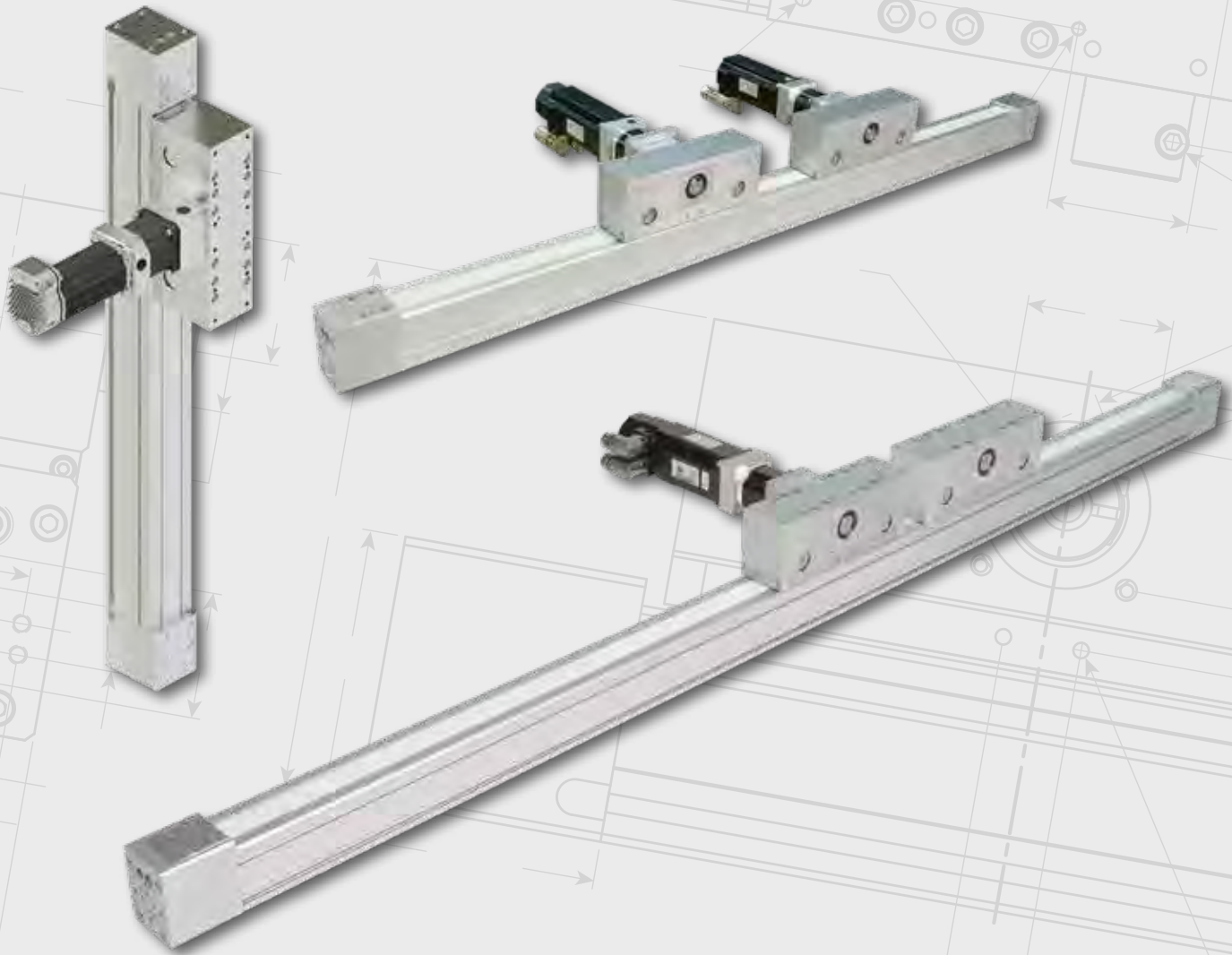


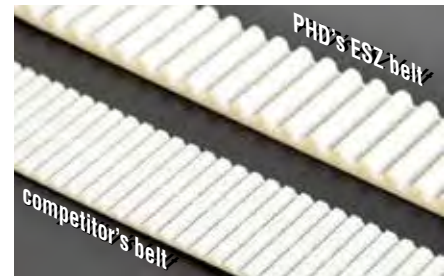
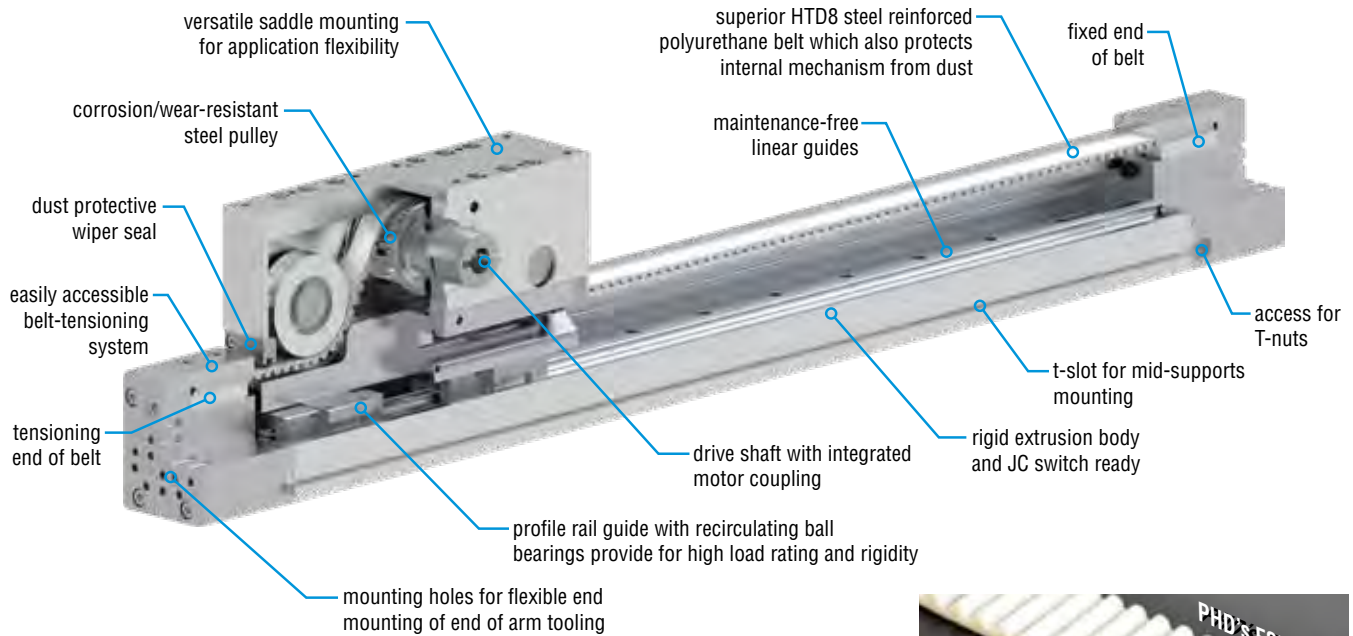
Electric Linear Cantilever Actuator

- Provides a robust “Z” axis vertical cantilever with a fixed saddle and a fixed base solution for robotic systems
- Delivers unparalleled speed, thrust, and precision, making it ideal for a multitude of vertical and horizontal applications
- Dual saddles available for increased load and moment loading
- Independently powered dual saddles available for a wide range of uses

Your Motor
Your Way



SERIES ESZ BELT-DRIVEN LINEAR CANTILEVER ACTUATOR

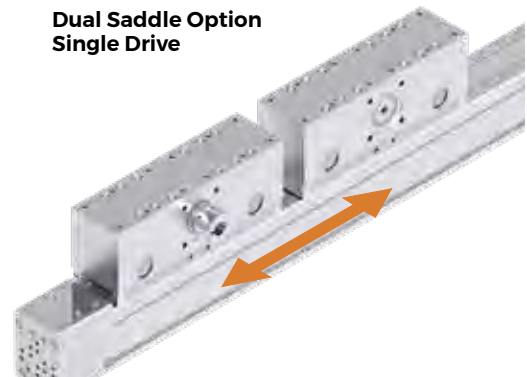


Your Motor Your Way

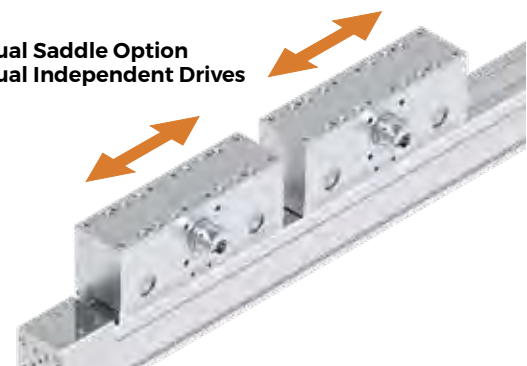
Major Benefits

- 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/s²
- 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.

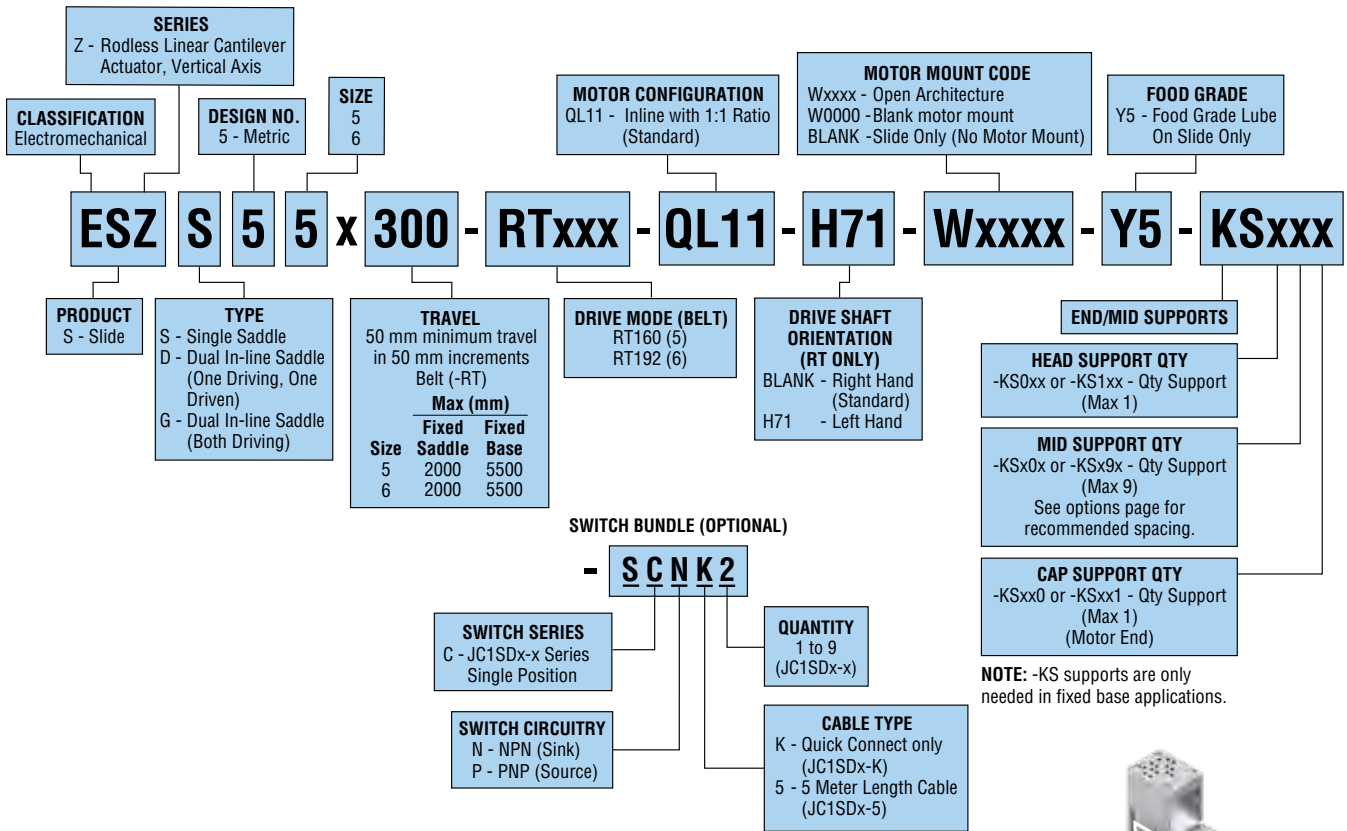
Dual Saddle Option
Single Drive



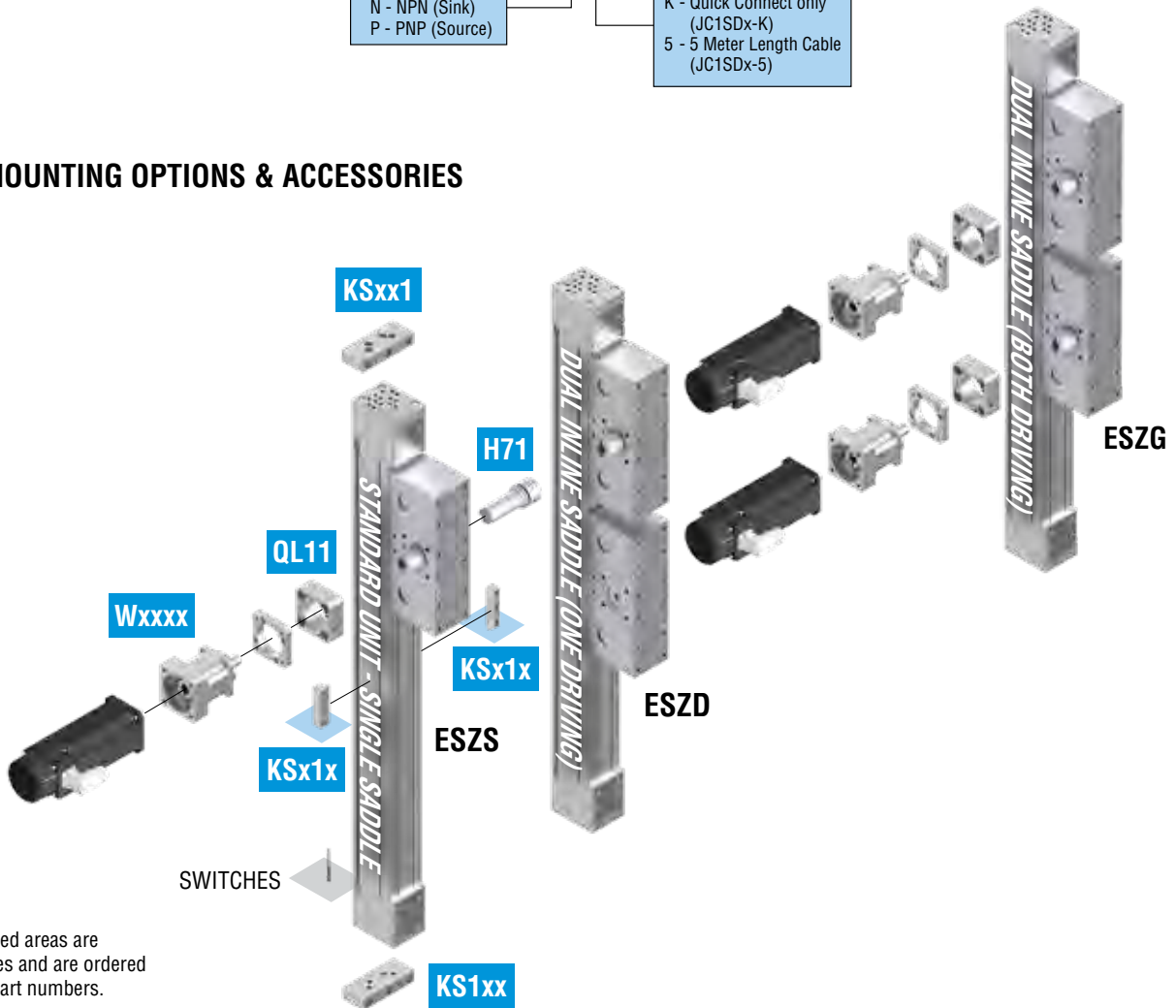
Dual Saddle Option
Dual Independent Drives



ORDERING DATA: Series ESZ Linear Cantilever Actuator



MOUNTING OPTIONS & ACCESSORIES



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

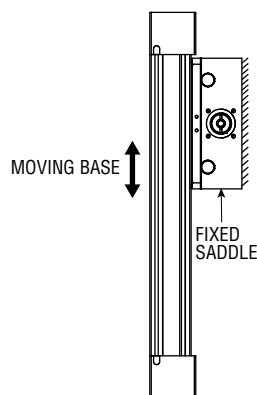
ENGINEERING DATA: Series Series ESZ Linear Cantilever Actuator

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	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]
THRUST SPEED	PULLEY DIAMETER	mm [in]	50.93 [2.005]	61.12 [2.406]
	MAXIMUM SPEED	mm/sec [in/sec]	5000 [197]	
TORQUE	MAXIMUM ACCELERATION	m/sec ² [in/sec ²]	50 [1970]	
	MAXIMUM THRUST	N [lbf]	1600 [360]	3330 [748]
	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	6.26E-03			1.01E-02			
	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
		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]	3.27E-03	—	—	9.65E-03	—	—		
	DUAL SADDLE- ACTUATOR @ ZERO TRAVEL (J ₀)	FIXED SADDLE	lb-in ²	—	14.694	14.694	—	42.642	42.642	
			[kg-m ²]	—	4.29E-03	4.29E-03	—	1.25E-02	1.25E-02	
	LENGTH ADDER (J _L)	FIXED SADDLE	lb-in ² /in	0.353			0.820			
			kg-m ² /mm	4.06E-06			9.43E-06			
	MOVING WEIGHT ADDER	FIXED SADDLE	lb-in ² /in	1.005			1.448			
			kg-m ² /kg	6.48E-04			9.34E-04			

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

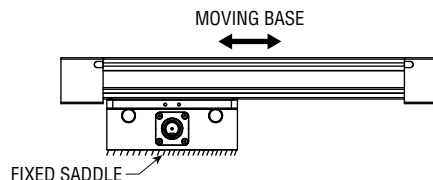
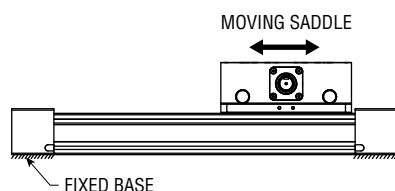


WEIGHT AND INERTIAL CALCULATIONS:

$$\text{TOTAL WEIGHT} = W_{OT} + (W_{LT} \times \text{TRAVEL}) + \text{MOTOR MOUNT WEIGHT}$$

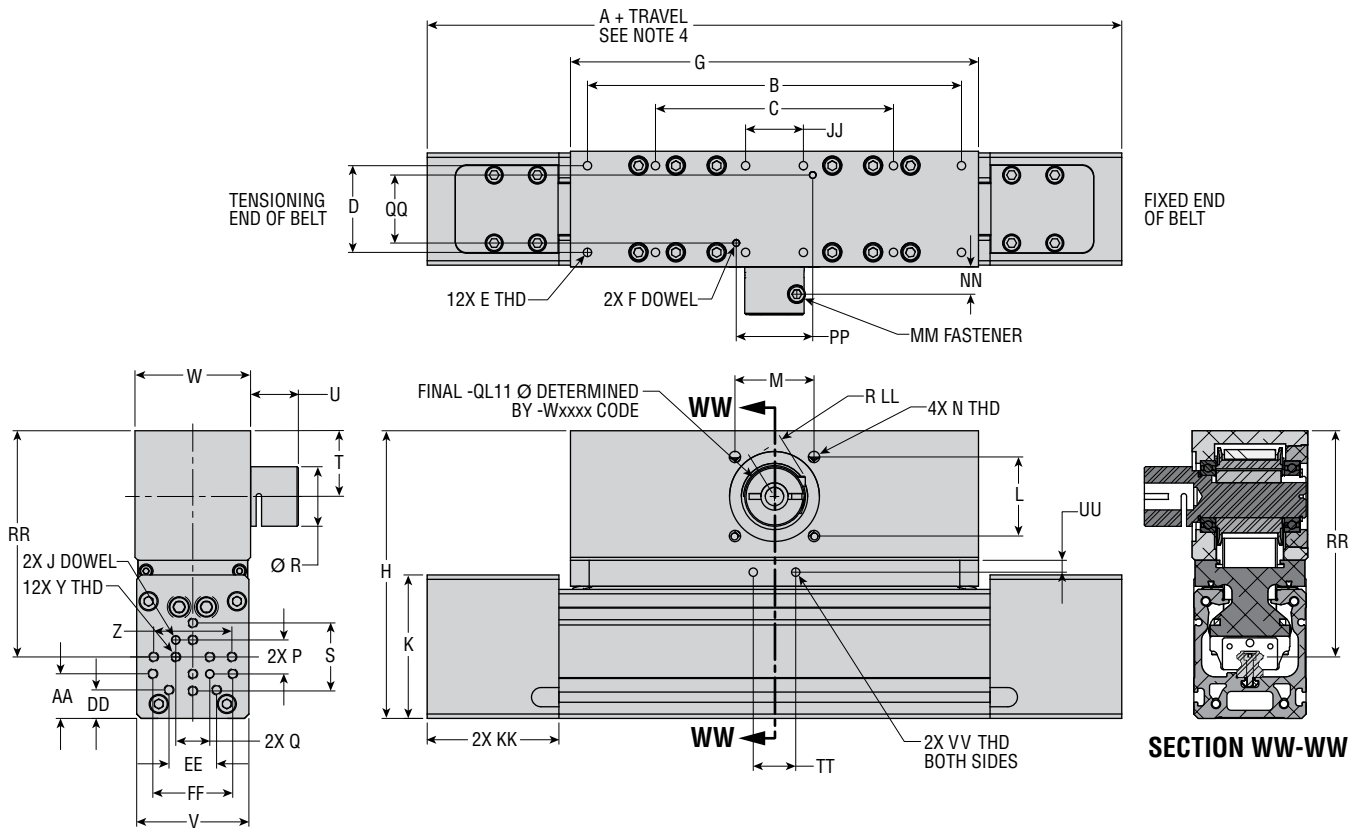
$$\text{TOTAL MOVING WEIGHT} = W_{OM} + (W_{LM} \times \text{TRAVEL}) + \text{EXTERNAL PAYLOAD}$$

$$\text{INERTIA}_{\text{Reflected}} = J_0 + (J_L \times \text{TRAVEL}) + (J_M \times \text{TOTAL MOVING WEIGHT})$$



DIMENSIONS: Series ESZS Linear Cantilever Actuator

STANDARD UNIT



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

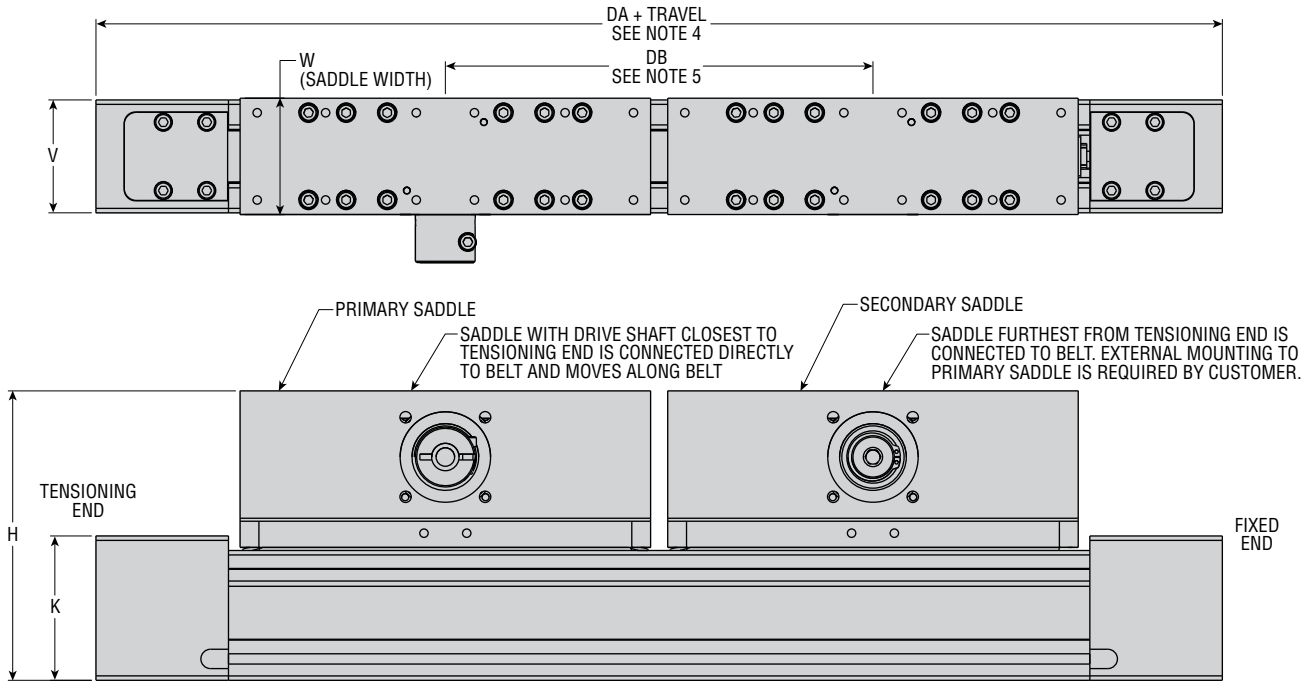
NOTES:

- 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.

DIMENSIONS: Series ESZD Linear Cantilever Actuator

DUAL SADDLE (ONE DRIVING)



REFER TO SERIES ESZS DIMENSIONS PAGE FOR DATA NOT SHOWN

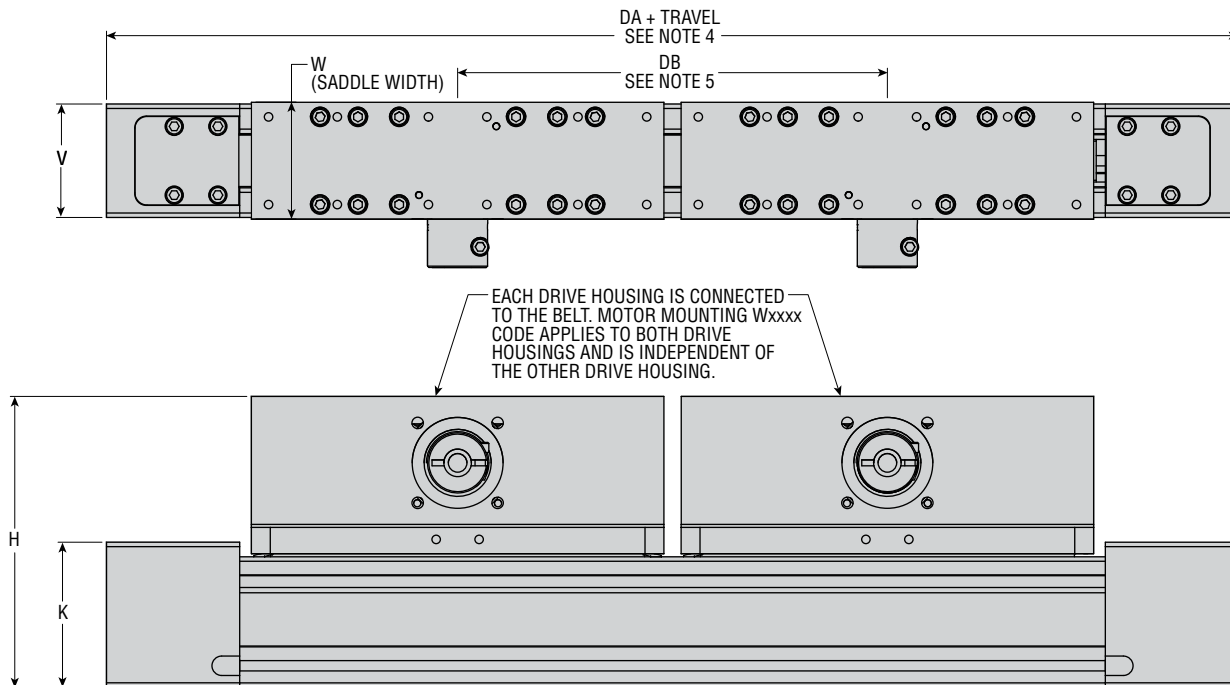
NOTES:

- 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.

DUAL SADDLE (BOTH DRIVING)



REFER TO SERIES ESZS DIMENSIONS PAGE FOR DATA NOT SHOWN

NOTES:

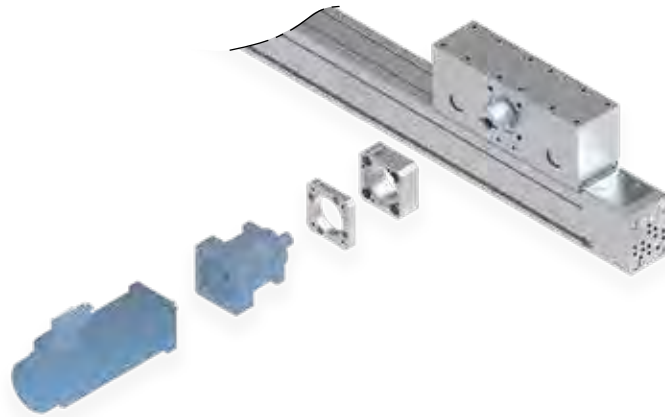
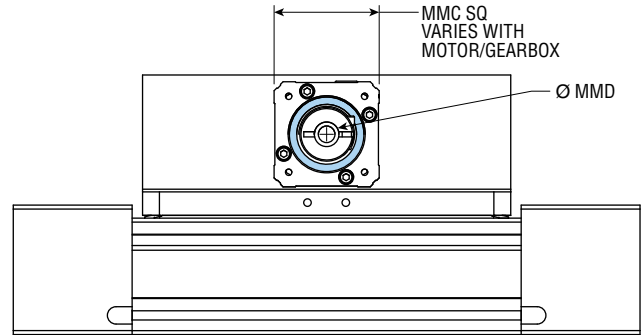
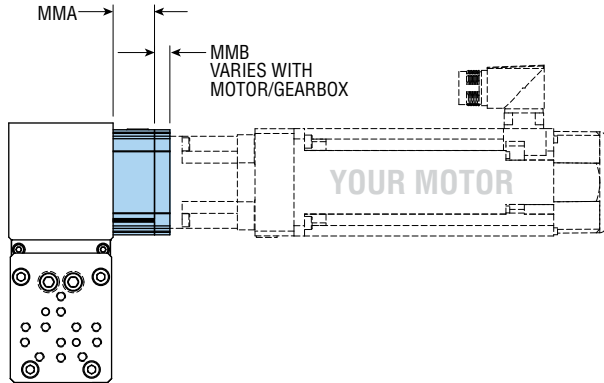
- 1) DIMENSIONS: mm
 - 2) SADDLES SHOWN IN MID POSITION
 - 3) UNIT SHOWN IS REPRESENTATIVE OF AN0 ESZG55 WITH 0 mm TRAVEL
 - 4) PHD RECOMMENDS TO ADD 50 mm TO THE TOTAL WORKING TRAVEL FOR SAFETY (25 mm PER END)
 - 5) SADDLE TO SADDLE DISTANCE SHOWN IS THE MINIMUM ALLOWED BETWEEN SADDLES. IF ADDITIONAL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

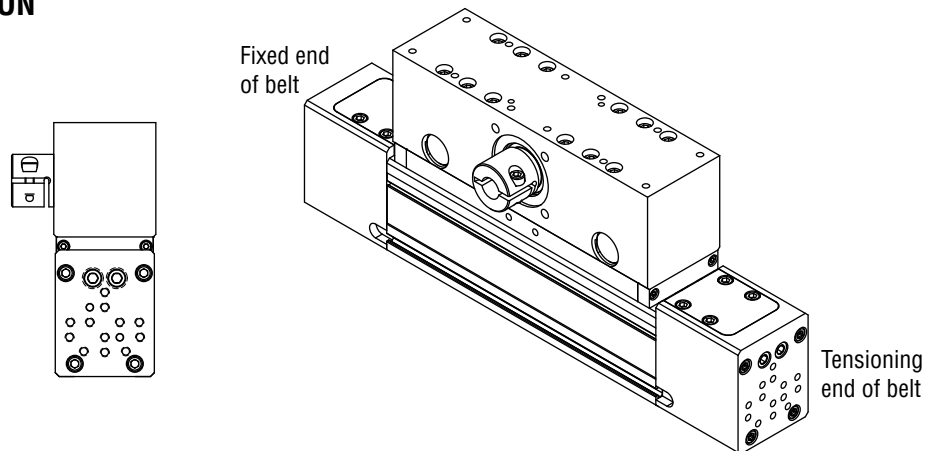
All dimensions are reference only unless specifically toleranced.

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



H71 LEFT HAND DRIVE SHAFT ORIENTATION



All dimensions are reference only unless specifically toleranced.

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

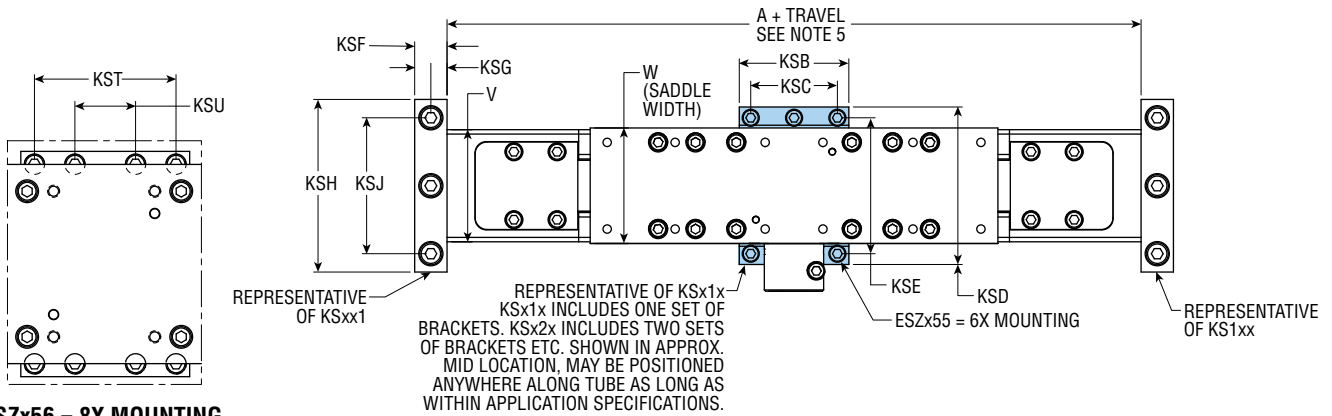
- Select your motor from the drop down menus or request a new motor if the preferred motor is not on the list.
- The generated motor mount code for the compatible motor will complete the ordering data necessary to download 3D CAD model or order the actuator tailored to your specific application.

Y5 FOOD GRADE

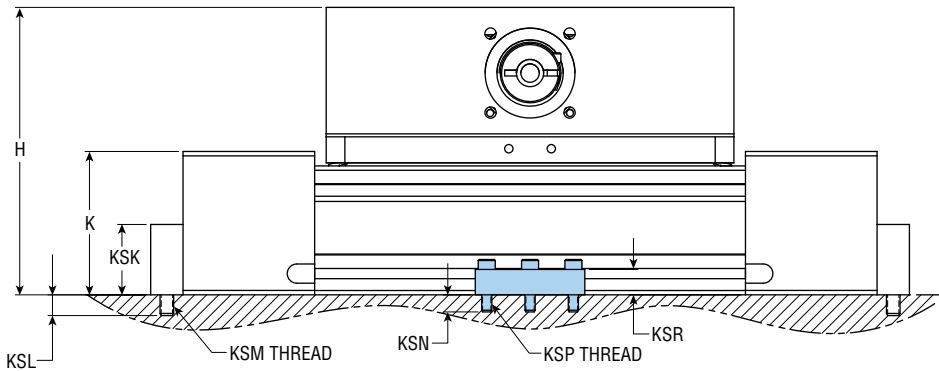
Food grade lubricant replaces all standard lubricants.

KSxxxx

END AND MID MOUNTING



ESZx56 = 8X MOUNTING



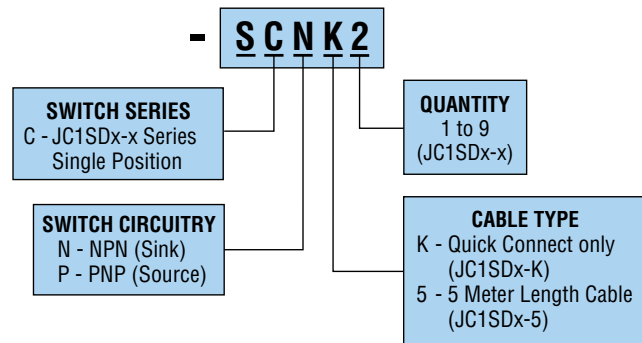
SIZE	A	H	K	V	W	KSB	KSC	KSD	KSE	KSF	KSG	KSH	KSJ	KSK	KSL	KSM	KSN	KSP	KSR	KST	KSU
55	408.5	169.2	84.4	66.0	68.0	64.5	51.0	92.7	80.0	19.1	9.5	101.6	80.0	41.4	12.2	M8 x 1.25	10.0	M6 x 1.0	15.0	—	—
56	514.0	225.5	107.9	86.0	98.5	83.5	—	112.7	100.0	25.4	12.7	152.4	100.0	42.8	17.8	M10 x 1.5	12.5	M6 x 1.0	27.5	70.0	30.0

All dimensions are reference only unless specifically toleranced.

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)



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.



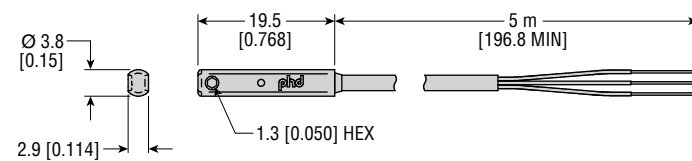
SERIES JC1SDx SINGLE POSITION SWITCHES

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

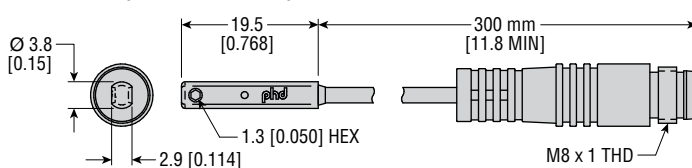
SERIES JC1SDx CORDSET

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

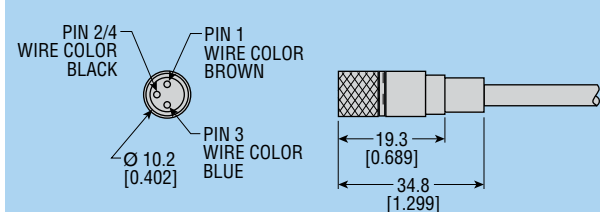
JC1SDx-5



JC1SDx-K (Quick Connect)



63549-xx CORDSET



All dimensions are reference only unless specifically tolerated.



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