

Electric Linear Actuator Solutions



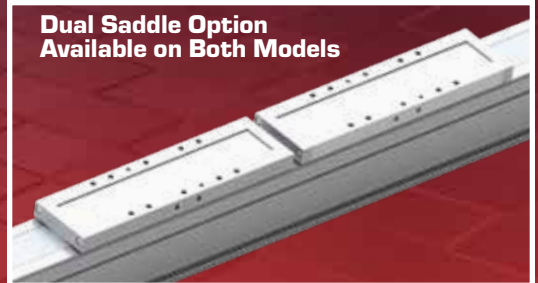
Electric Automation Solutions



- *Your Motor, Your Way and complete solutions with Kollmorgen® motor installed*
- *Exceptional moment and load capability*

Series ESU -RT Electric Belt-Driven Linear Actuators

- *Superior belt profile for improved performance*
- *Travels up to 5500 mm*
- *Speeds up to 5000 mm/s*



Series ESU -RB Electric Ball Screw Linear Actuators

- *Precision ball screw assembly for superior performance*
- *Travels up to 1000 mm*
- *Speeds up to 3200 mm/s*



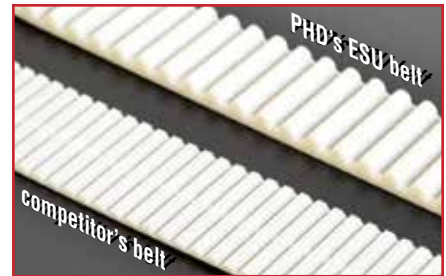
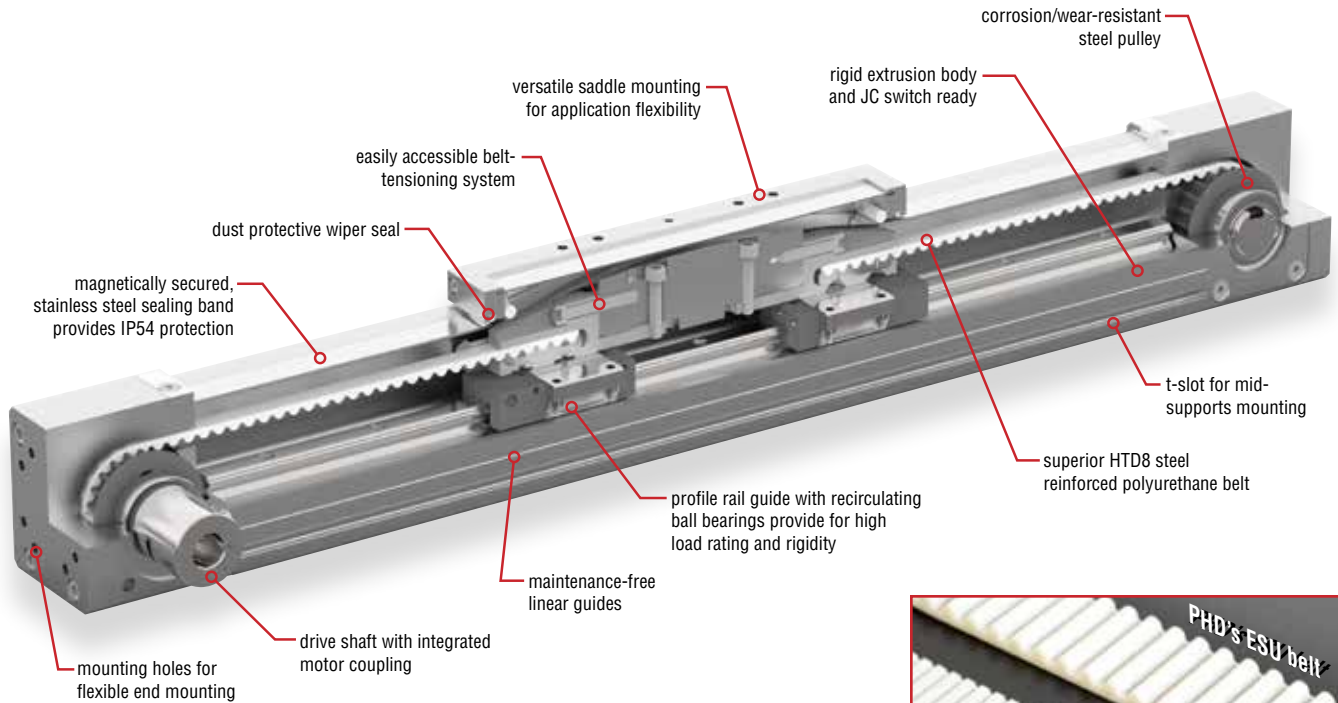
NEW!

**ISO 9001
REGISTERED**

Quality Management
System Certified

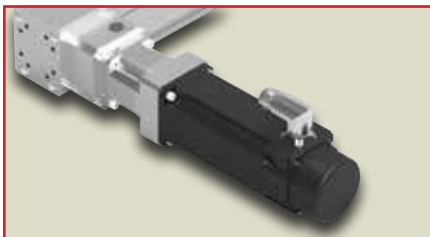
ESU02B

SERIES ESU -RT BELT-DRIVEN LINEAR ACTUATOR



-RT Belt-Driven Major Benefits

- Maximum travel up to 5500 mm
- Maximum speed 5000 mm/s, acceleration 50 m/s²
- Superior HTD8 steel reinforced polyurethane belt for uniform load distribution, precise tooth engagement, and improved performance
- Corrosion-resistant steel pulleys provide high structural strength and minimal wear
- Easy access belt tensioning system
- Integrated shaft coupling allows for a rigid connection and zero backlash



Integrated Motor & Gear Reducer Options (M Code + RW Code)

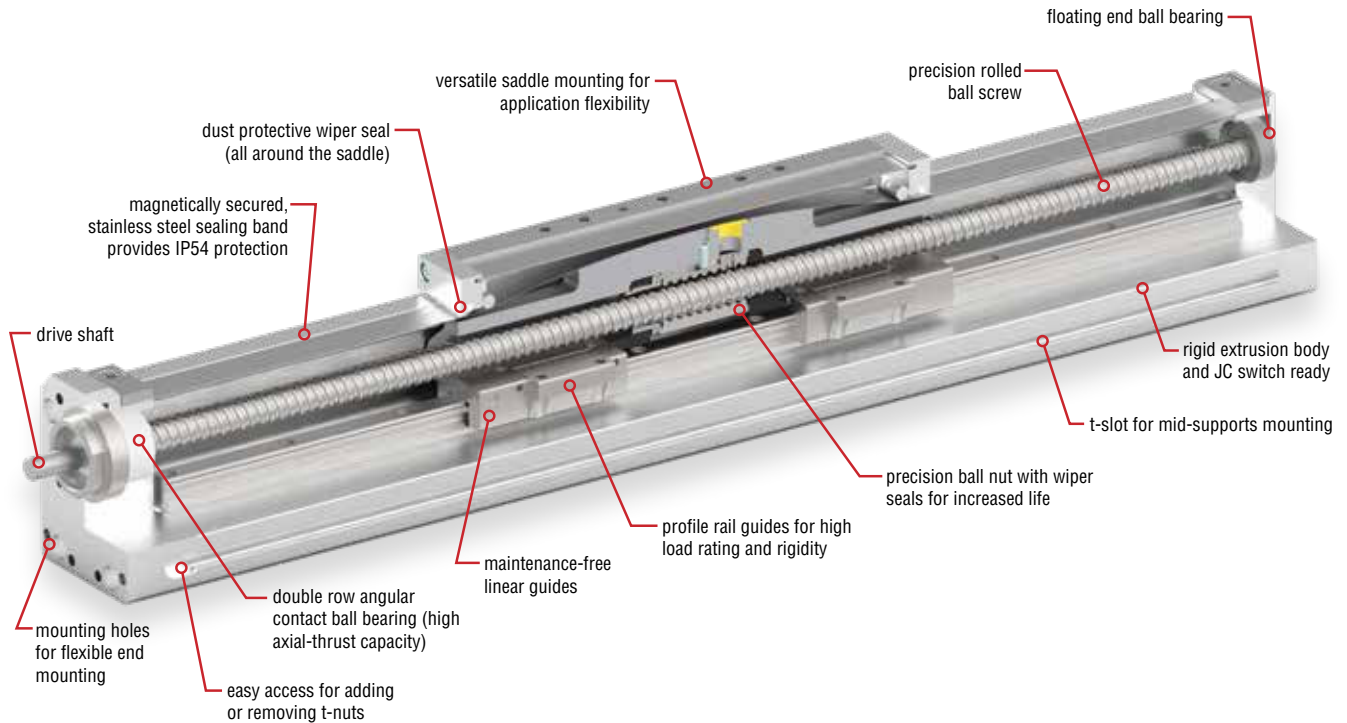
KOLLMORGEN[®]

solutions available

Common Major Benefits

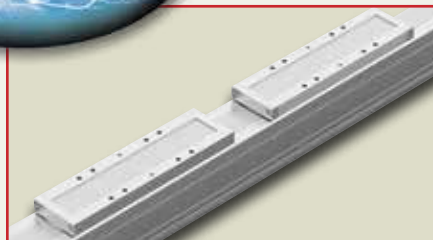
- High capacity rail bearing provides superior moment and load capability
- Self-lubricating linear guides provide maintenance-free operation
- Rigid construction with low backlash
- High degree of repeatability
- Proven band seal technology provides IP54 ingress protection
- Switch ready as standard
- Mid-support(s) mounting for long travels and high payloads
- Complete solutions with motor installed by PHD using Kollmorgen[®] motor or versatile mounting for multi-axis Cartesian systems
- *Your Motor, Your Way* allows motor and controls flexibility at no additional cost

SERIES ESU -RB BALL SCREW LINEAR ACTUATOR



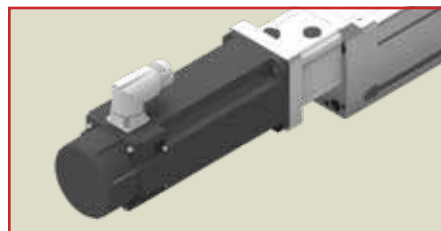
-RB Ball Screw Major Benefits

- Maximum travel up to 1000 mm
- Maximum speed 3200 mm/s, acceleration 20 m/s²
- Precision ball screw assemblies with long service life



Dual Saddle Option

Doubles the load capacity and increases My (pitch) and Mz (yaw) moment capacities.



Integrated Motor Option (M Code)

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ORDERING DATA: SERIES ESU -RT BELT-DRIVEN LINEAR ACTUATOR

Example Ordering Data:

ESU	S	5	5	x	300	RTxxx	QL11	Wxxxx	Mxxxx	RWxxx	Y5	
Electromechanical	Slide	Rollless Cylinder	Type	Metric Design	Size	Travel (Max.)	Drive Mode: Belt (RT)	Motor Configuration	Motor Mount Code	Motor Code	Gear Reducer Code (RT ONLY)	Food Grade
			S - Single Saddle D - Dual In-Line Saddle		5 6 8	55 5500 56 5500 58 5500	Size 55 RT160 160 56 RT192 192 58 RT256 256	QL11 - In-line with 1:1 Ratio (Standard) QLD1 - In-line Dual Shaft 1:1 Ratio	Wxxxx - Open Architecture W0000 - Blank Motor Mount Blank - Slide Only (No Motor Mount)	Mxxxx - Cross Reference to Motor P/N PHD provides motor installed as complete solution.	RW051 - 5:1 Reducer RW101 - 10:1 Reducer	Y5 - Food Grade Lube
						50 mm minimum Travel in 50 mm increments	RT000 = Passive Unit (without drive)	QL00 - No Shaft (Passive Configuration)				See Kollmorgen accessories below for controllers and cables.

Options must be ordered together

KSxxx	Sxxxx
End/Mid Supports	Switch Bundle (Optional)
Head Support Qty KS0xx or KS1xx Qty Support (Max 1)	Switch Series C - JC1SDx-x Series Single Position
Mid Support Qty KSx0x to KSx9x Qty Support (Max 9) See Options page for recommended spacing	Quantity 1 to 9 (JC1SDx-x)
Cap Support Qty KSxx0 or KSxx1 Qty Support (Max 1, Motor End)	Switch Circuitry N - NPN (Sink) P - PNP (Source)
	Cable Type K - Quick Connect only (JC1SDx-K) 5 - 5 Meter Length Cable (JC1SDx-5)

KOLLMORGEN CONTROLLERS

SIZE	M CODE	RW CODE	DESCRIPTION	PHD PART NO.	KOLLMORGEN PART NO.
55	M5000	RW051	AKD Motor Controller 6 Amp 120V/240V	87543-P00606-NBxx-00	AKD-P00606-NBxx-0000
	M5001	RW101			
56	M5002	RW051	AKD Motor Controller 12 Amp 120V/240V	87543-P01206-NBxx-00	AKD-P01206-NBxx-0000
	M5003	RW101			
58	M5004	RW051	AKD Motor Controller 24 Amp 120V/240V	87543-P02406-NBxx-00	AKD-P02406-NBxx-0000
	M5005	RW101			

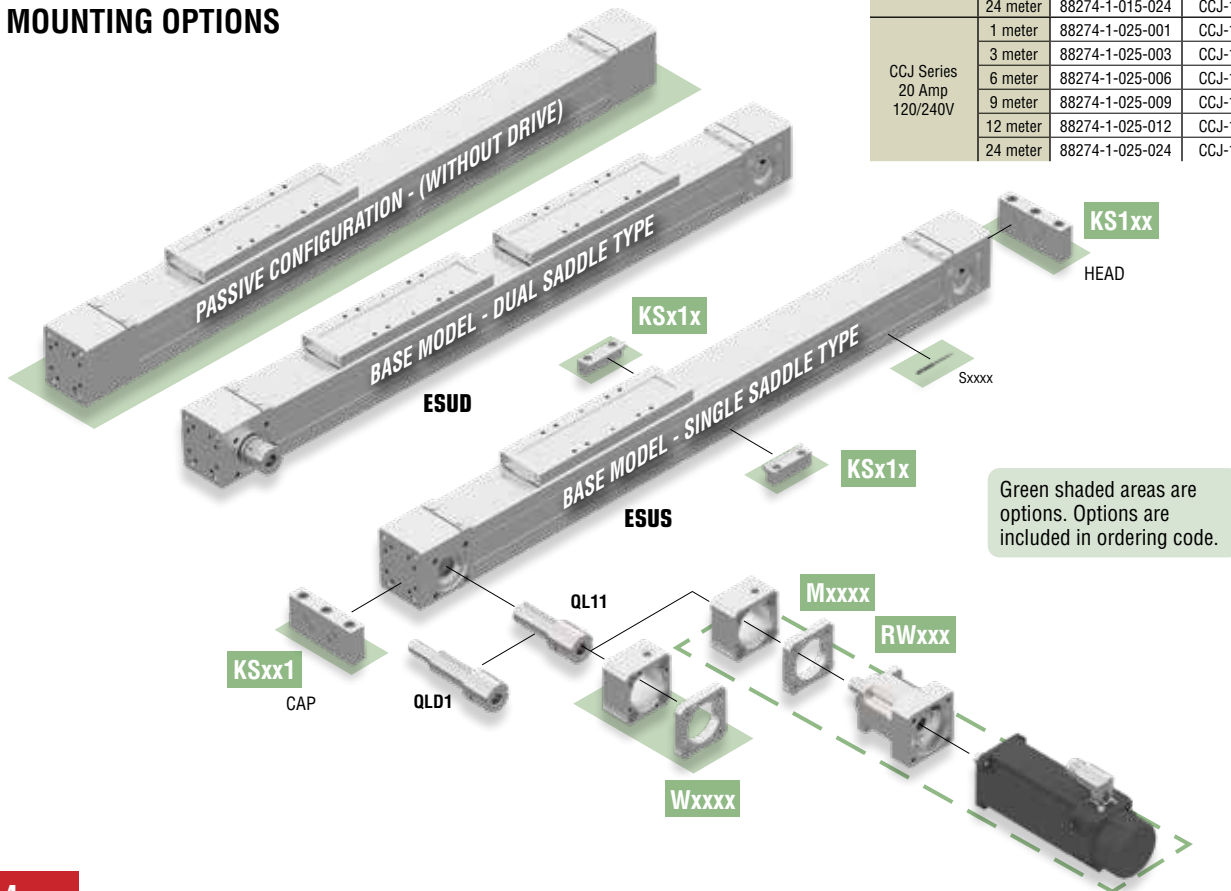
xx = Replace with letter designation for required fieldbus below:
AN = Analog - no fieldbus
EC = EtherCat
EI = Ethernet/IP
PN = Profinet

Example:
 PHD Controller Part No. 87543-P02406-NBEI-00 = AKD Motor Controller 24 Amp 120V/240V with Ethernet/IP for the ESUx58 Linear Actuator

KOLLMORGEN HYBRID SMART FEEDBACK CABLES

DESCRIPTION	LENGTH	PHD PART NO.	KOLLMORGEN PART NO.
CCJ Series 12 Amp 120/240V	1 meter	88274-1-015-001	CCJ-1A2-015-001-00
	3 meter	88274-1-015-003	CCJ-1A2-015-003-00
	6 meter	88274-1-015-006	CCJ-1A2-015-006-00
	9 meter	88274-1-015-009	CCJ-1A2-015-009-00
	12 meter	88274-1-015-012	CCJ-1A2-015-012-00
CCJ Series 20 Amp 120/240V	1 meter	88274-1-025-001	CCJ-1A2-025-001-00
	3 meter	88274-1-025-003	CCJ-1A2-025-003-00
	6 meter	88274-1-025-006	CCJ-1A2-025-006-00
	9 meter	88274-1-025-009	CCJ-1A2-025-009-00
	12 meter	88274-1-025-012	CCJ-1A2-025-012-00
	24 meter	88274-1-025-024	CCJ-1A2-025-024-00

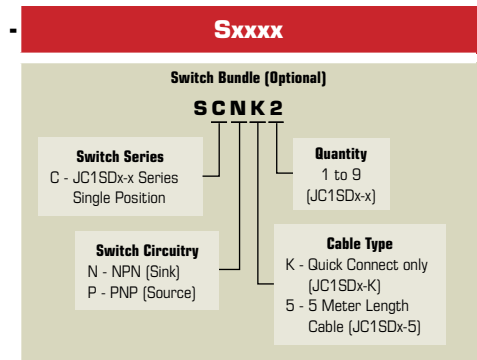
MOUNTING OPTIONS



ORDERING DATA: SERIES ESU -RB BALL SCREW LINEAR ACTUATOR

Example Ordering Data:

ESU	S	5	5	x	300	RBxxx	QL11	Wxxxx	Mxxxx	Y5	KSxxx	
Electromechanical	Slide	Rodless Linear Actuator	Type	Metric Design	Size	Travel (Max.)	Ball Screw Configuration	Motor Configuration	Motor Mount Code	Motor Code	Food Grade	End/Mid Supports
			S - Single Saddle D - Dual In-Line Saddle	5 6 8	Size mm 55 1000 56 1000 58 1000	50 mm minimum Travel in 50 mm increments	Size Lead mm 55 RB010 10 55 RB016 16 56 RB010 10 56 RB020 20 58 RB010 10 58 RB032 32	QL11 - Inline with 1:1 Ratio QF11 - Foldback with 1:1 Ratio QF21 - Foldback with 2:1 Ratio	Wxxxx - Open Architecture W0000 - Blank Motor Mount Blank - Slide Only (No Motor Mount)	Mxxxx - Cross Reference to Motor P/N PHD provides motor installed as complete solution.	Y5 - Food Grade Lube on Slide Only	Head Support Qty KS0xx or KS1xx Qty Support (Max 1) Mid Support Qty KSx0x to KSx9x Qty Support (Max 9) See Options page for recommended spacing Cap Support Qty KSxx0 or KSxx1 Qty Support (Max 1, Motor End)
						RB000 = Passive Unit (without drive)	QL00 - No Shaft (Passive Configuration)					



KOLLMORGEN CONTROLLERS

SIZE	M CODE	DESCRIPTION	PHD PART NO.	KOLLMORGEN PART NO.
55	M1091	AKD Motor Controller 6 Amp 120v/240v	87543-P00606-NBxx-00	AKD-P00606-NBxx-0000
56	M1108	AKD Motor Controller 12 Amp 120v/240v	87543-P01206-NBxx-00	AKD-P01206-NBxx-0000
58	M1112	AKD Motor Controller 24 Amp 120v/240v	87543-P02406-NBxx-00	AKD-P02406-NBxx-0000

xx = Replace with letter designation for required fieldbus below:
AN = Analog - no fieldbus
EC = EtherCat
EI = Ethernet/IP
PN = Profinet

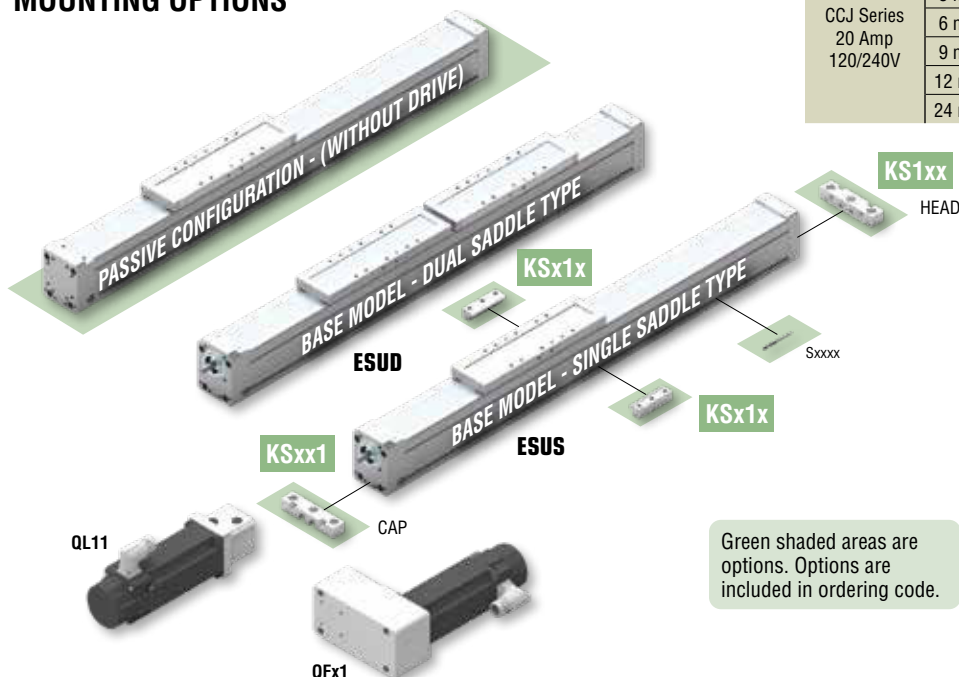
Example:

PHD Controller Part No. 87543-P02406-NBEI-00 = AKD Motor Controller 24 Amp 120V/240V with Ethernet/IP for the ESUx58 Linear Actuator

KOLLMORGEN HYBRID SMART FEEDBACK CABLES

DESCRIPTION	LENGTH	PHD PART NO.	KOLLMORGEN PART NO.
CCJ Series 12 Amp 120/240V	1 meter	88274-1-015-001	CCJ-1A2-015-001-00
	3 meter	88274-1-015-003	CCJ-1A2-015-003-00
	6 meter	88274-1-015-006	CCJ-1A2-015-006-00
	9 meter	88274-1-015-009	CCJ-1A2-015-009-00
	12 meter	88274-1-015-012	CCJ-1A2-015-012-00
CCJ Series 20 Amp 120/240V	1 meter	88274-1-025-001	CCJ-1A2-025-001-00
	3 meter	88274-1-025-003	CCJ-1A2-025-003-00
	6 meter	88274-1-025-006	CCJ-1A2-025-006-00
	9 meter	88274-1-025-009	CCJ-1A2-025-009-00
	12 meter	88274-1-025-012	CCJ-1A2-025-012-00
	24 meter	88274-1-025-024	CCJ-1A2-025-024-00

MOUNTING OPTIONS



Green shaded areas are options. Options are included in ordering code.

ENGINEERING DATA: SERIES ESU -RT BELT-DRIVEN LINEAR ACTUATOR

SPECIFICATIONS	TIMING BELT SERIES ESU-RT
REPEATABILITY	±0.05 mm [±0.002 in]
TRAVEL TOLERANCE	+2.5/-0.0 mm [+0.100/-0.000 in]
DUTY CYCLE	100%
OPERATING TEMPERATURE	4 - 65°C [40 - 150°F]
LUBRICATION INTERVAL	Factory lubricated for life
ENCAPSULATION CLASS	IP54

SPECIFICATIONS				SIZE		
				55	56	58
MECHANICS	DRIVE MECHANISM			Timing Belt		
	GUIDE			Recirculating Ball- Linear Motion Guide & Rail System		
	MAX TRAVEL ¹ mm [in]			5500 [216.53]		
	BELT			HTD8		
	PITCH (LINEAR TRAVEL PER REVOLUTION) mm [in]			160 [6.3]	192 [7.56]	256 [10.08]
	PULLEY DIAMETER mm [in]			50.93 [2.005]	61.12 [2.406]	81.5 [3.208]
SPEED	MAXIMUM SPEED mm/s [in/sec]			5000 [197]		
	MAXIMUM ACCELERATION m/s ² [ft/s ²]			50 [164.05]		
THRUST	MAXIMUM THRUST ² N [lbf]			1450 [326]	2610 [586]	5440 [1222]
TORQUE	MAX. PERMISSABLE DRIVE TORQUE ³ Nm [in-lb]			32 [283]	71 [628]	208 [1842]
	NO-LOAD TORQUE Nm [in-lb]			1.5 [13.3]	2.4 [22]	3.6 [32]
WEIGHT	TOTAL @ ZERO STROKE (W _{OT})	STANDARD	kg [lb]	6.38 [14.08]	13.69 [30.21]	25.66 [56.74]
		DUAL SADDLE	kg [lb]	9.46 [20.87]	20.43 [45.09]	37.47 [82.92]
	TOTAL TRAVEL ADDER (W _{LT}) kg/mm [lb/in]			6.50E-03 [0.366]	1.04E-02 [0.582]	1.54E-02 [0.881]
	MOVING @ ZERO TRAVEL (W _{OM})	STANDARD	kg [lb]	1.81 [3.99]	4.35 [9.59]	7.48 [16.52]
		DUAL SADDLE	kg [lb]	3.03 [6.69]	7.29 [16.09]	12.16 [26.87]
MOVING TRAVEL ADDER (W _{LM}) kg/mm [lb/in]			3.00E-04 [1.57E-02]	4.00E-04 [2.35E-02]	7.00E-04 [3.92E-02]	
INERTIA	ACTUATOR @ ZERO STROKE (J _o)	STANDARD	kg-m ² [lb-in ²]	1.17E-03 [4.00]	4.06E-03 [13.90]	1.24E-02 [42.50]
		DUAL SADDLE	kg-m ² [lb-in ²]	1.97E-03 [6.70]	6.81E-03 [23.30]	2.02E-02 [69.10]
	TRAVEL ADDER (J _L) kg-m ² /mm [lb-in ² /in]			1.82E-07 [1.58E-02]	3.92E-07 [3.40E-02]	1.16E-06 [1.01E-01]
	EXTERNAL PAYLOAD ADDER (J _M) kg-m ² /kg [lb-in ² /lb]			6.84E-04 [1.01]	9.34E-04 [1.45]	1.66E-03 [2.57]

NOTES:

- 1) STRONGLY RECOMMENDED: ORDERED TRAVEL = WORKING TRAVEL + SAFETY TRAVEL ON BOTH ENDS
- 2) REFER TO SPEED VS. THRUST CHART
- 3) REFER TO SPEED VS. TORQUE CHART

WEIGHT AND INERTIAL CALCULATIONS:

TOTAL WEIGHT = W_{OT} + (W_{LT} X TRAVEL) + MOTOR MOUNT WEIGHT
 TOTAL MOVING WEIGHT = W_{OM} + (W_{LM} X TRAVEL) + EXTERNAL PAYLOAD

INERTIA_{Reflected} = J_o + (J_L X TRAVEL) + (J_M X TOTAL MOVING WEIGHT)

DYNAMIC LOADS AND MOMENTS

f_c = Equivalent Load Factor

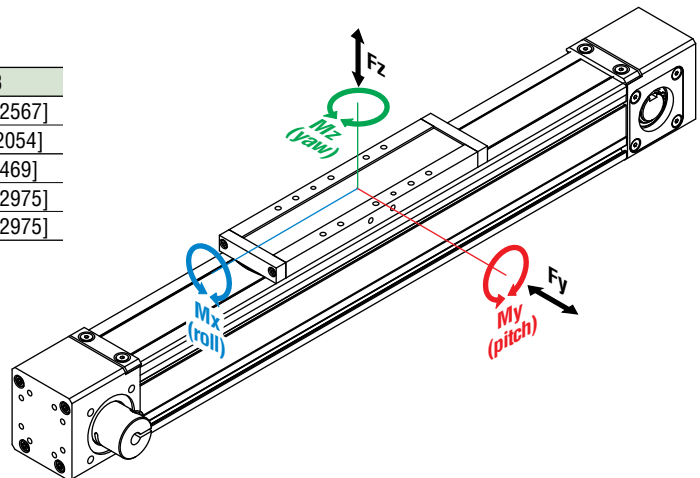
			55	56	58
Load (Max)	Fz	N [lb]	4903 [1103]	7648 [1720]	11410 [2567]
	Fy	N [lb]	3923 [883]	6120 [1377]	9129 [2054]
Bending Moments (Max)	Mx	Nm [in-lb]	43 [381]	94 [832]	166 [1469]
	My	Nm [in-lb]	380 [3363]	715 [6328]	1466 [12975]
	Mz	Nm [in-lb]	380 [3363]	715 [6328]	1466 [12975]

$$f_c = \frac{F_z}{F_z \text{ max}} + \frac{F_y}{F_y \text{ max}} + \frac{M_x}{M_x \text{ max}} + \frac{M_y}{M_y \text{ max}} + \frac{M_z}{M_z \text{ max}} \leq 1$$

NOTE: Max Loads and Moments correspond to 5000 km of actuator life when applied individually.

Mx, My and Mz are total Moments (Static + Dynamic)

To make the selection process quick and simple, refer to PHD's sizing software.



ENGINEERING DATA: SERIES ESU -RB BALL SCREW LINEAR ACTUATOR

SPECIFICATIONS	BALL SCREW SERIES ESU -RB
REPEATABILITY	±0.01 mm [±0.0004 in]
TRAVEL TOLERANCE	+2.5/-0.0 mm [+0.100/-0.000 in]
MAXIMUM BACKLASH	0.025 mm [0.001 in]
DUTY CYCLE	100%
OPERATING TEMPERATURE	4 - 65°C [40 - 150°F]
LUBRICATION INTERVAL	Rail bearing system - Factory lubricated for life Ball Screw - Horizontal: 2500 km [100 mil. inches], Vertical: 1500 km [60 mil. inches]
ENCAPSULATION CLASS	IP54

SPECIFICATIONS		SIZE								
		55		56		58				
MECHANICS	DRIVE MECHANISM	Ball Screw								
	GUIDE	Recirculating Ball - Linear Motion Guide & Rail System								
	MAX TRAVEL ¹	1000 [39.37]								
	BALL SCREW DIAMETER	15		20		32				
	SCREW CONFIGURATION	-RB010	-RB016	-RB010	-RB020	-RB010	-RB032			
PITCH (LINEAR TRAVEL PER REVOLUTION)	mm [in]									
SPEED	MAXIMUM SPEED ²	1000 [39.3]	1600 [63.0]	1000 [39.3]	2000 [78.7]	1000 [39.3]	3200 [126.0]			
	MAXIMUM ACCELERATION	-QL11	19.6 [772]							
		-QF21	9.8 [386]							
THRUST	MAXIMUM THRUST ³	N [lbf]		2430 [547]	1520 [342]	4410 [992]	2510 [565]	10210 [2297]	5478 [1233]	
TORQUE	MAXIMUM PERMISSIBLE DRIVE TORQUE ⁴	-QL11	Nm [in-lb]		4.3 [38.06]		7.8 [69.03]		16.3 [144.2]	31.0 [274.3]
	NO-LOAD TORQUE	-QF21			3 [26.55]		5.46 [48.32]		11.4 [101]	21.7 [192]
					0.40 [3.54]		0.55 [4.87]		1.50 [13.27]	
WEIGHT	TOTAL @ ZERO STROKE (W _{0T})	STANDARD	kg [lb]	4.83 [10.67]	4.91 [10.84]	10.36 [22.87]	10.54 [23.27]	21.23 [46.86]	21.26 [46.94]	
	TOTAL TRAVEL ADDER (W _L)	DUAL SADDLE	kg [lb]	8.01 [17.68]	8.09 [17.85]	17.03 [37.59]	17.21 [38.00]	33.63 [74.23]	33.66 [74.31]	
			kg/mm [lb/in]	0.008 [0.436]	0.008 [0.436]	0.012 [0.700]	0.012 [0.700]	0.022 [1.224]	0.022 [1.224]	
	MOVING @ ZERO TRAVEL (W _{0M})	STANDARD	kg [lb]	1.53 [3.36]	1.61 [3.54]	3.28 [7.22]	3.46 [7.61]	6.00 [13.21]	6.03 [13.29]	
MOMENT OF INERTIA	ACTUATOR @ ZERO STROKE (J ₀)	STANDARD	kg-m ² [lb-in ²]	8.36E-06 [0.029]	8.94E-06 [0.031]	2.98E-05 [0.102]	2.94E-05 [0.101]	2.52E-04 [0.860]	2.82E-04 [0.964]	
		DUAL SADDLE	kg-m ² [lb-in ²]	1.50E-5 [0.051]	1.63E-05 [0.056]	5.38E-05 [0.184]	5.29E-05 [0.181]	4.71E-04 [1.611]	5.42E-04 [1.853]	
	TRAVEL ADDER (J _L)	kg-m ² /mm [lb-in ² /in]	2.64E-08 [2.29E-03]	2.95E-08 [2.56E-03]	8.00E-08 [6.94E-03]	7.81E-08 [6.78E-03]	5.49E-07 [4.77E-02]	6.50E-07 [5.65E-02]		
	EXTERNAL PAYLOAD ADDER	kg-m ² /kg [lb-in ² /lb]	2.53E-07 [3.93E-04]	4.05E-07 [6.28E-04]	2.53E-07 [3.93E-04]	5.07E-07 [7.85E-04]	2.53E-07 [3.93E-04]	8.10E-07 [1.26E-03]		
	MOTOR CONFIGURATION	-QL11	kg-m ² [lb-in ²]	6.11E-06 [0.021]	6.11E-06 [0.021]	4.04E-05 [0.138]	4.04E-05 [0.138]	1.71E-04 [0.583]	1.71E-04 [0.583]	
		-QF11	kg-m ² [lb-in ²]	2.03E-04 [0.694]	2.03E-04 [0.694]	1.96E-04 [0.669]	1.96E-04 [0.669]	2.65E-03 [9.055]	2.65E-03 [9.055]	
		-QF21	kg-m ² [lb-in ²]	3.59E-04 [1.227]	3.59E-04 [1.227]	8.02E-04 [2.742]	8.02E-04 [2.742]	1.17E-02 [39.921]	1.17E-02 [39.921]	

WEIGHT AND INERTIAL CALCULATIONS:

TOTAL WEIGHT = W_{0T} + (W_L x TRAVEL) + MOTOR MOUNT WEIGHT
 TOTAL MOVING WEIGHT = W_{0M} + (W_{LM} x TRAVEL) + EXTERNAL PAYLOAD

FOR Qx11:

INERTIA_{Reflected} = J₀ + (J_L x TRAVEL) + (J_M x TOTAL MOVING WEIGHT) + J₀

FOR -QF21:

INERTIA_{Reflected} = [J₀ + (J_L x TRAVEL) + (J_M x TOTAL MOVING WEIGHT)] / 4 + J₀

DYNAMIC LOADS AND MOMENTS

f_c = Equivalent Load Factor

		55	56	58	
Load (Max)	Fz	N [lb]	4903 [1103]	7648 [1720]	11410 [2567]
	Fy	N [lb]	3923 [883]	6120 [1377]	9129 [2054]
Bending Moments (Max)	Mx	Nm [in-lb]	43 [381]	94 [832]	166 [1469]
	My	Nm [in-lb]	380 [3363]	715 [6328]	1466 [12975]
	Mz	Nm [in-lb]	380 [3363]	715 [6328]	1466 [12975]

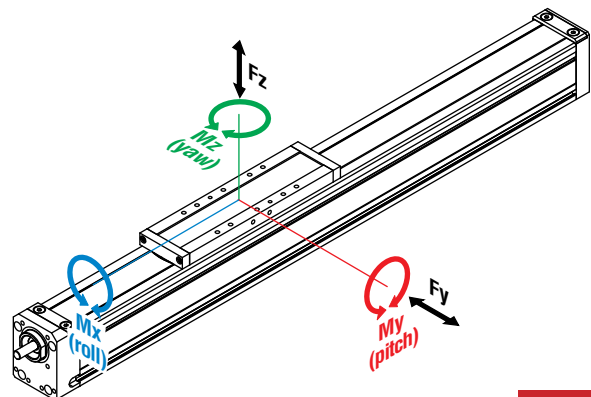
$$f_c = \frac{F_z}{F_z \max} + \frac{F_y}{F_y \max} + \frac{M_x}{M_x \max} + \frac{M_y}{M_y \max} + \frac{M_z}{M_z \max} \leq 1$$

NOTE: Max Loads and Moments correspond to 5000 km of actuator life when applied individually. M_x, M_y and M_z are total Moments (Static + Dynamic)

To make the selection process quick and simple, refer to PHD's sizing software.

NOTES:

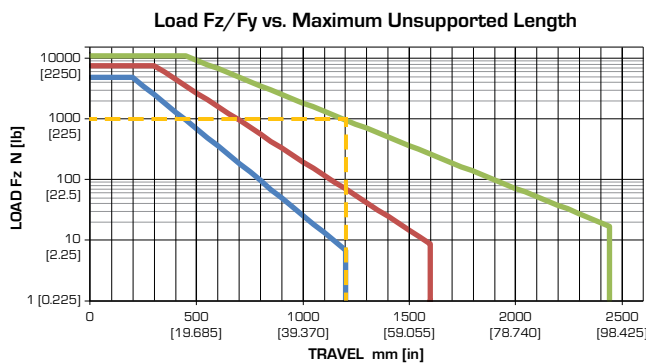
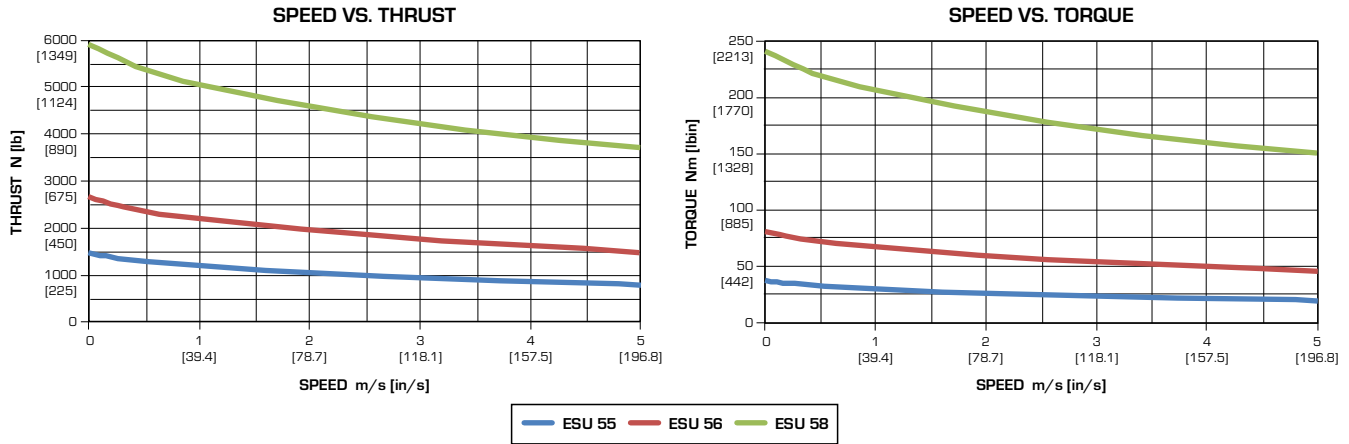
- 1) STRONGLY RECOMMENDED:
ORDERED TRAVEL = WORKING TRAVEL + SAFETY TRAVEL ON BOTH ENDS
- 2) REFER TO SPEED VS. TRAVEL CHART
- 3) REFER TO THRUST VS. LIFE CHART
- 4) REFER TO TORQUE VS. THRUST CHART



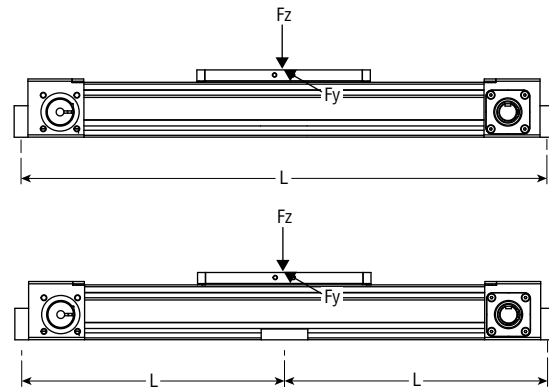
ENGINEERING DATA: SERIES ESU -RT BELT-DRIVEN LINEAR ACTUATOR

This section contains information on the capabilities of the Series ESU -RT version. It is not intended to be a comprehensive selection guide. To make the selection process simple and quick, refer to PHD's sizing software. You may request application assistance from your distributor or PHD's Inside Sales Department.

PERFORMANCE CHARTS



Mid-Support Calculation illustrated by dashed yellow line in graph above.



MID-SUPPORT CALCULATION

Example (Application Requirements)

Actuator – ESUS size 58

Load Fz – 1000 N [225 lb]

Travel – 3000 mm

Use Load Fz/Fy vs Maximum Unsupported Length graph

- 1) Find **Maximum Unsupported Length** from the above graph [1000 N = 1200 mm]
- 2) Calculate **Total Actuator Length** (refer to Dimensions page 10)
 $\text{Total Travel} + \text{Dimension A} = \text{Total Actuator Length}$
 $3000 + 628.1 = \mathbf{3628.1 \text{ mm}}$
- 3) Determine **number of required mid-supports**
 $(\text{Total Actuator Length} / \text{Maximum Unsupported Length}) - 1 = \text{Required mid-supports}$
 $(3628.1 \text{ mm} / 1200 \text{ mm}) - 1 = \mathbf{2 \text{ mid-supports}}$ (round up to next whole number)



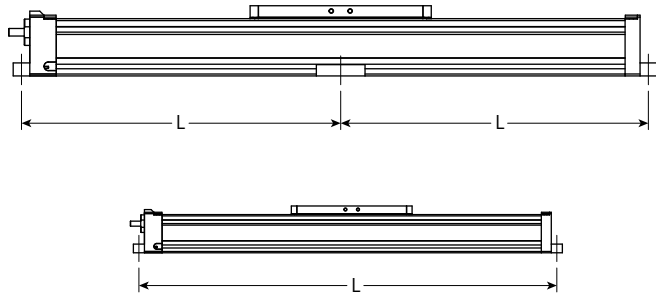
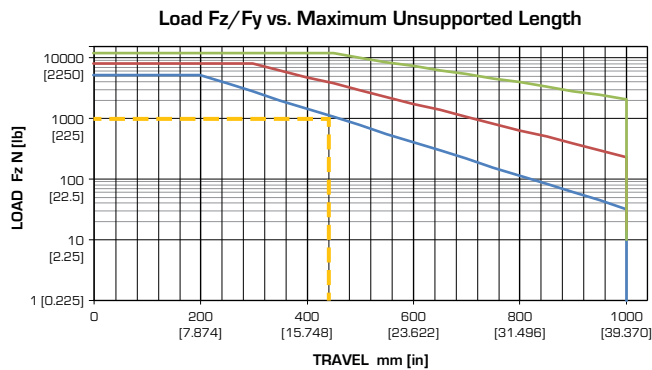
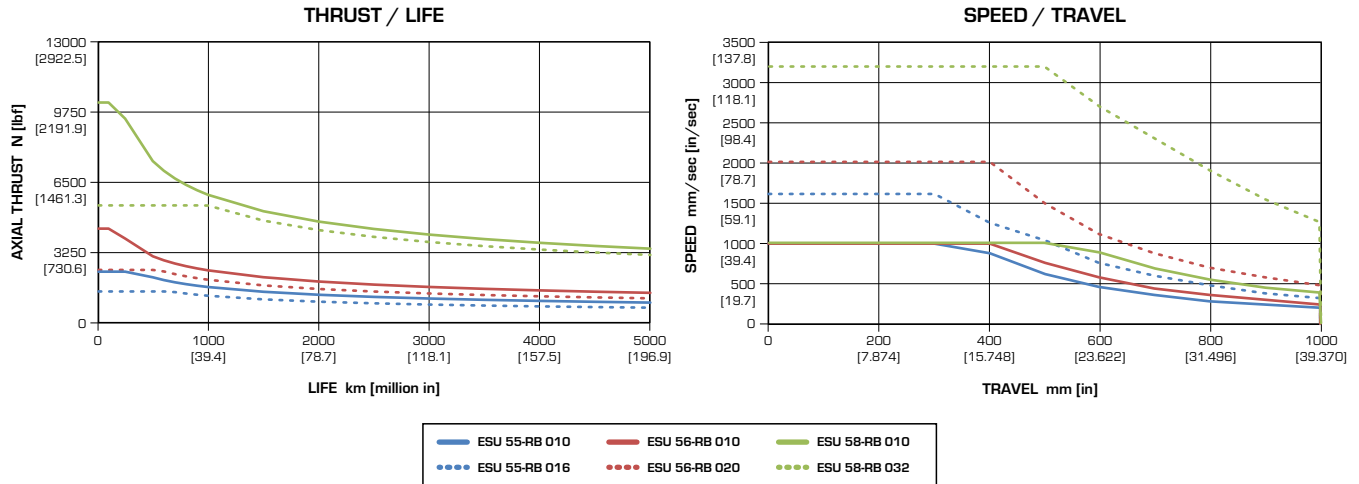
CAD & Sizing Assistance

Use PHD's free online Product Sizing and CAD Configurator at www.phdinc.com/myphd

ENGINEERING DATA: SERIES ESU -RB BALL SCREW LINEAR ACTUATOR

This section contains information on the capabilities of the Series ESU -RB version. It is not intended to be a comprehensive selection guide. To make the selection process simple and quick, refer to PHD's sizing software. You may request application assistance from your distributor or PHD's Inside Sales Department.

PERFORMANCE CHARTS



Mid-Support Calculation illustrated by dashed yellow line in graph above.

MID-SUPPORT CALCULATION

Example (Application Requirements)

Actuator – ESUS size 55
 Load Fz – 1000 N [225 lb]
 Travel – 1000 mm

Use Load Fz/Fy vs Maximum Unsupported Length graph

- 1) Find **Maximum Unsupported Length** from the above graph [1000 N = 440 mm]
- 2) Calculate **Total Actuator Length** (refer to Dimensions page 11)
 Total Travel + Dimension A = Total Actuator Length
 $1000 + 308.5 = 1308.5 \text{ mm}$
- 3) Determine **number of required mid-supports**
 $(\text{Total Actuator Length} / \text{Maximum Unsupported Length}) - 1 = \text{Required mid-supports}$
 $(1308.5 \text{ mm} / 440 \text{ mm}) - 1 = 2 \text{ mid-supports}$ (round up to next whole number)

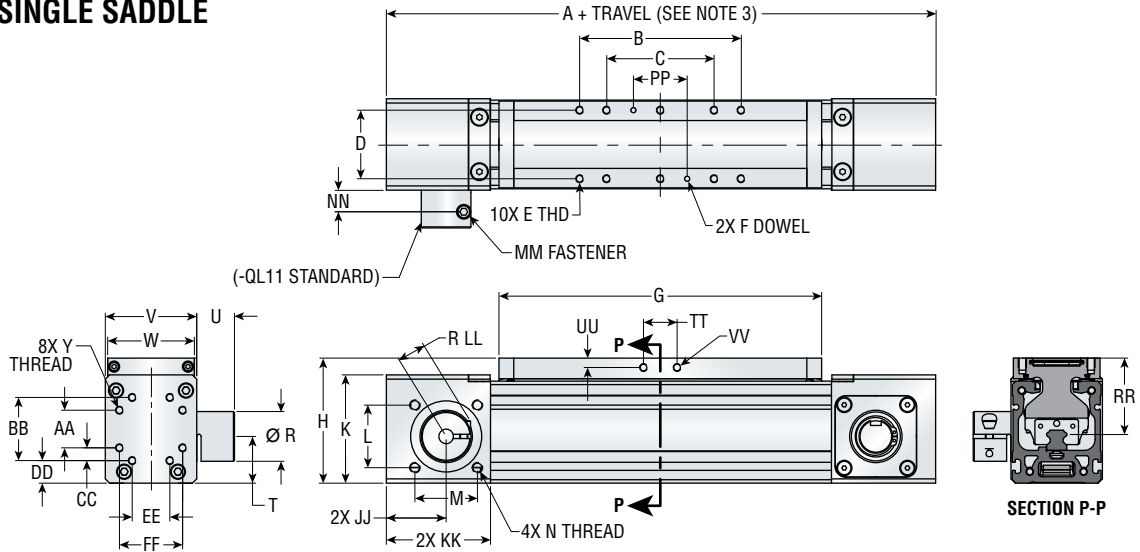


CAD & Sizing Assistance

Use PHD's free online Product Sizing and CAD Configurator at www.phdinc.com/myphd

DIMENSIONS: SERIES ESU -RT BELT-DRIVEN LINEAR ACTUATOR

ESUS SINGLE SADDLE



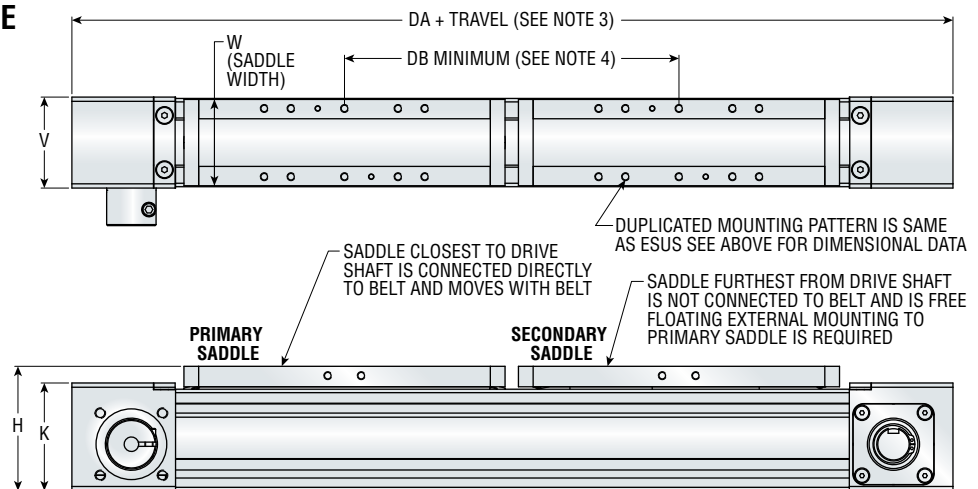
SIZE	A	B	C	D	E	F	G	H	K	L	M	N	R	T	U	V	W
55	408.5	120.0	80.0	51.0	M6 x 1 x 8.5	4 x 4	240.0	93.0	80.5	46.5	46.5	M8 x 1.25 x 12	37.0	34.8	28.1	68.0	64.5
56	514.0	160.0	100.0	70.0	M6 x 1 x 10.2	5 x 5	287.0	115.0	100.2	46.5	46.5	M8 x 1.25 x 14	42.0	41.1	31.4	88.0	83.5
58	628.1	175.0	105.0	75.0	M8 x 1.25 x 12.7	6 x 6	373.0	149.0	131.2	66.0	78.5	M10 x 1.5 x 15	55.0	57.7	44.2	105.0	99.0

SIZE	Y	AA	BB	CC	DD	EE	FF	JJ	KK	LL	MM	NN	PP	RR	TT	UU	VV
55	M6 x 1 x 9	28.0	47.0	9.5	16.8	28.0	47.0	44.5	77.5	R 21.3	M6 x 1	16.1	40.0	56.8	25.0	7.0	M6 x 1 x 8
56	M8 x 1.25 x 12	40.0	64.0	12.0	18.1	40.0	64.0	55.0	105.0	R 24.2	M6 x 1	15.9	40.0	72.2	25.0	7.0	M6 x 1 x 8
58	M10 x 1.5 x 16	47.5	80.0	16.3	25.6	47.5	80.0	69.0	125.0	R 31.9	M8 x 1.25	25.8	50.0	91.0	25.0	7.0	M6 x 1 x 8

NOTES:

- 1) DIMENSIONS: mm
- 2) SADDLE(S) SHOWN IN MID POSITION
- 3) PHD RECOMMENDS ADDING 50 mm TO THE TOTAL WORKING TRAVEL FOR OVER-TRAVEL PROTECTION (25 mm PER END)

ESUD DUAL SADDLE



NOTE:

- 4) MINIMUM SADDLE TO SADDLE DISTANCE SHOWN. IF ADDITIONAL DISTANCE BETWEEN SADDLES IS REQUIRED, ADD APPROPRIATE LENGTH TO TOTAL TRAVEL IN 50 mm INCREMENTS.

REFER TO SINGLE SADDLE DIMENSIONS ABOVE FOR DATA NOT SHOWN

EXAMPLES:

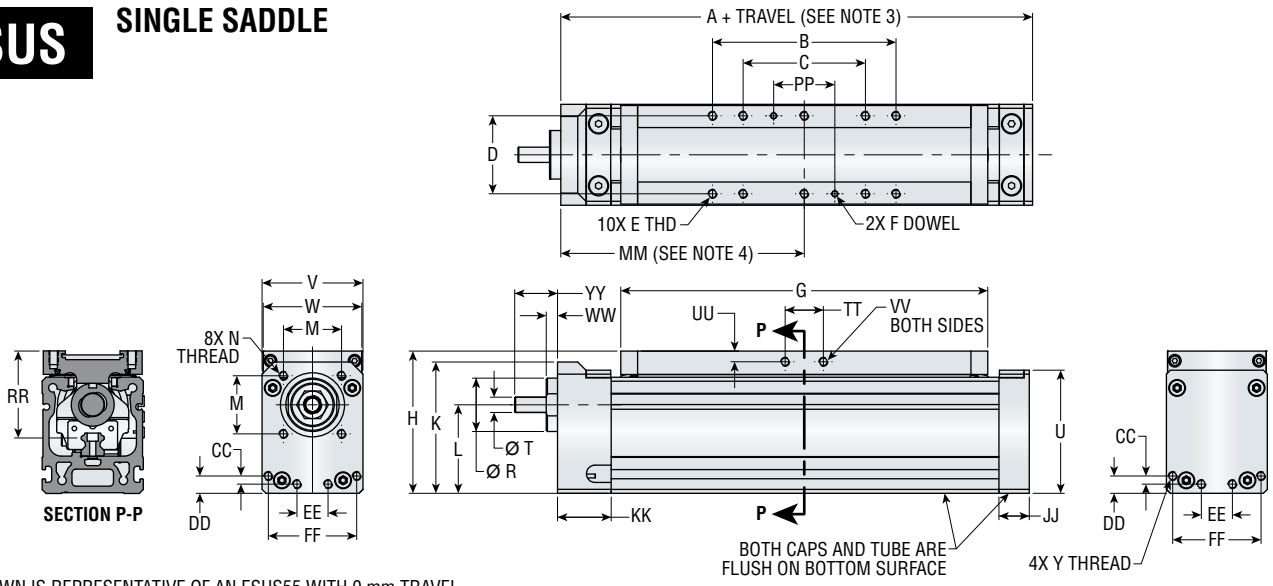
SIZE 55 WITH 500 mm TRAVEL WITH STANDARD "DB" DISTANCE OF 250 mm
ESUD55 x 500 -RTxxx (NO ADDITIONAL STROKE ADDER NEEDED)

SIZE 55 WITH 500 mm TRAVEL WITH "DB" DISTANCE OF 350 mm
ESUD55 x 600 -RTxxx (WILL NEED ADDITIONAL 100 mm STROKE ADDER)
FOR AN END RESULT OF 500 mm TRAVEL

SIZE	DA	DB	H	K	V	W
55	658.5	250.0	93.0	80.5	68.0	64.5
56	814.0	300.0	115.0	100.2	88.0	83.5
58	1028.1	400.0	149.0	131.2	105.0	99.0

DIMENSIONS: SERIES ESU -RB BALL SCREW LINEAR ACTUATOR

ESUS SINGLE SADDLE



UNIT SHOWN IS REPRESENTATIVE OF AN ESUS55 WITH 0 mm TRAVEL

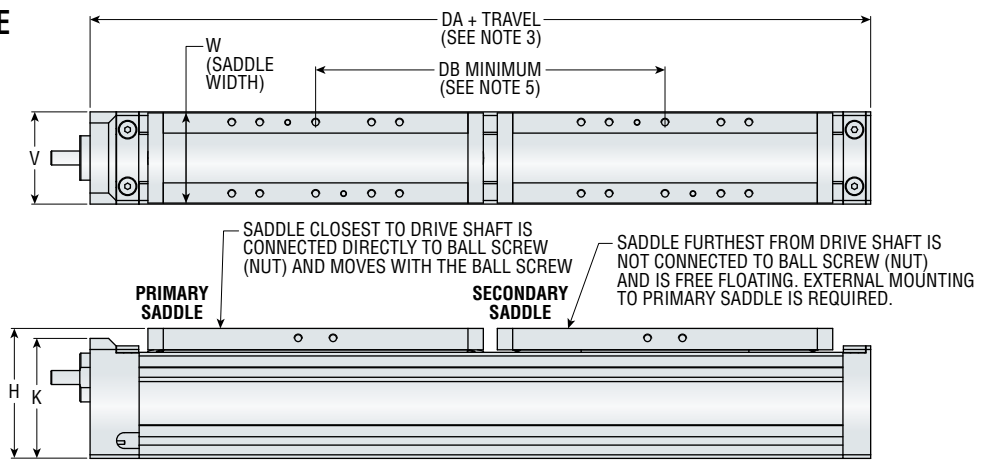
SIZE	A	B	C	D	E	F	G	H	K	L	M	N	ØR	ØT	U	V
55	308.5	120.0	80.0	51.0	M6 x 1 x 8.5	4 x 4	240.0	93.0	85.9	57.9	38.0	M6 x 1 x 18.7	34.9	10.0	80.5	66.0
56	414.0	160.0	100.0	70.0	M6 x 1 x 10.2	5 x 5	287.0	115.0	105.2	71.0	46.5	M8 x 1.25 x 22	48.5	12.0	100.2	86.0
58	528.1	175.0	105.0	75.0	M8 x 1.25 x 12.7	6 x 6	373.0	149.0	143.3	94.3	72.0	M10 x 1.5 x 15	61.9	22.0	131.2	103.0

SIZE	W	Y	CC	DD	EE	FF	JJ	KK	MM	PP	RR	TT	UU	VV	WW	YY
55	64.5	M6 x 1 x 13	5.3	11.3	20.3	57.8	19.8	35.1	161.4	40.0	56.8	25.0	7.0	M6 x 1.0 x 8	7.4	28.0
56	83.5	M8 x 1.25 x 22	10.5	18.1	19.7	40.0	55.0	55.0	206.5	40.0	72.2	25.0	7.0	M6 x 1.0 x 8	6.8	34.6
58	99.0	M10 x 1.5 x 23	15.0	25.4	37.0	56.0	75.0	75.0	263.5	50.0	91.0	25.0	7.0	M6 x 1.0 x 8	11.0	56.2

NOTES:

- 1) DIMENSIONS: mm
- 2) SADDLES SHOWN IN MID POSITION
- 3) PHD RECOMMENDS ADDING 50 mm TO THE TOTAL WORKING TRAVEL FOR OVER-TRAVEL PROTECTION (25 mm PER END)
- 4) SADDLE IS FULLY RETRACTED TO MOTOR END.

ESUD DUAL SADDLE



NOTE:

- 5) MINIMUM SADDLE TO SADDLE DISTANCE SHOWN. IF ADDITIONAL DISTANCE BETWEEN SADDLES IS REQUIRED, ADD APPROPRIATE LENGTH TO TOTAL TRAVEL IN 50 mm INCREMENTS.

REFER TO SINGLE SADDLE DIMENSIONS ABOVE FOR DATA NOT SHOWN

EXAMPLES:

SIZE 55 WITH 500 mm TRAVEL WITH STANDARD "DB" DISTANCE OF 250 mm
ESUD55 x 500 -RBxxx (NO ADDITIONAL STROKE ADDER NEEDED)

SIZE 55 WITH 500 mm TRAVEL WITH "DB" DISTANCE OF 350 mm
ESUD55 x 600 -RBxxx (WILL NEED ADDITIONAL 100 mm STROKE ADDER)
FOR AN END RESULT OF 500 mm TRAVEL

SIZE	H	K	V	W	DA	DB
55	93.0	85.9	66.0	64.5	558.5	250.0
56	115.0	105.2	86.0	83.5	714.0	300.0
58	149.0	143.3	103.0	99.0	928.1	400.0

All dimensions are reference only unless specifically tolerated.

OPTIONS: SERIES ESU LINEAR ACTUATOR

QL11 INLINE WITH 1:1 RATIO (STANDARD ON -RT)

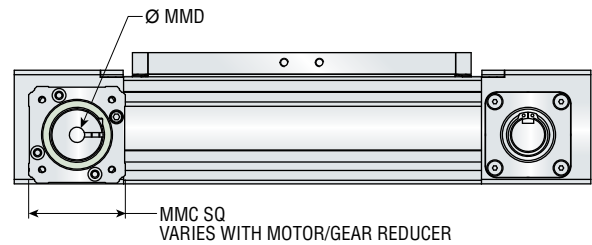
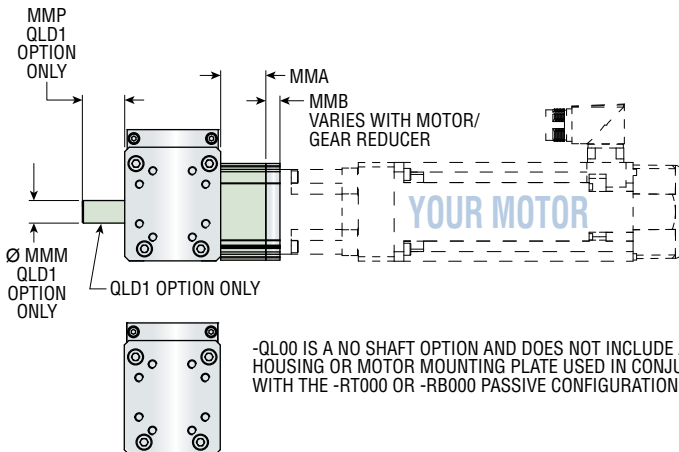
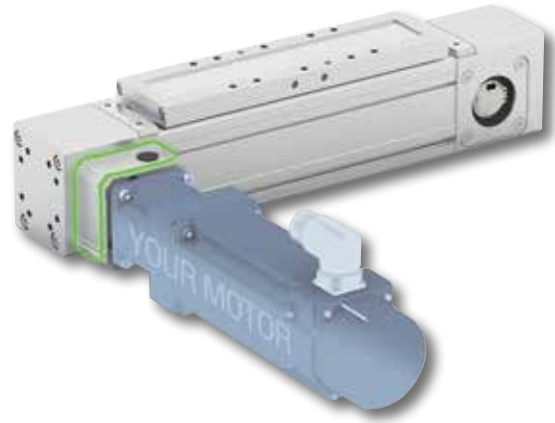
Inline motor mounting with the QL11 option provides a 1:1 drive ratio with the lowest overall weight. The simple low inertia design of the inline motor/gearbox mounting allows for a cost-effective solution with minimal assembly time. If blank mounting is desired, use -W0000 mounting code for a blank plate intended for customer modification.

QLD1 INLINE DUAL SHAFT 1:1 RATIO (-RT ONLY)

Inline dual shaft output motor mounting is a 1:1 drive ratio with a shaft extension thru opposite side of cap. The shaft extension allows for two axis mechanical synchronization from a single motor.

QL00 NO SHAFT (PASSIVE CONFIGURATION, AVAILABLE ON -RT AND -RB)

This option provides the ESU without drive. The option is a no shaft option and does not include a coupler housing or motor mount plate. Linear rail only.



-QL00 IS A NO SHAFT OPTION AND DOES NOT INCLUDE A COUPLER HOUSING OR MOTOR MOUNTING PLATE USED IN CONJUNCTION WITH THE -RT000 OR -RB000 PASSIVE CONFIGURATION

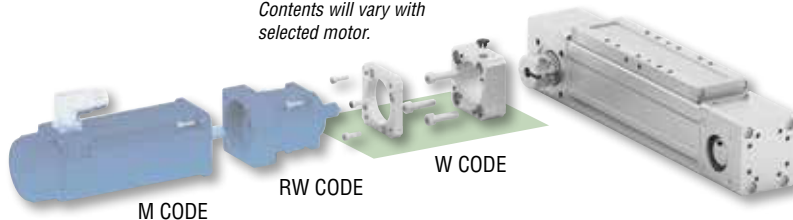
SIZE	-QL11 AND -QLD1					WEIGHT kg	-QLD1		-QL11-W0000	
	MMA	MMB MAX	MMB MIN	MMC STANDARD	MMC OVERSIZE		MMM	MMP	MMC	MMD
55	27.0	31.0	12.5	68.5	88.0	0.36	16.0	30.0	88.0	19.0
56	32.2	33.0	14.0	88.0	115.0	0.54	22.0	32.0	115.0	24.0
58	46.0	56.0	16.5	115.0	138.0	1.04	32.0	40.0	138.0	32.0

NOTES:

- 1) *YOUR MOTOR, YOUR WAY* MOTOR MOUNTS -QL11 & -QLD1 ARE PROVIDED IN KIT FORM TO ALLOW ASSEMBLY OF MOTOR TO ACTUATOR
- 2) KIT INCLUDES ALL PARTS REQUIRED TO ASSEMBLE AN ACTUATOR BASED ON -Wxxxx CODE SUPPLIED BY CUSTOMER
- 3) DIMENSIONS: mm

Typical Kit Contents

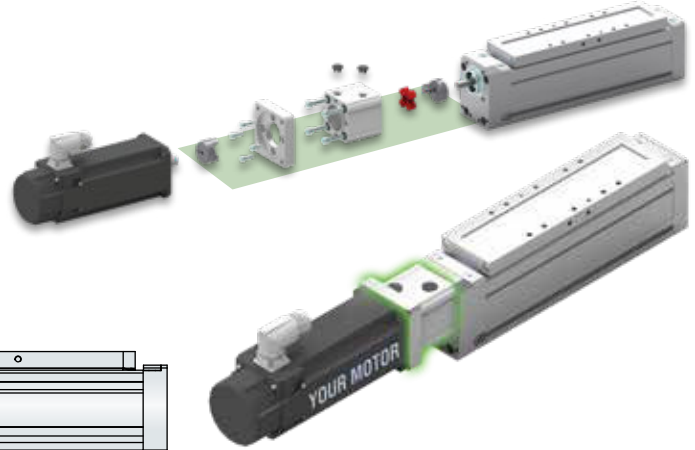
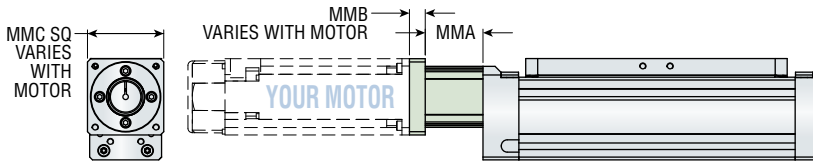
Contents will vary with selected motor.



OPTIONS: SERIES ESU LINEAR ACTUATOR

QL11 INLINE MOTOR MOUNTING WITH 1:1 DRIVE RATIO (-RB MODEL)

Inline motor mounting with the QL11 option provides a 1:1 drive ratio with the lowest overall unit weight and height for high speed applications. The simple, low inertia design of the inline motor mounting allows for a cost effective solution with minimal assembly time. If a blank motor mount is desired for special motor requirements, use -W0000 motor mount code to order a motor mount intended for customer modification. See page 14.



NOTES:

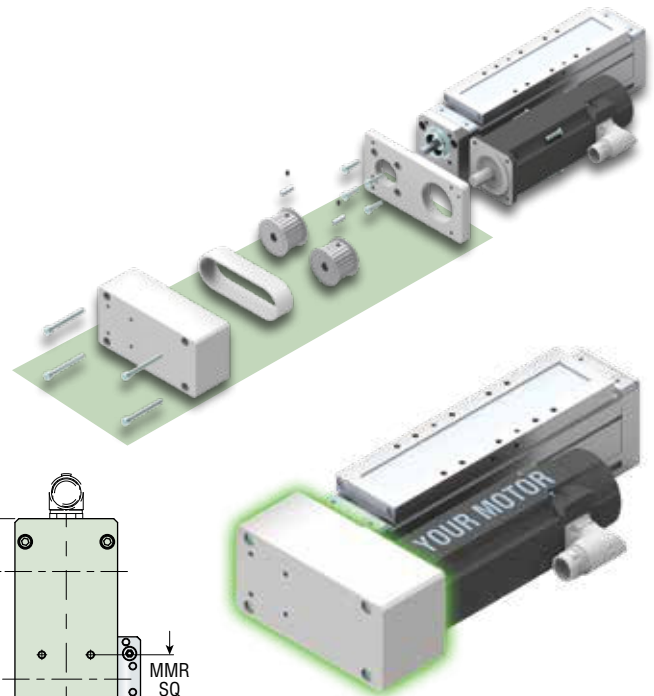
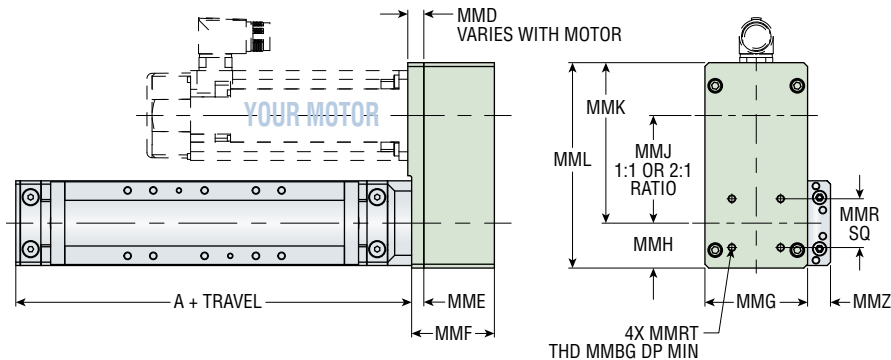
- 1) *YOUR MOTOR*, *YOUR WAY* MOTOR MOUNTS -QL11 IS PROVIDED IN KIT FORM TO ALLOW ASSEMBLY OF MOTOR TO ACTUATOR
- 2) KITS INCLUDE DIRECTIONS AND ALL PARTS REQUIRED TO ASSEMBLE AN ACTUATOR BASED ON -Wxxxx CODE SUPPLIED BY CUSTOMER
- 3) WHEN (-Wxxxx) IS SPECIFIED, COUPLER ID IS SUPPLIED WITH UNFINISHED ID Ø MMT AND MOTOR MOUNTING PLATE IS SUPPLIED AT MMC "OVERSIZE" AND WITHOUT MOTOR MOUNTING FEATURES
- 4) DIMENSIONS ARE mm

SIZE	MMA	MMB MAX	MMB MIN	MMC STANDARD	MMC OVERSIZE	WEIGHT kg
55	53.0	35.6	8.5	70.0	88.0	0.65
56	82.2	35.6	8.5	88.0	110.0	1.36
58	108.8	35.6	19.0	120.7	150.0	2.50

QF11 FOLDBACK MOTOR MOUNTING WITH 1:1 DRIVE RATIO (-RB ONLY)

QF21 FOLDBACK MOTOR MOUNTING WITH 2:1 DRIVE RATIO (-RB ONLY)

Foldback motor mounting with the QF11 option provides a 1:1 drive ratio allowing similar performance to the inline motor mounting in a shorter overall length. The QF21 option provides a 2:1 drive ratio reduction for applications that require higher thrust. Foldback motor mounting also provides a VDMA 24562 compliant mounting pattern that allows the use of many standard cylinder mounting accessories. If a blank motor mount is desired for special motor requirements, use -W0000 motor mount code to order a motor mount intended for customer modification. See page 14.



SIZE	A	MMD MIN	MMD MAX	MME	MMF	MMG	MMH	MMJ 1:1	MMJ 2:1	MMK	MML	MMR	MMRT	MMBG	MMZ	WEIGHT kg
55	308.5	9.5	22.5	9.5	64.5	80.0	35.0	85.1	83.9	125.1	160.1	38.0	M6 x 1	11.5	17.9	1.7
56	414.0	9.5	22.5	9.5	68.0	86.0	44.0	102.5	111.4	154.4	198.4	46.5	M8 x 1.25	14.5	28.0	2.37
58	528.1	15.0	25.4	15.0	86.0	122.0	61.0	140.3	158.2	223.1	284.1	72.0	M10 x 1.5	17	33.3	5.9

All dimensions are reference only unless specifically tolerated.

OPTIONS: SERIES ESU LINEAR ACTUATOR



WXXXX MOTOR MOUNT CODE

Your Motor, Your Way customizable motor mounting is generated by PHD's extensive motor database at www.config.phdinc.com. Users may select their compatible motor of choice from the pre-populated motor database. In the event the chosen motor is not in the database, they may enter necessary motor features to generate the PHD motor mount code.

phdplus.phdinc.com

The tailored motor mounting components are included with the specified driver and shipped in kit form.

Step 1 - Online Actuator Sizing size.phdinc.com

- Input your application data.
- The sizing software will tell you which actuator and motor performance parameters are needed for your application.



Step 2 - Motor Selection

- Based on the performance requirements determined by online sizing, select an appropriate motor from your preferred motor manufacturer.
- Return to the online sizing software with identified motor parameters to verify motor to application compatibility.

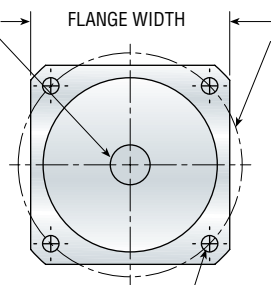
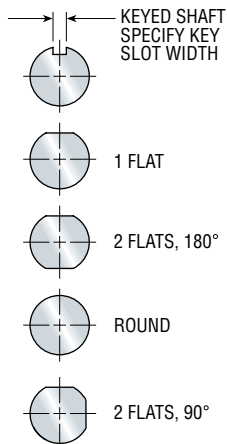
Step 3 - Your Motor, Your Way Configurator config.phdinc.com

- Select your motor from the drop down menus or enter the necessary motor geometry.
- The generated motor mount code for the compatible motor will complete the ordering data necessary to order the actuator tailored to your specific application.
- 3D CAD models are also available.
- If a blank motor mount is desired for special motor requirements, use -W0000 to order a motor mount intended for customer modification.

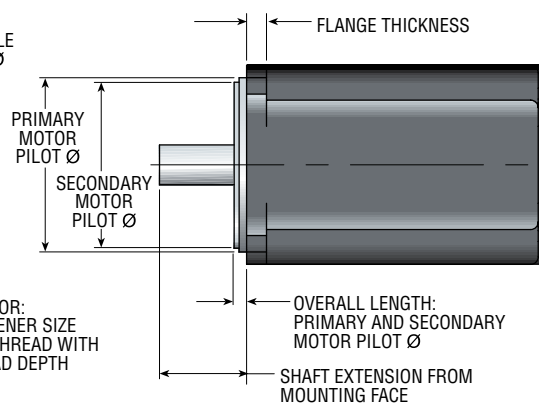
MOTOR GEOMETRY



SPECIFY FROM MOTOR:
 • MAXIMUM MOTOR SHAFT Ø
 • SHAFT TYPE:



SPECIFY FROM MOTOR:
 • MOUNTING FASTENER SIZE
 • THRU HOLE OR THREAD WITH MINIMUM THREAD DEPTH



All dimensions are reference only unless specifically tolerated.

OPTIONS: SERIES ESU LINEAR ACTUATOR

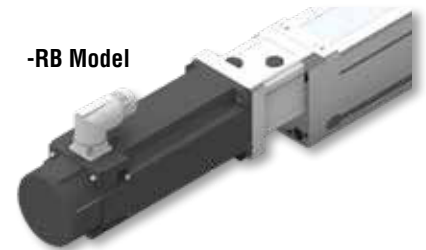
Mxxxx

MOTOR CODE

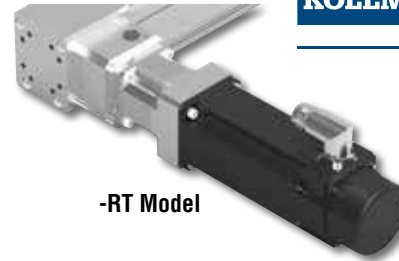
Mxxxx code is available for a factory provided and installed motor and gear reducer. This option requires the Wxxxx option to be selected as well. The available motors and associated Mxxxx codes can be selected using PHD's motor database at www.config.phdinc.com.

SIZE	MODEL	M CODE	PHD MOTOR PART NO.	KOLLMORGEN PART NO.
55	-RT	M5000	87540-33H-AN9NCA00	AKM-33H-AN9NCA00
	-RT	M5001	87540-33H-AN9NCA00	AKM-33H-AN9NCA00
	-RB	M1091	87540-33H-AC92CA00	AKM-33H-AC92CA00
56	-RT	M5002	87540-44J-AN9NCA00	AKM-44J-AN9NCA00
	-RT	M5003	87540-44J-AN9NCA00	AKM-44J-AN9NCA00
	-RB	M1108	87540-44J-AC92CA00	AKM-44J- AC92CA00
58	-RT	M5004	87540-54N-AN9NCA00	AKM-54N-AN9NCA00
	-RT	M5005	87540-54N-AN9NCA00	AKM-54N-AN9NCA00
	-RB	M1112	87540-54N-AC92CA00	AKM-54N- AC92CA00

-RB Model



KOLLMORGEN

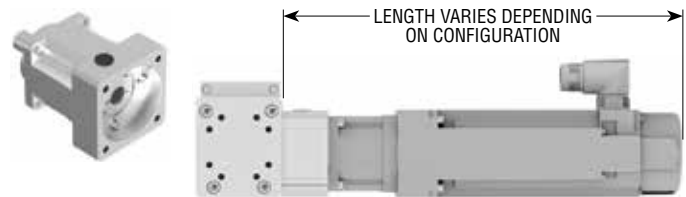


-RT Model

RWxxx

GEAR REDUCER (-RT ONLY)

A factory provided gear reducer is only available when a motor is configured from PHD. The available gear reducers and associated RWxxx codes can be selected using PHD's motor database at www.config.phdinc.com.



NOTES:

- 1) SIZE DEPENDS ON MOTOR USED, SEE CAD CONFIGURATOR MODEL FOR ACTUAL SIZE
- 2) QL11 AND QLD1 ARE TYPICALLY ORDERED WITH Wxxxx OR Mxxxx+RWxxx

Y5

FOOD GRADE

Food grade lubricant replaces all standard lubricants.

KSxxx

END/MID SUPPORTS

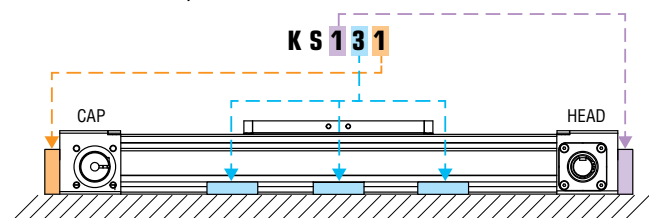
Mounting with optional supports using the integrated T-slot. Recommended number of mid-support mounts can be determined by finding the maximum distance between supports based on the load per your application. See Engineering Data page, Load Fz/Fy vs. Maximum Unsupported Length graph.

NOTE: PHD does not recommend only the use of mid supports for actuator mounting. Utilize end supports when applicable.

Mid supports include one set of brackets.

See dimensions on next page.

END/MID SUPPORT ORDERING EXAMPLE:



SUPPORT LOCATION	QUANTITY	
Head - KS0xx or KS1xx	0 or 1	KS1x includes one set of brackets
Mid - KSx0x to KSx9x	0 to 9	KS2x includes two sets of brackets, etc.
Cap - KSxx0 or KSxx1	0 or 1	

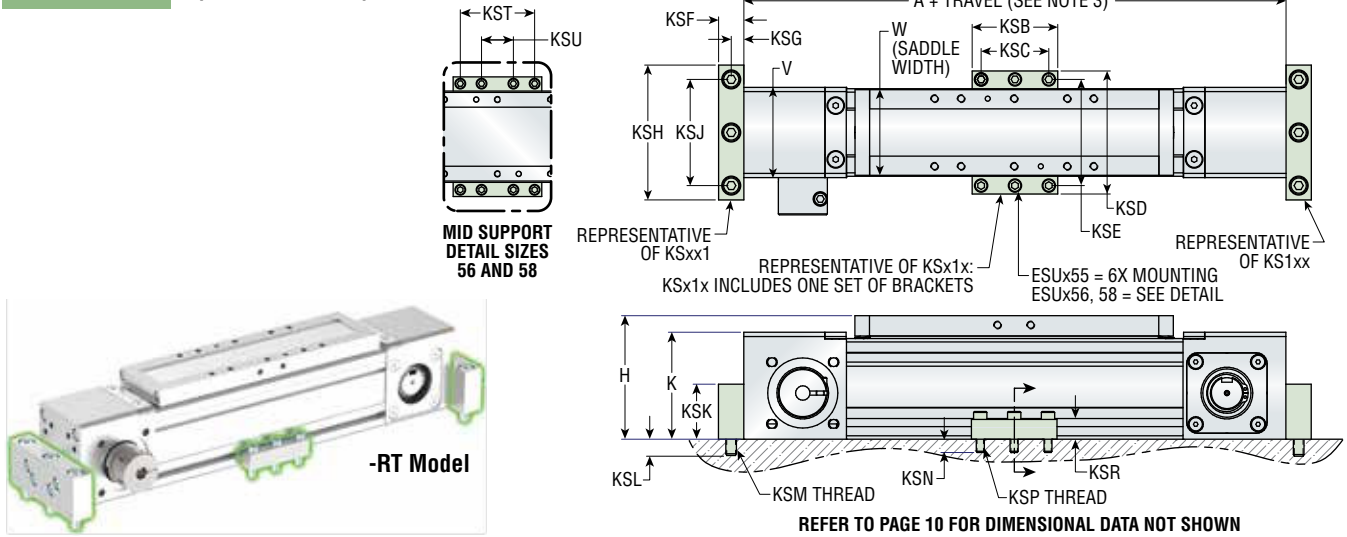
SUPPORT REPLACEMENT KITS

SUPPORT KITS	-RB SIZE			-RT SIZE		
	55	56	58	55	56	58
Head or Cap	90090-01	90090-02	90090-03	90036-01	90036-02	90036-03
Mid	90037-01	90037-02	90037-03	90037-01	90037-02	90037-03

OPTIONS: SERIES ESU LINEAR ACTUATOR

KSxxx

END/MID SUPPORTS (CONTINUED)

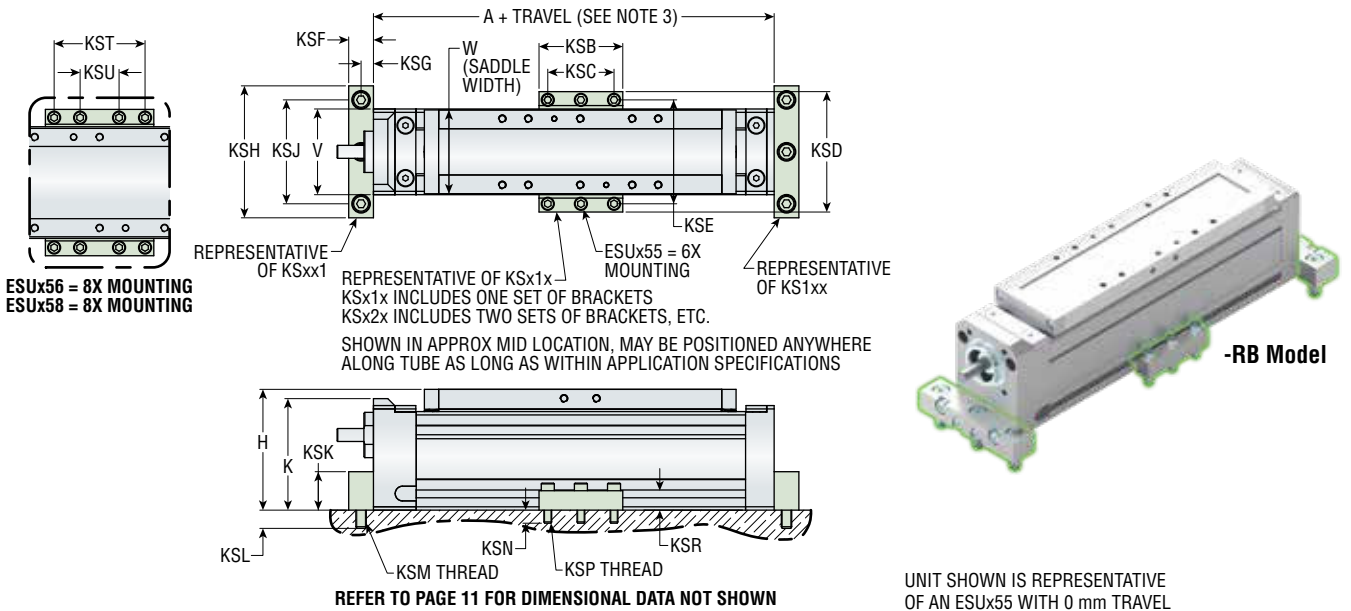


ESU -RT MODEL

SIZE	A	H	K	V	W	KSB	KSC	KSD	KSE	KSF	KSG	KSH	KSJ	KSK	KSL	KSM	KSN	KSP	KSR	KST	KSU
55	408.5	93.0	80.5	68.0	64.5	64.5	51.0	92.7	80.0	19.1	9.5	101.6	80.0	41.4	12.2	M8 x 1.25	10.0	M6 x 1.0	15.0	—	—
56	514.0	115.0	100.2	88.0	83.5	83.5	—	112.7	100.0	25.4	12.7	152.4	100.0	42.8	17.8	M10 x 1.5	12.5	M6 x 1.0	27.5	70.0	30.0
58	628.1	149.0	131.2	105.0	99.0	99.0	—	136.4	120.0	25.4	12.7	152.4	120.0	57.5	18.2	M10 x 1.5	14.5	M8 x 1.25	35.5	75.0	25.0

NOTES:

- 1) DIMENSIONS: mm
- 2) SADDLE SHOWN IN MID POSITION
- 3) PHD RECOMMENDS ADDING 50 mm TO THE TOTAL WORKING TRAVEL FOR OVER-TRAVEL PROTECTION (25 mm PER END)
- 4) BRACKETS AND HARDWARE BAGGED AND SHIPPED WITH UNIT



ESU -RB MODEL

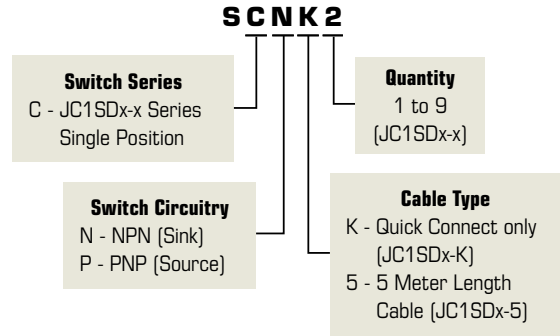
SIZE	A	H	K	V	W	KSB	KSC	KSD	KSE	KSF	KSG	KSH	KSJ	KSK	KSL	KSM	KSN	KSP	KSR	KST	KSU
55	308.5	93.0	85.9	66	64.5	64.5	51.0	92.7	80.0	22	9.5	101.6	80.0	17.2	16.4	M8 x 1.25	10.1	M6 x 1.0	15.0	—	—
56	414.0	115.0	105.2	86.0	83.5	83.5	—	112.7	100.0	25.4	12.7	127.0	100.0	25.4	25.2	M10 x 1.5	12.5	M6 x 1.0	27.5	70.0	30.0
58	528.1	149.0	143.3	103.0	99.0	99.0	—	135.9	120.0	25.4	12.7	152.4	120.0	34.5	26.1	M10 x 1.5	14.5	M8 x 1.25	35.5	75.0	25.0

UNIT SHOWN IS REPRESENTATIVE OF AN ESUx55 WITH 0 mm TRAVEL

OPTIONS: SERIES ESU LINEAR ACTUATOR

Sxxxx SWITCH BUNDLE

These options conveniently provide switches with additional hardware if required. Series JC1SDx-x single position switches are available as NPN or PNP. Connection method may also be specified along with quantity of switches, up to nine.



SERIES JC1SDx-x SINGLE POSITION MAGNETIC SWITCH

This switch provides the ability to identify a single position of travel. Solid-state sensing technology provides a highly reliable switch. Elliptical housing allows for easy “drop-in” installation. Includes LED indicator for convenient means of positioning. Available with PNP or NPN output. Available with cable or 8 mm threaded Quick Connect.



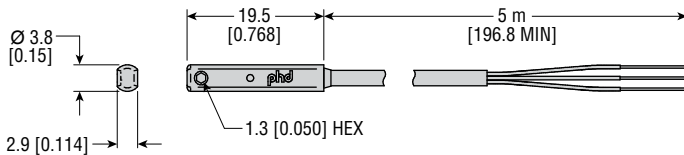
SERIES JC1SDx SINGLE POSITION SWITCHES

PART NO.	DESCRIPTION
JC1SDN-5	NPN (Sink) Solid State, 10-30 VDC, 5 m cable
JC1SDP-5	PNP (Source) Solid State, 10-30 VDC, 5 m cable
JC1SDN-K	NPN (Sink) Solid State, 10-30 VDC, Quick Connect
JC1SDP-K	PNP (Source) Solid State, 10-30 VDC, Quick Connect

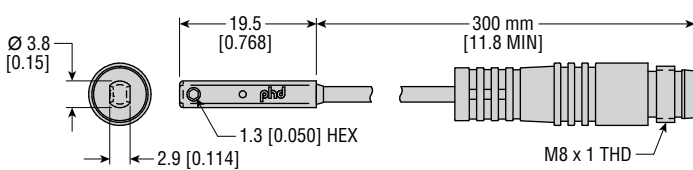
SERIES JC1SDx CORDSET

PART NO.	DESCRIPTION
63549-02	M8, 3 pin, Straight Female Connector, 2 m cable
63549-05	M8, 3 pin, Straight Female Connector, 5 m cable

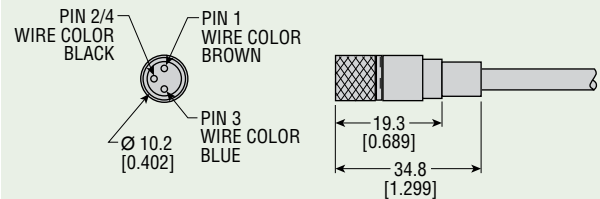
JC1SDx-5



JC1SDx-K (Quick Connect)



63549-xx CORDSET



All dimensions are reference only unless specifically tolerated.

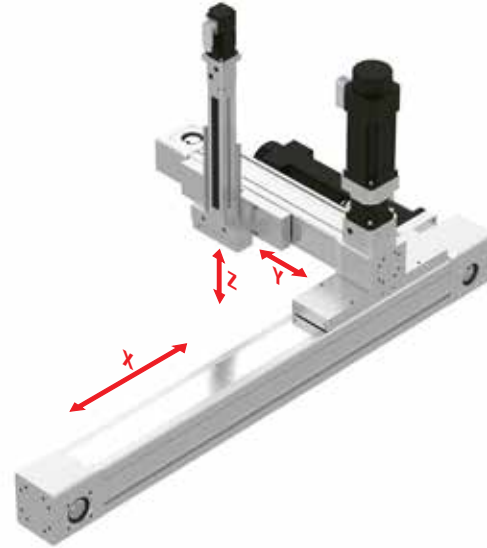
MODULAR CARTESIAN SYSTEM EXAMPLES

PHD's Series ESU -RT Electric Belt-Driven Linear Actuators feature a robust, enclosed design with a high capacity rail bearing system which delivers exceptional moment and load capability. The ESU -RT linear actuator and other PHD electric and pneumatic actuators can be used in a variety of combinations that create a full range of motion for a variety of cartesian systems. Below are a few examples of how PHD electric components can be configured.

3-Axis Cartesian Robot, Permanent Arm Type

- Z- Axis = ESCV Thruster Slide
- Y- Axis = ESU -RT Linear Actuator
- X- Axis = ESU -RT Linear Actuator

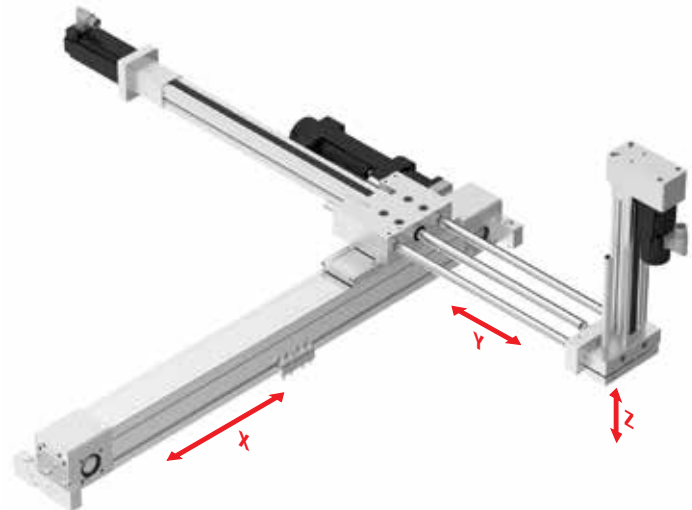
Advantages - Small footprint, high accuracy, high speed



3-Axis Cartesian Robot, Retracting Arm Type

- Z- Axis = ESCV Thruster Slide
- Y- Axis = ESL Thruster Slide
- X- Axis = ESU -RT Linear Actuator

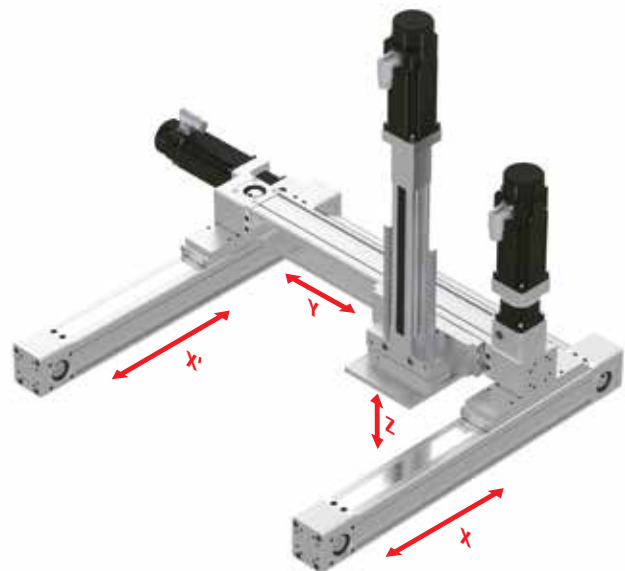
Advantages - Small footprint, lower cost



4-Axis Cartesian Robot, Gantry Type

- Z- Axis = ESCV Thruster Slide
- Y- Axis = ESU -RT Linear Actuator
- X- Axis = ESU -RT Linear Actuator
- X- Axis = ESU -RT Linear Actuator

Advantages - Large working area, high payload, high speed



ESU APPLICATION SIZING QUESTIONNAIRE

Date: _____ Completed By: _____

Distributor Name: _____

Customer Name: _____

Address: _____

City: _____ State: _____ Zip: _____

Contact Name /Title: _____ Telephone: _____

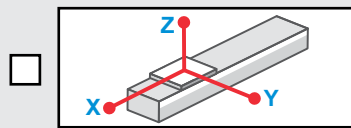
E-Mail Address: _____

End Customer (if other than above): _____ Location: _____

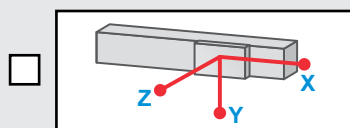
APPLICATION DETAILS

General Description: _____

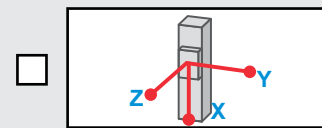
Application Type (Check all that apply):



Horizontal Installation



Wall Installation



Vertical Installation

	Horizontal	Load Offset (mm)	Wall	Load Offset (mm)	Vertical	Load Offset (mm)
Travel:	mm =	X =	mm =	X =	mm =	X =
Travel Time One direction:	sec =	Y =	sec =	Y =	sec =	Y =
Payload:	kg =	Z =	kg =	Z =	kg =	Z =

Duty Rate: Cycles/Minute Hour/Day Days/Week Weeks/Year

Repeatability	Environment	Fieldbus	Cable Length	Supply Voltage
± .05 mm <input type="checkbox"/>	Standard <input type="checkbox"/>	Analog <input type="checkbox"/>	1 m <input type="checkbox"/>	120 V <input type="checkbox"/>
	Cleanroom <input type="checkbox"/>	CANopen or EtherCAT <input type="checkbox"/>	3 m <input type="checkbox"/>	240 V <input type="checkbox"/>
	Food/Medical <input type="checkbox"/>	CANopen <input type="checkbox"/>	6 m <input type="checkbox"/>	400 V <input type="checkbox"/>
	Dusty <input type="checkbox"/>	EtherCAT <input type="checkbox"/>	9 m <input type="checkbox"/>	480 V <input type="checkbox"/>
	Coolant <input type="checkbox"/>	EtherNet / IP <input type="checkbox"/>	12 m <input type="checkbox"/>	
	Other <input type="checkbox"/>	PROFINET <input type="checkbox"/>	24 m <input type="checkbox"/>	
		SynqNet <input type="checkbox"/>		

Describe motion sequence:

Complete this form, save the file,
and send via email to:
apps@phdinc.com
It can also be printed and faxed to
260-747-6754, or call
Inside Sales at 800-624-8511
for assistance.

ELECTRIC SOLUTIONS

Cylinders, Slides, and Grippers

With Your Motor, Your Way!



**Series ESU-RT Electric
Belt-Driven Linear Actuator**



**Series ESU-RB Electric
Ball Screw Linear Actuator**



**Series ESK/ESL Electric
Thruster Slide**



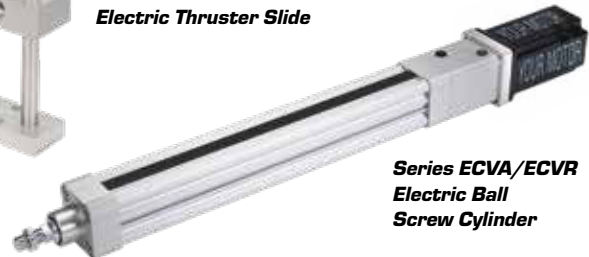
**Series ESCV Vertical
Electric Thruster Slide**



**Series EGRR Electric
High Capacity Gripper**



USDA Certified for CIP
**Series ECP Electric
IP69K Cylinder**



**Series ECVA/ECVR
Electric Ball
Screw Cylinder**

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