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versatile saddle mounting for application flexibility

corrosion/wear-resistant steel pulley

dust protective wiper seal

easily accessible belt-tensioning system

tensioning end of belt

superior HTD8 steel reinforced polyurethane belt which also protects internal mechanism from dust

fixed end of belt

maintenance-free linear guides

access for T-nuts

t-slot for mid-supports mounting

rigid extrusion body and JC switch ready

drive shaft with integrated motor coupling

profile rail guide with recirculating ball bearings provide for high load rating and rigidity

mounting holes for flexible end mounting of end of arm tooling
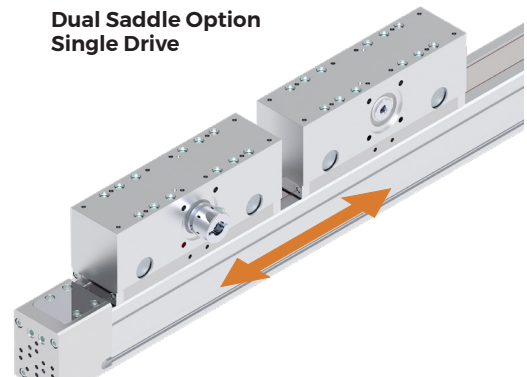
PHD's ESZ belt
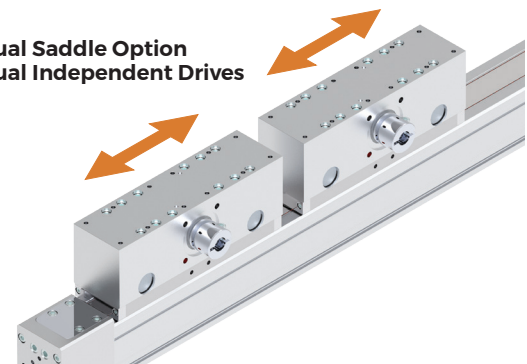
competitor's belt

Your Motor
Your Way

Major Benefits

- High-capacity rail bearing provides superior moment and load capability
- Integrated shaft coupling allows for a rigid connection and zero backlash
- Self-lubricating linear guides provide maintenance-free operation
- Travel lengths up to 2000 mm in fixed saddle applications, and 5,500 mm for fixed base applications.
- Maximum speed 5000 mm/s, acceleration 50 m/s^2
- Superior HTD8 steel-reinforced polyurethane belt for uniform load distribution, precise tooth engagement, and improved performance
- Easy access belt tensioning system
- Rigid construction with low backlash
- High degree of repeatability
- Switch ready as standard
- Mid-support(s) mounting for long travels and high payloads in traditional fixed base applications
- Dual saddle option for higher load/moment loading capabilities
- A model with two independently driven saddles is available for gripping/pick and place applications.
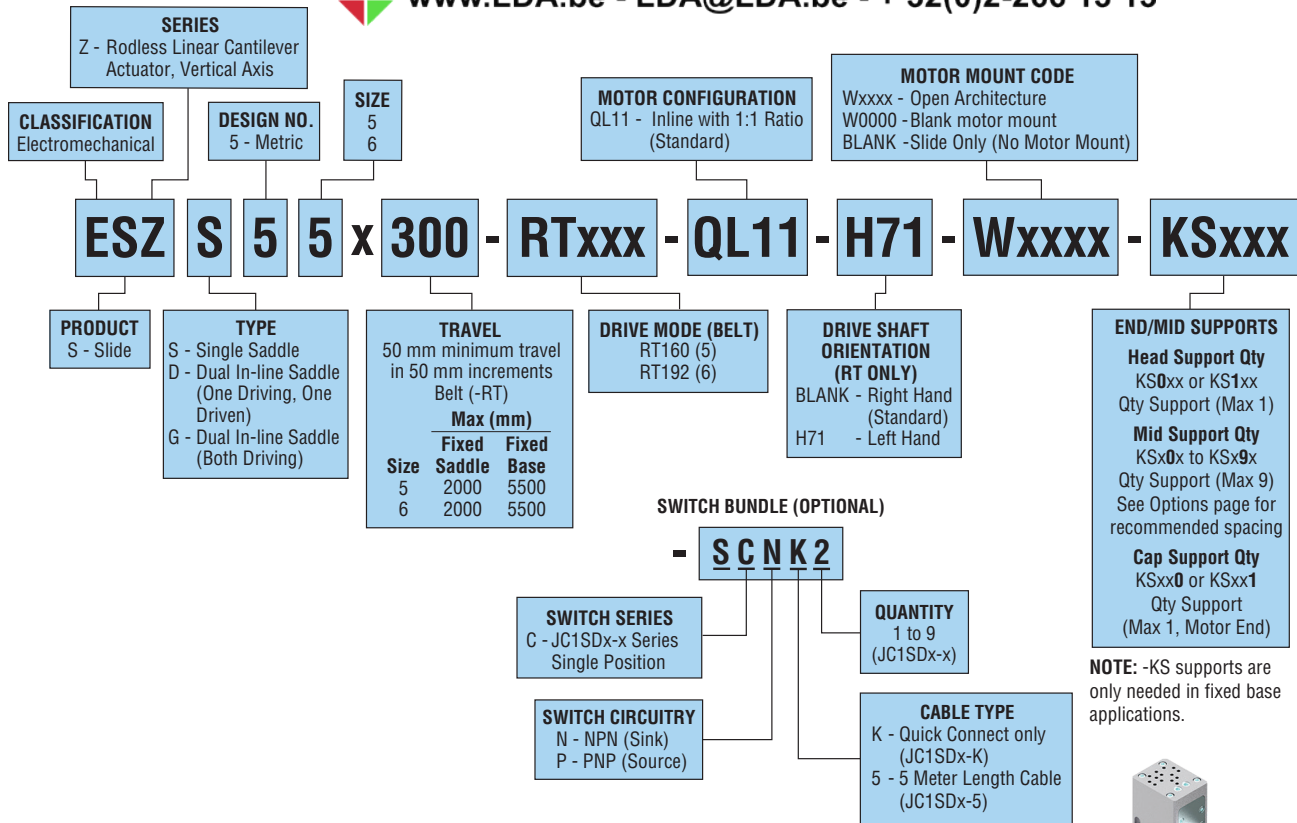
**Dual Saddle Option
Single Drive**

**Dual Saddle Option
Dual Independent Drives**

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SERIES
Z - Rodless Linear Cantilever Actuator, Vertical Axis

CLASSIFICATION
Electromechanical

DESIGN NO.
5 - Metric

SIZE
5
6

MOTOR CONFIGURATION
QL11 - Inline with 1:1 Ratio (Standard)

MOTOR MOUNT CODE
Wxxxx - Open Architecture
W0000 - Blank motor mount
BLANK - Slide Only (No Motor Mount)

ESZ S 5 5 x 300 - RTxxx - QL11 - H71 - Wxxxx - KSxxx

PRODUCT
S - Slide

TYPE
S - Single Saddle
D - Dual In-line Saddle (One Driving, One Driven)
G - Dual In-line Saddle (Both Driving)

TRAVEL
50 mm minimum travel in 50 mm increments
Belt (-RT)

	Max (mm)	
	Fixed	Fixed
	Saddle	Base
Size		
5	2000	5500
6	2000	5500

DRIVE MODE (BELT)
RT160 (5)
RT192 (6)

DRIVE SHAFT ORIENTATION (RT ONLY)
BLANK - Right Hand (Standard)
H71 - Left Hand

END/MID SUPPORTS
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)

NOTE: -KS supports are only needed in fixed base applications.

SWITCH BUNDLE (OPTIONAL)

- S C N K 2

SWITCH SERIES
C - JC1SDx-x Series Single Position

SWITCH CIRCUITRY
N - NPN (Sink)
P - PNP (Source)

QUANTITY
1 to 9
(JC1SDx-x)

CABLE TYPE
K - Quick Connect only (JC1SDx-K)
5 - 5 Meter Length Cable (JC1SDx-5)

MOUNTING OPTIONS & ACCESSORIES

Gray shaded areas are accessories and are ordered by kit or part numbers.

KSxx1
H71
QL11
Wxxxx
KSx1x
KSx1x
SWITCHES
KS1xx

STANDARD UNIT - SINGLE SADDLE
ESZS

DUAL INLINE SADDLE (ONE DRIVING)
ESZD

DUAL INLINE SADDLE (BOTH DRIVING)
ESZG

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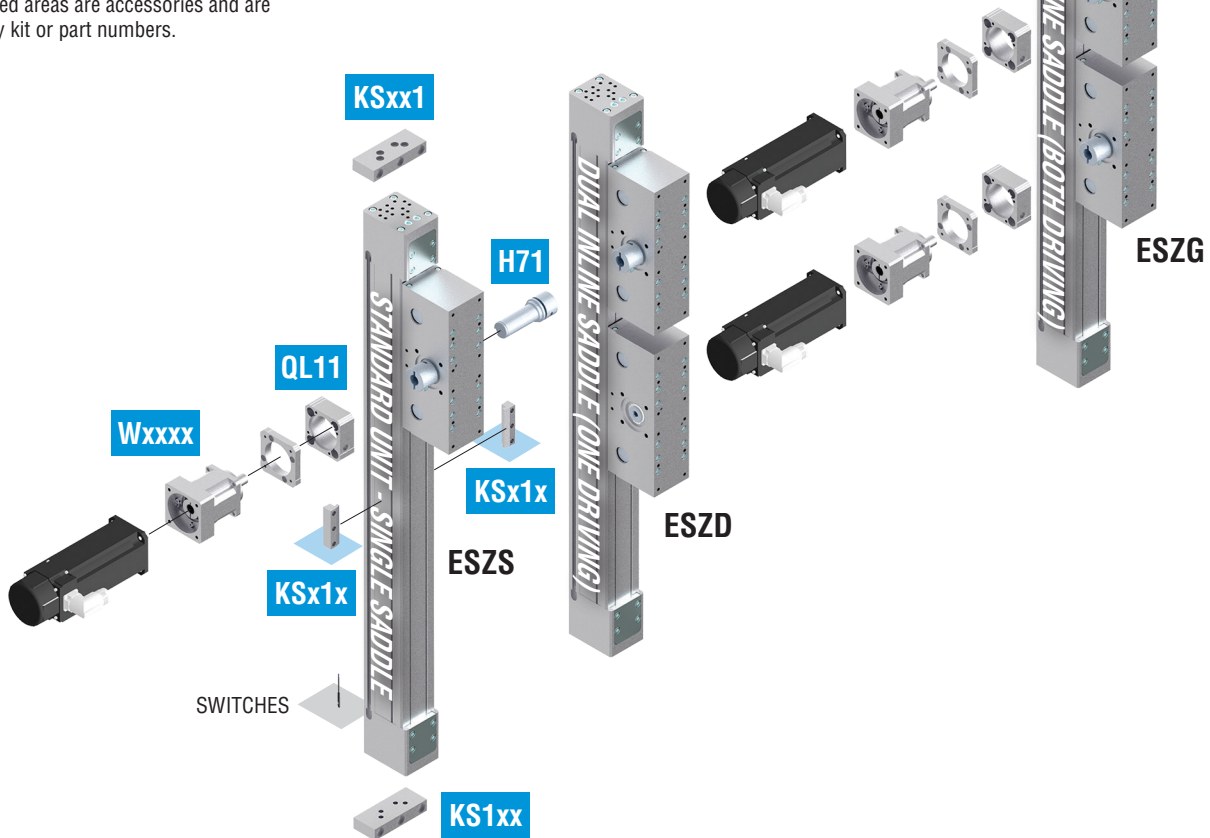
SPECIFICATIONS	SIZE 5	SIZE 6
REPEATABILITY	±0.05 mm [±0.002 in]	
TRAVEL TOLERANCE	+2.5 mm/ -0.0 mm [+0.100 in/ -0.000 in]	
DUTY CYCLE	100%	
OPERATING TEMPERATURE	4 - 65°C [40 - 150°F]	
LUBRICATION INTERVAL	Factory lubricated for life	
ENCAPSULATION CLASS	IP40	

	SPECIFICATIONS		SIZE 5	SIZE 6
MECHANICS	DRIVE MECHANISM		Timing Belt	
	GUIDE		Recirculating Ball- Linear Motion Guide & Rail system	
	MAX TRAVEL	mm [in]	Fixed Saddle: 2000 [78.740], Fixed Base: 5500 [216.535]	
	BELT		HTD8	
	PITCH (LINEAR TRAVEL PER REVOLUTION)	mm [in]	160 [6.3]	192 [7.56]
	PULLEY DIAMETER	mm [in]	50.93 [2.005]	61.12 [2.406]
SPEED	MAXIMUM SPEED	mm/sec [in/sec]	5000 [197]	
	MAXIMUM ACCELERATION	m/sec^2 [in/sec^2]	50 [1970]	
THRUST	MAXIMUM THRUST	N [lbf]	1600 [360]	3330 [748]
TORQUE	PERMISSIBLE DRIVE TORQUE	Nm [in-lb]	41 [360]	102 [901]
	NO-LOAD TORQUE	Nm [in-lb]	2.5 [23]	3.2 [29]

	SPECIFICATIONS			SIZE 5			SIZE 6		
				Single Saddle - S	Dual - D	Dual - G	Single Saddle -S	Dual - D	Dual - G
WEIGHT	TOTAL ACTUATOR WEIGHT	@ ZERO TRAVEL (W$_{OT}$)	lb	22.713	36.787	37.145	47.603	77.195	77.758
			kg	10.289	16.664	16.827	21.564	34.969	35.224
		LENGTH ADDER (W$_{LT}$)	lb/in	0.351			0.566		
			kg/mm	6.26 x 10^{-3}			1.01 x 10^{-2}		
	MOVING WEIGHT	@ ZERO TRAVEL (W$_{OM}$) FIXED SADDLE	lb	11.147	14.619	14.619	22.808	29.457	29.457
			Kg	5.050	6.622	6.622	10.332	13.344	13.344
		FIXED BASE	lb	11.566	21.280	22.526	24.795	45.656	48.300
			Kg	5.239	9.640	10.204	11.232	20.682	21.880
		LENGTH ADDER (W$_{LM}$) FIXED SADDLE	lb/in	0.351			0.566		
			kg/mm	0.006			0.010		
		FIXED BASE	lb/in	—			—		
			kg/mm	—			—		
INERTIA	STANDARD- ACTUATOR @ ZERO TRAVEL (J$_0$)		lb-in^2	11.204	—	—	33.016	—	—
			[kg-m^2]	3.27 x 10^{-3}	—	—	9.65 x 10^{-3}	—	—
	DUAL SADDLE- ACTUATOR @ ZERO TRAVEL (J$_0$)	FIXED SADDLE	lb-in^2	—	14.694	14.694	—	42.642	42.642
			[kg-m^2]	—	4.29 x 10^{-3}	4.29 x 10^{-3}	—	1.25 x 10^{-2}	1.25 x 10^{-2}
		FIXED BASE	lb-in^2	—	21.389	22.642	—	66.090	69.918
			[kg-m^2]	—	6.25 x 10^{-3}	6.62 x 10^{-3}	—	1.93 x 10^{-2}	2.04 x 10^{-2}
	LENGTH ADDER (J$_L$)		lb-in^2 /in	0.353			0.820		
			kg-m^2/mm	4.06 x 10^{-6}			9.43 x 10^{-6}		
	MOVING WEIGHT ADDER		lb-in^2/in	1.005			1.448		
			kg-m^2/kg	6.48 x 10^{-4}			9.34 x 10^{-4}		

NOTE: STRONGLY RECOMMENDED: ORDERED TRAVEL = WORKING TRAVEL + SAFETY TRAVEL ON BOTH ENDS

MOVING BASE
FIXED SADDLE

MOVING SADDLE
FIXED BASE

MOVING BASE
FIXED SADDLE
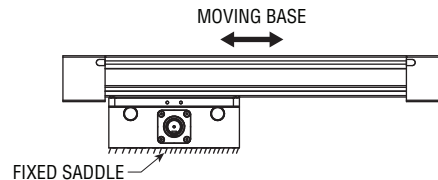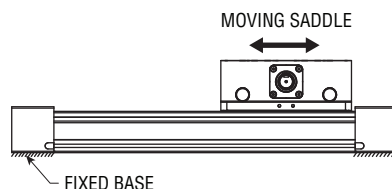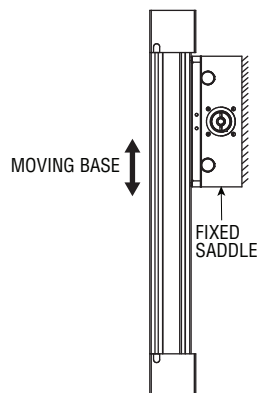
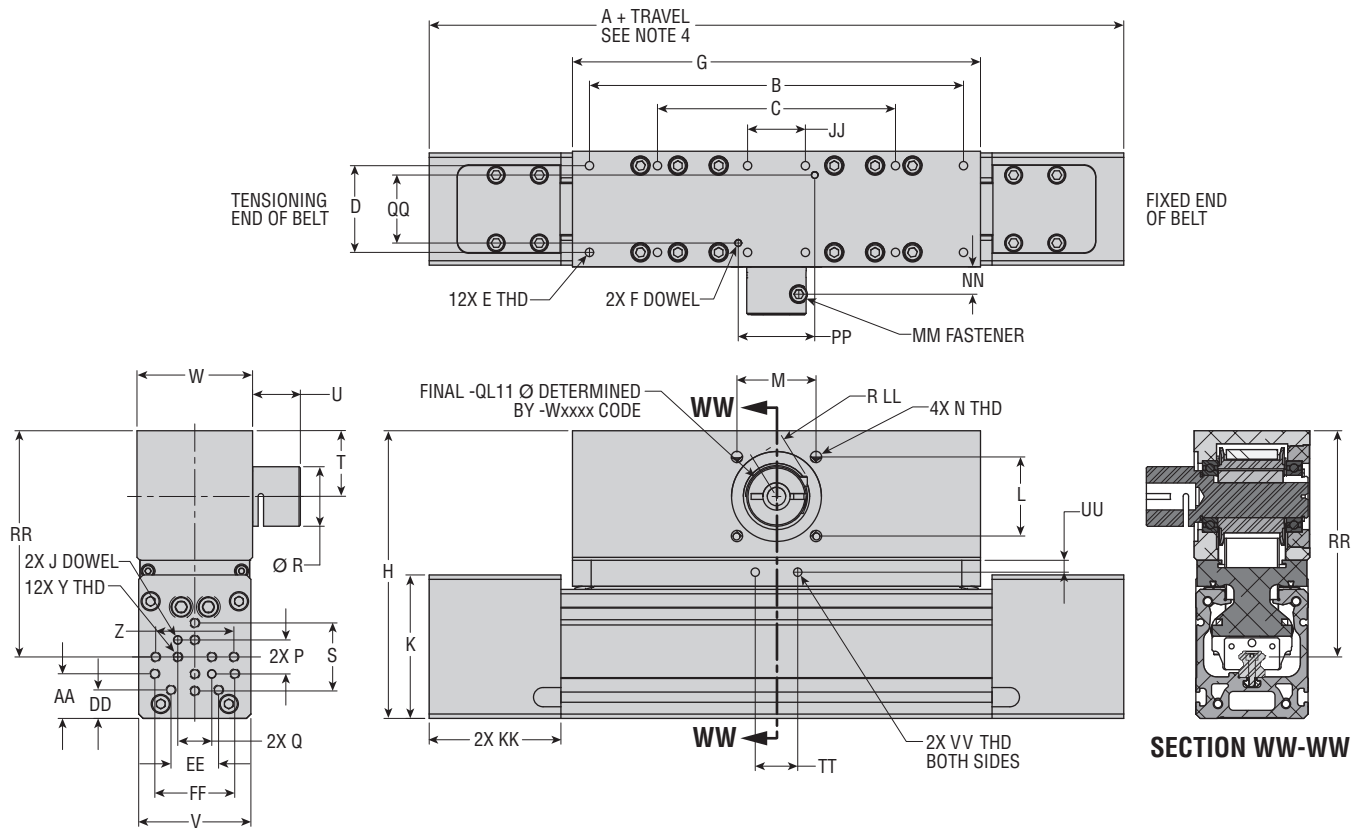## WEIGHT AND INERTIAL CALCULATIONS:

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$_0$ + (J$_L$ x TRAVEL) + (J$_M$ x TOTAL MOVING WEIGHT)

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STANDARD UNIT

SECTION WW-WW

SIZE	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W
5	408.5	220.0	140.0	51.0	M6 x 1 x 10 ⊥	4 x 4 ⊥	240.0	169.2	5 x 10 ⊥	84.4	46.5	46.5	M8 x 1.25 x 12 ⊥	20.0	20.0	35.0	40.0	38.7	28.1	66.0	68.0
6	514.0	220.0	135.0	72.0	M6 x 1 x 10 ⊥	5 x 5 ⊥	287.0	225.5	5 x 10 ⊥	107.9	46.5	46.5	M8 x 1.25 x 12 ⊥	30.0	30.0	42.0	60.0	47.7	31.4	86.0	98.5

SIZE	Y	Z	AA	DD	EE	FF	JJ	KK	LL	MM	NN	PP	QQ	RR	TT	UU	VV
5	M6 x 1 x 12 ⊥	46.0	26.3	16.8	28.0	47.0	34.0	77.5	21.4	M6 x 1	16.1	45.0	40.0	133.0	25.0	7.0	M6 x 1 x 8 ⊥
6	M8 x 1.25 x 16 ⊥	60.0	30.1	18.1	40.0	64.0	50.0	105.0	24.3	M6 x 1	15.9	50.0	50.0	182.7	25.0	7.0	M6 x 1 x 8 ⊥

NOTES:
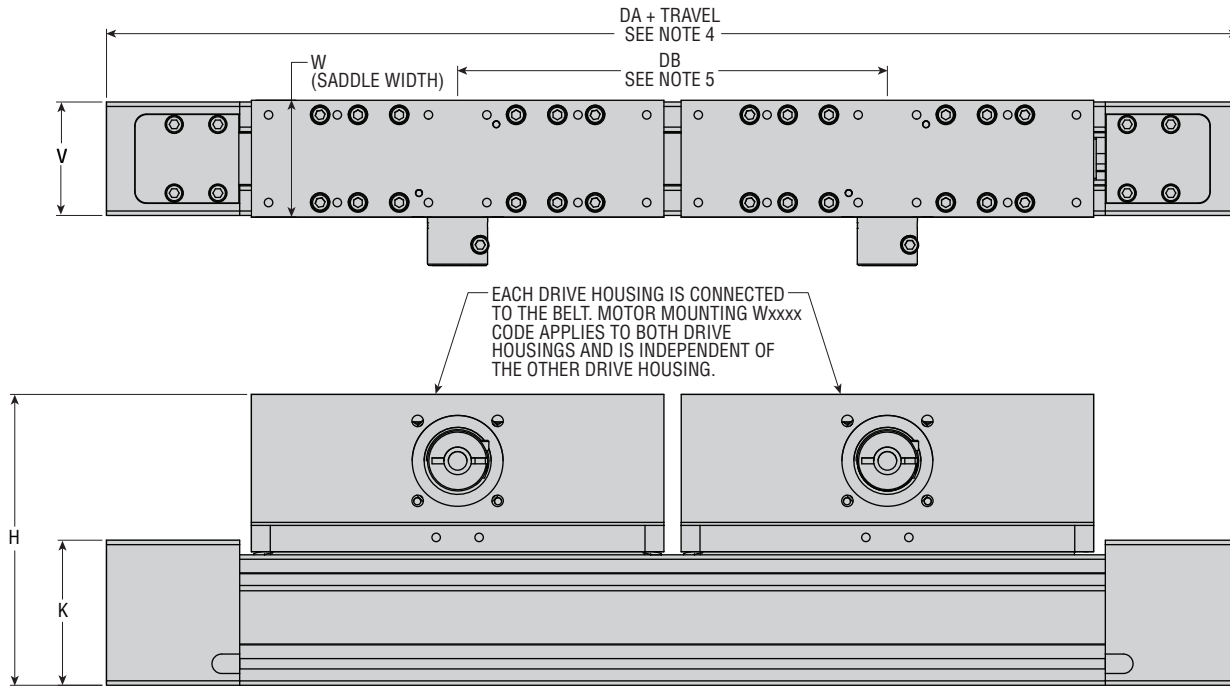1) DIMENSIONS: mm
2) SADDLE SHOWN IN MID POSITION
3) UNIT SHOWN IS REPRESENTATIVE OF AN ESZS55 WITH 0 mm TRAVEL
4) PHD RECOMMENDS TO ADD 50 mm TO THE TOTAL WORKING TRAVEL FOR SAFETY (25 mm PER END)

All dimensions are reference only unless specifically toleranced.

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DUAL SADDLE (ONE DRIVING)
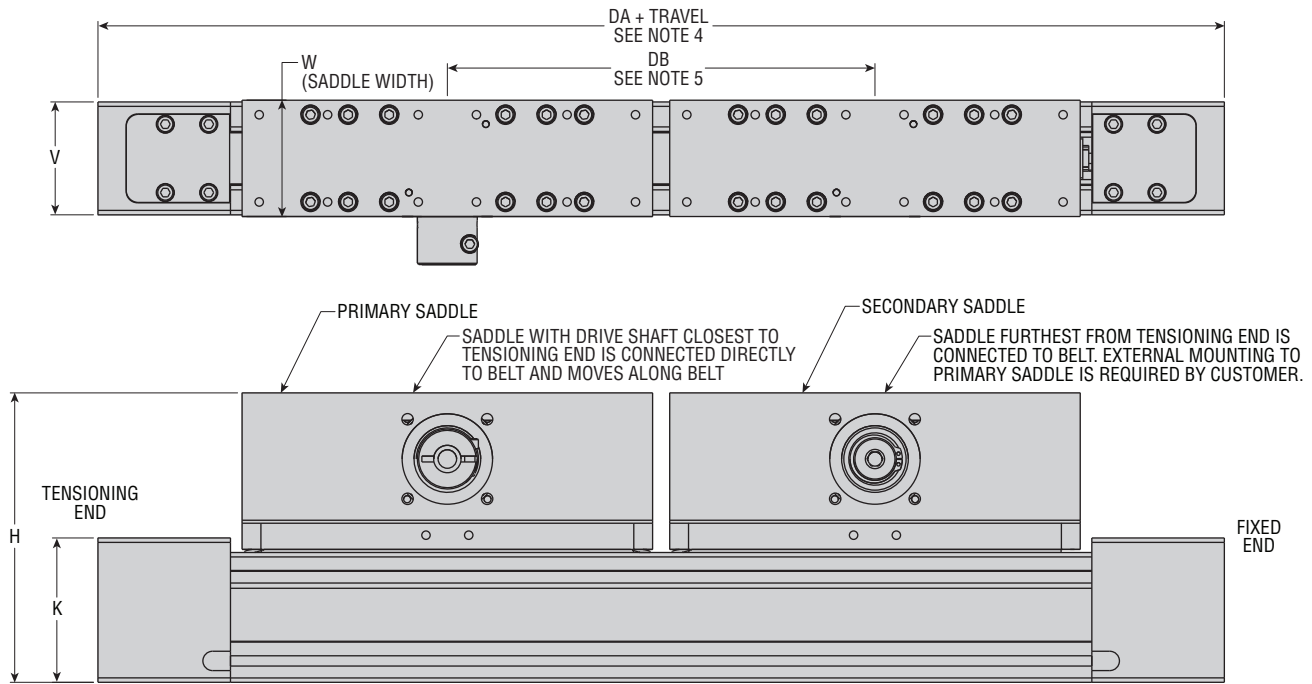
REFER TO SERIES ESZS DIMENSIONS PAGE FOR DATA NOT SHOWN

NOTES:

1) DIMENSIONS: mm
2) SADDLES SHOWN IN MID POSITION
3) UNIT SHOWN IS REPRESENTATIVE OF AN ESZD55 WITH 0 mm TRAVEL
4) PHD RECOMMENDS TO ADD 50 mm TO THE TOTAL WORKING TRAVEL FOR SAFETY (25 mm PER END)
5) SADDLE TO SADDLE DISTANCE SHOWN IS THE MINIMUM ALLOWED BETWEEN SADDLES. IF ADDITIONAL DISTANCE BETWEEN SADDLES IS REQUIRED, ADD APPROPRIATE LENGTH TO TOTAL TRAVEL IN 50 mm INCREMENTS
   EXAMPLES:
   SIZE 5 WITH 500 mm TRAVEL WITH STANDARD "DB" DISTANCE OF 250 mm
      ESZD55 x 500 -RTxxx (NO ADDITIONAL STROKE ADDER NEEDED)
   SIZE 5 WITH 500 mm TRAVEL WITH "DB" DISTANCE OF 350 mm
      ESZD55 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
5	658.5	250.0	169.2	84.4	66.0	68.0
6	814.0	300.0	225.5	107.9	86.0	98.5

All dimensions are reference only unless specifically toleranced.

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DUAL SADDLE (BOTH DRIVING)

EACH DRIVE HOUSING IS CONNECTED
TO THE BELT. MOTOR MOUNTING Wxxxx
CODE APPLIES TO BOTH DRIVE
HOUSINGS AND IS INDEPENDENT OF
THE OTHER DRIVE HOUSING.

REFER TO SERIES ESZS DIMENSIONS PAGE FOR DATA NOT SHOWN

NOTES:
1) DIMENSIONS: mm
2) SADDLES SHOWN IN MID POSITION
3) UNIT SHOWN IS REPRESENTATIVE OF AN0 ESZG55 WITH 0 mm TRAVEL
4) PHD RECOMMENDS TO ADD 50 mm TO THE TOTAL WORKING TRAVEL FOR SAFETY (25 mm PER END)
5) SADDLE TO SADDLE DISTANCE SHOWN IS THE MINIMUM ALLOWED BETWEEN SADDLES. IF ADDITIONAL DISTANCE BETWEEN SADDLES IS REQUIRED, ADD APPROPRIATE LENGTH TO TOTAL TRAVEL IN 50 mm INCREMENTS

EXAMPLES:
SIZE 5 WITH 500 mm TRAVEL WITH STANDARD "DB" DISTANCE OF 250 mm
   ESZG55 x 500 -RTxxx (NO ADDITIONAL STROKE ADDER NEEDED)
SIZE 5 WITH 500 mm TRAVEL WITH "DB" DISTANCE OF 350 mm
   ESZG55 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
5	658.5	250.0	169.2	84.4	66.0	68.0
6	814.0	300.0	225.5	107.9	86.0	98.5

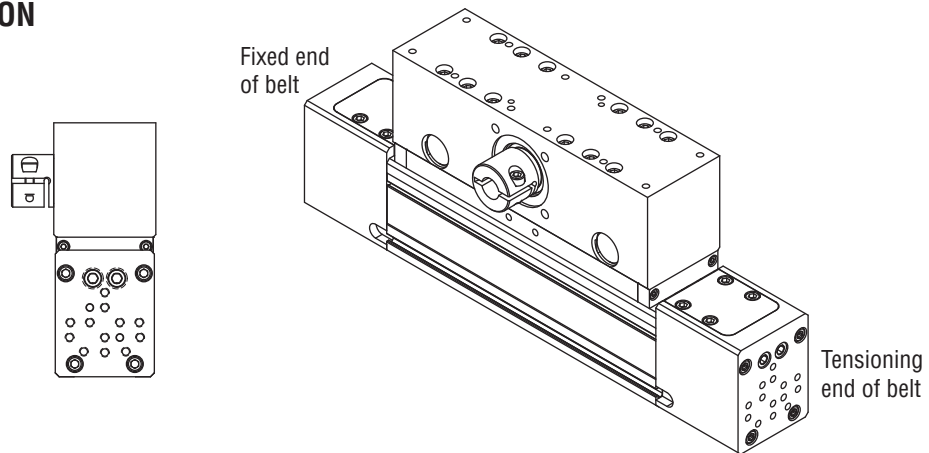All dimensions are reference only unless specifically toleranced.

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QL11 INLINE MOTOR MOUNTING WITH 1:1 DRIVE RATIO (STANDARD)

SIZE	-QL11						-QL11-W0000	
	MMA	MMB MAX	MMB MIN	MMC STANDARD	MMC OVERSIZE	WEIGHT kg	MMC	MMD
5	27.0	31.0	12.5	68.5	88.0	0.36	88.0	19.0
6	32.2	33.0	14.0	88.0	115.0	0.54	115.0	24.0

MMA

MMB VARIES WITH MOTOR/GEARBOX

YOUR MOTOR

MMC SQ VARIES WITH MOTOR/GEARBOX

Ø MMD

W CODE
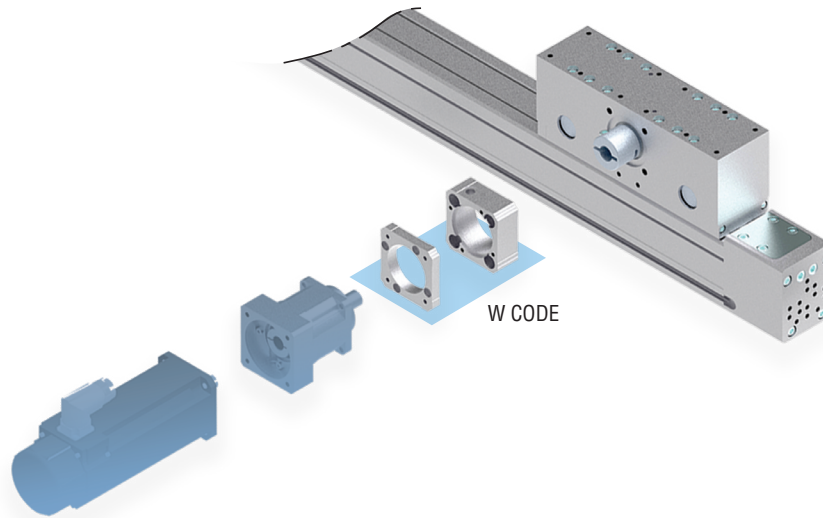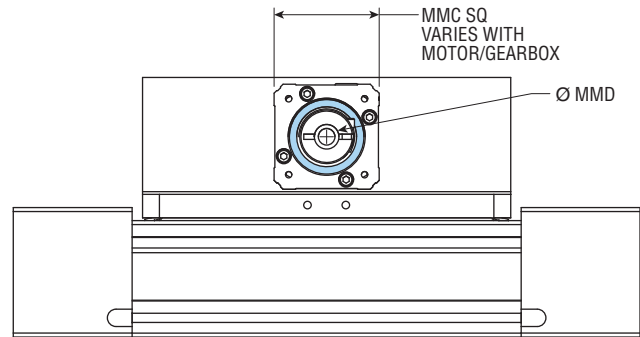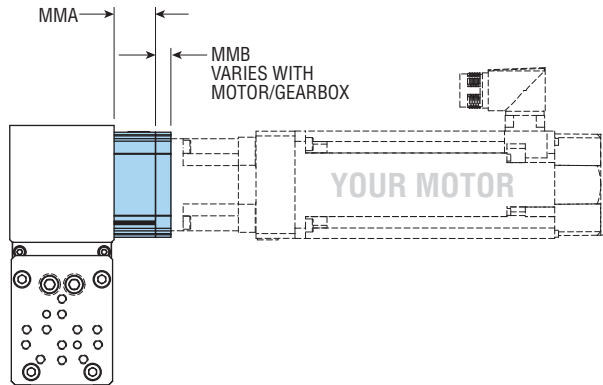
H71 LEFT HAND DRIVE SHAFT ORIENTATION

Fixed end of belt

Tensioning end of belt

All dimensions are reference only unless specifically toleranced.

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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.

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

Your Motor
Your Way

Select your compatible motor of choice from the pre-populated motor database!

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.

Step 3 - CAD Configurator - config.phdinc.com
- Select your motor from the drop down menus or request a new motor if the preferred motor is not on the list.
- The generated motor mount code for the compatible motor will complete the ordering data necessary to download 3D CAD model or order the actuator tailored to your specific application.
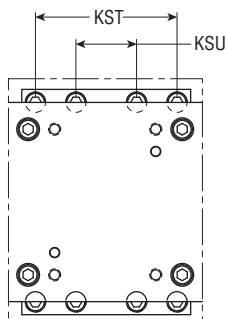
KSxxxx END AND MID MOUNTING

ESZx56 = 8X MOUNTING

REPRESENTATIVE OF KSxx1

REPRESENTATIVE OF KSx1x
KSx1x INCLUDES ONE SET OF BRACKETS. KSx2x INCLUDES TWO SETS OF BRACKETS ETC. SHOWN IN APPROX. MID LOCATION, MAY BE POSITIONED ANYWHERE ALONG TUBE AS LONG AS WITHIN APPLICATION SPECIFICATIONS.

ESZx55 = 6X MOUNTING

REPRESENTATIVE OF KS1xx

KSM THREAD
KSP THREAD
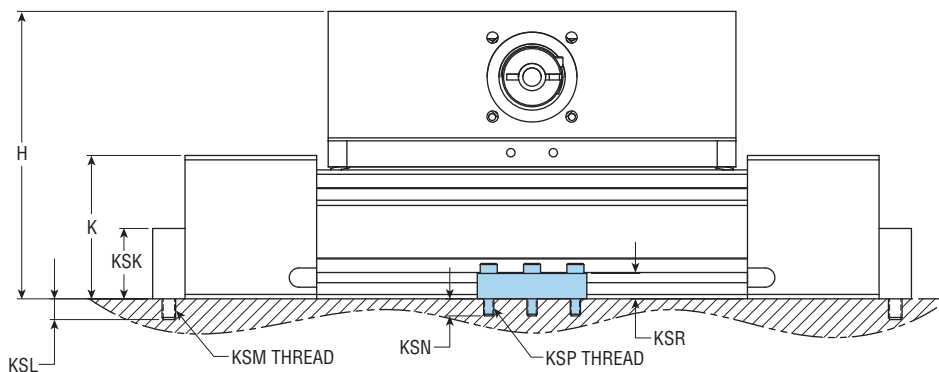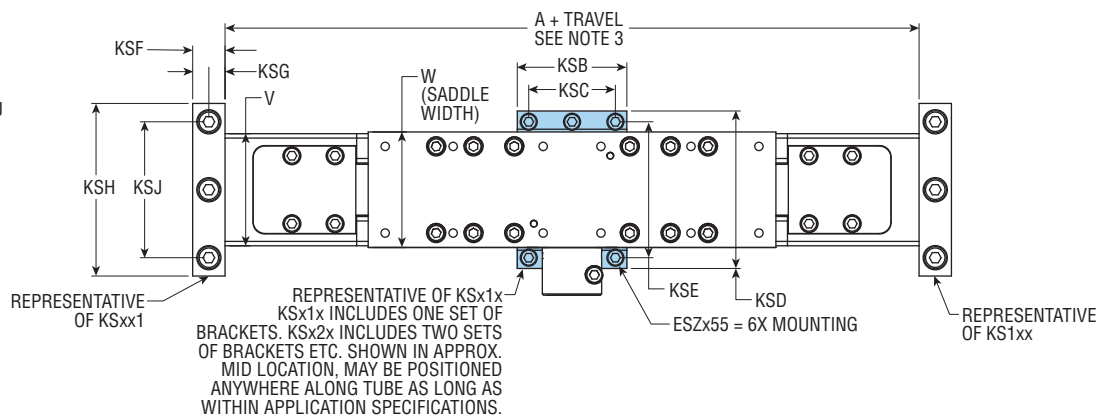
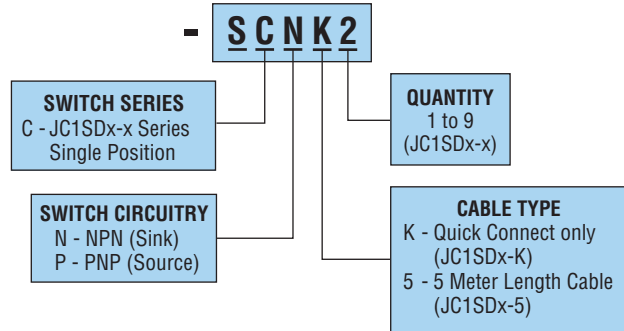| SIZE	A	H	K	V	W	KSB	KSC	KSD	KSE	KSF	KSG	KSH	KSJ	KSK	KSL	KSM	KSN	KSP	KSR	KST	KSU
5	408.5	169.2	84.4	66.0	68.0	64.5	51.0	92.7	80.0	19.1	9.5	101.6	80.0	41.4	12.2	M8 x 1.25	10.0	M6 x 1.0	15.0	—	—
6	514.0	225.5	107.9	86.0	98.5	83.5	—	112.7	100.0	25.4	12.7	152.4	100.0	42.8	17.8	M10 x 1.5	12.5	M6 x 1.0	27.5	70.0	30.0

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

All dimensions are reference only unless specifically tolerated.

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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.

SWITCH BUNDLE (OPTIONAL)

- S C N K 2

SWITCH SERIES
C - JC1SDx-x Series Single Position

SWITCH CIRCUITRY
N - NPN (Sink)
P - PNP (Source)

QUANTITY
1 to 9 (JC1SDx-x)

CABLE TYPE
K - Quick Connect only (JC1SDx-K)
5 - 5 Meter Length Cable (JC1SDx-5)

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.
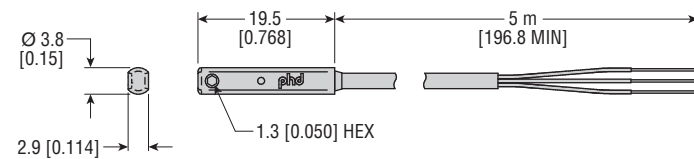
SERIES JC1SDx SINGLE POSITION SWITCHES

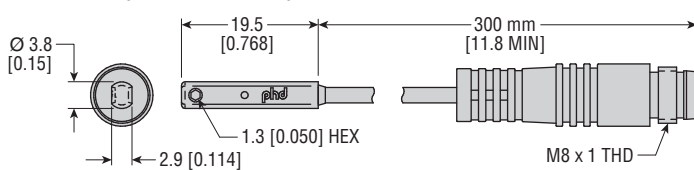| PART NO.	DESCRIPTION
JC1SDN-5	NPN (Sink) Solid State, 10-30 VDC, 5 m cable
JC1SDP-5	PNP (Source) Solid State, 10-30 VDC, 5 m cable
JC1SDN-K	NPN (Sink) Solid State, 10-30 VDC, Quick Connect
JC1SDP-K	PNP (Source) Solid State, 10-30 VDC, Quick Connect

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

Ø 3.8 [0.15]

19.5 [0.768]

5 m [196.8 MIN]

2.9 [0.114]

1.3 [0.050] HEX

JC1SDx-K (Quick Connect)

Ø 3.8 [0.15]

19.5 [0.768]

300 mm [11.8 MIN]

2.9 [0.114]

1.3 [0.050] HEX

M8 x 1 THD

63549-xx CORDSET

PIN 2/4 WIRE COLOR BLACK
PIN 1 WIRE COLOR BROWN
PIN 3 WIRE COLOR BLUE
Ø 10.2 [0.402]

19.3 [0.689]
34.8 [1.299]

All dimensions are reference only unless specifically toleranced.