350300 Dynamic Pressure Sensor

Datasheet

Cordant™

110M4613 Rev. E

Description

The Hydro Dynamic Pressure Sensor System consists of the 350300 Hydro Dynamic Pressure Transducer which uses piezoresistive sensing technology and the 146824 interconnect cable. It is intended for measuring both static and dynamic pressure in fluid machines such as hydro turbines or centrifugal pumps.

This sensor is an integral part of a Hydro Turbine or Centrifugal Pump Condition Monitoring and Asset Management System. When utilized with our Bently Nevada™ 3500/46M Hydro Monitor and System 1 Plant Asset Management software, it enables trends and specialized dynamic plots for diagnostics. The Dynamic Pressure Transducer has a robust design for high reliability in plant environments and is designed for 50 million cycles.

For Hydro Turbine applications this measurement can detect and manage hydraulic phenomena such as Rough Load Zone, vortexing, and cavitation in the draft tube and head cover area, as well as pulsations in the penstock. For centrifugal pump applications, it can help detect and manage cavitation and other flow instabilities that are potentially detrimental to machinery and operations.

Baker Hughes

Specifications

350300 Dynamic Pressure Sensor

Operation outside the specified limits will result in false or inaccurate readings.

Transducer Characteristics

Measurement Range (static)	0 to 15/ 30/ 45/ 50/ 60/ 75/ 100/ 200/ 300/ 500/ 1000/ 1500/ 2000/ 3000/ 5000 *psia* 0 to 0.103/ 0.207/ 0.310/ 0.345/ 0.414/ 0.517/ 0.68/ 1.37/ 2.07/ 3.44/ 6.89/ 10.3/ 13.8/ 20.7/ 34.5 *MPaa*
Proof (Over) Pressure	>3X Full Scale
Burst Pressure	>4X Full Scale
Scale Factor	667 mV/psia (15 psia range) 333 mV/psia (30 psia range) 222 mV/psia (45 psia range) 200 mV/psia (50 psia range) 167 mV/psia (60 psia range 133 mV/psia (75 psia range) 100 mV/psia (100 psia range) 50 mV/psia (200 psia range) 33 mV/psia (300 psia range) 20 mV/psia (500 psia range) 10 mV/psia (1000 psia range) 7 mV/psia (1500 psia range) 5 mV/psia (2000 psia range) 3 mV/psia (3000 psia range) 2 mV/psia (5000 psia range)
Full Scale Output	10 ± 0.1 Vdc
Offset	0.0 ± 0.1 Vdc
DC Output Impedance	< 200 Ω
Minimum Load Resistance	2,500 Ω
Max. Current	< 16 mA
Insulation Resistance	100 MΩ @ 500V
Reverse polarity protection	Yes
Compensated Temperature Range	-40°C to 125°C (-40°F to 257°F)

Operating Temperature	-55°C to 125°C (-67°F to 257°F)
Temperature Error (Reference 20°C)	-10°C to 50°C (14°F to 122°F) ± 1.0 %FS -40°C to 125°C (-40°F to 257°F) ± 1.5 %FS
Non-Linearity, Hysteresis & Repeatability (BFSL)	≤ ±0.1 %*FS*
Frequency response	2000 Hz
Vibration Sensitivity, Max	<0.00667 %FS/g (15 psia range) <0.00333 %FS/g (30 psia range) <0.00222 %FS/g (45 psia range) <0.00200 %FS/g (50 psia range) <0.00167 %FS/g (60 psia range) <0.00133 %FS/g (75 psia range) <0.00100 %FS/g (100 psia range) <0.00050 %FS/g (200 psia range) <0.00033 %FS/g (300 psia range) <0.00020 %FS/g (500 psia range) <0.00013 %FS/g (750 psia range) <0.0007 %FS/g (1500 psia range) <0.0005 %FS/g (2000 psia range) <0.0003 %FS/g (3000 psia range) <0.0002 %FS/g (5000 psia range)

Physical & Environmental

Weight	< 8 oz
Dimensions	See Figure 1 in Graphs and Figures section
Materials	316L Stainless Steel Body
Pressure Connection	¼-18 NPT male
Electrical Connector	MIL-C-26482 (4 pin)
Mounting Torque	15.0 N-m (11.1 lbf-ft)
Storage Temperature	-40°C to 140°C (-40°F to 284°F)

Check the chemical compatibility of the sensor's wetted parts (316L stainless steel) with the medium to be measured.

Power Supply

Power Supply Voltage	13 - 42 Vdc
Supply Voltage Effects	<0.005 %FS/V

Compliance and Certifications

FCC

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

- This device may not cause harmful interference.
- This device must accept any interference received, including interference that may cause undesired operation.

EMC

EN 61326-1: 2013

CISPR 11: 2009 + A1: 2010

55011: 2009 + A1: 2010

EMC Directive 2014/30/EC

PED

PED Directive 2014/68/EU

RoHS

RoHS Directive 2011/65/EU

Ordering Information

For the detailed listing of country and product specific approvals, refer to the **Approvals Quick Reference Guide**, Document 108M1756, at **Bently.com.**

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350300-AAAA-BB (All transducers have a 1/4 -18 NPT male thread)

A: Pressure Range Options

Select an option from the chart below (0015 to 5000) that meets both static and dynamic pressure range requirements. Note that the static pressure range must accommodate the dynamic pressure (pulsation) amplitude that will ride on top of (overshoot) the static pressure.

AAAA Ordering Option	Dynamic Pressure Range (3500/46M)1		Static Pressure Range2	
	Psi pk	KPa pk	Psia	KPaa
0 0 1 5	6	41	15	103
0 0 3 0	12	82.5	30	206
0 0 4 5	18	124	45	310
0 0 5 0	20	138	50	344
0 0 6 0	24	165	60	413
0 0 7 5	30	206	75	517
0 1 0 0	40	280	100	690
0 2 0 0	80	560	200	1380
0 3 0 0	125	861	300	2068
0 5 0 0	200	1380	500	3450
1 0 0 0	400	2757	1000	6894
1 5 0 0	575	3964	1500	10342
2 0 0 0	800	5515	2000	13789
3 0 0 0	1350	9307	3000	20684
5 0 0 0	2000	13789	5000	34500

1 Dynamic pressure ranges are expressed in peak amplitude units, half of the full peak-to-peak pulsation amplitude.

2 Static pressure ranges are in absolute pressure (Psia, KPaa), so static pressure requirements stated as gauge pressures (Psig, KPag) may necessitate a numerically higher absolute pressure full-scale range.

B: Approvals Option

00	No Approvals

146824 Interconnect Cable

146824-AAAA

A: Length Option

0010	10 ft (3 m)
0025	25 ft (7.6 m)
0050	50 ft (15.2 m)
0100	100 ft (30.5 m)
0200	200 ft (61.0 m)
0300	300 ft (91.4 m)
0400	400 ft (121.9 m)
0500	500 ft (152.4 m)
1000	1,000 ft (304.8 m)

Associated 3500 Monitors Spares

3500/46M	Hydro Monitor with Multimode Positive Input I/O Module

Spares

176449-06	3500/46M Hydro Monitor
169715-01	Multimode Positive Input I/O Module with Internal Terminations
169715-02	Multimode Positive Input I/O Module with External Terminations

Graphs and Figures

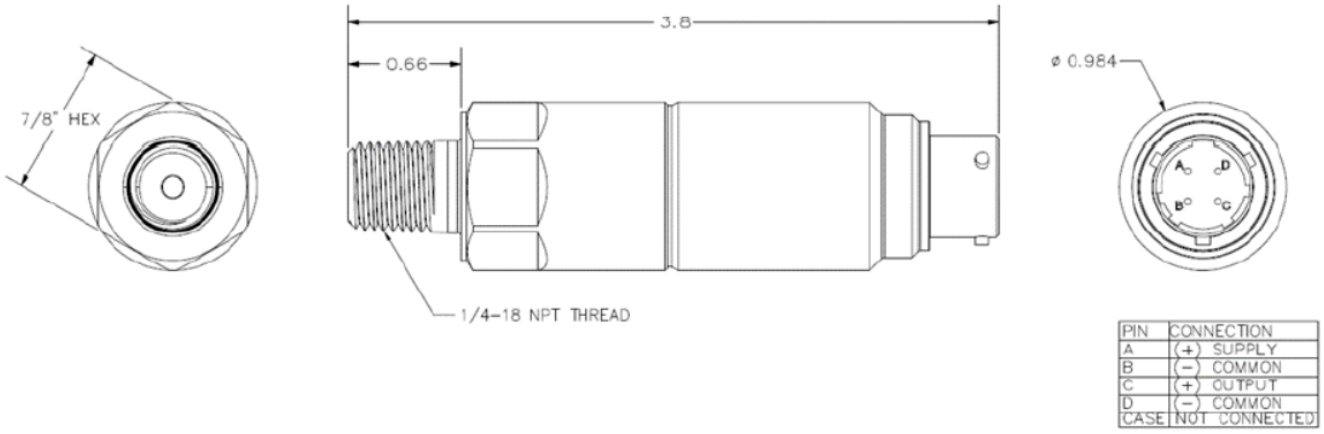
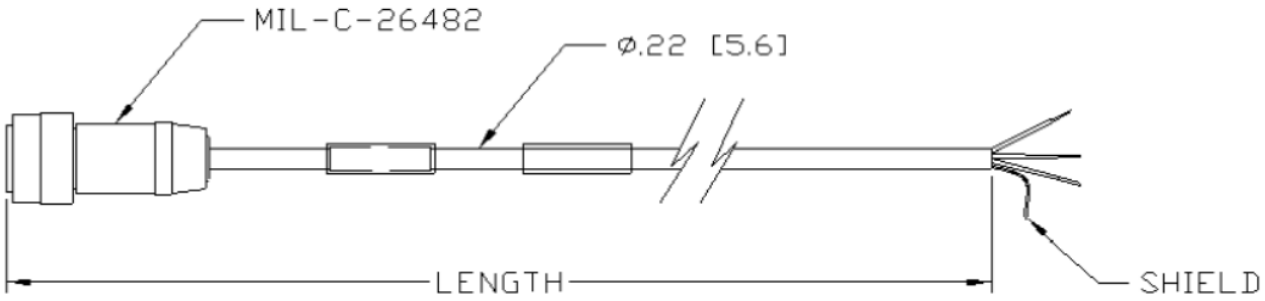


Figure 1: 350300 Dynamic Pressure Sensor Dimensions and Pinout



CONNECTOR	WIRE COLOR	WIRE DESCRIPTION
PIN "A"	RED	POWER
PIN "B"	BLACK	COMMON
PIN "C"	WHITE	SIGNAL
PIN "D"	N/C	

Figure 2: 146824-AAAA Cylinder Pressure Cable

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