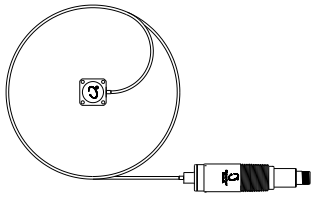
330750 and 330752 High Temperature Velomitor* System

Bently Nevada* Asset Condition Monitoring



Description

The standard 330500 Velomitor* Piezo-velocity Sensor has a limited temperature range it can be exposed to, due to its signal conditioning electronics being located in the same case as the sensing element. Temperature limitations of the electronics limit its maximum operating temperature to +121°C (+250°F).

The 330750 and 330752 High Temperature Velomitor System (HTVS) has a fundamentally different construction to solve this problem. Its design segregates the sensing element from the signal conditioning electronics, with the two permanently connected via a hardline cable. Current versions (see note below) of these sensors allow the sensing head to be mounted on surfaces with temperatures as high as +400°C (+752°F). Due to the segregated design, the signal conditioning electronics can be installed in a cooler location. This achieves overall transducer system performance comparable to other Velomitor transducers, but permits use at significantly higher temperatures. By eliminating connections between the sensing head and its associated signal conditioning electronics, a significant source of potential transducer failures (connector problems) is eliminated.

⚠ Caution

If housing measurements are being made for overall protection of the machine, thought should be given to the usefulness of the measurement for each application. Most common machine malfunctions (imbalance, misalignment, etc.) originate at the rotor and cause an increase (or at least a change) in rotor vibration. In order for any housing measurement alone to be effective for overall machine protection, a significant amount of rotor vibration must be faithfully transmitted to the bearing housing or machine casing, or more specifically, to the mounting location of the transducer.

In addition, care should be exercised in the physical installation of the transducer. Improper installation can result in a degradation of the transducer's performance, and/or the generation of signals which do not represent actual machine vibration.

Upon request, Bently Nevada can provide engineering services to determine the appropriateness of housing measurements for the machine in question and/or to provide installation assistance.

Note: The previous version limited the sensor head to +300°C (+572°F). The current versions will have the letter "G" preceding the serial number.

Specifications

Parameters are specified from +20 to +30°C (+68 to +86°F) and 100Hz unless otherwise indicated.

Note: Operation outside the specified limits may result in false readings or loss of machine monitoring.

Electrical

Sensitivity:

5.7 mV/mm/s (145 mV/in/s)

±5%

Frequency response:

15 to 2000 Hz (900 to 120,000 cpm) ± 3.0 dB;

20 to 1000 Hz (1,200 to 60,000 cpm) ± 0.9 dB

Transient Temperature Sensitivity

0.0762 mm/s/°C (0.003 in/s/°C), typical, as defined in ISO 5347-18:1993(E)

Amplitude range:

635 mm/s (25 in/s) peak

below 680 Hz.

2940 m/s^2 (300 g) peak

above 680 Hz.

Vibration at frequencies above 2 kHz will decrease this range.

Transverse sensitivity:

Less than 5% of Sensitivity

Amplitude linearity:

±2% to 152 mm/s (6 in/s) peak

Mounted resonant frequency:

Greater than 5 kHz

Broadband Noise floor (15Hz to 2kHz)

0.127 mm/s (0.005 in/s) rms nominal

Maximum cable length:

305 metres (1000 feet)

with no degradation of signal.

Hazardous Area Approvals

Multiple approvals for hazardous areas certified by Canadian Standards Association (CSA/US/C) in North America and by LCIE in Europe.

North America

Class I, Div I, Groups A, B, C, and D;

Class II, Div I, Groups E, F, and G;

Class III, Div I.

Ex ia IIC

AEx ia IIC

T4 @ Ta = 100° C

When installed with an approved zener barrier per BN drawing 168077.

Ex nL IIC; Class I, Zone 2

Class I, Div 2, Groups A, B, C, D.

When installed per BN drawing 168077

Europe/ATEX

 II 1 G

Ex ia IIC T4

T4 @ Ta = -40°C - 100°C

 II 3 G

Ex nA IIC T4

T4 @ Ta = -40°C - 100°C.

Environmental Limits

Operating and storage temperature range

Sensing head:

Maximum mounted surface temperature –55°C to +400°C (–67°F to +752°F)

Integral hardline cable:

–55°C to +400°

(–67°F to +752°F)

Electronics:

–55°C to +121°C

(–67°F to +250°F)

Shock survivability:

24,535 m/s^2 (2500 g) peak

Relative humidity:

To 100% non-submerged; case is hermetically sealed.

Physical

Weight (typical):

2 metres:

635 grams (1.40 lb)

4 metres:

794 grams (1.75 lb)

6 metres:

953 grams (2.10 lb)

8 metres:

1111 grams (2.45 lb)

Mounting:

See Dimensional Drawings, Figures 1 and 2

Case material:

300 series stainless steel.

Connector:

2-pin Mil-C-5015 receptacle, hermetically-sealed, 304 stainless steel shell.

Polarity:

Pin A goes positive with respect to Pin B when the applied velocity is from the base to the top of the transducer.

Bend Radius:

Minimum bend radius of 51mm (2.0in)

Note: Please read and understand the User Guide *before* attempting to install and use this product.

Ordering Information

For a detailed listing of country and product specific approvals, refer to the Approvals Quick Reference Guide (document 108M1756) located at the following website: www.GEmeasurement.com.

330750-AA-BB

AA: Length

2 0	2 metres
4 0	4 metres
6 0	6 metres
8 0	8 metres

BB: Approvals

0 5	Multiple Approvals (CSA, ATEX, and IECEx)

330752-AA-BB

AA: Length

2 5	2.5 metres
4 0	4 metres
6 0	6 metres
8 0	8 metres

BB: Approvals

0 5	Multiple Approvals (CSA, ATEX, and IECEx)

Dimensional Drawing – 330750 and 330752

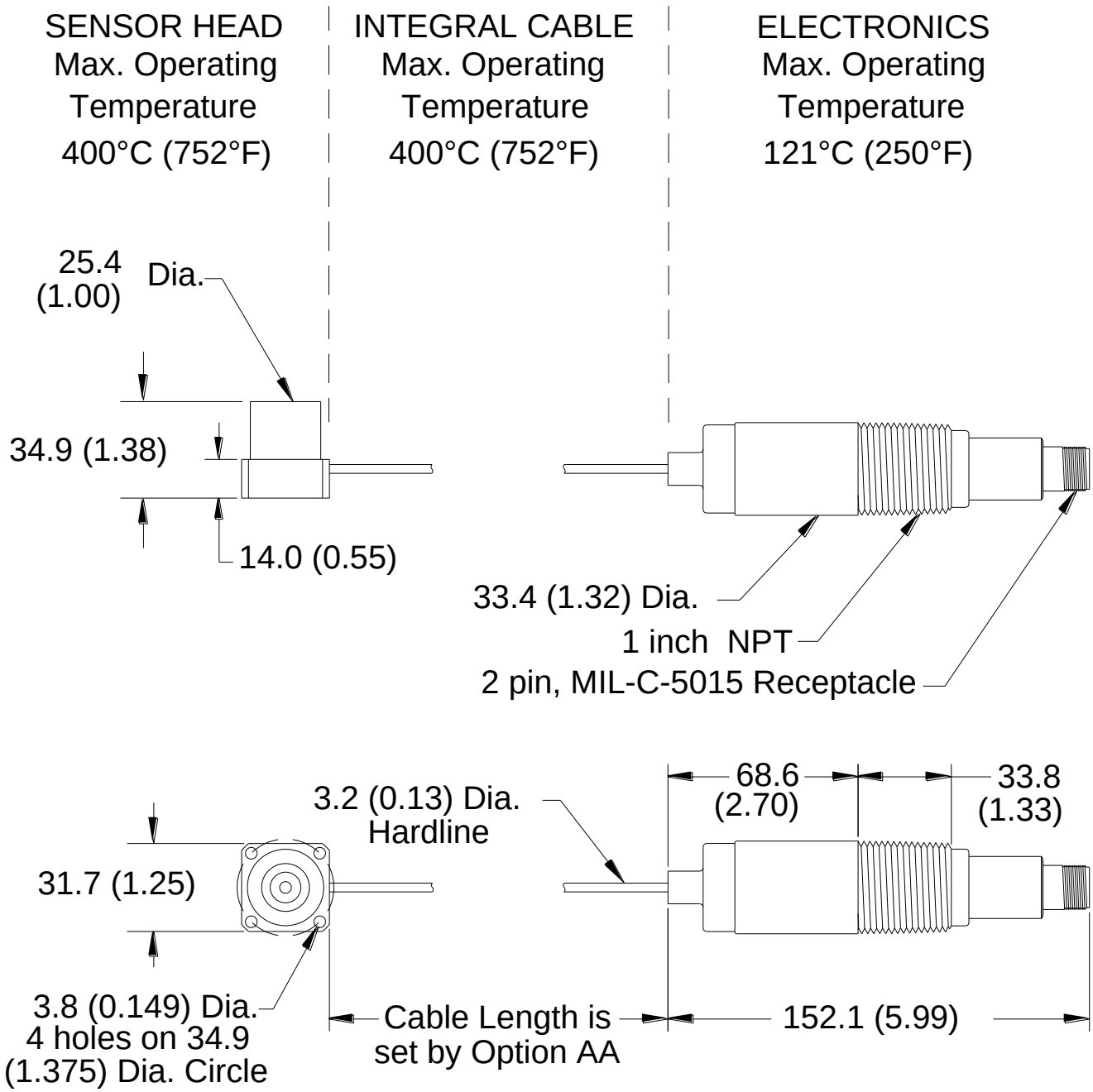


Figure 1: 330750 System Dimensional Drawing
Dimensions are in millimeters (inches)

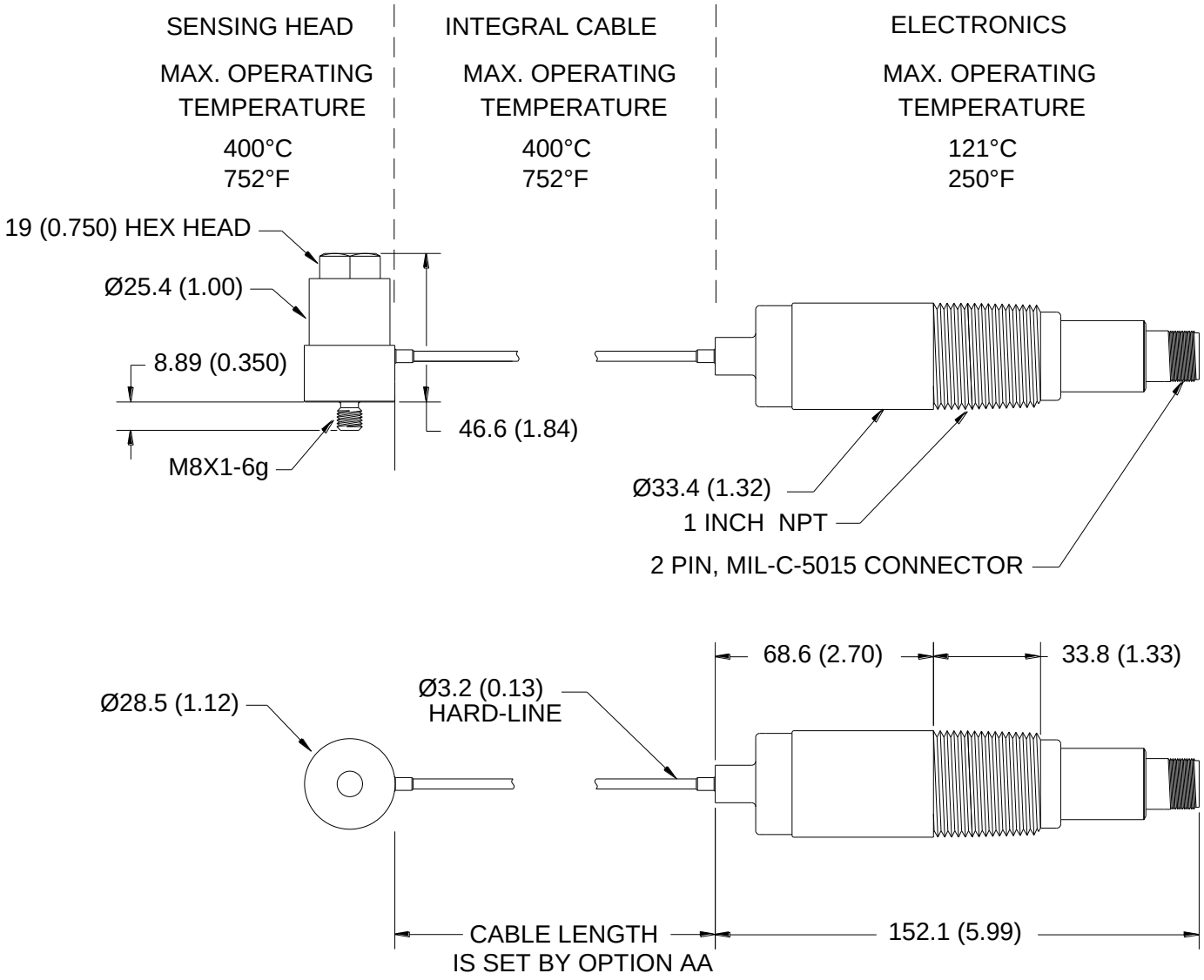


Figure 2: 330752 System Dimensional Drawing
Dimensions are in millimeters (inches)

Graphs – 330750 and 330752

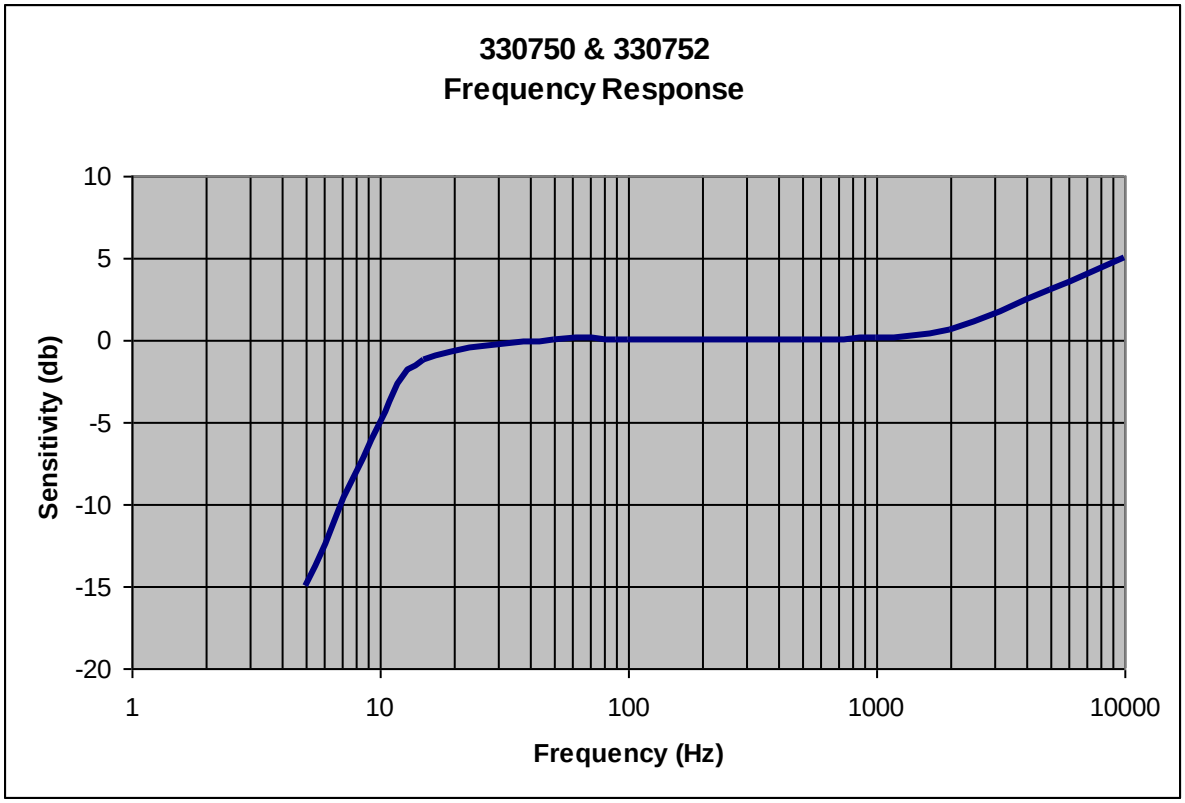


Figure 3: Velocity Amplitude

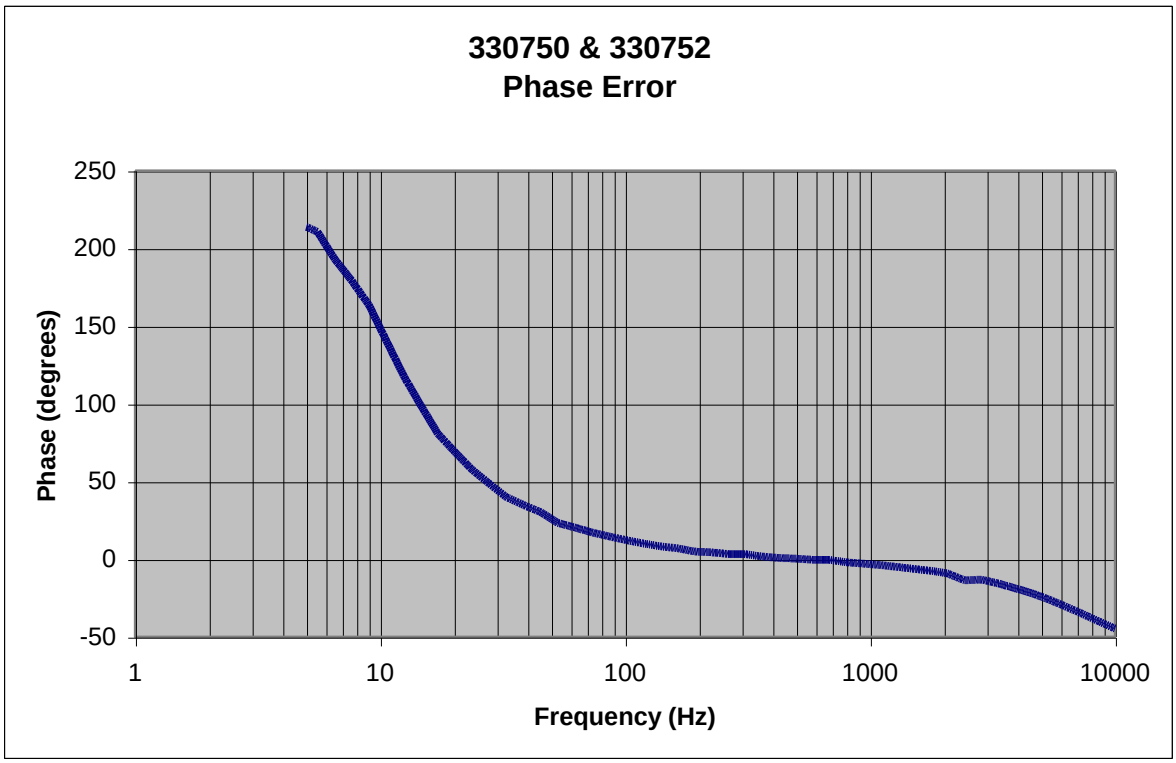
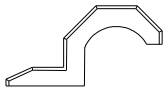
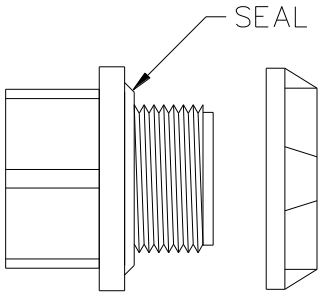
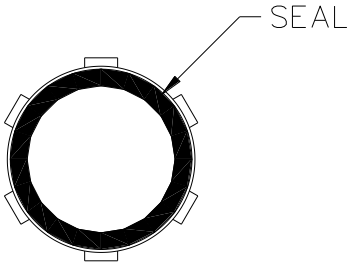
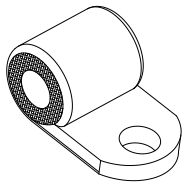


Figure 4: Velocity Phase Error

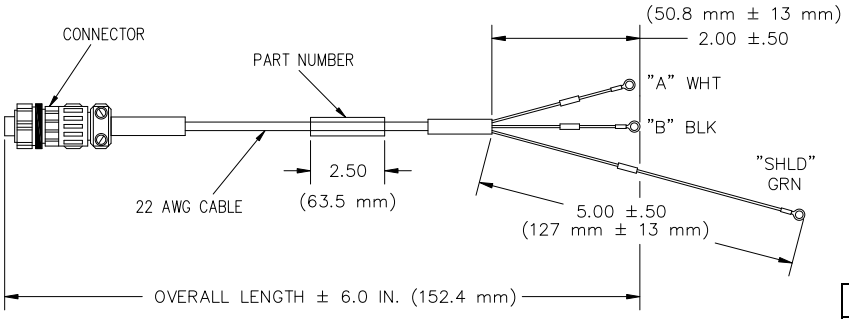
Table 1: Interconnection Cables and Accessories

APPLICATION	PART NUMBER	DESCRIPTION
†Note: AA - Specifies the length (in feet) of cable required		
Standard Interconnect Cable	9571-AA†	Shielded 0.382 mm² (22 AWG) cable with a moisture resistant female connector at the HTVS end and ring lugs at the monitor end. Temperature range -29 to 121°C (-20 to 250°F). See Figure 5
Standard Armored Interconnect Cable	84661-AA†	Stainless steel armor over shielded 0.382 mm² (22 AWG) cable with a moisture resistant female connector at the HTVS end and ring lugs at the monitor end. Temperature range -29 to 121°C (-20 to 250°F). See Figure 6
Right Angle Interconnect Cable	89477-AA†	Shielded 0.963 mm² (18 AWG) cable with a moisture resistant right angle female connector at the HTVS end and ring lugs at the monitor end. Temperature range -29 to 121°C (-20 to 250°F). See Figure 7
Short Run Interconnect Cable	122129-AA†	Shielded 0.963 mm² (18 AWG) cable with a moisture resistant female connector at the HTVS end and ring lugs at the monitor end. Temperature range -29 to 121°C (-20 to 250°F). See Figure 8
CE Installation Interconnect Cable (**Required for CE Installations)	02173034	Shielded 0.382 mm² (22 AWG) cable with a splash-proof boot over a female connector at the HTVS end and flush cut at the monitor end. Temperature range -55 to 125°C (-67 to 257°F). See Figure 9
0.963 mm² (18 AWG) Bulk Cable	02173006	Shielded twisted pair. Same cable as used on 89477-AA and 122129-AA. Specify number of feet.
0.382 mm² (22 AWG) Bulk Cable	02173007	Shielded twisted pair. Same cable as used on 9571-AA and 84661-AA. Specify the number of feet. The maximum length that should be used with the HTVS is 305 m (1000 ft)
Spare Connector	00502025	Same connector as used on 9571-AA and 84661-AA
Right Angle Connector	101212-01	Right angle connector kit. Same connector as used on 89477-AA.
330750 & 330752 Manual	135090-01	User Guide
Spare Mating Connector	00531061	Mating connector for 330750 & 330752 Velomitor System.

Cable Mounting Clamp	00530574	Mating connector clamp to be used with 00531061
Electronics Housing Strap	03818073	1 inch rigid conduit strap for securing the electronics housing. 
Electronics Mounting Hub	03818071	1 inch weather tight hub used to mount the electronics housing in a weatherproof enclosure. 
Seal Ring	03818072	1 inch sealing lock ring used to mount the electronics housing. Two rings are required to mount the electronics. 

Cable Clamp	169546	Stainless steel mesh tie down clamp for the hardline cable. For temperatures greater than 260C (500F). 

PART NUMBER 9571 – ☐☐ (SEE NOTE)

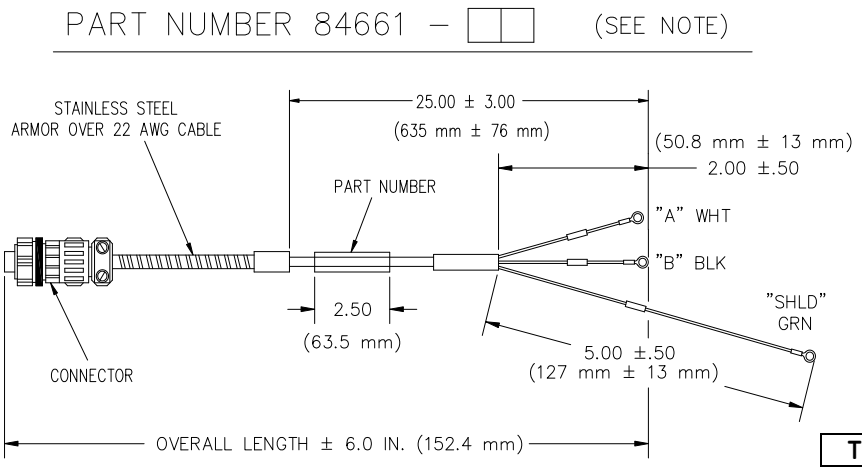


NOTE

ORDER IN INCREMENTS OF 1.0 FOOT (0.30 m)
EXAMPLE: 02 = 2 FEET (0.60 m) 25 = 25 FEET (7.6 m)
MIN LENGTH = 2.0 FEET (0.60 m) MAX LENGTH = 99 FEET (30 m)

The following are standard lengths	
Feet	**Metres (approx.)**
6	1.8
8	2.4
10	3.0
12	3.6
15	4.5
17	5.0
20	6.0
25	7.6
30	9.0
33	10.0
50	15.2
99	30.0
NOTE: Non-standard/custom lengths can also be ordered at additional cost	

Figure 5: Standard Interconnect Cable

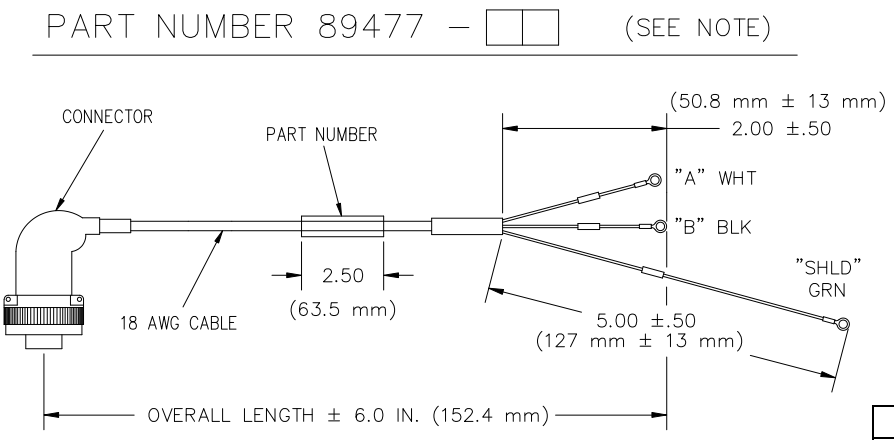


NOTE

ORDER IN INCREMENTS OF 1.0 FOOT (0.30 m)
EXAMPLE: 03 = 3 FEET (0.91 m) 25 = 25 FEET (7.6 m)
MIN LENGTH = 3.0 FEET (0.91 m) MAX LENGTH = 96 FEET (29 m)

The following are standard lengths	
Feet	**Metres (approx.)**
6	1.8
8	2.4
10	3.0
12	3.6
15	4.5
17	5.0
20	6.0
25	7.6
30	9.0
33	10.0
50	15.2
99	30.0
NOTE: Non-standard/custom lengths can also be ordered at additional cost	

Figure 6: Standard Armored Interconnect Cable

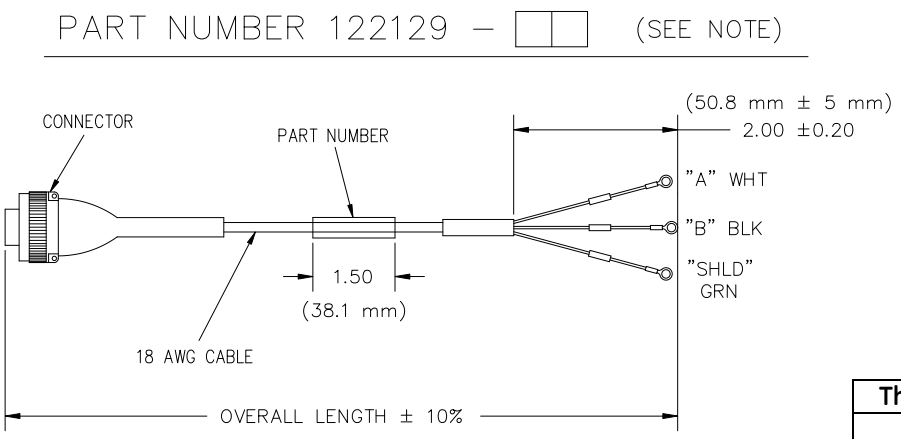


NOTE

ORDER IN INCREMENTS OF 1.0 FOOT (0.30 m)
EXAMPLE: 02 = 2 FEET (0.60 m) 25 = 25 FEET (7.6 m)
MIN LENGTH = 2.0 FEET (0.60 m) MAX LENGTH = 99 FEET (30 m)

The following are standard lengths	
Feet	**Metres (approx.)**
6	1.8
8	2.4
10	3.0
12	3.6
15	4.5
17	5.0
20	6.0
25	7.6
30	9.0
33	10.0
50	15.2
99	30.0
NOTE: Non-standard/custom lengths can also be ordered at additional cost	

Figure 7: Standard Right Angle Interconnect Cable



NOTE

ORDER IN INCREMENTS OF 2.0 INCHES (50.8 mm)
EXAMPLE: 06 = 6 INCHES (152 mm) 24 = 24 INCHES (610 mm)
MIN LENGTH = 6.0 INCHES (152 mm) MAX LENGTH = 24 INCHES (610 mm)

The following are standard lengths	
Inches	**Millimetres (approx.)**
6	152.4
8	203.2
10	254
12	304.8
14	355.6
16	406.4
18	457.2
20	508
22	558.8
24	609.6
NOTE: Non-standard/custom lengths can also be ordered at additional cost	

Figure 8: Short Run Interconnect Cable

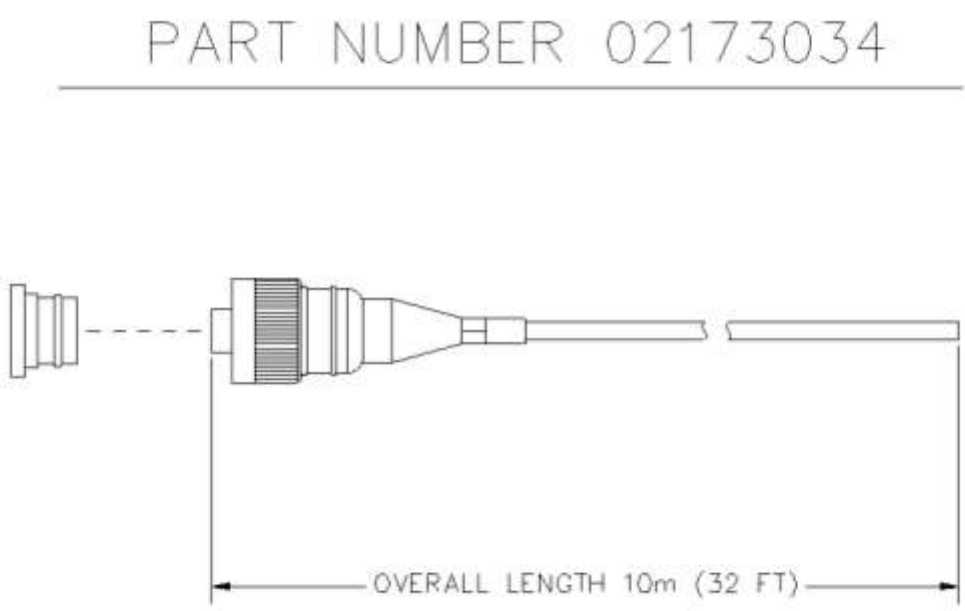


Figure 9: CE Installation Interconnect Cable

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