

DATA SHEET

Series 160, 161 & 162

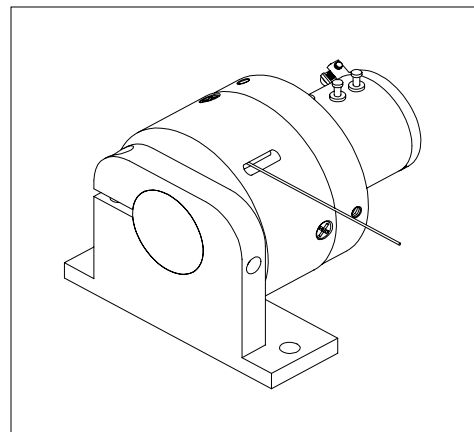
Analog-Output Miniature Position Transducers



S021H(M): page 1 of 4

KEY FEATURES

- 42.5-Inch (1080-mm) Maximum Travel (Series 162)
- Analog Signal Using Precision Conductive Plastic/Hybrid Potentiometers
- Threaded Drum for Enhanced Repeatability
- Bearing-Mounted Rotating Components
- Optional Flexible Mounting Bases



POTENTIOMETER SPECIFICATIONS

	<u>1-turn</u>	<u>3-turn</u>	<u>5-turn</u>
Potentiometer Type	1-turn, conductive plastic	3-turn, hybrid construction	5-turn, hybrid construction
Resistance: Value, Tolerance	5K ohms, $\pm 20\%$	5K ohms, $\pm 5\%$	5K ohms, $\pm 5\%$
Travel: Electrical, Mechanical	340°, 360°	1080°, 1080° $\pm 10^\circ$ -0°	1800°, 1800° $\pm 10^\circ$ -0°
Mechanical Life	10 million shaft revolutions	5 million shaft revolutions	5 million shaft revolutions
Power Rating	1.0 watts at 158° F (70° C)	1.5 watts at 158° F (70° C)	2.0 watts at 158° F (70° C)
Max. Indep. Linearity Error	$\pm 1.0\%$ per VRCI-P-100A	$\pm 0.5\%$ per VRCI-P-100A	$\pm 0.35\%$ per VRCI-P-100A
Output Smoothness	< 0.1%	0.5% max.	0.35% max.
Insulation Resistance	100 Mohms at 1000 VDC min.	1000 Mohms at 500 VDC min.	1000 Mohms at 500 VDC min.
Dielectric Strength	1000 VDC	1000 VDC	1000 VDC
Resolution	infinite signal	infinite signal	infinite signal
Operating Temperature	-40° to 257° F (-40° to 125° C)	-67° to 257° F (-55° to 125° C)	-67° to 257° F (-55° to 125° C)
Electrical Connection	3-terminal (1, 2, 3)	3-terminal (CW, CCW, S)	3-terminal (CW, CCW, S)
Shock	50 g for 11 ms	100 g for 6 ms	100 g for 6 ms
Vibration	10 to 2000 Hz at 15 g	10 to 2000 Hz at 15 g	10 to 2000 Hz at 15 g
Temperature Coefficient (Max.)	± 400 ppm/°C	$\pm 0.007\%/^\circ\text{C}$	$\pm 0.007\%/^\circ\text{C}$
Output Signal	analog signal from 0 to supply voltage (voltage divider circuit)		
Max. Supply Current	12 mA		
Max. Supply Voltage	35 VDC / 35 VAC (using voltage divider circuit)		

OTHER SPECIFICATIONS

Case Materials	precision-machined anodized 2024 aluminum
Displacement Cable	0.018-inch (0.46-mm) dia., 7-by-7 stranded stainless steel, 40-lb (177-N) min. breaking strength. A minimum of 12 inches (305 mm) of displacement cable is provided with an uncrimped loop sleeve and pull ring for connection to the application. The 160001-01 installation kit is available if you do not have a suitable crimping solution.
Electrical Connections	Three solder terminals. Customer-specified electrical cable and connectors available upon request.

Approximate Weight

Series 160	Series 161	Series 162
4 oz. 113 g	6.1 oz. 170 g	9 oz. 255 g

Environmental Protection

NEMA 4 / IP 56, DO-160D Env. Cat. E1E1ABXHRFDFSAXXXXXXXXXXX (with optional sensor cover)

A Small, Flexible Alternative to LVDTs and Linear Potentiometers

Specifications Subject to Change Without Prior Notice.

SpaceAge Control, Inc.
38850 20th Street East, Palmdale, CA 93550 USA

661-273-3000
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S021H(M): page 2 of 4

MODEL NUMBERS AND CABLE TENSIONS: Series 160

Model	Range		Nominal Cable Tension Range (Full Retraction to Full Extraction)							
	inches	mm	Opt 5: -.050 spring		Opt 6: -.060 spring		Opt 7: -.070 spring		Opt 8: -.080 spring	
			oz.	N	oz.	N	oz.	N	oz.	N
160-0161	2.00	51	9 to 15	3 to 4	16 to 25	4 to 7	30 to 37	8 to 10	40 to 55	11 to 15
160-0241	3.00	76	7 to 12	2 to 3	10 to 18	3 to 5	60 to 80	17 to 22	40 to 55	11 to 15
160-0321	4.00	102	4 to 8	1 to 2	5 to 12	1 to 4	12 to 20	3 to 6	28 to 55	7 to 16
160-0483	6.00	152	10 to 21	3 to 6	12 to 30	3 to 8	48 to 72	13 to 20	75 to 160	21 to 45
160-0643	8.00	203	7 to 17	2 to 5	9 to 24	3 to 7	22 to 38	6 to 11	40 to 120	11 to 33
160-0803	10.00	254	6 to 13	2 to 4	8 to 19	2 to 5	16 to 32	4 to 9	35 to 100	10 to 28
160-0963	12.00	305	5 to 11	1 to 3	7 to 19	2 to 5	14 to 27	4 to 8	24 to 82	7 to 23
160-1085	13.50	343	7 to 20	2 to 6	12 to 28	3 to 8	18 to 53	5 to 15	30 to 134	8 to 37
160-1285	16.00	406	6 to 17	2 to 5	8 to 24	2 to 7	19 to 40	5 to 11	17 to 102	5 to 28
160-1505	18.75	476	5 to 14	1 to 4	8 to 120	2 to 6	15 to 39	4 to 11	24 to 74	6 to 21
160-1705	21.25	540	5 to 12	1 to 3	7 to 19	2 to 5	12 to 33	3 to 9	14 to 79	4 to 22
161-0461	5.75	146	-	-	4 to 15	1 to 4	13 to 32	4 to 9	35 to 50	10 to 14
161-1283	16.00	406	-	-	6 to 12	2 to 3	10 to 25	3 to 7	14 to 70	4 to 19
161-1915	23.88	606	-	-	5 to 17	1 to 5	13 to 30	4 to 8	20 to 80	6 to 22
161-2145	26.75	679	-	-	7 to 14	2 to 4	10 to 25	3 to 7	11 to 60	3 to 17
161-2405	30.00	762	-	-	5 to 12	1 to 3	8 to 23	2 to 6	9 to 60	3 to 17
162-2735	34.13	867	-	-	-	-	8 to 21	2 to 6	25 to 40	7 to 11
162-2945	36.75	933	-	-	-	-	7 to 20	2 to 6	15 to 44	4 to 12
162-3205	40.00	1016	-	-	-	-	7 to 18	3 to 5	10 to 43	3 to 12
162-3405	42.50	1080	-	-	4 to 14	1 to 4	7 to 17	2 to 5	8 to 41	2 to 11

Bolded entries are standard cable tension and are the default unless overridden on the purchase order.

Model	Maximum Cable Acceleration (g's)			
	Opt 5: -.050 spring	Opt 6: -.060 spring	Opt 7: -.070 spring	Opt 8: -.080 spring
160-0161	10	19	35	46
160-0241	14	22	123	82
160-0321	8	10	23	69
160-0483	38	54	173	357
160-0643	43	55	147	427
160-0803	38	64	121	242
160-0963	30	42	103	182
160-1085	55	65	109	165
160-1285	42	47	99	105
160-1505	16	49	98	127
160-1705	30	40	75	70
161-0461	5	8	16	23
161-1283	-	38	76	126
161-1915	51	72	133	205
161-2145	50	70	130	201
161-2405	40	56	72	95
162-2735	-	-	60	84
162-2945	-	-	48	73
162-3205	-	-	37	63
162-3405	-	18	31	45

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S021H(M): page 3 of 4

ORDERING CODE 16_ _ _ _ _abcd (example: 160-0321-S5SB (cable exit: slot, cable tension: -050, sensor cover, and base: big foot))

Series 160

a->	S	cable exit: slot (_60)
	C	cable exit: cable guide (_60); pn 160045-1
	D	cable exit: idler (_60); pn 160022; cannot be installed with cable guide
b->	5	cable tension: -050
	6	cable tension: -060
	7	cable tension: -070
	8	cable tension: -080
c->	N	no sensor cover (_60)
	S	sensor cover (_60); pn 160060
d->	D	base: mounting disk (_6_); 160040-1
	S	base: standard (_60); pn 160015-1
	U	base: universal (_60); pn 160030-1
	B	base: big foot (_60/_61); pn 160015-13
	H	base: h (_60); pn 160015-G1

Series 161

a->	S	cable exit: slot (_61)
	C	cable exit: cable guide (_61); pn 160045-3
	D	cable exit: idler (_61/_62); pn 161022; cannot be installed with cable guide
b->	5	cable tension: -050
	6	cable tension: -060
	7	cable tension: -070
	8	cable tension: -080
c->	N	no sensor cover (_61)
	S	sensor cover (_61); pn 160060
d->	D	base: mounting disk (_6_); 160040-1
	S	base: standard (_61); pn 160015-3
	U	base: universal (_61); pn 160030-3
	B	base: big foot (_60/_61); pn 160015-13

Series 162

a->	S	cable exit: slot (_62)
	C	cable exit: cable guide (_62); pn 160045-5
	D	cable exit: idler (_61/_62); pn 161022; cannot be installed with cable guide
b->	5	cable tension: -050
	6	cable tension: -060
	7	cable tension: -070
	8	cable tension: -080
c->	N	no sensor cover (_62)
	S	sensor cover (_62); pn 160060
d->	D	base: mounting disk (_6_); 160040-1
	S	base: standard (_62); pn 160015-5
	U	base: universal (_62); pn 160030-5
	B	base: big foot (_62); pn 160015-15

* for factory crimping of hardware to displacement cable, indicate excess cable length to be provided and hardware type; 160001-01 installation kit is also available for this task

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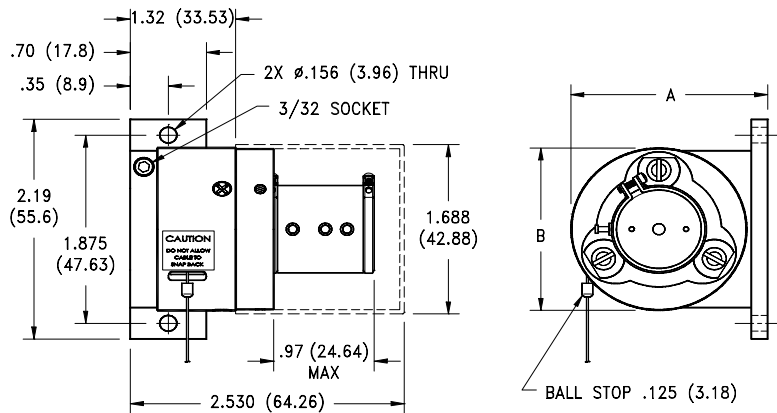
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S021H(M): page 4 of 4

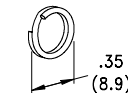
DIMENSIONS: shown with slot cable exit, standard base, and optional sensor cover.



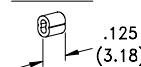
SERIES	A	B
160	1.81 (46.0)	1.62 (41.1)
161	2.43 (61.7)	2.24 (56.9)
162	3.19 (81.0)	2.99 (75.9)

ALL DIMENSIONS ARE IN INCHES (MM)
AND WITHOUT SENSOR COVER

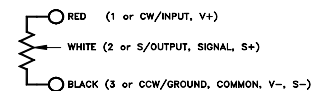
PULL RING



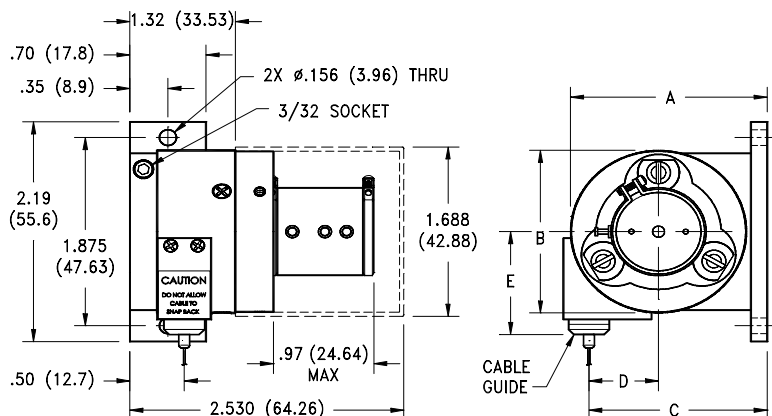
LOOP SLEEVE



ELECTRICAL SCHEMATIC



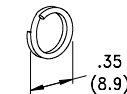
DIMENSIONS: shown with cable guide cable exit, standard base, and optional sensor cover.



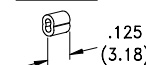
SERIES	A	B	C	D	E
160	1.81 (46.0)	1.62 (41.1)	1.64 (41.7)	.64 (16.3)	1.03 (26.2)
161	2.43 (61.7)	2.24 (56.9)	2.26 (57.4)	.95 (24.1)	1.34 (34.0)
162	3.19 (81.0)	2.99 (75.9)	3.02 (76.7)	1.33 (33.8)	1.71 (43.4)

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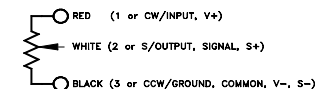
PULL RING



LOOP SLEEVE

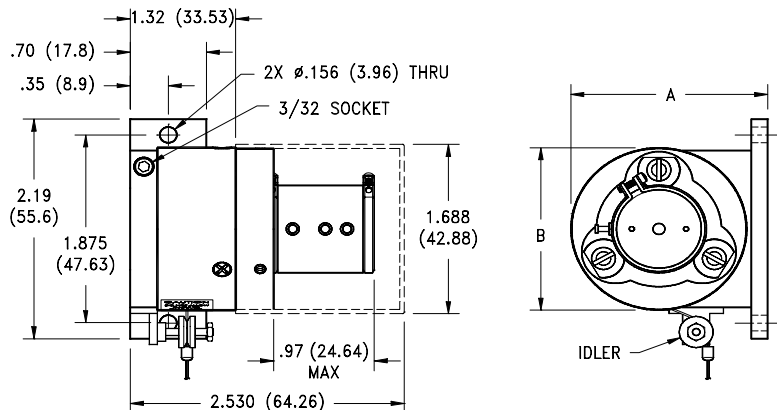


ELECTRICAL SCHEMATIC



DIMENSIONS: shown with idler cable exit, standard base, and optional sensor cover.

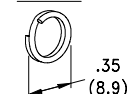
Note: Idler cable exit will reduce displacement cable life and may reduce maximum range by up to 0.75 inch (19.1 mm).



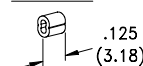
SERIES	A	B
160	1.81 (46.0)	1.62 (41.1)
161	2.43 (61.7)	2.24 (56.9)
162	3.19 (81.0)	2.99 (75.9)

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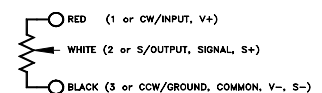
PULL RING



LOOP SLEEVE



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