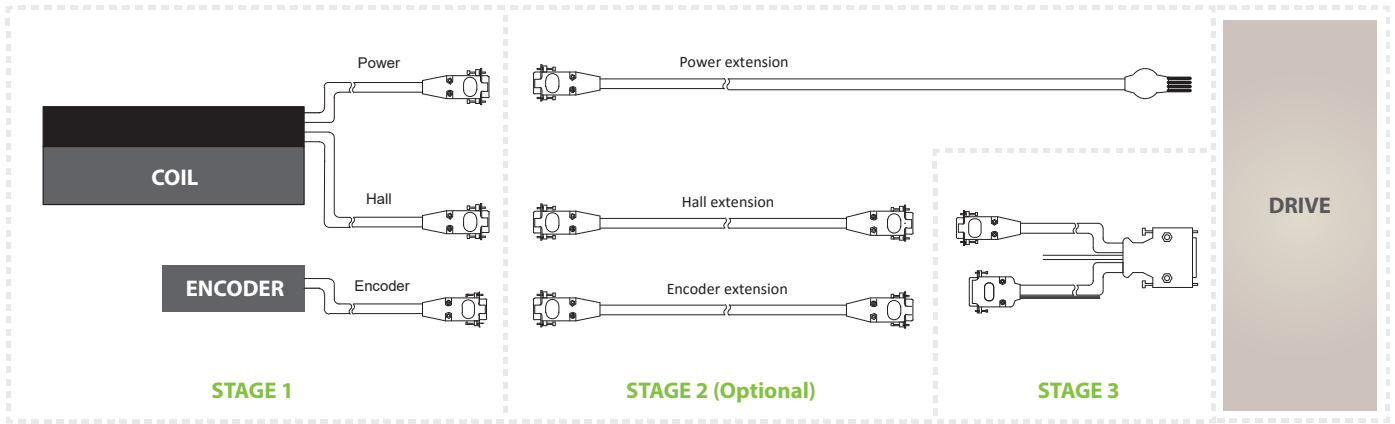


MOTOR MODEL	STROKE (S) mm	ACTUATOR LENGTH (L) mm	P	Q	SLIDER MASS	MODULE MASS
					kg	kg
C1	350	728	04	10	0.8	10.4
	650	1028	06	14		19.8
	950	1328	08	18		29.2
	1250	1628	10	22		38.6
	1550	1928	12	26		48.0
	1850	2228	14	30		57.4
	2150	2528	16	34		66.8
	2450	2828	18	38		76.2

Notes:

- Slider Mass = Coil Mass + Carriage Mass

CABLE OPTION



STAGE 1

POWER AND HALL CABLE OPTION

OCTO-L44-D3-C1-S-TM-1.0-FC-HC-E1.0-1250-00

	POWER CABLE OPTIONS																												
NF		<table border="1"> <tr><td>M1</td><td>Pink & Yellow</td></tr> <tr><td>M2</td><td>Green & Blue</td></tr> <tr><td>M3</td><td>Brown & Black</td></tr> <tr><td>PE</td><td>Yellow</td></tr> <tr><td>Temp sensor 1</td><td>Orange / Black</td></tr> <tr><td>Temp sensor 2</td><td>Orange</td></tr> </table>	M1	Pink & Yellow	M2	Green & Blue	M3	Brown & Black	PE	Yellow	Temp sensor 1	Orange / Black	Temp sensor 2	Orange															
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	HALL SENSOR OPTIONS																
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CHC	 Push Pull 5 Pin Male	<table border="1"> <tr><td>P1</td><td>Hall A</td><td>White</td></tr> <tr><td>P2</td><td>Hall B</td><td>Green</td></tr> <tr><td>P3</td><td>Hall C</td><td>Blue</td></tr> <tr><td>P4</td><td>5V</td><td>Red</td></tr> <tr><td>P5</td><td>0V</td><td>Black</td></tr> </table>	P1	Hall A	White	P2	Hall B	Green	P3	Hall C	Blue	P4	5V	Red	P5	0V	Black
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The temperature in which the thermostat is active is shown as below:

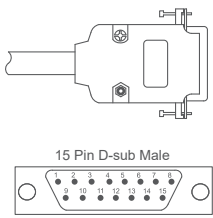
MODEL	THERMAL DEVICE TYPE	THERMOSTAT (NC) OPENS AT
DX 30B	PT100	See Note 1
DX 30B	Thermostat	100°C

Note 1

- Programmable on temperature controller or analog inputs on motion controller.
- Recommended to set cut-off temperature to 100°C (max) to prevent coil damage.
- User has to ensure that the thermal protection devices are wired to appropriate electronics to ensure that the motor power cutoff is active when temperature reaches its allowable limit.

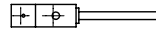
OCTO CABLE PIN OUT

ENCODER CONNECTOR - 15 PIN D-SUB MALE



RGH41		
15 Pin D-sub Male	Digital	Analog
P1	X	V1-
P2	0V	V2-
P3	E-	V0+
P4	Z-	5V
P5	B-	
P6	A-	BID
P7	5V	Vp/ Vx
P8		Vq
P9	0V	V1+
P10	Q	V2+
P11	E+/P	V0-
P12	Z+	0V
P13	B+	
P14	A+	DIR
P15	Shield	Shield

PROXIMITY SENSOR (GL-8FX10)

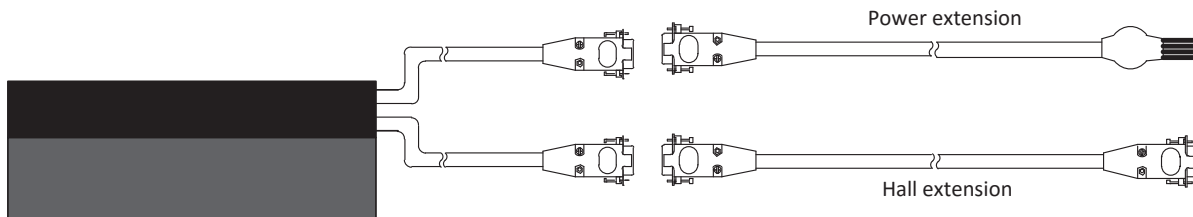


+5V dc	Brown
GND	Blue
LIGHT-ON	Black
DARK-ON	White

STAGE 2

OCTO EXTENSION CABLE

Connection example: OCTO-L44-D3-C1-S-TM-1.0-FC-HC-E1.0-1250-00



	Extension Cable	Part Number																	
Power Extension Cable		CBL_EXT_PWR_DX_X.X																	
		CBL_EXT_PWR_DX_CC_X.X																	
Hall Sensor Extension Cable		CBL_EXT_HALL_DX_X.X																	
		CBL_EXT_HALL_DX_CC_X.X																	
Encoder Extension Cable		CBL_EXT_REN00_X.X																	
	<table border="1"> <thead> <tr> <th>CABLE</th> <th>CABLE LENGTH (X.X)</th> </tr> </thead> <tbody> <tr> <td>00</td> <td>RGH41 Digital</td> </tr> <tr> <td rowspan="5">00A</td> <td>RGH41 Analog</td> </tr> <tr> <td>0.5</td> <td>0.5 meter</td> </tr> <tr> <td>1.0</td> <td>1.0 meter</td> </tr> <tr> <td>2.0</td> <td>2.0 meter</td> </tr> <tr> <td>3.0</td> <td>3.0 meter</td> </tr> <tr> <td>4.0</td> <td>4.0 meter</td> </tr> <tr> <td>5.0</td> <td>5.0 meter</td> </tr> </tbody> </table>	CABLE	CABLE LENGTH (X.X)	00	RGH41 Digital	00A	RGH41 Analog	0.5	0.5 meter	1.0	1.0 meter	2.0	2.0 meter	3.0	3.0 meter	4.0	4.0 meter	5.0	5.0 meter
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Notes: 1. X.X is the length of the cable in meters 2. For customized cable length, contact PBA