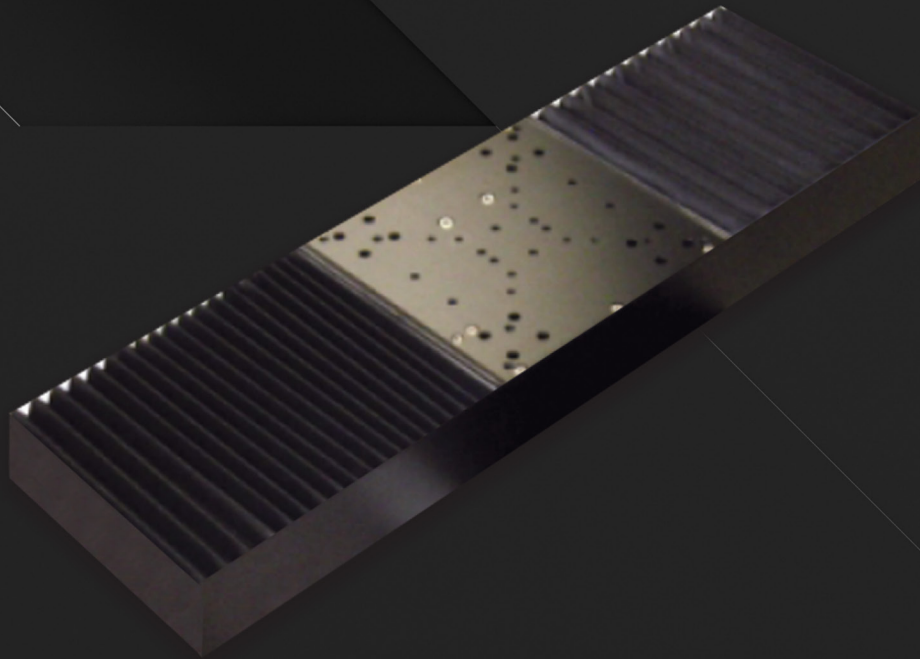




**DIRECT DRIVE TECHNOLOGY**  
Product Catalogue  
VERSION 4.1.1



# PDAB SERIES

LINEAR SERVO MOTOR ACTUATOR

- PLAY VIDEO -

# PART NUMBERING SYSTEM

## COIL ASSEMBLY

PDAB - D5 - C1 - S - TM - 1.0 - FC - HC - E1.0 - O - 1600 - 00

### ACTUATOR MODEL

### MOTOR MODEL

D3	DX30B
D3T	DX30BT
D5	DX50B
D5T	DX50BT

### COIL SIZE

C1
C2
C3
C4
C5

### CONNECTION TYPE

S	Series
P	Parallel

### THERMAL PROTECTION

TC*	PT 100
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

### 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

### DESIGN VERSIONS

00	Standard
01	Customized Version
:	

### EFFECTIVE STROKE (mm)

100-1600	Open type
100-1600	Covered Type
100-520	Bellow Type

### ACTUATOR SIZE

O	Open
C	Covered
B	Bellow

### ENCODER RESOLUTION

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

### HALL SENSOR AND CONNECTOR OPTIONS

H	Flying Leads (No Connector)
HC	9 pins D Sub (Male Connector)
CHC	5 Pins Circular (Quick Lock Male Connector)
HCL	9 pins D Sub (Male Connector with Line Driver)

DXB/ BT  
PIX  
PSM/PSME  
CVC  
CVC A  
RVCA  
PDDR  
PCA  
PWA  
PLA  
PDAB  
PIAB  
OCTO  
PRG  
LINEAR ENCODER  
SERVO AMPLIFIER

\* TC - Sensor output to temperature controller  
 \*\* TM - On/Off switch, triggers at 100°C  
 \*\*\* Encoder, power & hall cable

# PDAB SERIES

## IRONLESS LINEAR MOTOR

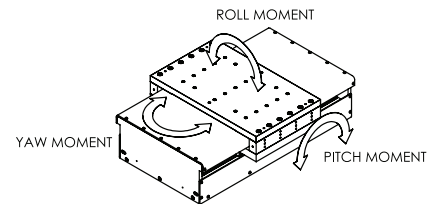
# PDAB-D3/D3T

- Ironless Linear Motor
- Peak force to 434N, Continuous force to 87N

SPECIFICATION		MODEL							
		DX30B/BT							
		PDAB-D3-C1		PDAB-D3-C2		PDAB-D3T-C2		PDAB-D3-C3	
Motor Parameters	Unit	S	P	S	P	P	S	P	
Peak Force	N	145		289			434		
Continuous Force @ 120°C*	N	29		58			87		
Peak Power @ 120°C	W	695		1390			2086		
Continuous Power @ 120°C*	W	28		56			83		
Peak Current	Apk	11.81	23.63	11.81	23.63	47.25	11.81	23.63	
Continuous Current @ 120°C*	Apk	2.36	4.73	2.36	4.73	9.45	2.36	4.73	
Continuous Stall Current @ 120°C*	Arms	1.75	3.5	1.75	3.5	7	1.75	3.5	
Force Constant	N/Apk	12.3	6.1	24.5	12.3	6.1	36.8	18.4	
Back EMF Constant	Vpk/m/s	14.1	7	28.2	14.1	7	42.3	21.1	
Coil Resistance L-L @ 25°C	Ohm	4.8	1.2	9.6	2.4	0.6	14.4	3.6	
Coil Resistance L-L @ 120°C*	Ohm	6.6	1.7	13.3	3.3	0.8	19.9	5	
Inductance L-L @ 1kHz	mH	3	0.75	6	1.5	0.38	9	2.25	
Motor Constant @ 25°C*	N/√W	6.46		9.13			11.18		
Motor Constant @ 120°C*	N/√W	5.49		7.76			9.51		
Max. Terminal Voltage	Vdc				400				
Thermal Resistance @ 120°C*	°C/W	3.42		1.71			1.14		
Max. Coil Temperature	°C				120				
Electrical Cycle Length	mm				60				
Specifications									
Repeatability**	um				±2.0				
Accuracy***	um				±20um/300mm				
Straightness***	um				±8um/300mm				
Flatness***	um				±8um/300mm				
Linear Guide Rated Load and Static Moment									
Model Code					LM Guide				
Block Quantity					4				
Maximum bearing load	kN				3.1				
Pitch moment	Nm	104		191			287		
Yaw moment	Nm	104		191			287		
Roll moment	Nm				218				

**Notes:**

1.  $Apk = 1.414 * Arms$ ;  $Vpk = 1.414 * Vrms$ .
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. Peak force and current : 4% duty ratio and 1 second duration.
5. \*\* Depend on encoder resolution.
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.
9. Specifications are subject to change without prior notice.



# PDAB SERIES

## IRONLESS LINEAR MOTOR

# PDAB-D3/D3T

- Ironless Linear Motor
- Peak force to 724N, Continuous force to 145N

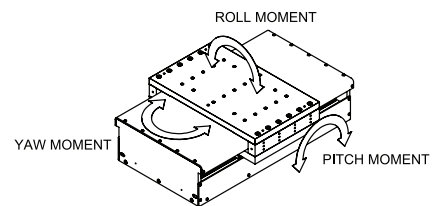
SPECIFICATION		MODEL					
		DX30B/BT					
		PDAB-D3-C4		PDAB-D3T-C4		PDAB-D3-C5	
Motor Parameters	Unit	S	P	P	S	P	
Peak Force	N	579		724			
Continuous Force @ 120°C*	N	116		145			
Peak Power @ 120°C	W	278		3476			
Continuous Power @ 120°C*	W	111		139			
Peak Current	Apk	11.81	23.63	47.25	11.81	23.63	
Continuous Current @ 120°C*	Apk	2.36	4.73	9.45	2.36	4.73	
Continuous Stall Current @ 120°C*	Arms	1.75	3.5	7	1.75	3.5	
Force Constant	N/Apk	49	24.5	12.3	61.3	30.6	
Back EMF Constant	Vpk/m/s	56.4	28.2	14.1	70.4	35.2	
Coil Resistance L-L @ 25°C	Ohm	19.2	4.8	1.2	24	6	
Coil Resistance L-L @ 120°C*	Ohm	26.6	6.6	1.7	33.2	8.3	
Inductance L-L @ 1kHz	mH	12	3	0.75	15	3.75	
Motor Constant @ 25°C*	N/√W	12.91		14.44			
Motor Constant @ 120°C*	N/√W	10.98		12.27			
Max. Terminal Voltage	Vdc			400			
Thermal Resistance @ 120°C*	°C/W	0.85		0.68			
Max. Coil Temperature	°C			120			
Electrical Cycle Length	mm			60			

Specifications		
Repeatability**	um	±2.0
Accuracy***	um	±20um/300mm
Straightness***	um	±8um/300mm
Flatness***	um	±8um/300mm

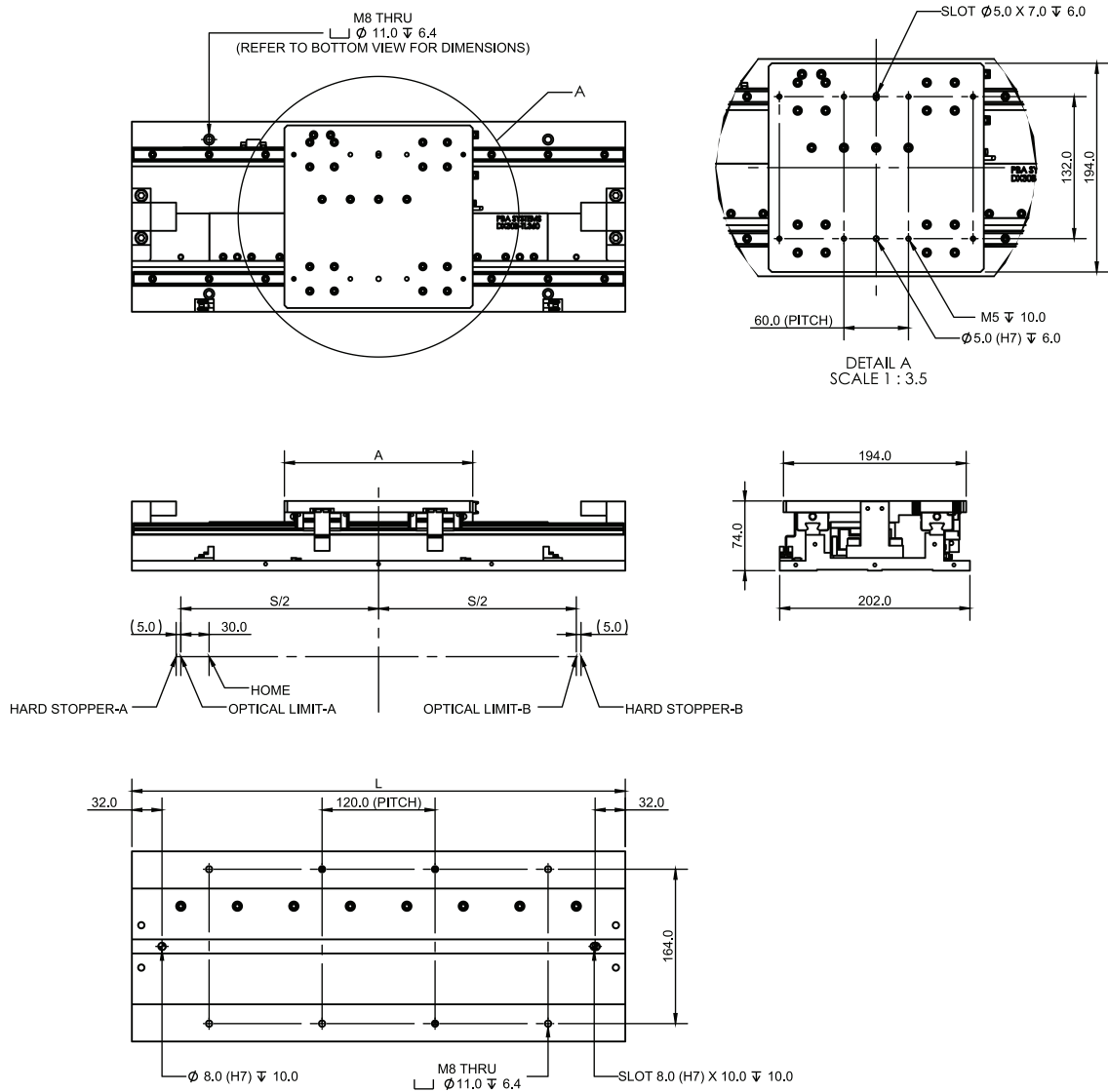
Linear Guide Rated Load and Static Moment		
Model Code		LM Guide
Block Quantity		4
Maximum bearing load	kN	3.1
Pitch moment	Nm	287
Yaw moment	Nm	287
Roll moment	Nm	218

Notes:

1.  $Apk = 1.414 * Arms$ ;  $Vpk = 1.414 * Vrms$ .
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. Peak force and current : 4% duty ratio and 1 second duration.
5. \*\* Depend on encoder resolution.
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.
9. Specifications are subject to change without prior notice.



# PDAB-D3/D3T (OPEN TYPE)

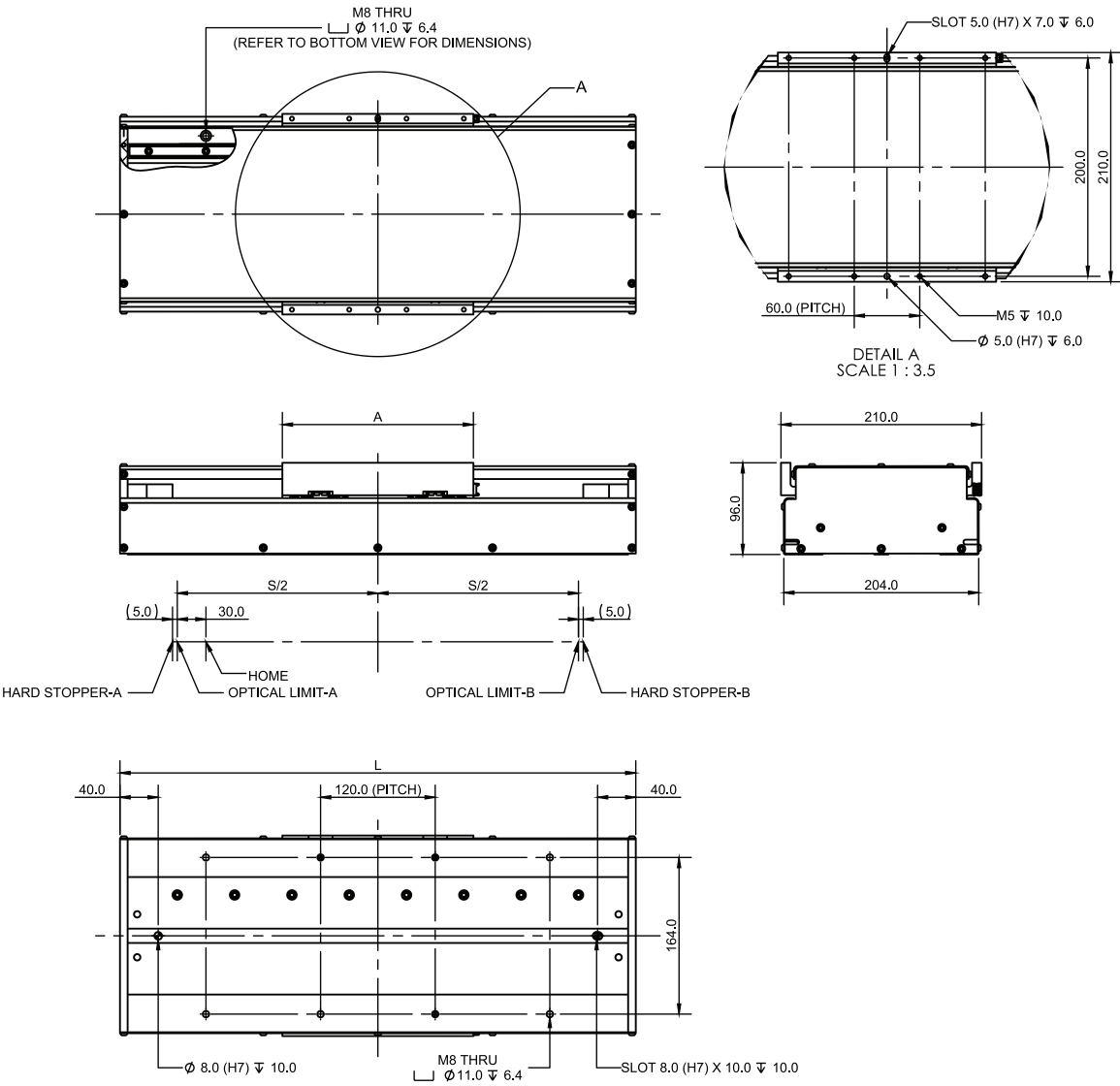


MOTOR MODEL	STROKE (S) mm	ACTUATOR LENGTH (L) mm	STROKE/ACTUATOR LENGTH (S)/(L) mm	CARRIAGE LENGTH (A) mm	SLIDER MASS kg	MODULE MASS (W) kg
C1	MIN:100 MAX:1600	MIN:284 MAX:1784	S=100+(Multiple of 60mm) L=S+A+(104mm)	80	1.2	MIN:7.6 MAX:40.1 W=7.6 + (Multiple of 1.3kg)
C2		MIN:344 MAX:1844		140	2.1	MIN:9.2 MAX:41.7 W=9.2 + (Multiple of 1.3kg)
C3		MIN:404 MAX:1904		200	2.8	MIN:11.6 MAX:44.1 W=11.6 + (Multiple of 1.3kg)
C4		MIN:464 MAX:1964		260	3.4	MIN:12.9 MAX:45.4 W=12.9 + (Multiple of 1.3kg)
C5		MIN:524 MAX:2024		320	4.0	MIN:15.3 MAX:47.8 W=15.3 + (Multiple of 1.3kg)

**Notes:**

- Slider Mass = Coil Mass + Carriage Mass
- Module mass increment of 1.3kg per 60mm

# PDAB-D3/D3T (COVERED TYPE)



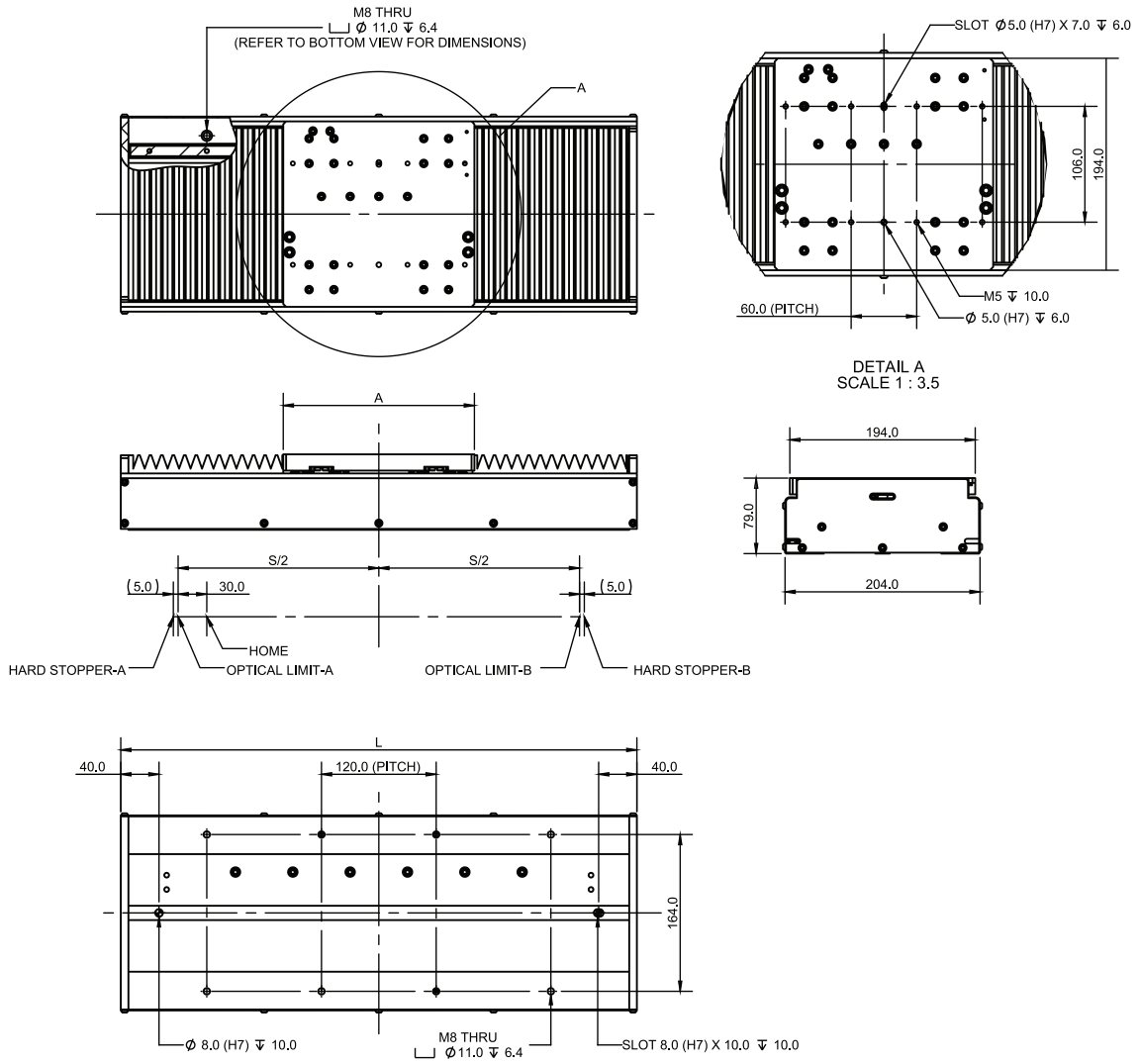
MOTOR MODEL	STROKE (S) mm	ACTUATOR LENGTH (L) mm	STROKE/ACTUATOR LENGTH (S)/(L) mm	CARRIAGE LENGTH (A) mm	SLIDER MASS kg	MODULE MASS (W) kg
C1	MIN:100 MAX:1600	MIN:300 MAX:1800	S=100+(Multiple of 60mm) L=S+A+(120mm)	80	1.3	MIN:9.5 MAX:47.0 W=9.5 + (Multiple of 1.5kg)
C2		MIN:360 MAX:1860		140	2.3	MIN:11.4 MAX:48.9 W=11.4 + (Multiple of 1.5kg)
C3		MIN:420 MAX:1920		200	3.1	MIN:14.1 MAX:51.6 W=14.1 + (Multiple of 1.5kg)
C4		MIN:480 MAX:1980		260	3.8	MIN:15.7 MAX:53.2 W=15.7 + (Multiple of 1.5kg)
C5		MIN:4540 MAX:2040		320	4.5	MIN:18.4 MAX:55.9 W=18.4 + (Multiple of 1.5kg)

**Notes:**

1. Slider Mass = Coil Mass + Carriage Mass
2. Module mass increment of 1.5kg per 60mm

DXB/ BT  
 PIX  
 PSM/PSME  
 CVC  
 CVCA  
 RVCA  
 PDDR  
 PCA  
 PWA  
 PLA  
**PDAB**  
 PIAB  
 OCTO  
 PRG  
 LINEAR ENCODER  
 SERVO AMPLIFIER

# PDAB-D3/D3T (BELLOW TYPE)



MOTOR MODEL	STROKE (S) mm				ACTUATOR LENGTH (L) mm				CARRIAGE LENGTH (A) mm	SLIDER MASS kg	MODULE MASS (W) kg			
	100	160	220	280	300	420	540	600			8.9	10.9	12.9	13.9
C1	340	400	460	520	720	840	900	1020	80	1.3	15.9	17.9	18.9	20.9
	100	160	220	280	360	480	600	660			140	2.3	10.7	12.7
C2	340	400	460	520	780	900	960	1080	200	3.1			17.7	19.7
	100	160	220	280	420	540	660	720			260	3.8	13.3	15.3
C3	340	400	460		840	960	1020		320	4.5			20.3	22.3
	100	160	220	280	480	600	720	780			17.3	19.3	21.3	22.3
C4	340	400			900	1020			24.3	26.3				
	100	160	220	280	540	660	780	840						
C5	340	400			960	1080								



# PDAB SERIES

## IRONLESS LINEAR MOTOR

# PDAB-D5/D5T

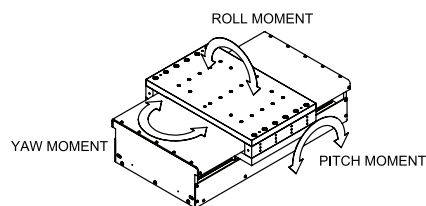
- Ironless Linear Motor
- Peak force to 446N, Continuous force to 89N

SPECIFICATION		MODEL					
		DX50B/BT					
		PDAB-D5-C1		PDAB-D5-C2		PDAB-D5T-C2	
Motor Parameters	Unit	S	P	S	P	P	
Peak Force	N	223		446			
Continuous Force @ 120°C*	N	45		89			
Peak Power @ 120°C	W	751		1502			
Continuous Power @ 120°C*	W	30		60			
Peak Current	Apk	13.13	26.25	13.13	26.25	52.5	
Continuous Current @ 120°C*	Apk	2.63	5.25	2.63	5.25	10.5	
Continuous Stall Current @ 120°C*	Arms	2.1	4.2	2.1	4.2	8.4	
Force Constant	N/Apk	17	8.5	34	17	8.5	
Back EMF Constant	Vpk/m/s	19.6	9.8	39.1	19.6	9.8	
Coil Resistance L-L @ 25°C	Ohm	4.2	1.1	8.4	2.1	0.5	
Coil Resistance L-L @ 120°C*	Ohm	5.8	1.5	11.6	2.9	0.7	
Inductance L-L @ 1kHz	mH	3.11	0.78	6.22	1.56	0.39	
Motor Constant @ 25°C*	N/√W	9.58		13.55			
Motor Constant @ 120°C*	N/√W	8.14		11.51			
Max. Terminal Voltage	Vdc			400			
Thermal Resistance @ 120°C*	°C/W	3.16		1.58			
Max. Coil Temperature	°C			120			
Electrical Cycle Length	mm			60			

Specifications		
Repeatability**	um	±2.0
Accuracy***	um	±20um/300mm
Straightness***	um	±8um/300mm
Flatness***	um	±8um/300mm

Linear Guide Rated Load and Static Moment		
Model Code		LM Guide
Block Quantity	2	4
Maximum bearing load	kN	3.1
Pitch moment	Nm	191
Yaw moment	Nm	191
Roll moment	Nm	218

- Notes:
1.  $Apk = 1.414 * Arms$ ;  $Vpk = 1.414 * Vrms$ .
  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. Peak force and current : 4% duty ratio and 1 second duration.
  5. \*\* Depend on encoder resolution.
  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.
  9. Specifications are subject to change without prior notice.



# PDAB SERIES

## IRONLESS LINEAR MOTOR

### PDAB-D5/D5T

- Ironless Linear Motor
- Peak force to 116N, Continuous force to 223N

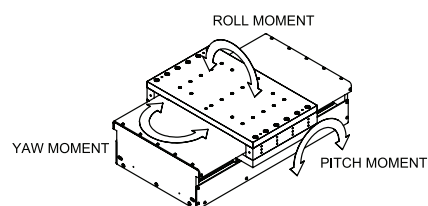
SPECIFICATION		MODEL							
		DX50B/BT							
		PDAB-D5-C3		PDAB-D5-C4		PDAB-D5T-C4		PDAB-D5-C5	
Motor Parameters	Unit	S	P	S	P	P	S	P	
Peak Force	N	669		893			1116		
Continuous Force @ 120°C*	N	134		179			223		
Peak Power @ 120°C	W	2253		3004			3755		
Continuous Power @ 120°C*	W	90		120			150		
Peak Current	Apk	13.13	26.25	13.13	26.25	52.5	13.13	26.25	
Continuous Current @ 120°C*	Apk	2.63	5.25	2.63	5.25	10.5	2.63	5.25	
Continuous Stall Current @ 120°C*	Arms	2.1	4.2	2.1	4.2	8.4	2.1	4.2	
Force Constant	N/Apk	51	25.5	68	34	17	85	42.5	
Back EMF Constant	Vpk/m/s	58.7	29.3	78.2	39.1	19.6	97.8	48.9	
Coil Resistance L-L @ 25°C	Ohm	12.6	3.2	16.8	4.2	1.1	21	5.3	
Coil Resistance L-L @ 120°C*	Ohm	17.4	4.4	23.2	5.8	1.5	29.1	7.3	
Inductance L-L @ 1kHz	mH	9.33	2.33	12.44	3.11	0.78	15.55	3.89	
Motor Constant @ 25°C*	N//W	16.59		19.16			21.42		
Motor Constant @ 120°C*	N//W	14.1		16.28			18.21		
Max. Terminal Voltage	Vdc				400				
Thermal Resistance @ 120°C*	°C/W	1.05		0.79			0.63		
Max. Coil Temperature	°C				120				
Electrical Cycle Length	mm				60				

Specifications		
Repeatability**	um	±2.0
Accuracy***	um	±20um/300mm
Straightness***	um	±8um/300mm
Flatness***	um	±8um/300mm

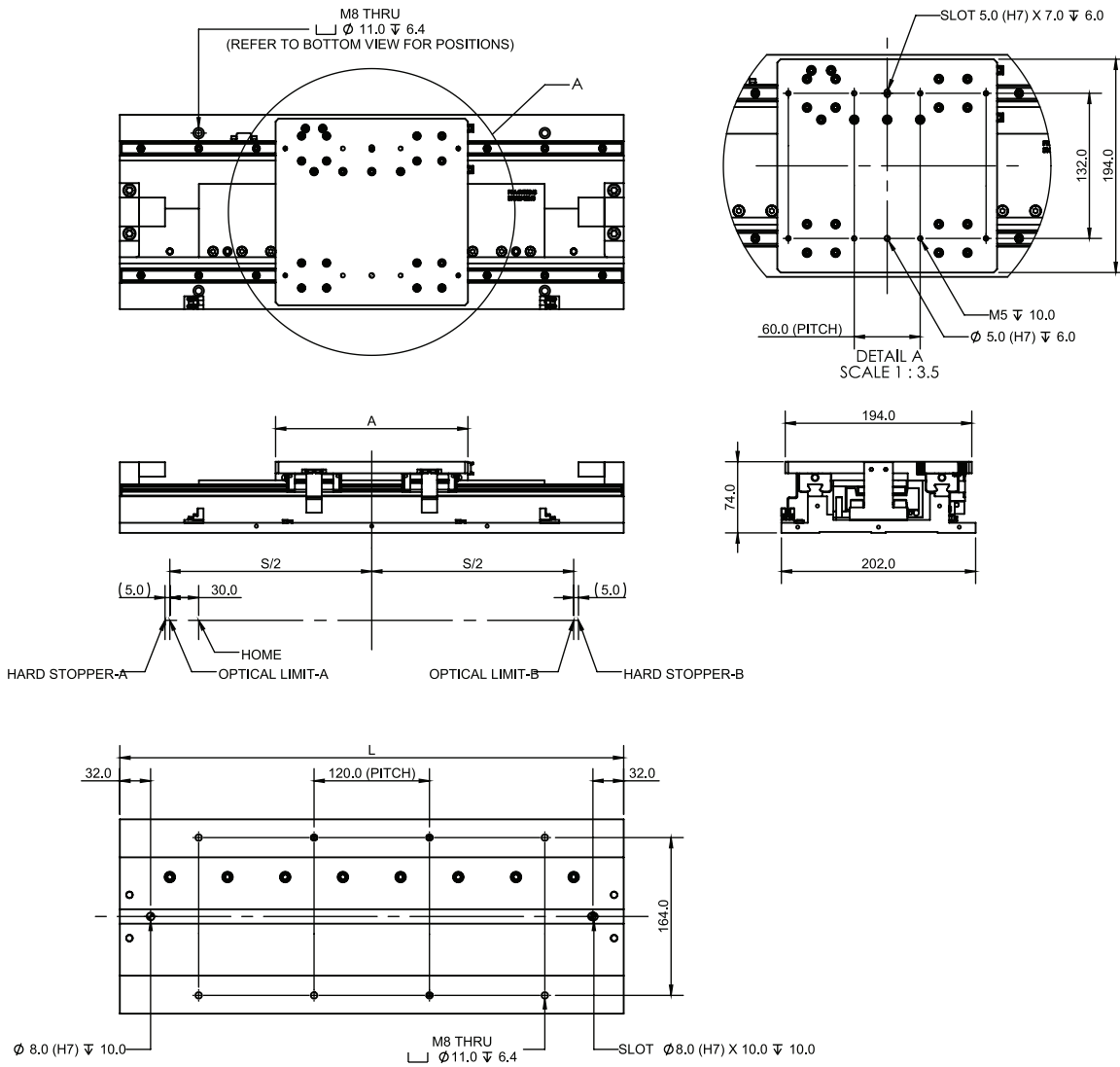
Linear Guide Rated Load and Static Moment		
Model Code		LM Guide
Block Quantity		4
Maximum bearing load	kN	3.1
Pitch moment	Nm	287
Yaw moment	Nm	287
Roll moment	Nm	218

Notes:

1.  $Apk = 1.414 * Arms$ ;  $Vpk = 1.414 * Vrms$ .
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. Peak force and current : 4% duty ratio and 1 second duration.
5. \*\* Depend on encoder resolution.
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.
9. Specifications are subject to change without prior notice.



# PDAB-D5/D5T (OPEN TYPE)



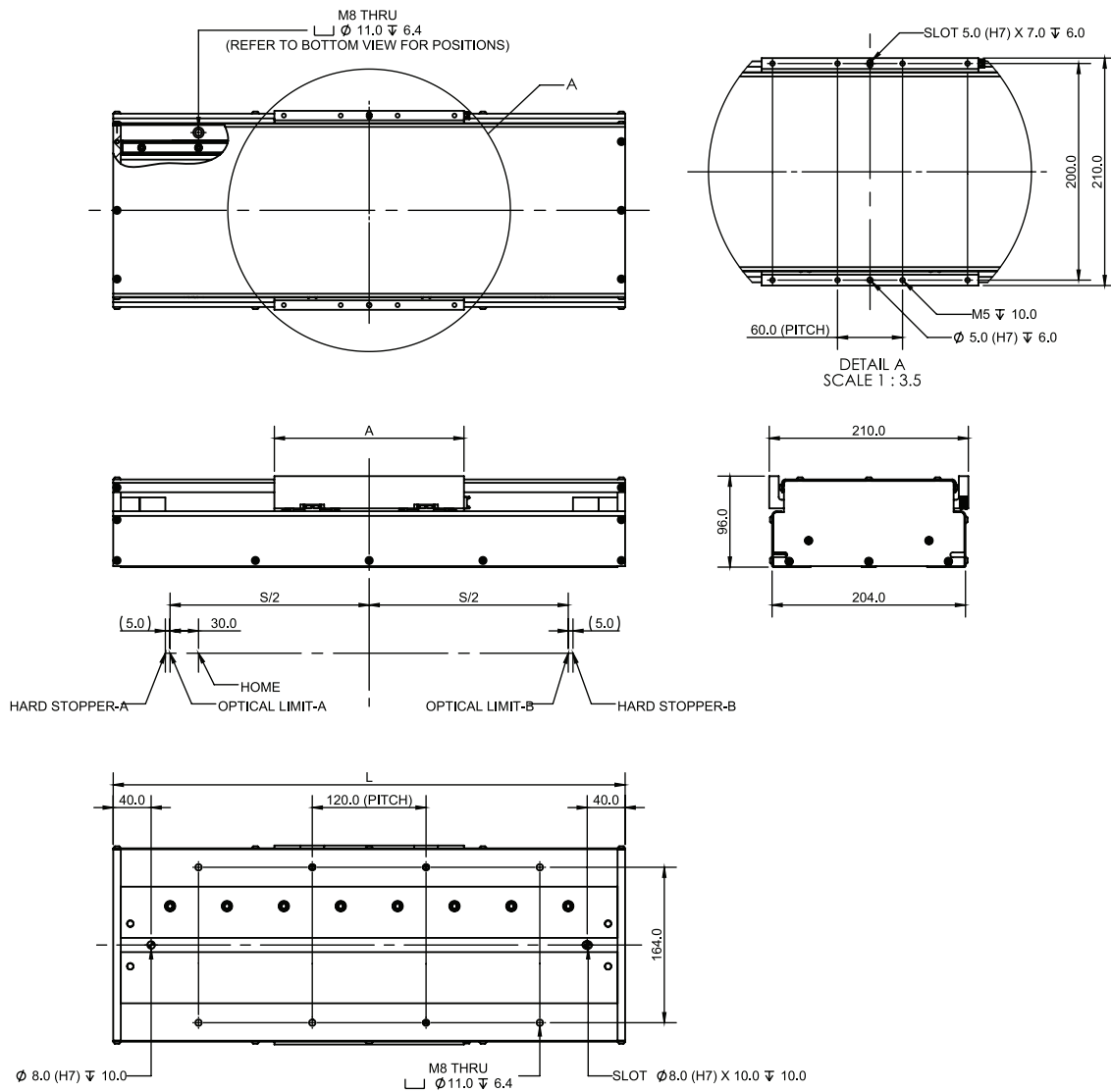
MOTOR MODEL	STROKE (S) mm	ACTUATOR LENGTH (L) mm	STROKE/ACTUATOR LENGTH (S)/(L) mm	CARRIAGE LENGTH (A) mm	SLIDER MASS kg	MODULE MASS (W) kg	
C1	MIN:100 MAX:1600	MIN:284 MAX:1784	S=100+(Multiple of 60mm) L=S+A+(104mm)	80	1.2	MIN:8.9 MAX:51.4	W=8.9 + (Multiple of 1.7kg)
C2		MIN:344 MAX:1844		140	2.2	MIN:10.5 MAX:53.0	W=10.5 + (Multiple of 1.7kg)
C3		MIN:404 MAX:1904		200	2.8	MIN:13.6 MAX:56.1	W=13.6 + (Multiple of 1.7kg)
C4		MIN:464 MAX:1964		260	3.5	MIN:14.8 MAX:57.3	W=14.8 + (Multiple of 1.7kg)
C5		MIN:524 MAX:2024		320	4.1	MIN:18.6 MAX:61.1	W=18.6 + (Multiple of 1.7kg)

**Notes:**

1. Slider Mass = Coil Mass + Carriage Mass
2. Module mass increment of 1.7kg per 60mm

DXB/ BT  
 PIX  
 PSM/PSME  
 CVC  
 CVCA  
 RVCA  
 PDDR  
 PCA  
 PWA  
 PLA  
**PDAB**  
 PIAB  
 OCTO  
 PRG  
 LINEAR ENCODER  
 SERVO AMPLIFIER

# PDAB-D5/D5T (COVERED TYPE)

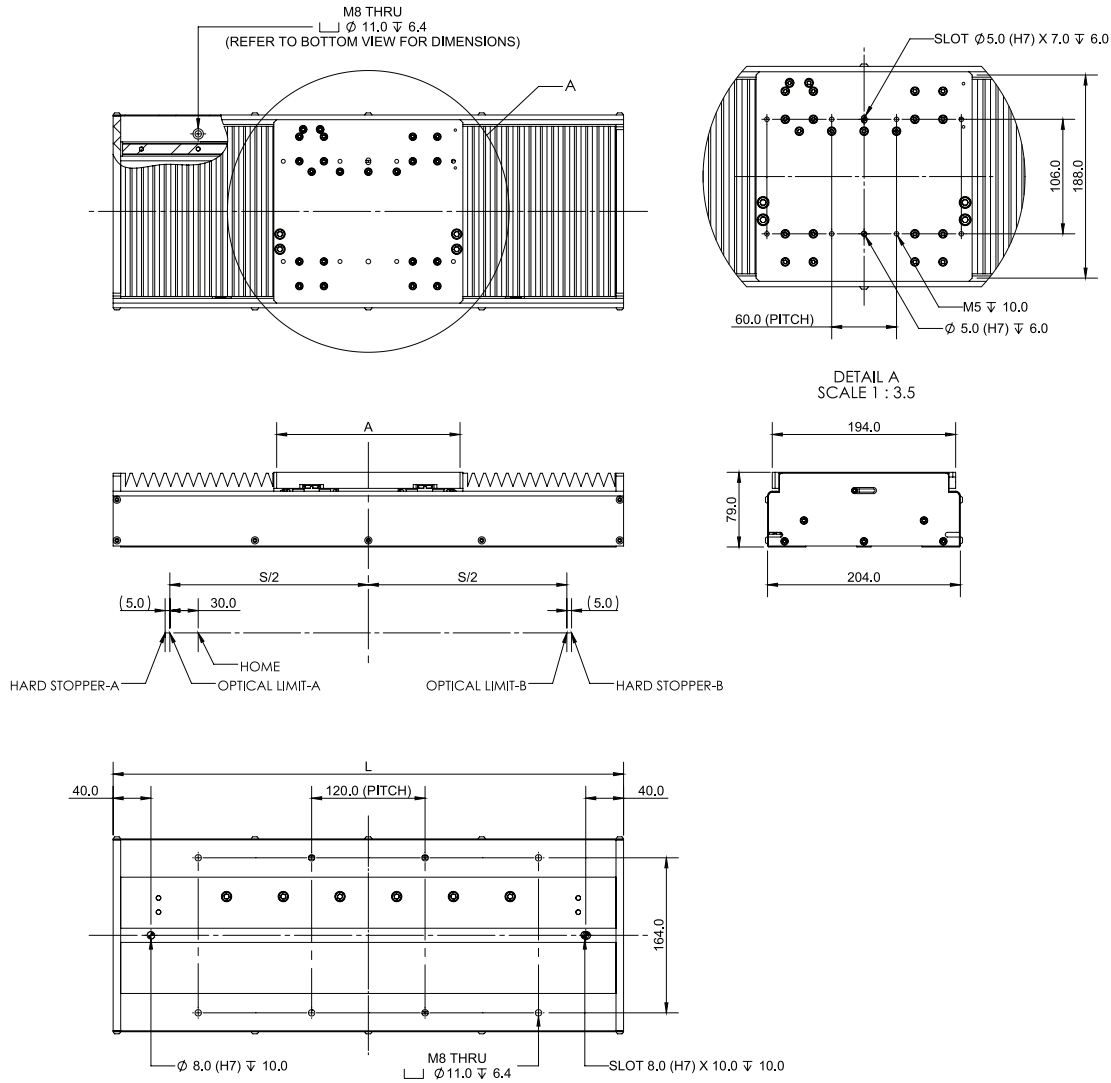


MOTOR MODEL	STROKE (S) mm	ACTUATOR LENGTH (L) mm	STROKE/ACTUATOR LENGTH (S)/(L) mm	CARRIAGE LENGTH (A) mm	SLIDER MASS kg	MODULE MASS (W) kg	
C1	MIN:100 MAX:1600	MIN:300 MAX:1800	S=100+(Multiple of 60mm) L=S+A+(120mm)	80	1.3	MIN:10.9 MAX:58.4	W=10.9 + (Multiple of 1.9kg)
C2		MIN:360 MAX:1860		140	2.4	MIN:12.8 MAX:60.3	W=12.8 + (Multiple of 1.9kg)
C3		MIN:420 MAX:1920		200	3.1	MIN:16.1 MAX:63.6	W=16.1 + (Multiple of 1.9kg)
C4		MIN:480 MAX:1980		260	3.9	MIN:17.7 MAX:65.2	W=17.7 + (Multiple of 1.9kg)
C5		MIN:540 MAX:2040		320	4.6	MIN:21.0 MAX:68.5	W=21.0 + (Multiple of 1.9kg)

## Notes:

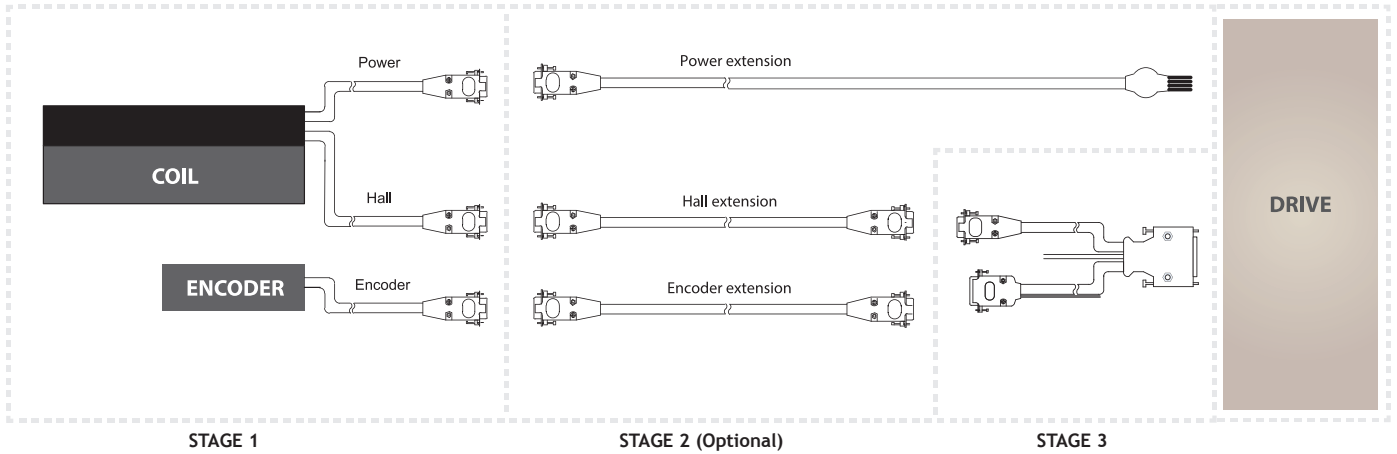
- Slider Mass = Coil Mass + Carriage Mass
- Module mass increment of 1.7kg per 60mm

# PDAB-D5/D5T (BELLOW TYPE)



MOTOR MODEL	STROKE (S) mm				ACTUATOR LENGTH (L) mm				CARRIAGE LENGTH (A) mm	SLIDER MASS kg	MODULE MASS (W) kg			
	100	160	220	280	300	420	540	600			10.3	12.3	14.3	15.3
C1	340	400	460	520	720	840	900	1020	80	1.3	17.3	19.3	20.3	22.3
	100	160	220	280	360	480	600	660			140	2.3	12.0	14.0
C2	340	400	460	520	780	900	960	1080	140	2.3	19.0	21.0	22.0	24.0
	100	160	220	280	420	540	660	720			200	3.1	16.2	17.2
C3	340	400	460		840	960	1020		200	3.1	22.2	24.2	25.2	
	100	160	220	280	480	600	720	780			260	3.8	16.6	18.6
C4	340	400			900	1020			260	3.8	23.6	25.6		
	100	160	220	280	540	660	780	840			320	4.5	19.8	21.8
C5	340	400			960	1080			320	4.5	26.8	28.8		

# CABLE OPTION



## STAGE 1 | POWER AND HALL CABLE OPTION

PDAB-D5-C1-S-TM-1.0-FC-HC-E1.0-O-1600-00

POWER CABLE OPTIONS																													
NF		<table border="1"> <tr><td>M1</td><td>Grey</td></tr> <tr><td>M2</td><td>Brown</td></tr> <tr><td>M3</td><td>Black</td></tr> <tr><td>PE</td><td>Yellow</td></tr> <tr><td>Temp sensor 1</td><td>Black</td></tr> <tr><td>Temp sensor 2</td><td>Orange</td></tr> </table>	M1	Grey	M2	Brown	M3	Black	PE	Yellow	Temp sensor 1	Black	Temp sensor 2	Orange															
M1	Grey																												
M2	Brown																												
M3	Black																												
PE	Yellow																												
Temp sensor 1	Black																												
Temp sensor 2	Orange																												
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HALL SENSOR OPTIONS																		
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P6	Hall C-																	
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P8	0V																	

Notes: All connectors shown are front view

The temperature in which the thermostat is active is shown as below:

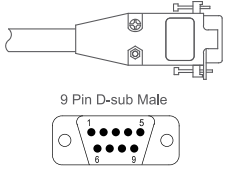
MODEL	THERMAL DEVICE TYPE	THERMOSTAT (NC) OPENS AT
DX30B	PT100	See Note 1
DX30B	Thermostat	100 °C
DX50B	Thermostat	100 °C

**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.

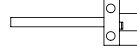
# PDAB CABLE PIN OUT

## ENCODER CONNECTOR - 9 PIN D-SUB MALE



	RH200X / RH200Z	RH200B
P1	0V DC	0V DC
P2	A+	Sine+
P3	Z+	Z+
P4	B+	Cosine+
P5	+5V DC	+5V DC
P6	A-	Sine-
P7	Z-	Z-
P8	B-	Cosine-
P9	Inner	Inner
Casing	Outer	Outer

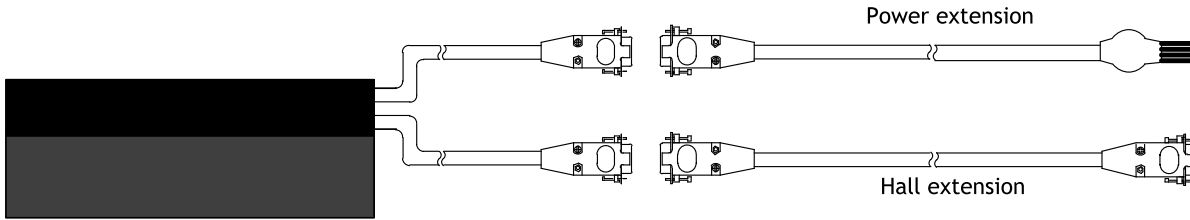
## OPTICAL LIMIT SWITCH (PM-L24)



+5 to 24V DC	Brown
GND	Blue
LIGHT-ON	Black
DARK-ON	White

## STAGE 2 | PDAB EXTENSION CABLE

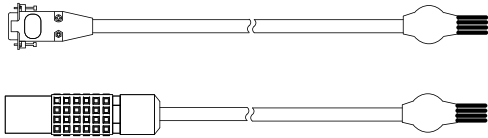
Connection example: PDAB-D5-C1-S-TM-1.0-FC-HC-E1.0-O-1600-00



### Extension Cable

### Part Number

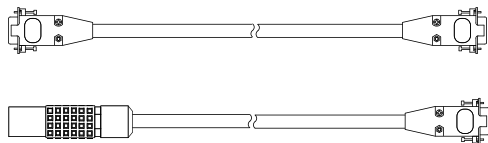
Power Extension Cable



CBL\_EXT\_PWR\_DX\_X.X

CBL\_EXT\_PWR\_DX\_CC\_X.X

Hall Sensor Extension Cable

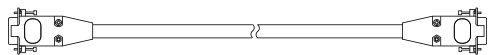


CBL\_EXT\_HALL0\_X.X

CBL\_EXT\_HALL0\_CC\_X.X

CBL\_EXT\_HALL0\_DIF\_X.X

Encoder Extension Cable



CBL\_EXT\_REN01\_X.X

CBL\_EXT\_REN01B\_X.X

	CABLE
00	RGH41, VIONIC, QUANTIC Digital
00A	RGH41 Analog
01	RH200 Digital
01B	RH200 Analog
05	ATOM Ri Interface Digital
05A	ATOM Ri Interface Analog

CABLE LENGTH (X.X)	
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

Notes: 1. X.X is the length of the cable in meters 2. For customized cable length, contact PBA

DXB/BT  
 PIX  
 PSM/PSME  
 CVC  
 CVCA  
 RVCA  
 PDDR  
 PCA  
 PWA  
 PLA  
**PDAB**  
 PIAB  
 OCTO  
 PRG  
 LINEAR ENCODER  
 SERVO AMPLIFIER

# Application Form - Linear Motor Selection

Customer Name:	Date (DD/MM/YY):
Contact Email:	

## PBA LINEAR MOTOR SELECTION QUESTIONNAIRE

### 1. Application Description

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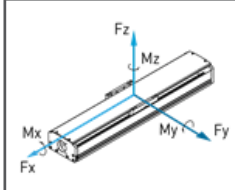
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### 1a. Application Sketch With Approx Dimensions

### 2. Load Parameter

Moving mass (without motor coil)		kg	
Frictional force		N	
Opposing force		N	
Mx	N.m	My	N.m
		MZ	N.m

### Stage Requirements



<input type="checkbox"/> Horizontal	<input type="checkbox"/> Vertical
<input type="checkbox"/> Sidewall	<input type="checkbox"/> Upside-down

### 3. Motion Parameter

	Profile 1	Profile 2	Profile 3
Moving distance	mm		
Moving time	s		
Moving velocity	m/s		
Acceleration	m/s <sup>2</sup>		
Dwell time	s		

### 4. Command/Bus (Please Circle Accordingly)

Pulse and direction / Analog / EtherCAT / IO trigger / Other : \_\_\_\_\_

### 5. Encoder (Please Circle Accordingly)

Resolution	um	
Incremental / Absolute / Analog		

### 6. Motion Precision

Accuracy	um/mm	
Repeatability	um	

### 7. Mechanical Specification

Effective stroke	mm	
Flatness	um/mm	
Straightness	um/mm	
Space constraints ( L x W x H )	mm	

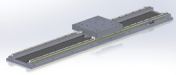
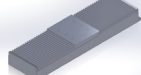
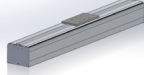
### 8. Working Environment

Room temperature	°C	
Clean room class		

### 9. Additional Requirements (Please Tick ( ) Accordingly)

Motor cable length	Controller	Amplifier	Encoder	Other: _____
m				

### 10. Actuator

Open Frame	Enclosed			
	PARTIAL		BELLOW	
			STRIP SEAL	

### 11. Remarks: If you have any special motion request for sizing procedure, please specify your requirement in below remarks.



# PBA SYSTEMS LINEAR MOTOR SIZER SOFTWARE



PBA Systems is a one-stop robotics provider with a focus on the development of core technology to offer a robust range of products and solutions in precision robotics and general robotics - enabling companies to thrive by making Industry 4.0 technology accessible to the market.

Our core strength is in design, development, and manufacturing of direct drive motor design and manufacturing, motion control, and precision modular assemblies.

Address:  
**505 Yishun Industrial Park, A,  
 Singapore 768733**

Contact Us:  
**Tel: +(65) 6576 6766  
 Fax: +(65) 6576 6768**



## PBA SYSTEMS LINEAR MOTOR SIZER SOFTWARE

PBA Systems Motor Sizer Software is available to download from our website to assist in the calculation and selection.

Kindly visit us at [www.pbasystems.com.sg](http://www.pbasystems.com.sg) or simply scan the QR CODE

## SIMULATED PERFORMANCE CHARTS

PBA Motor Sizer

Application Version: 10.7.0.0 | Local Database Version: 7.0.16 | Server Database Version: 7.0.16

Guest [About PBA Online](#)

**Motor Sizer**

**Project Details**  
 Customer Name: PBA | Project Name: XYZ | Date: 6/1/2022 | Project Data Version: 7.0.16

**Axis Details**  
 Axis Name: X | Motor Category: DXB | Safety Margin: 20 | 300

**Profiles**

No	Motion Profile	Travel Distance (m)	Travel Time (s)	Max. Speed (m/s)	Max. Accel. (m/s <sup>2</sup> )	Dwell Time (s)	Mass of Load (Kg)	Angle Of Incl. (°)	Direction	Coefficient of Friction	Opposing Force (N)	Ambient Temp. (°C)	RMS Force (N)	Peak Force (N)	Frictional Force (N)	Accel. Time (s)	Cruise Time (s)	Decel. Time (s)	Total Time (s)
1	Trapezoidal	1.000	1.000	1.500	4.500	0.100	10.000	0.000	▶	0.003	0.000	30.000	35.034	45.294	0.294	0.333	0.333	0.333	1.100
2	Trapezoidal	0.500	1.000	0.750	2.250	0.000	20.000	0.000	▶	0.003	0.000	30.000	36.747	45.589	0.589	0.333	0.333	0.333	1.000
3	Trapezoidal	0.500	1.000	0.750	2.250	0.000	30.000	0.000	▶	0.003	0.000	30.000	55.121	68.383	0.883	0.333	0.333	0.333	1.000

**Final Calculations for Axis**

Parameter	Value	Recommended Motor	Safety (%)
Required RMS Force	43.026 N	DX30B-C2-S	32
Required Peak Force	68.383 N	DX30B-C2-P	32
Total Travel Distance	2.000 m	DX50B-C2-S	101
Total Cycle Time	3.100 s	DX50B-C2-P	101
Total Dwell Time	0.100 s	DX50BT-C2-P	101
Max Speed	1.500 m/s	DX50BT-C4-P	294
Max Acceleration	4.500 m/s <sup>2</sup>		
Max. Ambient Temp.	30.000 °C		

**Selected Motor**  
 Motor: DX50B-C2-S

Continuous Force	89.00 N	L To L Resistance	8.40 ohm
Peak Force	446.00 N	L To L Inductance	6.22 mH
Continuous Current	2.63 A	Continuous Power	60.00 W
Peak Current	13.13 A	Peak Power	1502.00 W
Motor Constant	11.51 N/VW	Coil Weight	0.520 kg
Force Constant	34.00 N/A	Coil Length	121.00 mm
Back EMF Constant	39.10 V/(m/s)	Attractive Force	0.00 N

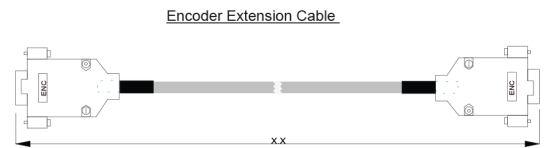
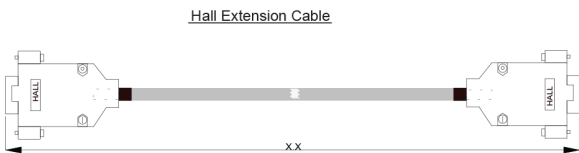
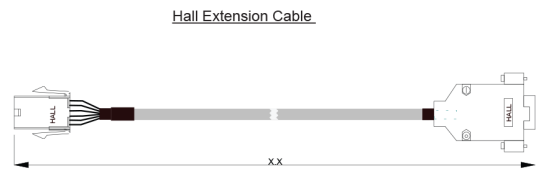
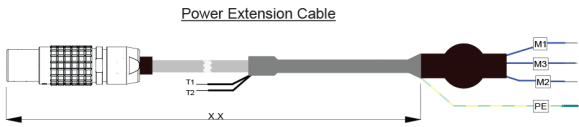
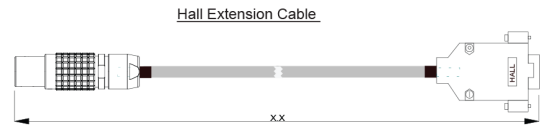
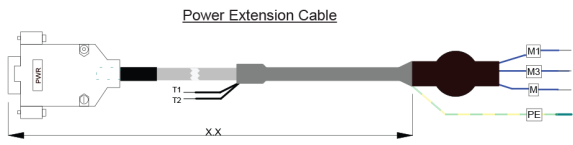
**Calculated Motor Values for Application**

Reqd. RMS Force	44.21 N	Reqd. Peak Force	69.57 N
Cont. Current	1.30 A	Peak Current	2.05 A
Coil Temp	48.03 °C	DC Bus Voltage	70.42 V
Safety Factor	101.29 %		

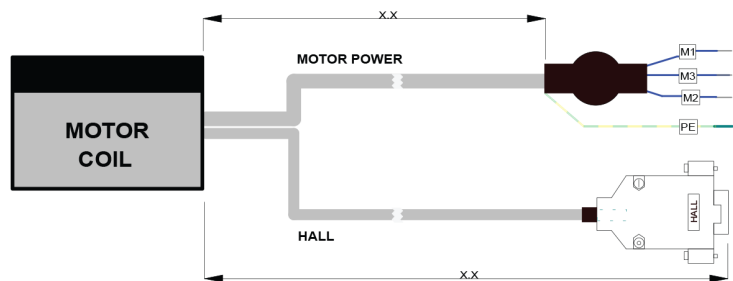
Servo Drive Model: MT-6/25-230AP1

Cont. Current: 6.30 A | Peak Current: 25.40 A

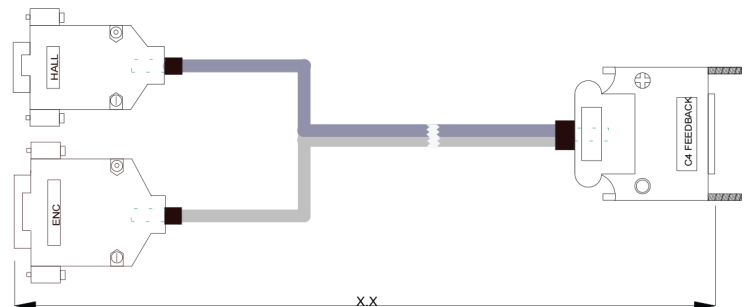
# APPENDIX



## MOTOR POWER HALL CABLE



## MAXTUNE FEEDBACK CABLE



### Notes:

1. X.X is the length of the cable in meter with a tolerance of  $\begin{matrix} +0.10 \\ -0 \end{matrix}$
2. All measurements are in meters (m) unless stated