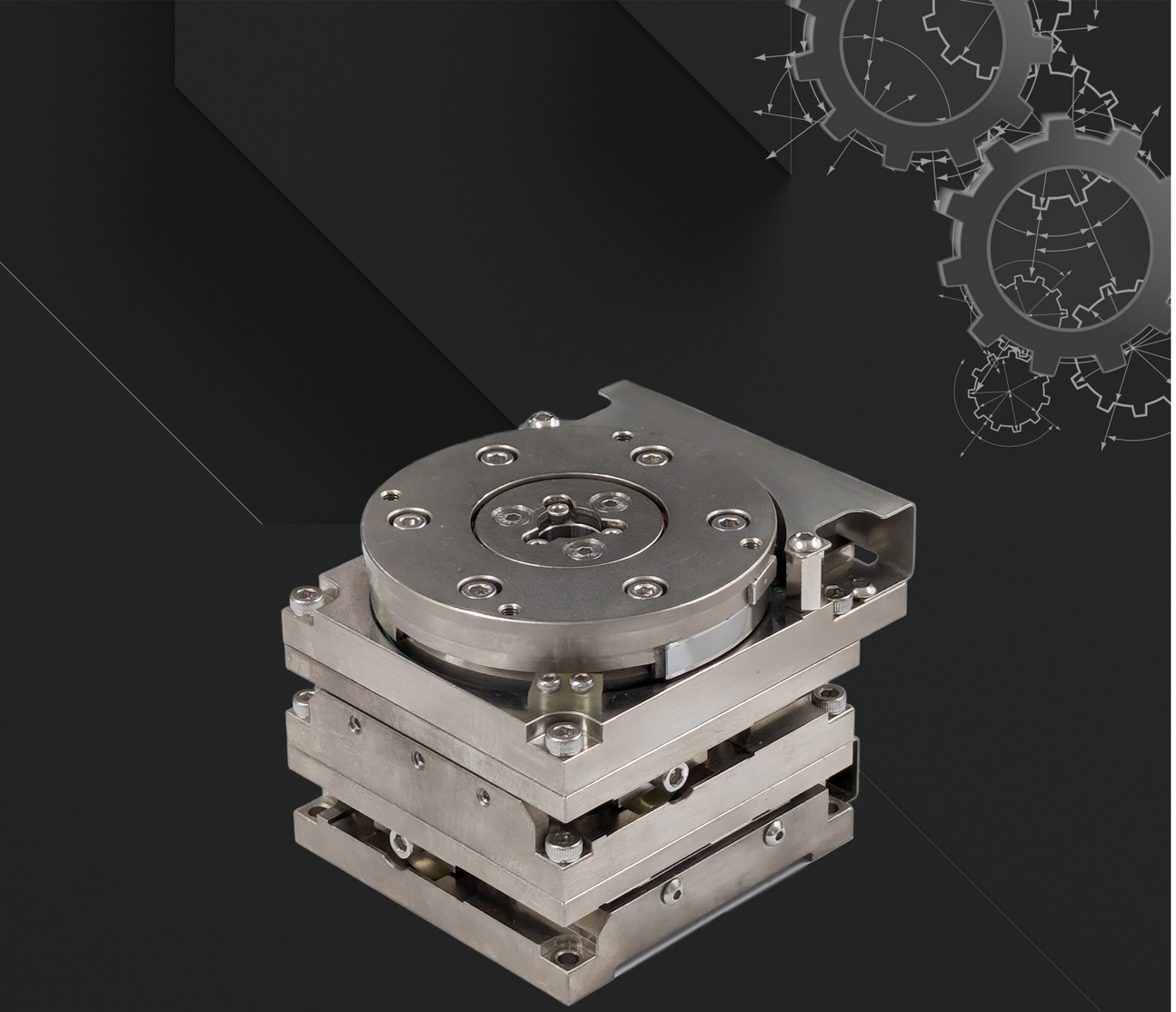
pba

SYSTEMS

DIRECT DRIVE TECHNOLOGY

Product Catalogue



PAS SERIES

ALIGNMENT STAGE

VERSION 4.1.7

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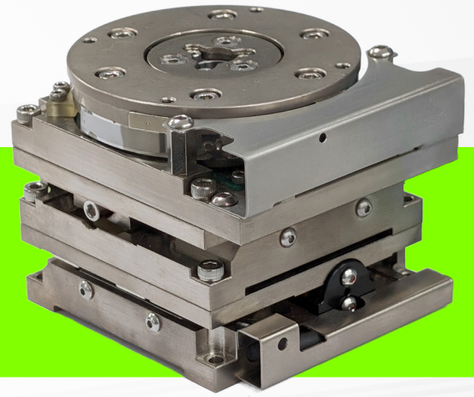
PAS SERIES

IRONLESS LINEAR MOTOR



PAS Series Alignment Stage is a low-profile, 3-axis, XYθ motion, compact, miniature stage.

Ideal for closed loop short stroke positioning applications where precision, repeatability and low speed/force ripple are of utmost importance.

PBA PAS stage is powered by PBA direct drive motors comes with built-in precision cross roller guides that provide high rigidity to complement the high acceleration capability of the PAS module which has very low electrical/mechanical time constants and zero hysteresis.

With the combination of high-resolution linear encoder, PBA PAS Stage ensures high-accuracy positioning operation without any backlash. It is most suitable for alignment processing utilizing image processing such as semiconductor and liquid crystal related manufacturing equipment, and positioning mechanism for measuring equipment and inspection instruments that require clean environments.

- Direct drive technology
- Compact and low profile
- Cross roller bearing for excellent precision and rigidity
- Zero cogging , zero backlash and zero hysteresis
- Low moving mass, fast response
- Integrated high precision linear encoder
- Excellent reliability
- Stackable configuration

**Technical specifications subject to change without prior notice*

APPLICATION

- **Alignment process**
- **Inspection**
- **Pick and Place**
- **Dispensing**
- **Printing**
- **Laser marking**

PART NUMBERING SYSTEM

PAS – XNN065 – CRX – E0.1 – C0.9 – 00

MODEL
PAS

AXIAL CONFIGURATION

XNN	X:One axis
NNR	Rotary:One axis
XYN	X,Y:Two axis
XNR	X, Rotary:Two axis
XYR	X,Y,Rotary:Three axis

NOTE: N None

SIZE

065	65mm

LINEAR GUIDE

CRX	Cross Roller

DESIGN VERSIONS

00	Standard
01	Customised Version

CABLE LENGTH

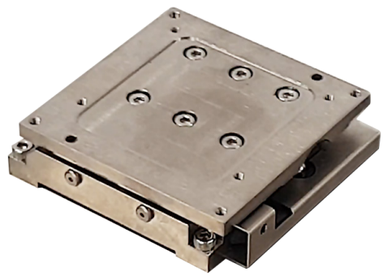
C0.9	0.9mm

ENCODER

E0.1	XNN	X : One axis
	XYN	X, Y : Two axis
EA	NNR	Rotary : One axis
E0.1A	XNR	X, Rotary : Two axis
	XYR	X, Y, Rotary : Three axis

PAS SERIES

Alignment Stage



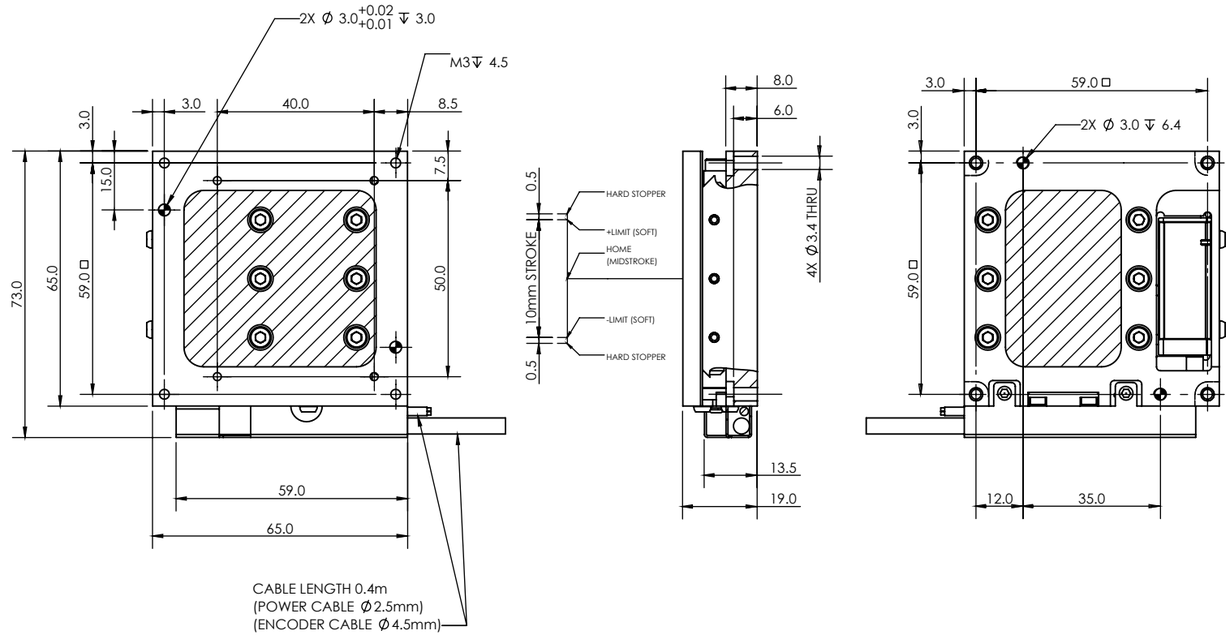
PAS SERIES

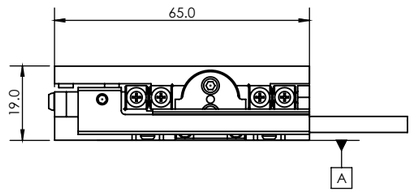
- Direct drive technology
- Compact and low profile
- Low moving mass, fast respon
- Cross roller bearing for excellent precision and rigidity
- Stackable configuration

SPECIFICATION		MODEL
		PAS-XNN065-CRX
Performance	**Unit**	
Stroke	mm	10.0
Peak Force	N	30.1
Continuous Stall Force @ 100°C*	N	4.3
Peak Power @ 100°C*	W	254.8
Continuous Power @ 100°C	W	5.2
Electrical		
Peak Current	A	7.0
Continuous Stall Current @ 100°C	A	1.0
Force Constant @ Mid Stroke	N/A	4.3
Back EMF Constant @ Mid Stroke	V/m/s	4.3
Coil Resistance @ 25°C	ohm	4.0
Coil Resistance @ 100°C	ohm	5.2
Inductance @ 1kHz (Inside fully)	mH	0.5
Motor Constant @ 100°C	N/√W	1.9
Max. Terminal Voltage	Vdc	48
Thermal		
Thermal Resistance @ 100°C	°C/W	14.4
Max. Coil Temperature	°C	110
Mechanical		
Moving Mass	kg	0.21
Total Mass	kg	0.48
Resolution	um	0.1
Repeatability**	um	±0.5
Straightness	um	±2.0
Flatness	um	±2.0
Type of Linear Bearing		X-Roller Bearing
Surface Treatment		EN
Moment		
M_Y	Nm	2.75
M_R	Nm	1.44
M_P	Nm	2.00

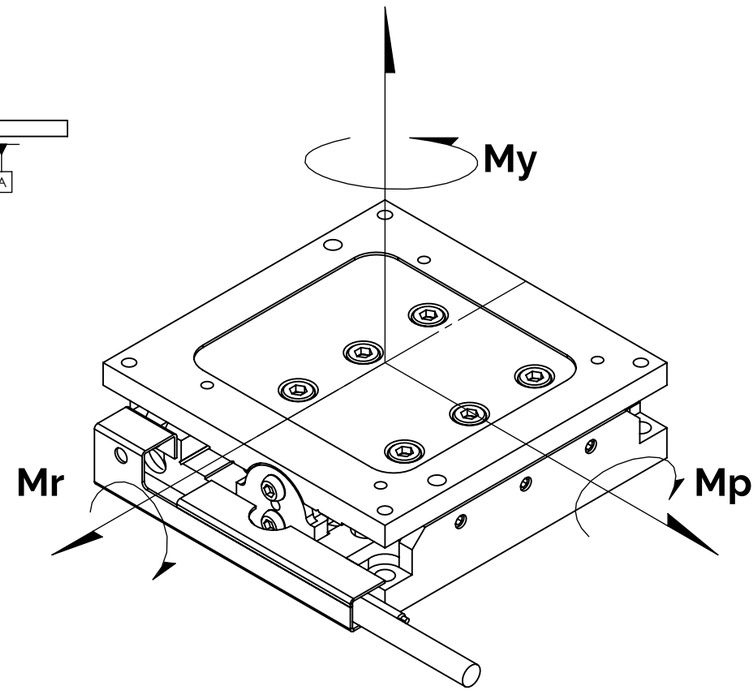
Notes:
1. *Ambient temperature 25ºC, heat dissipation by nation convection, without heat sink attached.
2. Specification tolerance: ±10%
3. ** Depend on encoder resolution.
4. Peak force and current: 4% duty ratio and 1 second duration.
5. PAS-YNN065-CRX specification same as PAS-NXN065-CRX
6. Specifications are subject to change without prior notice.

XNN065-CRX



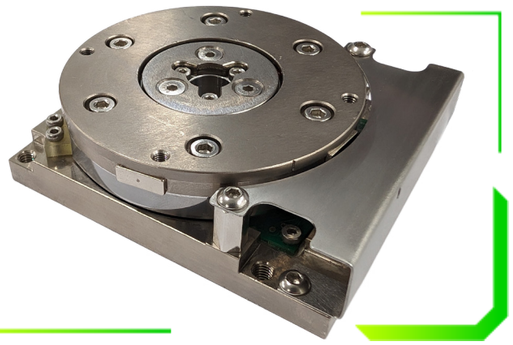


NOTE: DATUM A AS REFERENCE
FOR MOVING FLATNESS



PAS SERIES

Alignment Stage



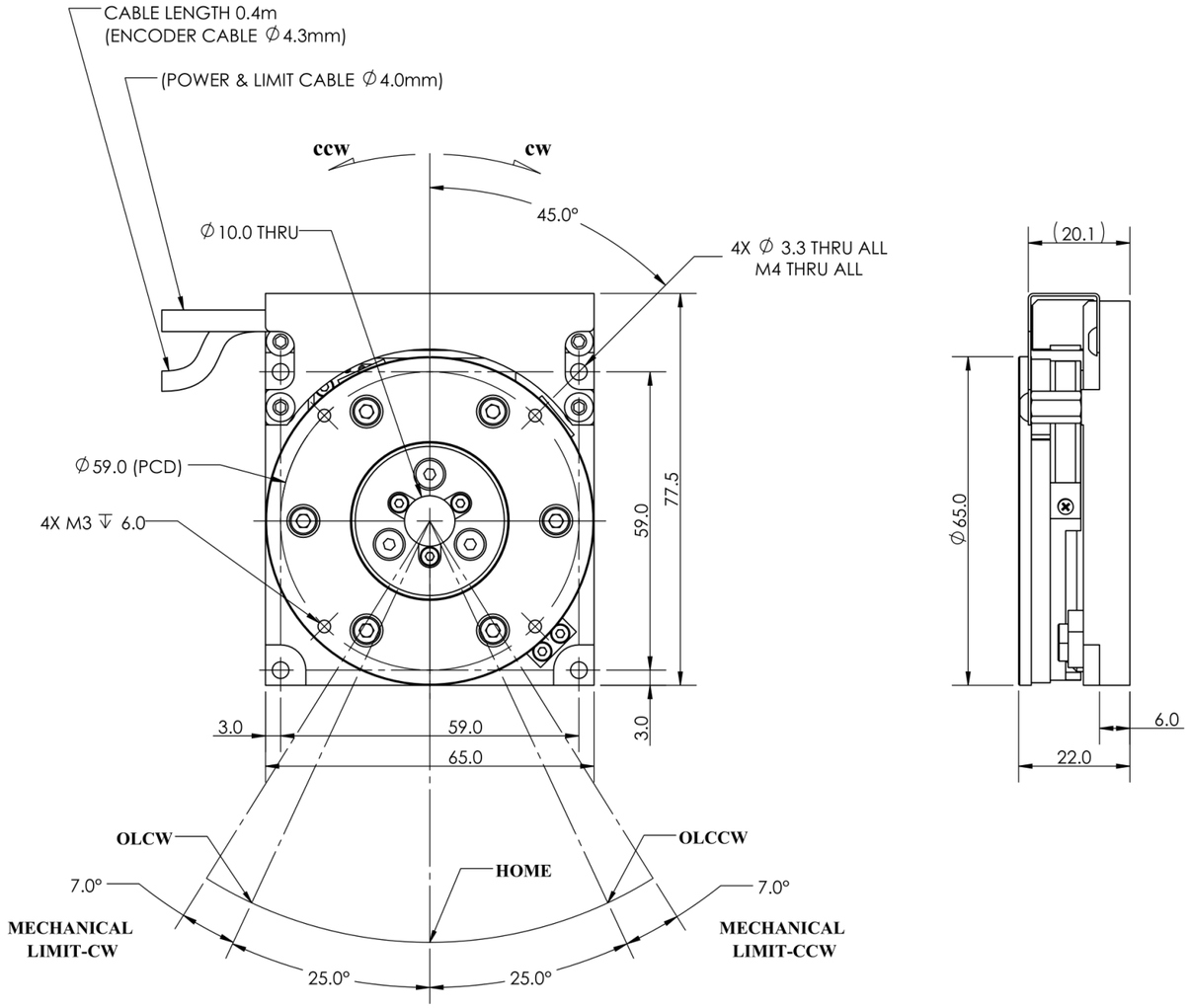
PAS SERIES

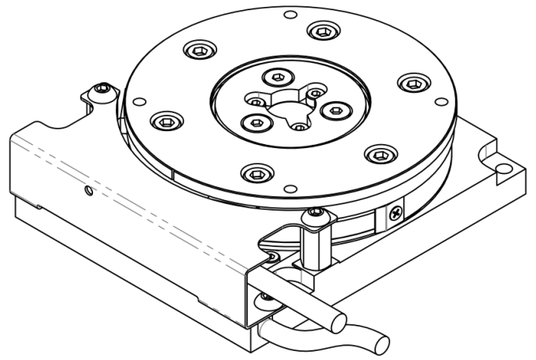
- Direct drive technology
- Compact and low profile
- Low moving mass, fast respon
- Cross roller bearing for excellent precision and rigidity
- Stackable configuration

SPECIFICATION		MODEL
		PAS-NNR065-CRX
Performance	**Unit**	
Stroke	degree	±25.0
Peak Torque	N.m	0.721
Continuous Torque @ 100°C*	N.m	0.09
Peak Power @ 100°C	W	692.4
Continuous Power @ 100°C*	W	10.8
Electrical		
Peak Current	Apk	9.050
Continuous Current @ 100°C	Apk	1.130
Continuous Stall Current @ 100°C	Arms	0.800
Torque Constant	N.m/Apk	0.08
Back EMF Constant L-L	Vpk/rad/s	0.092
Resistance L-L @ 25°C	ohm	8.65
Resistance L-L @ 100°C*	ohm	11.272
Inductance L-L @ 1kHz	mH	1.480
Motor Constant @ 100°C*	N.m//W	0.027
Max. Terminal Voltage	Vdc	48.0
Thermal		
Thermal Resistance @ 100°C	°C/W	6.9
Max. Winding Temperature	°C	110
Mechanical		
Rotor Inertia	kg.m^2	0.00014
Motor Weight	kg	0.5
Magnatic Pitch (N-N)	degree	60
Max. Speed	degree/sec	720
Max. Axial Load	kg	2.25
Axial Run-out (no load)	um	±8.0
Radial Run-out (no load)	um	±8.0
Resolution (after quadrature)	LPR	A (Analogue)
		4,966
Parallelism	um	±8.0
Repeatability**	arc-sec	±1.3
Surface Treatment		EN

Notes:
1. Apk=1.414 * Arms; Vpk=1.414 * Vrms
2. *Ambient temperature 25ºC, heat dissipation by natural convection, without heat sink attached.
3. Specifications tolerance: ±10%.
4. ** Depend on encoder resolution.
5. Peak force and current: 4% duty ratio and 1 second duration.
6. Specifications are subject to change without prior notice.

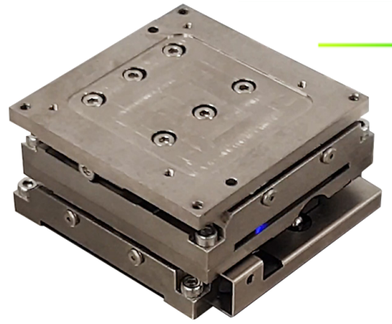
NNR065-CRX





PAS SERIES

Alignment Stage



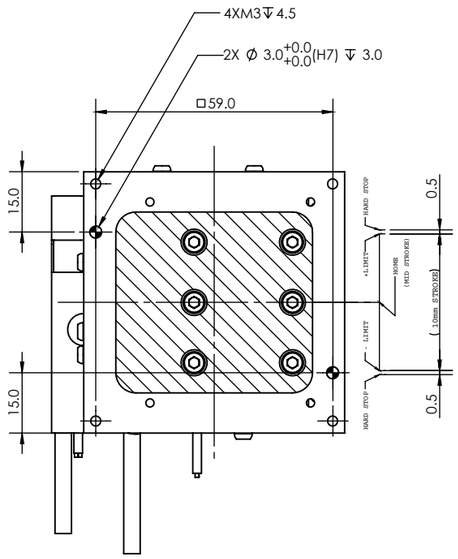
PAS SERIES

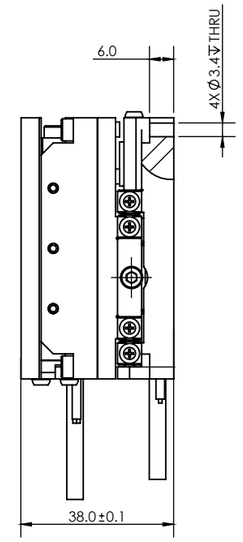
- Direct drive technology
- Compact and low profile
- Low moving mass, fast respon
- Cross roller bearing for excellent precision and rigidity
- Stackable configuration

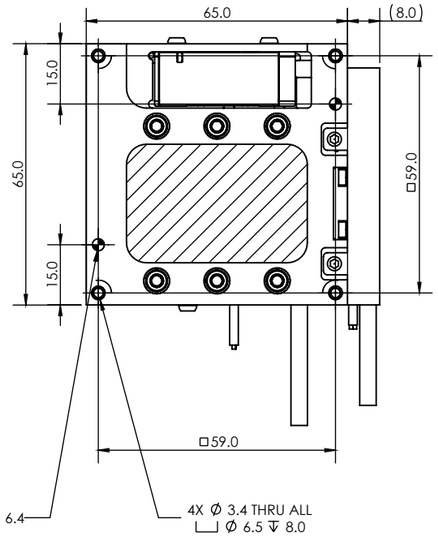
SPECIFICATION		MODEL
		PAS-XYN065-CRX
Mechanical	**Unit**	
		X Stage
Stroke	mm	10.0
Lower Axis Moving Mass	kg	0.7
X-Resolution	um	0.1
Peak Force	N	30
Continuous Force	N	4.3
Repeatability	um	±0.5
Straightness	um	±2.0
Max Speed	mm/s	691
		Y Stage
Stroke	mm	10
Lower Axis Moving Mass	kg	0.21
X-Resolution	um	0.1
Peak Force	N	30
Continuous Force	N	4.3
Repeatability	um	±0.5
Straightness	um	±2.0
Max Speed	mm/s	691
		PAS-XYN065-CBX
Total Mass	kg	0.98
Resolution	um	0.1
Max. Axial Load	kg	1.9
Parallelism	um	±5.0
Repeatability**	um	±0.5
Straightness	um	±2.0
Flatness	um	±4.0
Type of Linear Bearing	---	X-Roller Bearing
Surface Treatment	---	EN

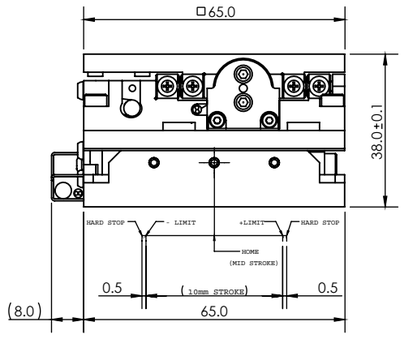
Notes:
1. Specifications tolerance: ±10%.
2. ** Depend on encoder resolution.
3. Peak force and current: 4% duty ratio and 1 second duration.
4. Specifications are subject to change without prior notice.

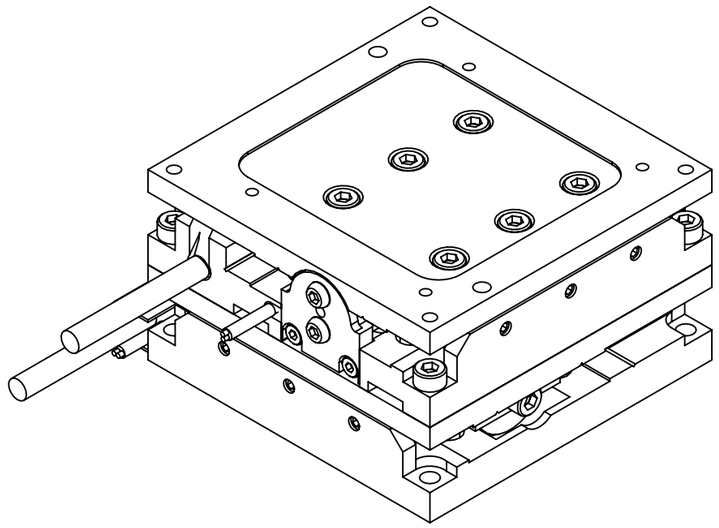
XYN065-CRX





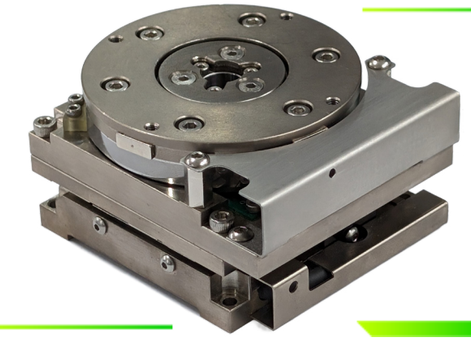






PAS SERIES

Alignment Stage



PAS SERIES

- Direct drive technology
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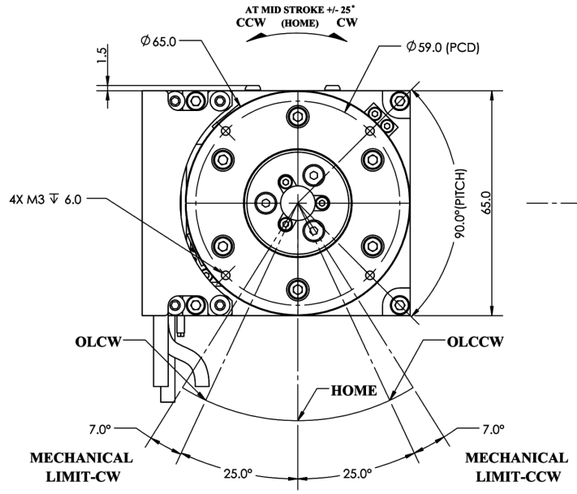
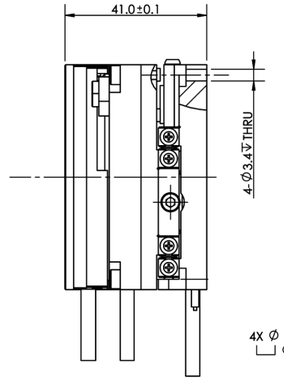
- Cross roller bearing for excellent precision and rigidity
- Stackable configuration

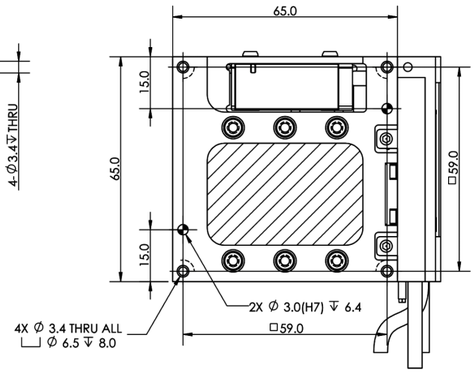
SPECIFICATION		MODEL
		PAS-XNR065-CRX
Mechanical	**Unit**	
		R Stage
Stroke	degree	±25.0
Rotor Inertia	kg.m^2	0.00014
Magnatic Pitch (N-N)	degree	60
Max. Speed	degree/sec	720
Max. Axial Load	kg	2.25
Axial Run-out (no load)	um	±8.0
Radial Run-out (no load)	um	±8.0
Resolution (after quadrature)	LPR	A (Analogue)
		4,966
Repeatability	arc-sec	±1.3
		X Stage
Stroke	mm	10.0
Upper Axis Moving Mass	kg	0.71
Resolution	um	0.1
Repeatability	um	±0.5
Straightness	um	±2.0
Type of Linear Bearing		X-Roller Bearing
Surface Treatment		EN
		PAS-XNR065-CRX
Total Mass	kg	0.98
Flatness	um	±2.0

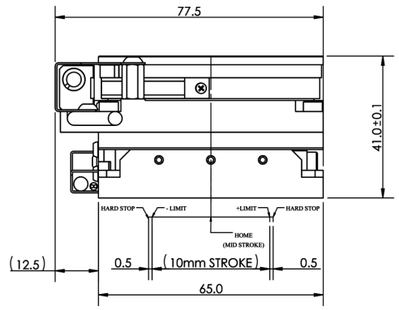
Notes:
1. Specifications tolerance: ±10%.
2. ** Depend on encoder resolution.
3. Peak force and current: 4% duty ratio and 1 second duration.
4. Specifications are subject to change without prior notice.

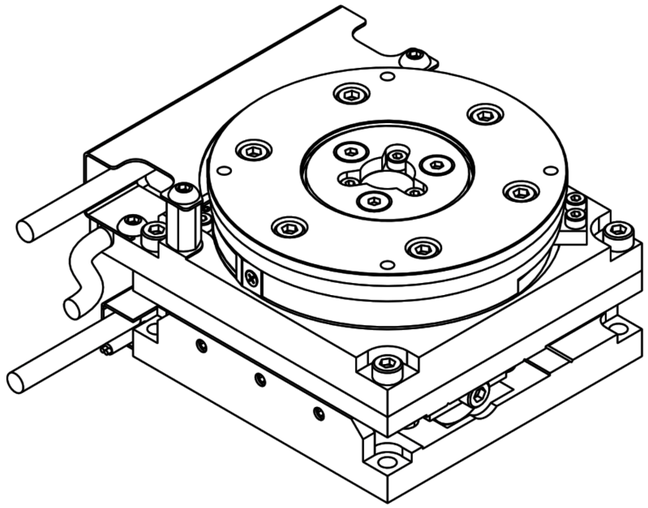
XNR065-CRX





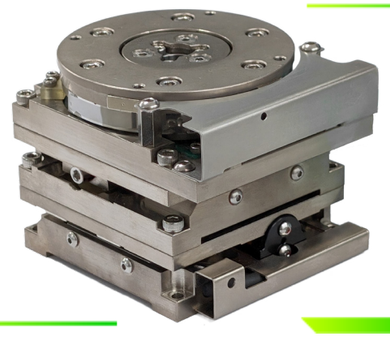






PAS SERIES

Alignment Stage



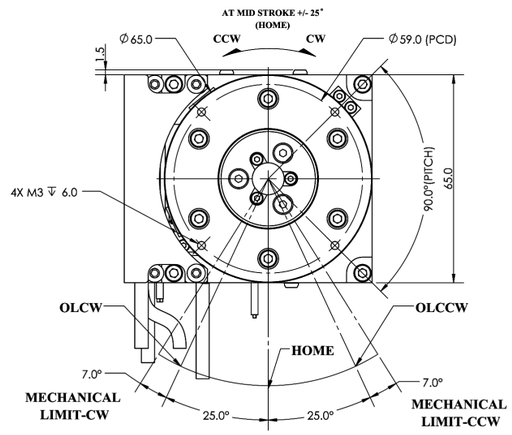
PAS SERIES

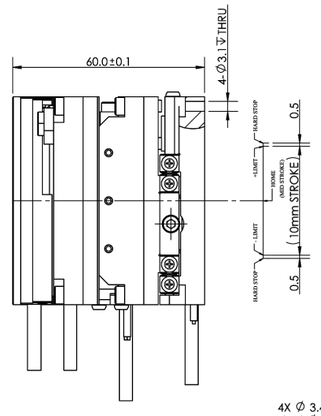
- Direct drive technology
- Compact and low profile
- Low moving mass, fast respon
- Cross roller bearing for excellent precision and rigidity
- Stackable configuration

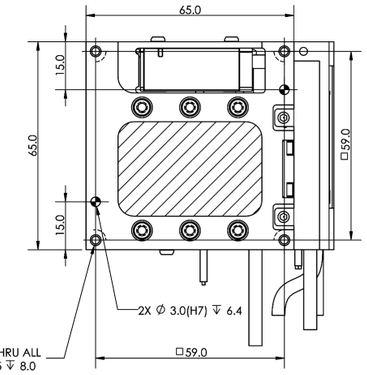
SPECIFICATION		MODEL
		PAS-XYR065-CRX
Mechanical	**Unit**	
		R Stage
Stroke	degree	±25.0
Rotor Inertia	kg.m^2	0.00014
Magnatic Pitch (N-N)	degree	60
Max. Speed	degree/sec	720
Max. Axial Load	kg	2.25
Axial Run-out (no load)	um	±8.0
Radial Run-out (no load)	um	±8.0
Resolution (after quadrature)	LPR	A (Analogue)
		4,966
Repeatability	arc-sec	±1.3
		X Stage
Stroke	mm	10.0
Bottom Axis Moving Mass	kg	0.71
Resolution	um	0.1
Repeatability	um	±0.5
Straightness	um	±2.0
Type of Linear Bearing		X-Roller Bearing
Surface Treatment		EN
		Y Stage
Stroke	mm	10.0
Upper Axis Moving Mass	kg	1.19
Resolution	um	0.1
Repeatability	um	±0.5
Straightness	um	±2.0
Type of Linear Bearing		X-Roller Bearing
Surface Treatment		EN
		PAS-XYR065-CRX
Total Mass	kg	1.47
Flatness	um	±2.0

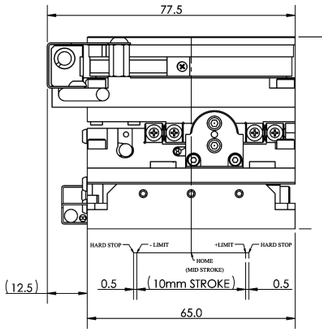
Notes:
1. Specifications tolerance: ±10%.
2. ** Depend on encoder resolution.
3. Peak force and current: 4% duty ratio and 1 second duration.
4. Specifications are subject to change without prior notice.

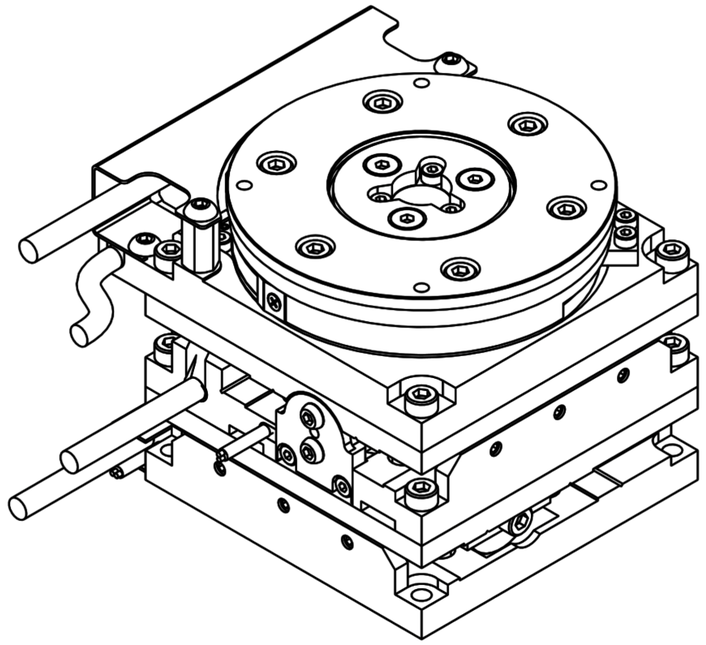
XYR065-CRX



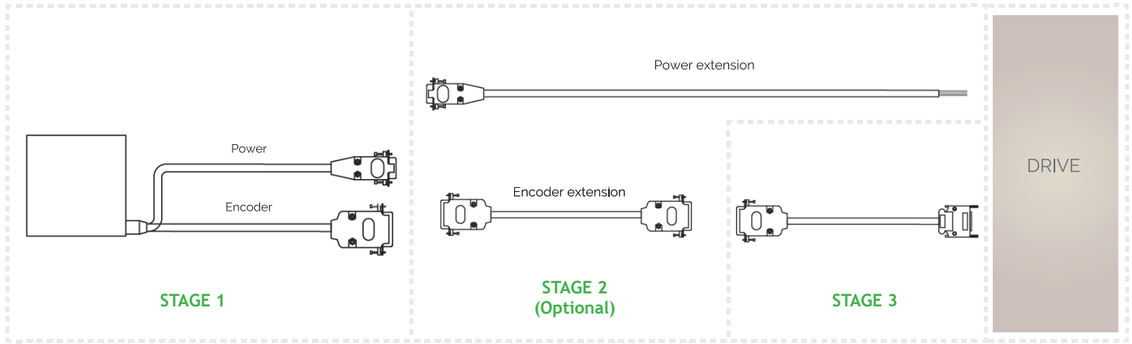








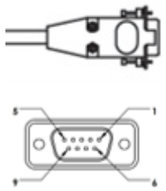
CABLE OPTION - ROTARY



STAGE 1 | PAS SERIES CABLE COLOUR CODE AND PIN OUT

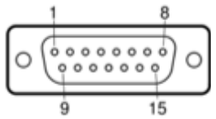
MOTOR POWER CABLE/LIMIT SENSOR

9NF



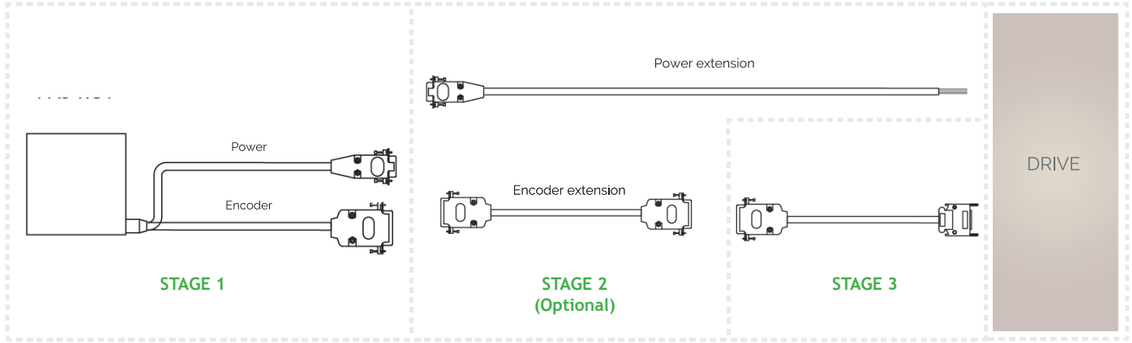
PIN	CODE
1	M1
2	M2
3	M3
CASE	PE

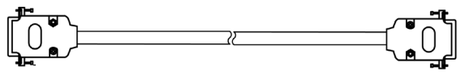
ENCODER CONNECTOR



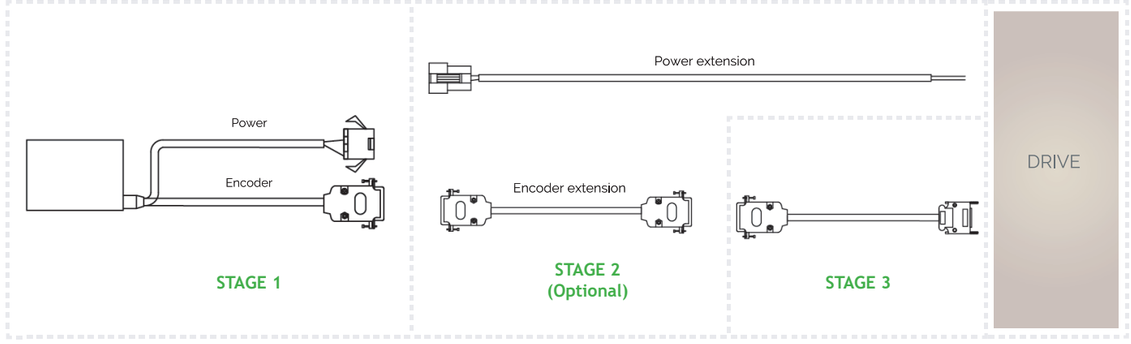
PIN	CODE	PIN	CODE
1	V1-	9	V1+
2	V2-	10	V2+
3	V0+	11	V0-
4	+5V	12	0V
5	+5V	13	0V
6	E-	14	CAL
7	Vp	CASE	SHIELD
8	Vq		

STAGE 2 | PAS SERIES EXTENSION CABLE



Extension Cable		Part Number
Power Extension Cable		CBL_EXT_PWR0_X.X
Encoder Extension Cable		CBL_EXT_REN00A_UL_X.X

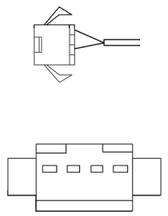
CABLE OPTION - LINEAR



STAGE 1 | PAS SERIES CABLE COLOUR CODE AND PIN OUT

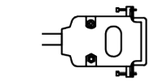
MOTOR POWER CABLE/LIMIT SENSOR

9NF



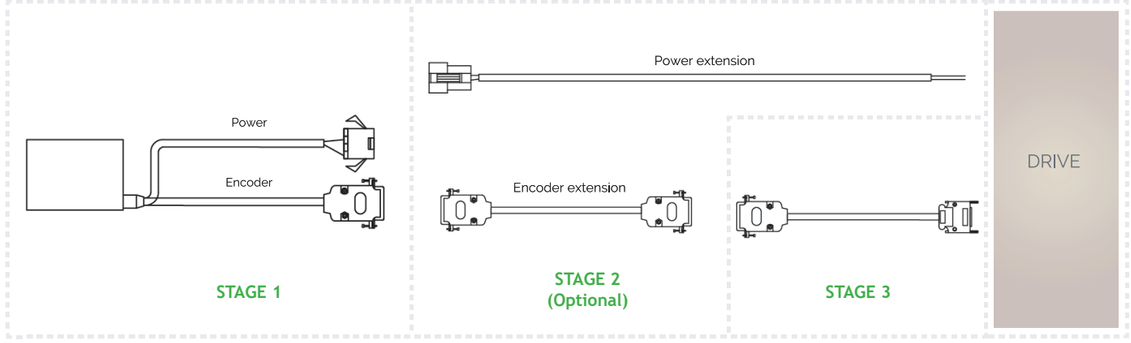
P1	RED (+)
P2	-
P3	BLACK (-)
P4	-

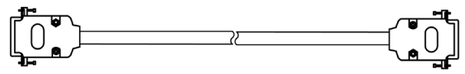
ENCODER CONNECTOR



P1	CAL
P2	0V
P3	E-
P4	Z-
P5	B-
P6	A-
P7	+5V
P8	+5V
P9	0V
P10	Q
P11	P
P12	Z+
P13	B+
P14	A+
P15	
CASE	SHIELD

STAGE 2 | PAS SERIES EXTENSION CABLE



Extension Cable		Part Number
Power Extension Cable		CBL_EXT_PWR_CVC_X.X
Encoder Extension Cable		CBL_EXT_REN00_X.X

Application Form - Linear Motor Selection

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

PBA LINEAR MOTOR SELECTION QUESTIONAIRE

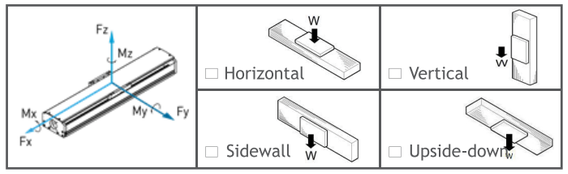
1. Application Description

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



3. Motion Parameter

		Profile 1	Profile 2	Profile 3
Moving distance	mm			
Moving time	s			
Moving velocity	m/s			
Acceleration	m/s^2			
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	

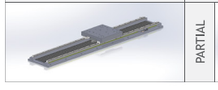
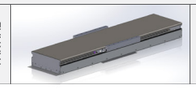
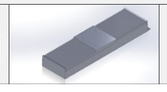
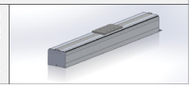
8. Working Environment

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.

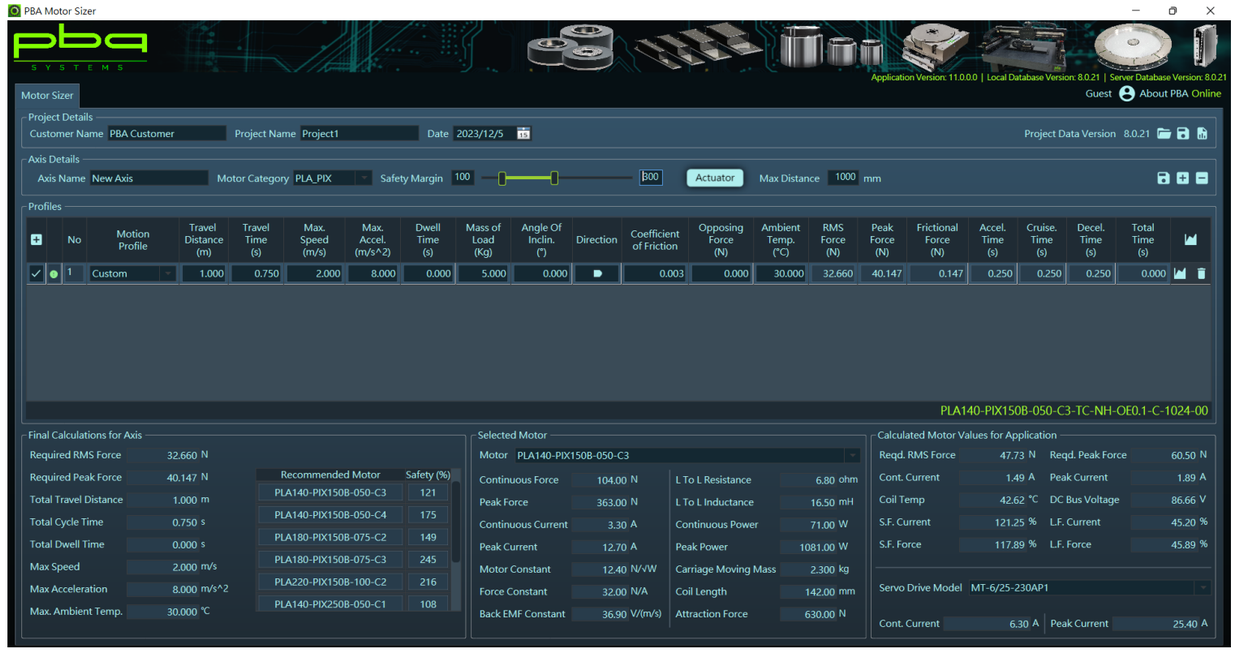
PBA SYSTEMS LINEAR MOTOR SIZER SOFTWARE

PBA SYSTEMS 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 or simply scan the QR CODE

SIMULATED PERFORMANCE CHARTS



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