

# DV301

## Instrument Grade • Position/Velocity

### Position and Velocity Output Signals

Stroke Range Options: 0–2 to 0–100 inches

Powder Painted & Anodized Aluminum Enclosure

Industrial Automation & Testing Applications

### GENERAL

Full Stroke Range Options	0-2 to 0-100 inches
Measuring Cable	see ordering information
Enclosure Material	powder-painted and anodized aluminum
Weight	2 lbs. max.

### POSITION

Output Signal	voltage divider (potentiometer)
Accuracy	$\pm 0.25\%$ to $\pm 0.10\%$ full stroke (see ordering information)
Repeatability	$\pm 0.02\%$ full stroke
Resolution	essentially infinite
Sensor	plastic-hybrid precision potentiometer
Input Resistance Options	500, 1K, 5K or 10K $\Omega$
Power Rating, Watts	2.0 at 70°F derated to 0 at 250° F
Maximum Input Voltage	see ordering information
Output Signal Change Over Full Stroke Range	94% $\pm 4\%$ of input voltage

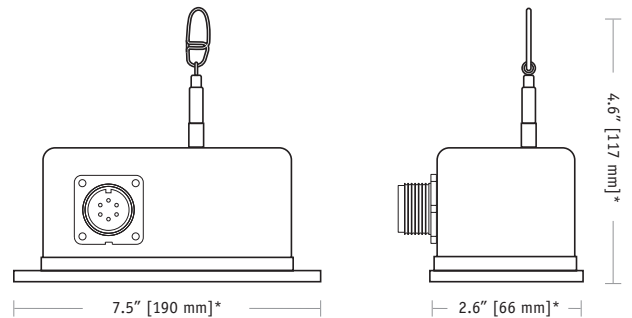
### VELOCITY

Output Signal	DC tachometer output
Linearity	better than $\pm 0.10\%$ of output at any velocity
Repeatability	$\pm 0.10\%$ of reading
Maximum Velocity • Retraction Acceleration	see ordering information
Sensor	tach generator
Input Voltage	none required
Output Voltage @ 100 inches per minute	see ordering information
Output Impedance	350 ohms $\pm 10\%$
Output Ripple (when output $\geq 280$ mV)	$\pm 3\%$ rms

### ENVIRONMENTAL

Enclosure	IP50, NEMA 1
Operating Temperature	-40° to 200°F (-40° to 90°C)
Vibration	up to 10 g to 2000 Hz maximum

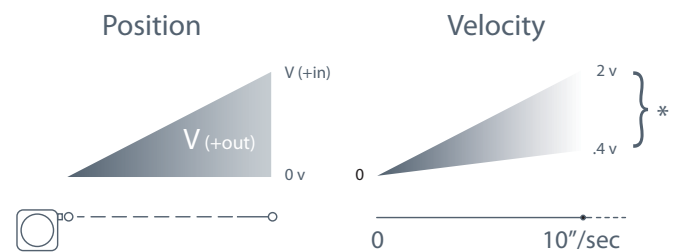
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\*50-inch range model, dimensions may differ for other ranges

The DV301 is a combination position and velocity transducer for full-scale measurement ranges from 2 to 100 inches. A precision plastic-hybrid potentiometer provides accurate position feedback while a self-generating DC tachometer provides a velocity signal that is proportional to the speed of the traveling stainless-steel measuring cable.

### Electrical Output Signals

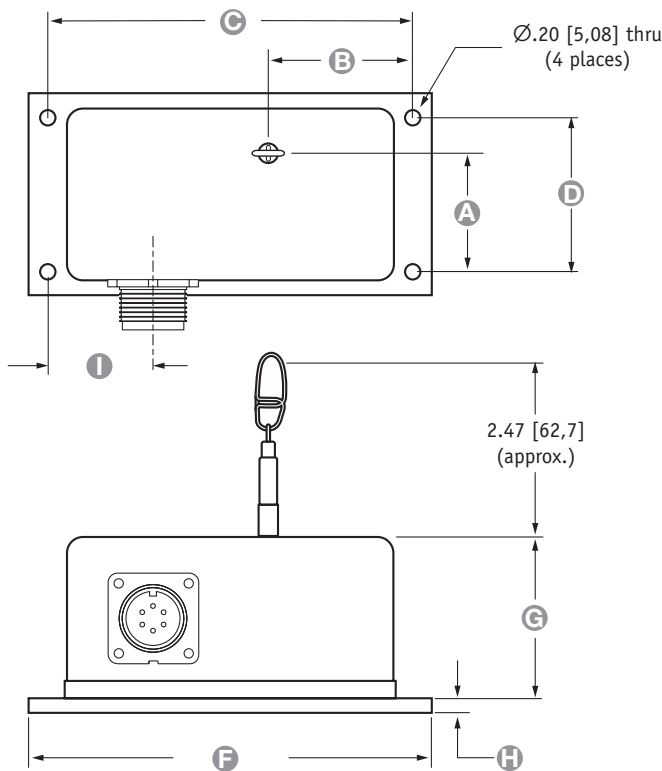


\*varies by stroke range – see ordering information



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Fig. 1, Top Exit:



ALL DIMENSIONS ARE IN INCHES [MM]  
tolerances are ±0.02 in. [±0,5mm]

ALL DIMENSIONS ARE IN INCHES [MM] • tolerances are ±0.02 in. [±0,5mm]

Range	A	B	C	D	E	F	G	H	I
2", 10", 20"	1.34 [34,0]	4.00 [101,6]	7.00 [177,8]	2.00 [50,8]	2.63 [66,8]	7.50 [190,5]	2.10 [53,3]	.16 [4,1]	1.37 [34,8]
5", 25", 50"	1.85 [47,0]	4.00 [101,6]	7.00 [177,8]	2.00 [50,8]	2.63 [66,8]	7.50 [190,5]	2.10 [53,3]	.16 [4,1]	1.37 [34,8]
15", 30"	1.51 [38,4]	4.00 [101,6]	7.00 [177,8]	2.00 [50,8]	2.63 [66,8]	7.50 [190,5]	2.10 [53,3]	.16 [4,1]	1.37 [34,8]
40"	1.67 [42,4]	4.00 [101,6]	7.00 [177,8]	2.00 [50,8]	2.63 [66,8]	7.50 [190,5]	2.10 [53,3]	.16 [4,1]	1.37 [34,8]
60"	2.19 [55,6]	3.88 [98,5]	7.00 [177,8]	2.37 [60,2]	3.25 [82,5]	7.50 [190,5]	2.60 [66,0]	.19 [4,8]	1.37 [34,8]
75", 80"	2.52 [64,0]	4.38 [111,3]	6.75 [171,4]	2.50 [63,5]	3.63 [92,2]	7.50 [190,5]	2.86 [72,6]	.19 [4,8]	1.37 [34,8]
100"	3.18 [80,7]	5.18 [131,5]	7.38 [187,5]	3.00 [76,2]	4.25 [108,0]	8.00 [203,2]	3.80 [96,5]	.19 [4,8]	3.69 [93,7]

Ordering Information:

Model Number:

DV301 -      -      - 1 -      - 1 -      - 0  
order code:      R      A      B      C      D      E      F      G

Sample Model Number:

DV301 - 0025 - 111 - 1110

- R range: 25 inches
- A measuring cable tension: standard - 5 oz.
- C cable exit: top
- D output signals: 500 ohm position / DC tachometer velocity
- E electrical connection: 6-pin plastic connector

Full Stroke Range:

<b>R</b> order code:	0002	0005	0010	0015	0020	0025	0030	0040	0050	0060	0075	0100
full stroke range, min:	2 in.	5 in.	10 in.	15 in.	20 in.	25 in.	30 in.	40 in.	50 in.	60 in.	75 in.	100 in.
position accuracy (% of f.s.):	0.25%	0.25%	0.15%	0.15%	0.10%	0.15%	0.10%	0.10%	0.10%	0.10%	0.10%	0.10%
potentiometer cycle life*1:	2.5 x 10 <sup>6</sup>	2.5 x 10 <sup>6</sup>	5 x 10 <sup>5</sup>	5 x 10 <sup>5</sup>	5 x 10 <sup>5</sup>	5 x 10 <sup>5</sup>	5 x 10 <sup>5</sup>	2.5 x 10 <sup>5</sup>	2.5 x 10 <sup>5</sup>	2.5 x 10 <sup>5</sup>	2.5 x 10 <sup>5</sup>	2.5 x 10 <sup>5</sup>
velocity output signal (±3%)*2:	322 mV	130 mV	322 mV	217 mV	322 mV*3	130 mV	217 mV*3	165 mV*3	130 mV*3	112 mV	91 mV	66 mV

\*1 - 1 cycle is defined as the travel of the measuring cable from full retraction to full extension and back to full retraction \*2-at the rate of 100 inches per minute \*3 - output signal is reduced by 50% when Measuring Cable Tension options 2 or 3 is selected below

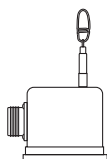
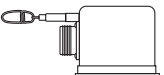
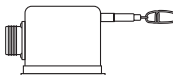
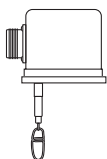
Ordering Information (cont.):

**Measuring Cable Tension:**

order code:	1	H	M	2*	3*
	standard tension tension, $\pm 30\%$ • max. acceleration	high tension tension, $\pm 40\%$	max tension tension, $\pm 40\%$	medium tension tension, $\pm 40\%$	high tension tension, $\pm 40\%$
2, 10, 20 inch range:	39 oz. • 25g	65 oz.	116 oz.	65 oz.	116 oz.
5, 25, 50 inch range:	16 oz. • 5g	26 oz.	47 oz.	26 oz.	47 oz.
15, 30 inch range:	26 oz. • 6g	44 oz.	78 oz.	44 oz.	78 oz.
40 inch range:	21 oz. • 11g	33 oz.	61 oz.	34 oz.	61 oz.
60 inch range:	13 oz. • 4g	22 oz.	40 oz.	22 oz.	40 oz.
75, 80 inch range:	17 oz. • 5g	31 oz.	n/a	31 oz.	61 oz.
100 inch range:	24 oz. • 10g	n/a	n/a	47 oz.	47 oz.
measuring cable:	.019-in. dia. nylon-coated stainless steel			.024-in. diameter stainless steel	

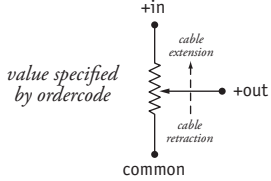

\*note – outline dimensions for these options are **not** controlled on this datasheet!

**Measuring Cable Exit:**

order code:	1	2	3	4
	top exit (see fig. 1)	front exit*	rear exit*	bottom exit*
				

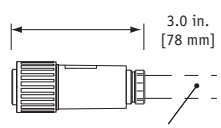
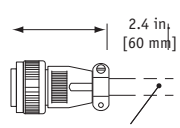
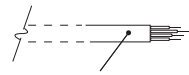
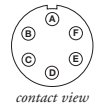
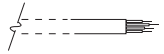
\*–note: dimensions for optional cable exits not controlled on this datasheet, please contact factory

**Output Signals:**

order code:	1	2	3	4
position sensing potentiometer:	500 ohms*	1000 ohms*	5000 ohms*	10,000 ohms*
	position sensing circuit	velocity sensing circuit		
				
				max. input voltage & power rating
				2-inch, 5-inch range    10-inch to 100-inch range
				500-ohms:    20 V AC/DC (1 W)    30 V AC/DC (2 W)
				1K to 10K-ohms:    30 V AC/DC (1 W)    30 V AC/DC (2 W)

\*–tolerance =  $\pm 10\%$

**Electrical Connection:**

order code:	1	3	4
	6-pin plastic connector with mating plug	6-pin metal connector with mating plug	25-ft. instrumentation cable 24 AWG, shielded
			
	1/2 - 5/16" [14 - 8 mm] cable dia. 16 AWG max conductor size connector: MS3102E-14S-6P mating plug: MS3106E-14S-6S	3/8-in. [9 mm] max cable dia. 16 AWG max conductor size connector: MS3102E-14S-6P mating plug: MS3106E-14S-6S	25 ft. x 0.2-in. dia. [7,5 M x 5 mm dia.] 24 AWG, shielded
	6-pin mating plug:	25-ft. instrumentation cable:	
			
	pin A B C D E F	color red black green white brown	
	signal + in common + out - + out - out	signal + in common + out + out - out	
	} position	} position	
	} velocity	} velocity	

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