

Simultaneous velocity and position measurement

The **VP Series** combines a self-generating tachometer and a precision potentiometer to give an output of both velocity and analog position. Standard position output is a voltage divider circuit. Outputs optionally available are the bridge circuit, 4-20 mA, 0-10 VDC, and ± 10 VDC. See *PB*, *P420* and *P510* series data sheets for specifications.



SPECIFICATIONS

FOR *VPB*, *VP420* AND *VP510* SERIES SPECIFICATIONS, SEE *PB*, *P420*, AND *P510* SERIES PAGES.

GENERAL

- Positional Linearity (*VPA Only*)
 - 2", 3", 4" & 5" Ranges $\pm 0.25\%$ Full Scale
 - 10", 15", 20" & 25" Ranges $\pm 0.15\%$ Full Scale
 - All other ranges $\pm 0.10\%$ Full Scale
- Repeatability¹ $\pm 0.015\%$ Full Scale
- Positional Resolution Essentially Infinite
- Construction Aluminum Cover & Baseplate
- Sensing Devices Tacho-Generator (velocity)
Precision Potentiometer (position)
- Connector MS3102A-14S-6P
- Wire Rope $\varnothing.016$ Stainless Steel
- Wire Rope Tension See Table 6
- Wire Rope Inbound Acceleration See Table 6
- Weight
 - Up to 50" 1.96 lb. (0.54 Kg)
 - 60" & 80" 2.20 lb. (1.00 Kg)
- Dimensional Information See Supplemental Data¹, Fig. 3
- Options and Accessories See Supplemental Data¹

ELECTRICAL (POSITION)

- Input Impedance ("A" Circuit) $1000\Omega \pm 10\%$
- Excitation Voltage (Ve) 25 Volts Max. AC or DC
- Output Voltage Change Over
- Full Range of Transducer 92% to 98% of Excitation Voltage

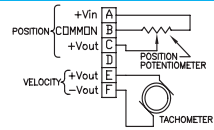
ELECTRICAL (VELOCITY)

- Output See Table 6
- Linearity $\pm 0.10\%$ F.S. with 10 VDC Max Output
- Ripple 3% Max.
- Output Impedance 350Ω

TABLE 6

RANGE (inches)	VELOCITY OUTPUT		WIRE ROPE TENSION		WIRE ROPE ACCEL		WEIGHT	
	(mV/in/sec)	(mV/cm/sec)	(oz)	(N)	(G's)	(lb)	(Kg)	
2, 10	200	78	34	9.5	33	1.20	0.54	
3, 15, 30	136	53	24	6.7	30	1.20	0.54	
4, 20, 40	102	40	24	6.7	36	1.20	0.54	
5, 25, 50	82	32	34	9.5	33	1.20	0.54	
60	69	27	24	6.7	27	1.54	0.70	
80	52	20	19	5.3	16	1.54	0.70	

CONNECTION DIAGRAM



POSITIVE OUTPUT OCCURS WITH CABLE EXTENDING

ENVIRONMENTAL

- Thermal Coefficient of potentiometer ± 100 PPM/ $^{\circ}$ C max.
- Operating temperature -40° C to $+95^{\circ}$ C
- Operating humidity 95% R.H. max. non-condensing
- Vibration 15 G's 0.1 ms max.
- Shock 50 G's 0.1 ms max.
- Ingress Protection IP-40 (NEMA 1)

FOOTNOTES TO SPECIFICATIONS

1. Supplemental Data section located at end of Standard Series pages.

MODEL NUMBER CONFIGURATION



BASIC CONFIGURATION (FOR ALL RANGES)

VPA-50-S10-N1S-10C

- E ELECTRICAL OUTPUT**
POSITION ELECTRICAL OUTPUT
A Voltage Divider Circuit
B Bridge Circuit
420 4 to 20 mA
510 0 to 10 VDC
- 0 RANGE**
2 2" (50 mm)
3 3" (75 mm)
4 4" (100 mm)
5 5" (125 mm)
10 10" (250 mm)
15 15" (390 mm)
20 20" (500 mm)
25 25" (640 mm)
30 30" (750 mm)
40 40" (1000 mm)
50 50" (1250 mm)
60 60" (1500 mm)
80 80" (2000 mm)

- 1 WIRE ROPE**
S $\varnothing.016$ (0,4 mm) Stainless Steel
N $\varnothing.018$ (0,45 mm) Nylon Jacketed Stainless Steel
- 2 WIRE ROPE TENSION**
1 Standard (50 G Units to 50")
2 Reduced (See Table 7 for Value)
3 Increased (100G Ranges to 50")
**Not Available Ranges 2" to 5"*
- 3 WIRE ROPE EXIT DIRECTION**
USE NUMBER DESIGNATORS SHOWN

0=STANDARD EXIT

- 4 DUST WIPER OPTION**
N No dust wiper
D Dust Wiper Included
- 5 POTENTIOMETER VALUE**
VPB
VP420
VP510
0 Required Designator
VPA
1 1K Ω
3 5K Ω *
4 10K Ω *
**Not Available Ranges 2" to 5"*
SEE SUPPLEMENTAL DATA FOR LINEARITY OPTION
- 6 ELECTRICAL OUTPUT POLARITY**
S Standard (increasing output as wire rope is extended)
R Reversed (decreasing output as wire rope is extended)

- 7 CONNECTOR LOCATION**
USE NUMBER DESIGNATORS SHOWN

1=STANDARD LOCATION
NOTE: Locations 2 and 5 are available on VPA Model only.
- 8 0** Required Designator
- 9 ELECTRICAL INTERFACE**
C Mating Connector Included
K Mating Connector Omitted*
T Terminal Strip
*Electrical cable with mating connector may be ordered separately as part number 10028-xM where 'x' is the length required in meters.

ADDITIONAL OPTIONS

TABLE 7

STANDARD SERIES — WIRE ROPE TENSION AND ACCELERATION															
RANGE	PA, PB, P420, P510 SERIES					EP SERIES				V & VP SERIES					
	STANDARD WIRE ROPE TENSION		STANDARD WIRE ROPE ACCEL		REDUCED WIRE ROPE TENSION		REDUCED WIRE ROPE ACCEL		STANDARD WIRE ROPE TENSION		STANDARD WIRE ROPE ACCEL		REDUCED WIRE ROPE TENSION		REDUCED WIRE ROPE ACCEL
(in) (mm)	(oz) (N)	(G's)	(oz) (N)	(G's)	(oz) (N)	(G's)	(oz) (N)	(G's)	(oz) (N)	(G's)	(oz) (N)	(G's)	(oz) (N)	(G's)	
2 50	34 9.5	>50	16 4.4	28	—	—	—	—	34 9.5	33	16 4.4	14			
3 75	24 6.7	>50	14 3.9	16	—	—	—	—	24 6.7	30	14 3.9	15			
4 100	24 6.7	>50	11 3.1	12	—	—	—	—	24 6.7	36	11 3.1	15			
5 125	34 9.5	>50	8 2.2	7	—	—	—	—	34 9.5	33	8 2.2	6			
10 250	34 9.5	>50	16 4.4	28	34 9.5	43	16 4.4	19	34 9.5	33	16 4.4	14			
15 390	24 6.7	>50	14 3.9	16	—	—	—	—	24 6.7	30	14 3.9	15			
20 500	24 6.7	>50	11 3.1	12	—	—	—	—	24 6.7	36	11 3.1	14			
25 640	34 9.5	>50	8 2.2	7	34 9.5	37	8 2.2	7	34 9.5	33	8 2.2	6			
30 750	24 6.7	>50	14 3.9	16	—	—	—	—	24 6.7	30	14 3.9	15			
40 1000	24 6.7	>50	11 3.1	12	—	—	—	—	24 6.7	36	11 3.1	12			
50 1250	34 9.5	>50	8 2.2	7	34 9.5	37	8 2.2	7	34 9.5	33	8 2.2	5			
60 1500	24 6.7	27	7 1.8	2	24 6.7	18	7 1.8	5	24 6.7	27	7 1.8	6			
80 2000	19 5.3	16	5 1.4	2	19 5.3	7	5 1.4	2	19 5.3	16	5 1.4	3			

LIFE

Ranges 2" to 5" 5,000,000 full stroke cycles
 Ranges 10" to 25" 500,000 full stroke cycles
 Ranges 30" to 80" 250,000 full stroke cycles

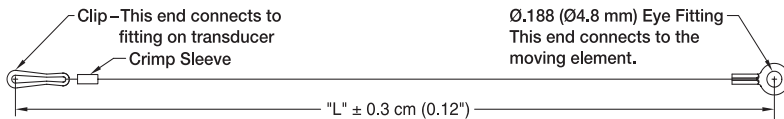
*With 1K ohm potentiometer, wire rope misalignment 2° maximum at full stroke, relatively dust free environment, and with nylon jacketed wire rope

OPTION DESCRIPTIONS

OPTION	OPTION DESIGNATOR	DESCRIPTION						
Nylon jacketed wire rope	N	Replaces standard stainless steel wire rope with Ø.018 nylon jacketed wire rope. Increases wire rope life dramatically but may increase non-linearity by as much as ±0.05% of full scale.						
Reduced Wire Rope Tension	2	Reduces the overall tension in the wire rope and increases wire rope life. Dynamic response of the transducer is reduced due to the reduced inbound acceleration capability.						
Increased Wire Rope Tension	3	Increases tension in the wire rope which increases the dynamic response of the transducer. On selected units with range of 50" (1250 mm) or less, inbound acceleration capability is 100G's. Wire rope life may be adversely affected by the high tension option.						
Dust wiper	D	Lubricated wiper strips dust and debris from wire rope as it retracts into case. Adds 0.36" (9 mm) height to wire rope exit location.						
Non-standard potentiometer (applies to PA series only)	3,4	Non-standard potentiometer linearity is as follows: <table border="1" style="margin-left: 20px;"> <thead> <tr> <th>RANGE</th> <th>LINEARITY</th> </tr> </thead> <tbody> <tr> <td>10" to 25"</td> <td>±0.50% of full scale</td> </tr> <tr> <td>30" and above</td> <td>±0.25% of full scale</td> </tr> </tbody> </table> Note: This option is subject to potentiometer availability.	RANGE	LINEARITY	10" to 25"	±0.50% of full scale	30" and above	±0.25% of full scale
RANGE	LINEARITY							
10" to 25"	±0.50% of full scale							
30" and above	±0.25% of full scale							
Reversed output	R	Output is at a maximum when wire rope is fully retracted. Output decreases as wire rope is extended. Does not apply to velocity or encoder signal.						
Terminal strip	T	Replaces connector with a terminal strip.						

10067 – AUXILIARY WIRE ROPE EXTENSION KIT

The auxiliary wire rope extension may be used to facilitate mounting the transducer remotely from the measurement point. The clip on the extension attaches to the eye fitting on the transducer. The eye fitting on the opposite end, which is identical to the fitting on the transducer, mounts to the moving element. The extension kit is also available with the clip end unterminated for situations where it is more convenient to size the wire rope length during installation. Clip and crimp fitting are included with the unterminated version.



10067- 1 -CM- 2

- 1 DIMENSION "L"**
Specify Dimension "L" in centimeters to the nearest whole centimeter
NOTES: 1. 1 cm = 0.394", 1 inch = 2.54 cm
2. Shortest length "L" is 5 cm (approximately 2")
- 2 UNTERMINATED CLIP END**
Leave Blank.... Completed kit (No designator required)
U..... Unterminated Clip End (clip and crimp sleeve included in kit)

REPLACEMENT WIRE ROPE KITS

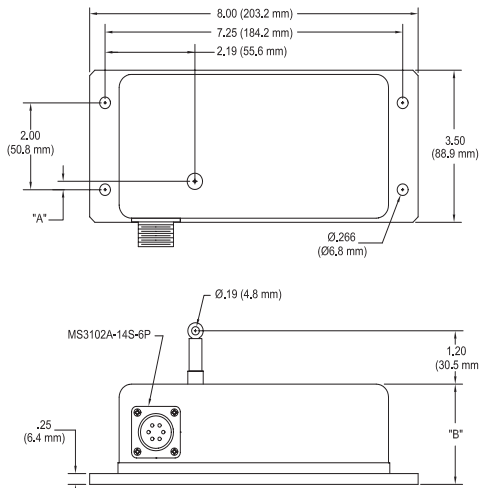
The replacement Wire Rope Kit includes a new wire rope with all end terminations, wire rope guide, felt dust wiper where applicable and installation instructions. To order, replace 'xx' in the part number with the applicable measurement range in inches.

- 10107-xx Replacement Wire Rope Kit**—Standard Ø.016" Stainless Steel Wire Rope.
- 10108-xx Replacement Wire Rope Kit**—Ø.018" Nylon Jacketed Stainless Steel Wire Rope.
- 10127-xx Replacement Wire Rope Kit**—Standard Ø.016" Stainless Steel Wire Rope with Dust Wiper.
- 10128-xx Replacement Wire Rope Kit**—Ø.018" Nylon Jacketed Stainless Steel Wire Rope with Dust Wiper.

DIMENSIONAL INFORMATION

VP SERIES (VELOCITY/POSITION) — ALL MEASUREMENT RANGES

FIG. 3



Dimensions in brackets are millimeters

VP SERIES				
RANGE	DIM "A"		DIM "B"	
	(inch)	(mm)	(inch)	(mm)
2", 10"	0.66	16.8	2.25	57.0
3", 15", 30"	0.51	12.9	2.25	57.0
4", 20", 40"	0.35	8.8	2.25	57.0
5", 25", 50"	0.19	4.8	2.25	57.0
60"	0.04	1.0	3.25	82.6
80"	-0.28	-7.1	3.25	82.6