

Cable-Extension Position Transducer

Position and Velocity Output Signals

Ranges: 0-2 to 0-100 inches

Instrument Grade



DV301

Specification Summary:

GENERAL

Full Stroke Range Options 0-2 to 0-100 inches
 Measuring Cable
 with standard cable tension 0.019-in. dia. nylon-coated stainless steel
 with increased or high cable tension ... 0.024-in. dia. nylon-coated stainless steel
 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 Ω *see ordering information*
 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 ≥ 280 mV) $\pm 3\%$ rms

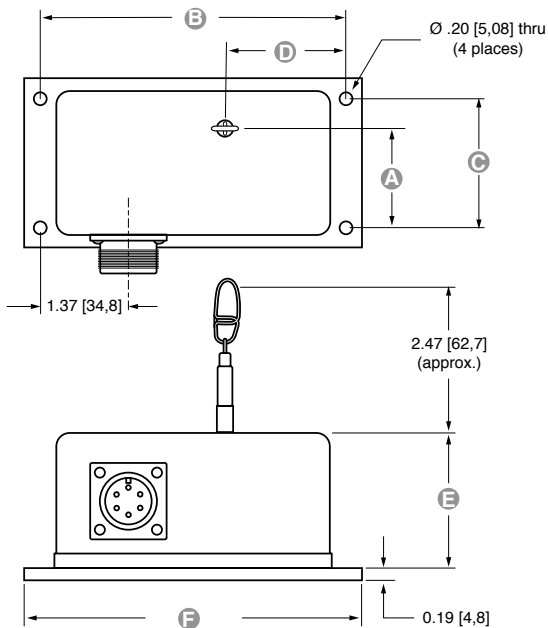
ENVIRONMENTAL

Enclosure NEMA 1
 Operating Temperature -40° to 200°F (-40° to 90°C)



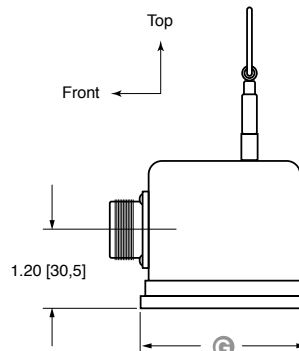
The DV301 is a combination position and velocity transducer for full-scale measurement ranges from 2 to 100 inches. A precision plastic-hybrid potentiometer provides accurate position feedback while a self-generating DC tachometer provides a velocity signal that is proportional to the speed of the traveling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

Outline Drawing



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

ALL DIMENSIONS ARE IN INCHES [MM] tolerances are ± 0.02 in. [$\pm 0,5$ mm] unless otherwise noted



DV301 • Cable-Extension Transducer: Position and Velocity Output Signals

Ordering Information:

Model Number:

DV301 - - **1** - **1** **0**

order code: **B** **A** **B** **C** **D** **E** **F** **G**

Sample Model Number:

DV301 - 0025 - 111 - 1110

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

Full Stroke Range:

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 ⁶	2.5 x 10 ⁶	5 x 10 ⁵	5 x 10 ⁵	5 x 10 ⁵	5 x 10 ⁵	5 x 10 ⁵	2.5 x 10 ⁵	2.5 x 10 ⁵	2.5 x 10 ⁵	2.5 x 10 ⁵	2.5 x 10 ⁵
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

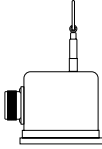
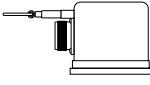
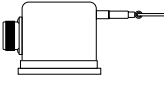
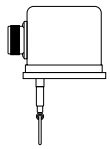
*¹ - 1 cycle is defined as the travel of the measuring cable from full retraction to full extension and back to full retraction *² - at the rate of 100 inches per minute
 *³ - output signal is reduced by 50% when **Measuring Cable Tension** options 2 or 3 is selected below

Measuring Cable Tension:

A order code:	1	2**	3**
	standard tension* (max. acceleration)	increased tension*	high tension*
2, 10, 20 inch range:	30 oz. (25 G)	60 oz.	120 oz.
5, 25, 50 inch range:	14 oz. (5 G)	28 oz.	56 oz.
15, 30 inch range:	20 oz. (6 G)	40 oz.	80 oz.
40 inch range:	17 oz. (11 G)	34 oz.	68 oz.
60 inch range:	13 oz. (4 G)	26 oz.	52 oz.
75, 80 inch range:	18 oz. (5 G)	36 oz.	72 oz.
100 inch range:	26 oz. (10 G)	52 oz.	104 oz.

* - tolerance: ±20% ** - Options 2, 3 for re-orders only.

Measuring Cable Exit:

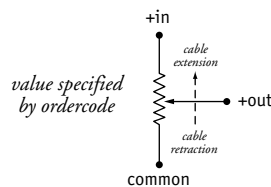
C order code:	1	2	3	4
	top exit	front	rear	bottom
				

Output Signals:

D order code:	1	2	3	4
position sensing potentiometer:	500 ohms*	1000 ohms*	5000 ohms*	10,000 ohms*

* - tolerance = ±10%

position sensing circuit



velocity sensing circuit



max. input voltage and power rating

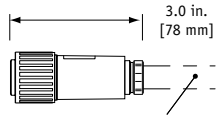
	2-inch, 5-inch range	10-inch to 100-inch range
500-ohms:	20 V AC/DC (1 W)	30 V AC/DC (2 W)
1K to 10K-ohms:	30 V AC/DC (1 W)	30 V AC/DC (2 W)

Ordering Information (cont.):

Electrical Connection:

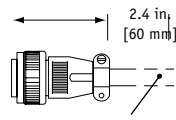
order code:

1
6-pin plastic connector
with mating plug



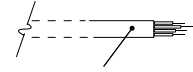
1/2 - 5/16" [14 - 8 mm] cable dia.
16 AWG max conductor size
connector: MS3102E-14S-6P
mating plug: MS3106E-14S-6S

3
6-pin metal connector
with mating plug



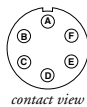
3/8-in. [9 mm] max cable dia.
16 AWG max conductor size
connector: MS3102E-14S-6P
mating plug: MS3106E-14S-6S

4
25-ft. instrumentation cable
24 AWG, shielded



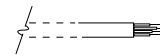
25 ft. x 0.2-in. dia.
[7,5 M x 5 mm dia.]
24 AWG, shielded

6-pin mating plug:



pin	signal		
A	+ in	} position	⋮
B	common		
C	+ out		
D	-	} velocity	⋮
E	+ out		
F	- out		

25-ft. instrumentation cable:



color	signal	
red	+ in	} position
black	common	
green	+ out	
white	+ out	} velocity
brown	- out	