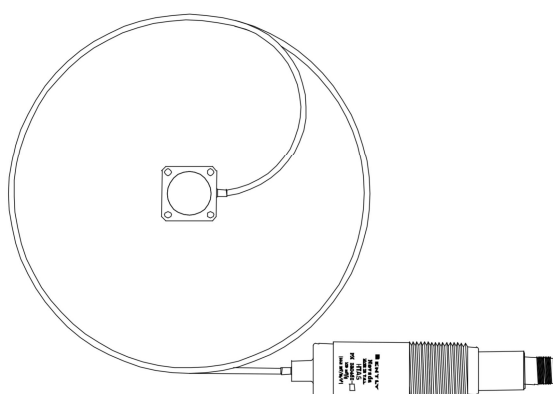


330450 High Temperature Acceleration System

Datasheet

Cordant™

169885 Rev. G



Description

The 330450 High Temperature Acceleration System (HTAS) segregates the sensing element from the signal conditioning electronics, with the two permanently connected via a hardline cable. 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 acceleration transducers, but permits use at significantly higher temperatures.



Earlier versions of the standard 330400 Accelerometer located the electronics in the same case as the sensing element. This limited the sensor to a maximum operating temperature of +300°C (+572°F). The serial number of current versions that measure up to +400°C (+752°F) are preceded by the letter "G".

By eliminating connections between the sensing head and its associated signal conditioning electronics, a significant source of potential transducer failures (connector problems) is eliminated.



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Most common machine malfunctions (unbalance, misalignment, etc.) occur on the rotor and originate as an increase (or at least a change) in rotor vibration. For any individual casing measurement to be effective for overall machine protection, the system must continually transmit a significant amount of rotor vibration to the machine casing, or mounting location of the transducer.

In addition, be careful to install the accelerometer transducer on the bearing housing or machine casing. Improper installation may decrease the transducer amplitude and frequency response and/or generate false signals that do not represent actual vibration. Refer to the appropriate instruction manuals and Application Notes.

Upon request, Bently Nevada provides engineering services that can identify the appropriate machine housing measurements and installation assistance if needed.



Earlier versions of the sensor were limited to a maximum of +300°C (+572°F). The serial number of more recent versions is preceded by the letter "G".

Specifications

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



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

Electrical

Sensitivity	10.2 mV/m/s ² (100 mV/g) ±5%.
Acceleration Range	785 m/s ² (80 g) peak overall acceleration within the 15 to 10000 Hz frequency span.
Amplitude Linearity	±2% to 785 m/s ² (80 g) peak.
Broadband Noise Floor (10 Hz to 15 kHz)	0.059 m/s ² (0.006 g) rms.
Frequency Response	15 to 10000 Hz (900 to 600,000 cpm) ±3dB; 40 to 4000 Hz (2400 to 240,000 cpm) ±5%
Transverse Sensitivity	Less than 5% of axial.
Mounted Resonant Frequency	Greater than 15 kHz.
Maximum Cable Length	305 metres (1000 ft) with no degradation of signal.

Power requirements

Input Voltage	-24 ± 0.5 Vdc.
Bias Current	2 mA nominal.
Output Bias Voltage	-12 ± 0.5 Vdc.
Grounding	Case isolated.

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 +100°C (-67°F to +212°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 Graphs and Figures on page 10.
Case material	300 series stainless steel.
Connector	3-pin Mil-C-5015 receptacle, hermetically-sealed, 304 stainless steel shell.
Polarity	Pin A goes positive with respect to Pin C when the applied force is from the base to the top of the sensing head.
Bend Radius	Minimum bend radius of 51mm (2.0in)  Please read and understand the 330450 User Guide (document 139976) before attempting to install and use this product.

Compliance and Certifications

ATEX

60079-01

60079-07

60079-11

60079-15

ATEX Directive 2014/34/EU

Hazardous Area Approvals



For the detailed listing of country and product specific approvals, refer to the *Approvals Quick Reference Guide* (108M1756) available from Bently.com.

CSA/NRTL/C

330450	Ex ia IIC T4: AEx ia IIC T4: Class I, Div 1, Groups A, B, C, D. Class II, Div 1, Groups E, F, G; Class III, Div 1 Install per drawing 168078 T4 @ Ta (-40°C to 100°C) Enclosure Type 4X Ex nL IIC T4: Ex ec IIC T4: Class I, Zone 2 Class II, Div 2, Groups A, B, C and D Install per drawing 168078 T4 @ Ta (-40°C to 100°C) Enclosure Type 4X
350900	Ex ia IIC T4 AEx ia IIC T4 Class I, Zone 0 Class I, Division 1, Groups A, B, C and D; Class II, Division 1, Groups E, F, and G; Class III, Division 1 When installed with an approved zener barrier per BN drawing 167923. T4 @ T4 = 100°C Ex nL IIC Class I, Zone 2 Ex ec IIC Class I, Zone 2 Class I, Division 2 (non-incendive), Groups A, B, C, and D when installed per BN drawing 168077.
330750, 330752	Ex ia IIC Class I, Zone 0, AEx ia IIC Class I, Division 1, Groups A, B, C and D Class II, Division 1, Groups E, F and G Class III, Division 1 Ex nL IIC Ex ec IIC Class I, Division 2, Groups A, B, C and D

ATEX/IECEx

330450, 350900, 330750, 330752

330450, 350900, 330750, 330752	 II 1 G Ex ia IIC or IIB Ta, T4 492°C  II 3 G Ex na IIC or IIB Ta, T4, T1 492°C Gc Ex ec IIC or IIB Ta T4, T1 492°C Gc Ta, T1, T4 492°C Ta, T4, T1 492°C
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Temperature Class	Temperature Range	Equipment
T4	-40°C to +100°C	Electrical Housing
T1	-40°C to +400°C	Sensor and Cable
T1	-40°C to +482°C	Sensor and Cable (3509000)

Entity Parameters for Zone 0/1 and Zone 2

Group	IIC				IIB
Type	330450 Type S	330750 Type S	330752 Type S	350900	350900
Ui	30 V	28 V	28 V	28 V	29.2 V
Ii	200 mA	120 mA	120 mA	153 mA	279 mA
Pi	1.5 W	1.0 W	1.0 W	0.84 W	1.95 W
Ci	7 nF	1 nF	1 nF	37 nF	37 nF
Li	30 μH	30 μH	30 μH	30 μH	30 μH

Hazardous Area Conditions of Safe Use

ATEX/IECEx

Zone 0/1:

Equipment must be connected to equipment, which meets the above listed entity parameters.

The cables type A or B (in compliance with EN 60079-25) must respect the cable parameters listed with the entity parameters.

Special Notes for 330450, 330750, 330752 and 350900

- This equipment is intrinsically safe and can be used in potentially explosive atmospheres.
- The intrinsically safe apparatus shall only be connected to an associated intrinsically safe apparatus. The association shall comply with the requirements of EN 60079-25 standard.
- Operating ambient temperature range:
 - -40°C Tamb +100°C (electronic housing)
 - -40°C Tamb +400°C (sensor and cable)
 - -40°C Tamb +482°C (sensor and cable) for model 350900

Zone 2 :

The supply electrical parameters shall not exceed the values mentioned in the tables above.

Special Notes for 330450, 330750, 330752 and 350900

- The equipment is safe when connected to an associated source, containing a reliable material limiting current and voltage meeting the entity parameters.
- Operating ambient temperature range:
 - -40°C to +100°C (Electronic Housing)
 - -40°C to +400°C (Sensor and Cable)
 - -40°C to +482°C (Sensor and Cable for 350900).
- The mating part of the connector shall provide IP54 ingress protection or better according to requirements of IEC 60079-0 and IEC 60079-7 or IEC 60079-15.
- Provisions shall be made for ensuring that the rated voltage and current are not exceeded while in service.
- Shall be supplied from Class II limited energy source according to

requirements of C22.2 No 61010-1-12 and
UL 61010-1 3rd Edition.

- Transient protection shall be provided that is set at a level not exceeding 140 % of the peak rated voltage value at the supply terminals to the equipment.

Ordering Information



For the detailed listing of country and product specific approvals, refer to the *Approvals Quick Reference Guide* (108M1756) available from [Bently.com](https://www.bentley.com).

330450-AA

A: Length	
2 0	2 metres
4 0	4 metres
6 0	6 metres
8 0	8 metres

Graphs and Figures

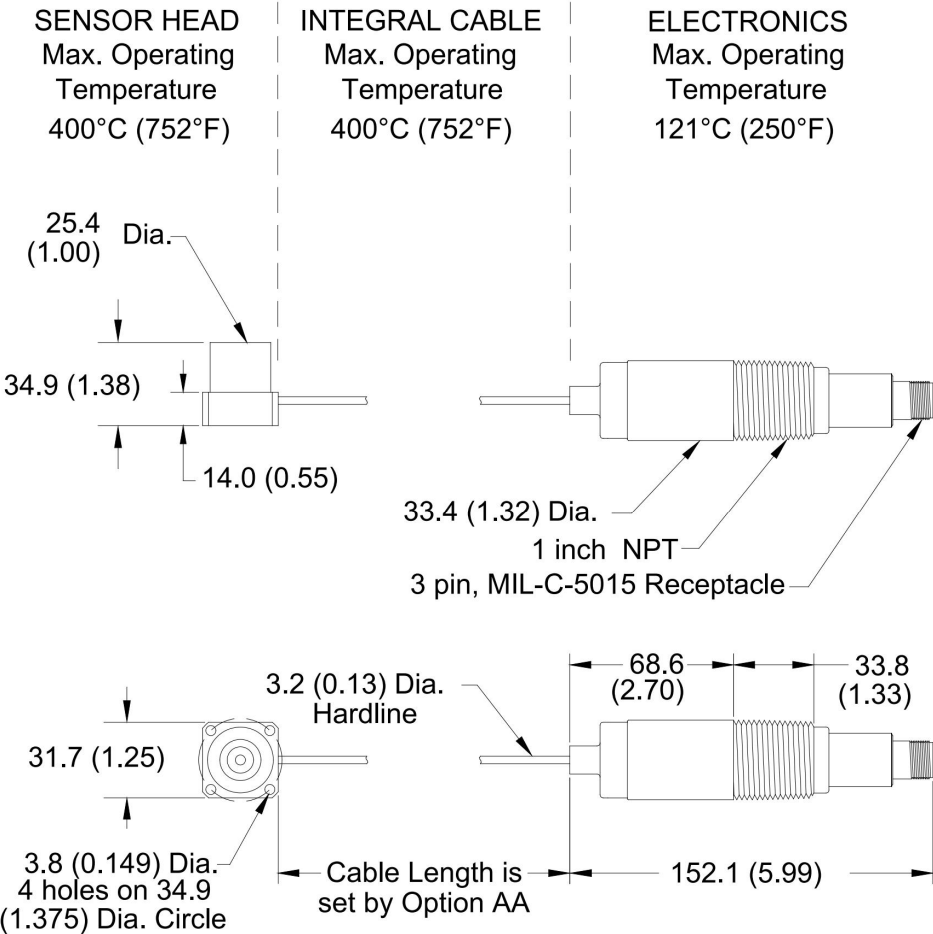


Figure 1: 330450 System Dimensional Drawing

Dimensions are in millimeters (inches)

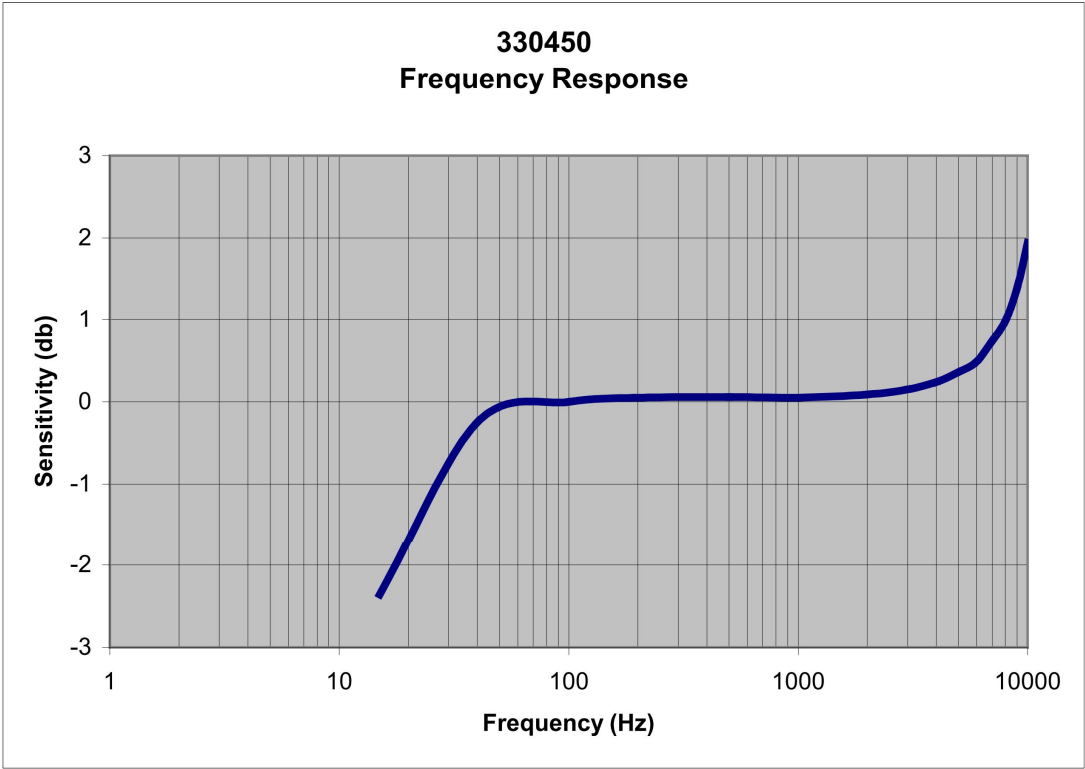


Figure 2: Acceleration Amplitude

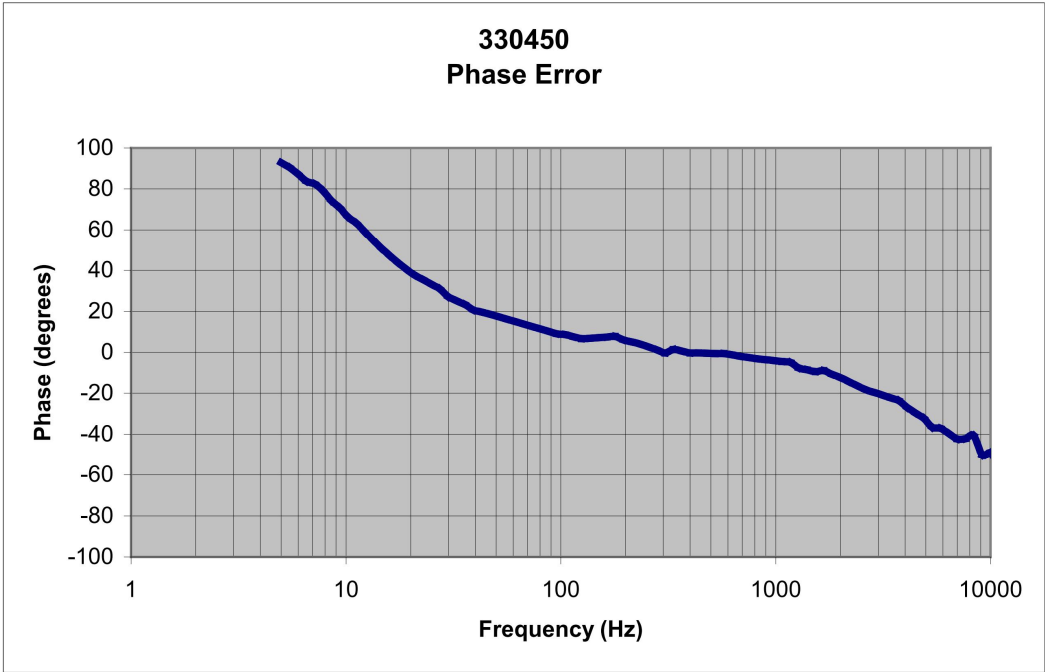
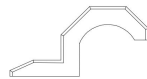
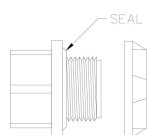
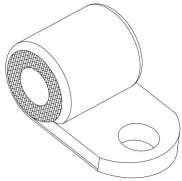


Figure 3: Acceleration Phase Error

Table 1: Interconnection Cables and Accessories

APPLICATION	PART NUMBER	DESCRIPTION
†Note: AA - Specifies the length (in feet) of cable required		
Standard Interconnect Cable	6925-AA†	3-conductor shielded 22 AWG (0.5 mm ²) cable with 3-socket plug at one end, terminal lugs at the other end. Minimum length of 2.0 ft (0.6 m), maximum length of 99 ft (30 m). See Figure 4
Standard Armored Interconnect Cable	16710-AA†	3-conductor shielded 22 AWG (0.5 mm ²) armored cable with 3-socket plug at one end, terminal lugs at the other end. Minimum length of 3.0 ft (0.9 m), maximum length of 99 ft (30 m). See Figure 5
Interconnect Cable with Boot	130539-AA†	3-conductor shielded 18 AWG (1.0 mm ²) cable with 3-socket plug and fluorosilicone elastomer boot at one end, terminal lugs at the other end. Minimum length of 2.0 ft (0.6 m), maximum length of 99 ft (30 m). A manual is available to assist with installation of this cable (part number 133080-01). See Figure 6
Spare Mating Connector	00531080	Mating connector for 330450 HTAS.
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. 

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



PART NUMBER 16925 – (SEE NOTE)

NOTE

INCREMENTS OF 1.0 FOOT (0.30 Metres)
EXAMPLE: = 2 FEET (0.61 Metres)
= 25 FEET (7.62 Metres)
MIN LENGTH = 2.0 FEET (0.61 Metres)
MAX LENGTH = 99 FEET (30.18 Metres)

*ALL DIMENSION ARE IN INCHES (MILLIMETRES) UNLESS OTHERWISE SPECIFIED.

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

 Non-standard/custom lengths can also be ordered at additional cost.

Figure 4: Standard Interconnect Cable

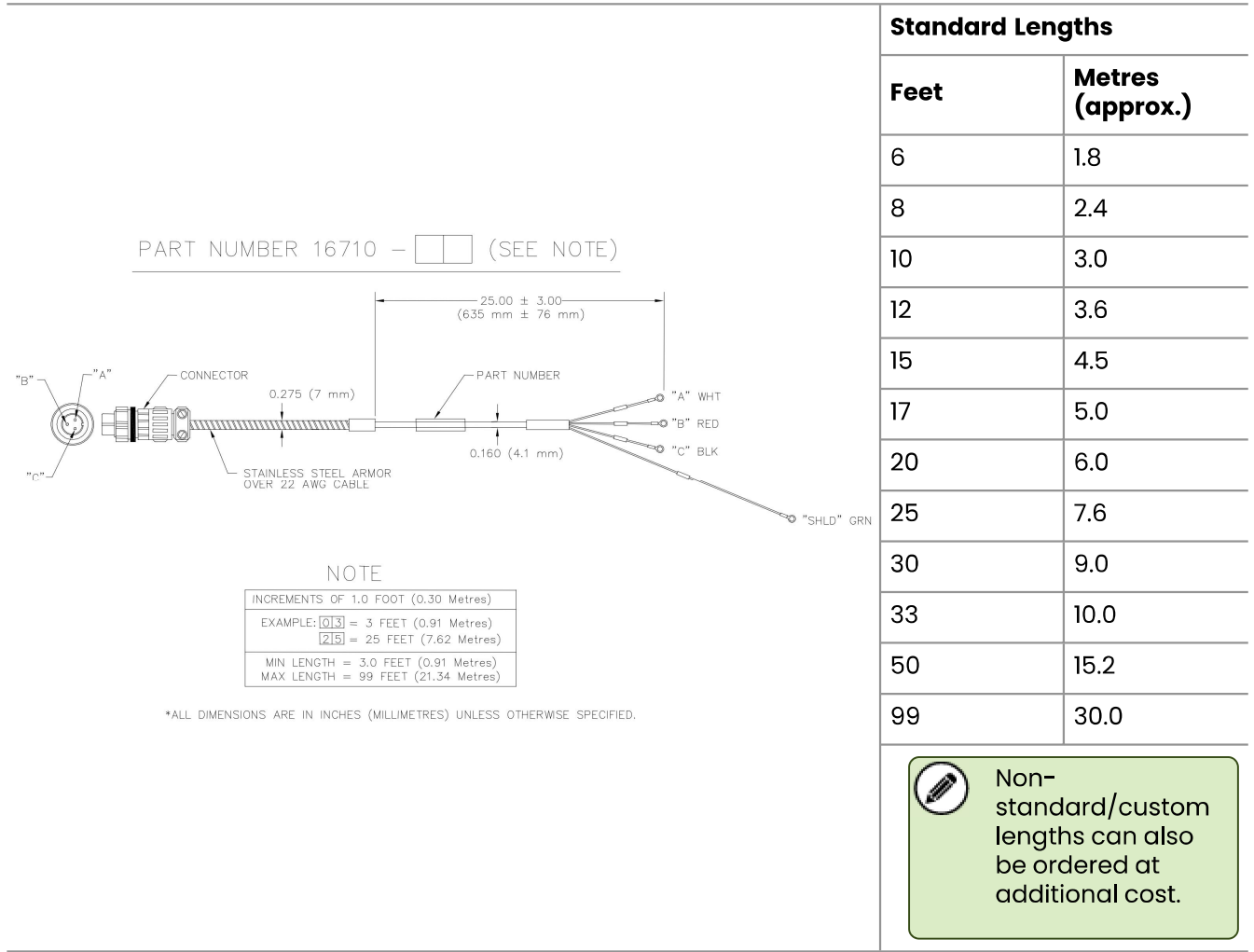


Figure 5: Standard Armored Interconnect Cable

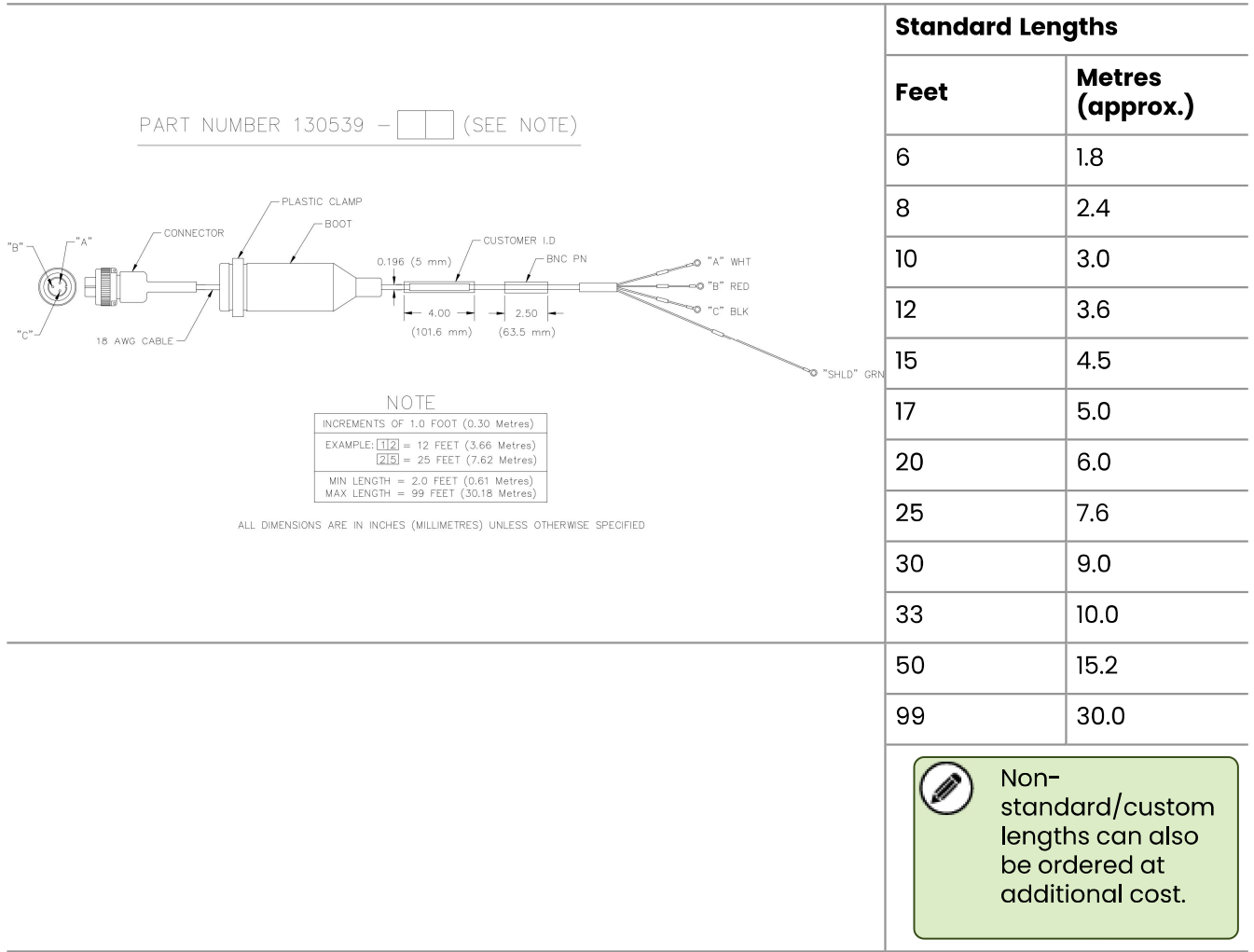


Figure 6: Standard Right Angle Interconnect Cable

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