

# 350300 Dynamic Pressure Sensor

## Datasheet

Bently Nevada Machinery Condition Monitoring

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### 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 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.

## 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/ 150/ 200/ 300/ 500/ 750/ 1000/ 1500/ 2000/ 3000/ 5000 <i>psia</i>  0 to 0.103/ 0.207/ 0.310/ 0.345/ 0.414/ 0.517/ 0.68/ 1.03/ 1.37/ 2.07/ 3.44/ 5.17/ 6.89/ 10.3/ 13.8/ 20.7/ 34.5 <i>MPaa</i>
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) 67 mV/psia (150 psia range) 50 mV/psia (200 psia range) 33 mV/psia (300 psia range) 20 mV/psia (500 psia range) 13 mV/psia (750 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	Yes

protection	
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) <0.00067 %FS/g (150 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) <0.0001 %FS/g (1000 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	1/4-18 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.

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## 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](http://Bently.com).

### 350300 Dynamic Pressure Sensor

**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) <sup>1</sup>		Static Pressure Range <sup>2</sup>	
	Psi pk	KPa pk	Psia	KPaa
0015	6	41	15	103
0030	12	82.5	30	206
0045	18	124	45	310
0050	20	138	50	344
0060	24	165	60	413
0075	30	206	75	517
0100	40	280	100	690
0150	60	413	150	1034
0200	80	560	200	1380
0300	125	861	300	2068
0500	200	1380	500	3450
0750	310	2137	750	5171
1000	400	2757	1000	6894
1500	575	3964	1500	10342
2000	800	5515	2000	13789
3000	1350	9307	3000	20684
5000	2000	13789	5000	34500

AAAA Ordering Option	Dynamic Pressure Range (3500/46M) <sup>1</sup>		Static Pressure Range <sup>2</sup>	
	Psi pk	KPa pk	Psia	KPaa
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

<b>00</b>	No Approvals
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## 146824 Interconnect Cable

### 146824-AAAA

#### A: Length Option

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

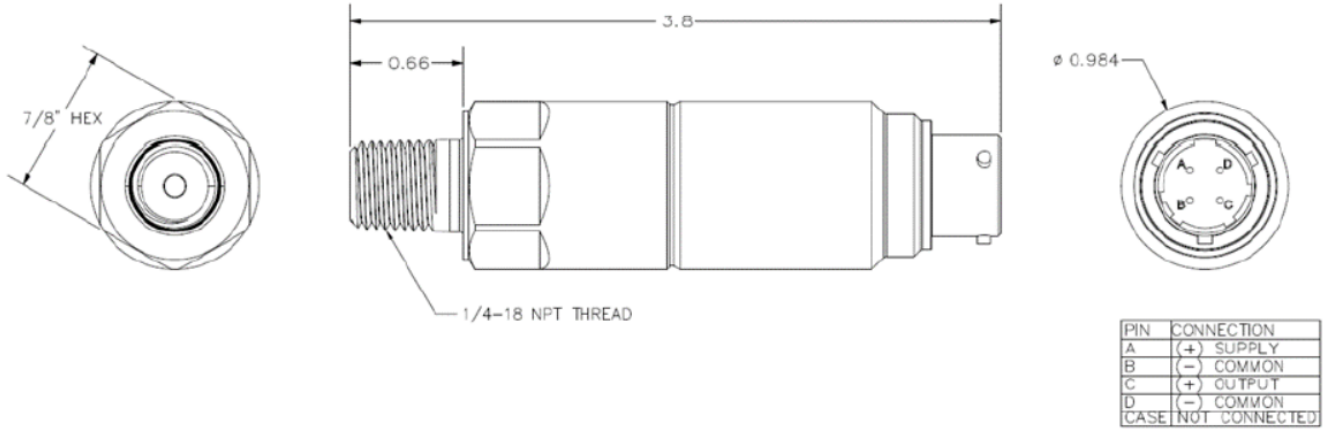
## Associated 3500 Monitors Spares

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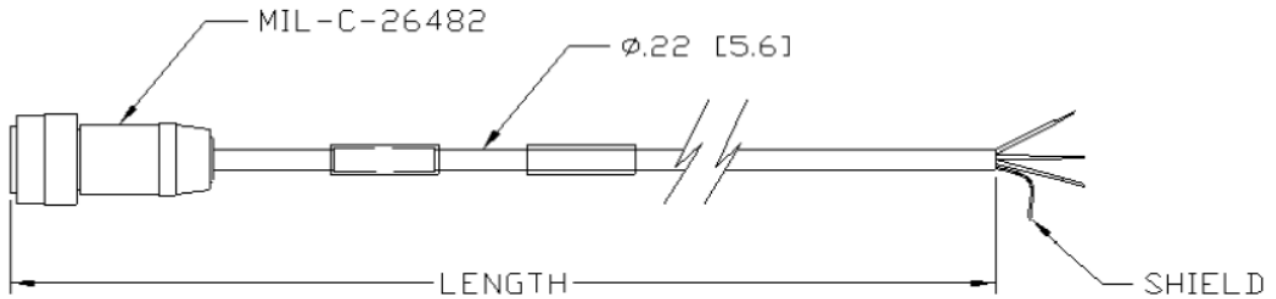
## Spares

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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1631 Bently Parkway South, Minden, Nevada USA 89423

Phone: 1.775.782.3611 [Bently.com](http://Bently.com)

