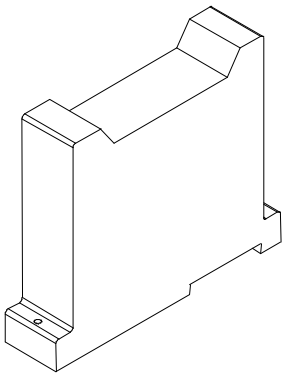
Описание на датчик динамического давления. Модель 1701/30

BENTLY
Nevada

1701/30 FieldMonitor™ Dynamic Pressure Monitor

Bently Nevada™ Asset Condition Monitoring



Description

The 1701/30 FieldMonitor™ Dynamic Pressure Monitor is a specialized monitor that monitors the pressure pulsations that can result from gas turbine combustion instability. The monitor accepts signals via its associated transducer I/O module from 3rd-party dynamic pressure sensors or our 350500 Dynamic Pressure Charge Amplifier. The monitor conditions these signals into the appropriate measurement units, compares them to user-programmable alarm setpoints, and generates appropriate alarm signals for communication to the host control system. Filtering and signal conditioning is designed to meet certain gas turbine Original Equipment Manufacturer (OEM) requirements (refer to specifications for details). The monitor also provides current values of its measured parameters to the control system for display(?) and trending. Embedded self-tests permit the monitor to assess its own integrity, and that of its connected transducers. the monitor can detect and annunciate a Not OK condition when problems with the monitor or its connected transducers exist.

The monitor is programmed to operate in one of three modes:

Single Channel Type 1 and Type 2 Modes:

Single Channel Type 1 and 2 Modes configure the monitor to interface to a single dynamic pressure sensor that connects to Channel A and to return up to 4 different measurement variables. This mode of operation and signal conditioning options applies to combustion instability monitoring on Alstom Power Cyclone, Tempest, Typhoon, and Tornado gas turbines, and on Solar turbines.

In these two modes the monitor can be programmed to return measurements in these units:

- peak-to-peak dynamic pressure
- rms dynamic pressure

Dual Channel Mode:

Dual Channel Mode configures the monitor to interface to 2 high temperature dynamic pressure sensors using an external charge amplifier such as the 350500. The monitor returns a single measurement variable on each channel. This mode of operation and the signal conditioning options also applies to certain gas turbines.

In Dual Channel mode the user can program the monitor to return measurements in these units:

- peak-to-peak dynamic pressure
- rms dynamic pressure
- derived peak dynamic pressure
- derived peak-to-peak dynamic pressure

Application Advisory

Proper measurement of dynamic pressure pulsations caused by combustion problems is highly dependent on sensor location, mounting, and acoustic characteristics of the sensor installation. The amplitude and frequency content of the signal will be affected by these factors. The signal conditioning requirements are determined by the OEMs using empirical testing.

Consult your OEM for information on sensor installation.

Specifications

1701/30 Dynamic Pressure Monitor / Single Channel Mode Type 1

Programmable Options

Proportional Values

Returns 3 or 4 value per monitor from a single sensor connected to Channel A:

- direct peak-to-peak (pp) dynamic pressure
- rms dynamic pressure
- filtered pp dynamic pressure
- filtered rms dynamic pressure

Alarms

Alarm 1 (Alert), Alarm 2 (Danger)

Over Alarm 1 and Over Alarm 2 on each proportional value.

Alarm Time Delays

0.15, 0.2, 0.3, 0.5, 0.6, 1.0, 2.0, 3.0, 5.0, 6.0, 10.0, and 20.0 seconds

Latching / Non-Latching Alarms

Non-latching only

Trip Multiply

None, 1.5x, 2x, 3x

OK Mode

Non-latching only

Timed OK Channel Defeat

Enabled or Disabled

Alarm Hysteresis

0.5% of full-scale

Signal Processing Options

Bandwidth/ Filtering

Direct pk-pk and rms Dynamic Pressure:

10 Hz to 1,660 Hz

Filters

Programmable band-pass. Minimum rolloff each side: -48 dB/ octave)

Filter Programmable Options

Direct Option

10 Hz to 1660 Hz

Bandpass Options

40.5 Hz to 74.6Hz
139.5 Hz to 200 Hz
281 Hz to 403Hz
20 Hz to 138 Hz
140 Hz to 240Hz
242 Hz to 450 Hz
452 Hz to 950 Hz
34.1 Hz to 39.3 Hz
36 Hz to 83 Hz
132 Hz to 152 Hz
673 Hz to 806 Hz
30 Hz to 55 Hz
180 Hz to 210 Hz
210 Hz to 250 Hz
690 Hz to 730 Hz

Full-scale Ranges

Peak-to-Peak Dynamic Pressure:

0 - 4 psi pp
0 - 6 psi pp
0 - 10 psi pp
0 - 15 psi pp

0 - 20 psi pp

0 - 40 psi pp

0 - 350 mbar pp

0 - 700 mbar pp

0 - 1400 mbar pp

0 - 2700 mbar pp

0 - 3400 mbar pp

RMS Dynamic Pressure:

0 - 0.5 psi rms

0 - 1 psi rms

0 - 2 psi rms

0 - 5 psi rms

0 - 10 psi rms

0 - 15 psi rms

0 - 20 psi rms

0 - 150 mbar rms

0 - 350 mbar rms

0 - 700 mbar rms

0 - 1400 mbar rms

Barriers Options

- Internal galvanically isolated barrier 170190-01 (requires the 1701/06 Isolator Terminal Base).
- External Zener Barrier **(170180-03-xx I/O Only)**
- External galvanically isolated barrier

Supported Transducer I/O Modules

170180-03-XX

Velomitor® I/O.

External Transducer Options

170180-03-XX

PCB 102M203 or PCB102M206 Dynamic Pressure Sensors.

Control I/O

- Channel On/Off
- Monitor Reset
- Channel Inhibit
- Trip Multiply: Enabled, Disabled

Specifications at 25°C (77°F)

Direct Accuracy (exclusive of filters)

1% of full-scale for full-scale ranges with voltage spans > 200mVp.

2.0% of full-scale for full-scale ranges with voltage spans ≤ 200 mVp

Direct Resolution

0.1% of full-scale

Power Input

-24 V, +5 V, from 1701 Power Supply

Power Consumption

1.5 W (not including transducers)

Setpoint Resolution

0.5% of full-scale

Flex™ Adapter Read/Write Rate:

≥ 25 millisec (monitor to Flex adapter)

Buffered Output

Note: Buffered signal is unprocessed transducer signal.

30 m (100 ft) cable at 60pF/ft, not isolated

Output impedance: 200 Ω.

Physical

Dimensions (HxWxD):

127 mm x 21.6 mm x 105 mm

(5.00 in x 0.85 in x 4.15 in)

Weight:

314 g (0.69 lbm)

Environmental Limits

Operating Temperature

-20 °C to + 70 °C (-4 °F to +158 °F)

Storage Temperature

-40 °C to + 85 °C (-40 °F to +185 °F)

Operating Humidity

5% to 95% non-condensing relative humidity

Storage Humidity

5% to 95% non-condensing relative humidity

1701/30 Dynamic Pressure Monitor / Single Channel Mode Type 2

Programmable Options

Proportional Values

Returns 3 or 4 value per monitor from a single sensor connected to Channel A:

- direct peak-to-peak (pp) dynamic pressure
- rms dynamic pressure
- filtered pp dynamic pressure
- filtered rms dynamic pressure

Alarms

Alarm 1 (Alert), Alarm 2 (Danger)

Over Alarm 1 and Over Alarm 2 on each proportional value.

Alarm Time Delays

0.15, 0.2, 0.3, 0.5, 0.6, 1.0, 2.0, 3.0, 5.0, 6.0, 10.0, and 20.0 seconds

Latching / Non-Latching Alarms:

Non-latching only

Trip Multiply

None, 1.5x, 2x, 3x

OK Mode

Non-latching only

Timed OK Channel Defeat

Enabled or Disabled

Alarm Hysteresis

0.5% of full-scale

Signal Processing Options

Bandwidth/ Filtering

Filters

Programmable band-pass. Minimum rolloff each side: -48 dB/ octave)

Filter Programmable Options

Bandpass Options

20 Hz to 60 Hz
70 Hz to 100 Hz
245 Hz to 255 Hz
390 Hz to 460 Hz
80 Hz to 120 Hz
180 Hz to 220 Hz
230 Hz to 240 Hz
280 Hz to 320 Hz
150 Hz to 240 Hz
250 Hz to 260 Hz
360 Hz to 390 Hz
400 Hz to 450 Hz
120 Hz to 180 Hz
180 Hz to 190 Hz
200 Hz to 500 Hz
310 Hz to 330 Hz

Full-scale Ranges

Peak-to-Peak Dynamic Pressure:

0 - 4 psi pp
0 - 6 psi pp
0 - 10 psi pp
0 - 15 psi pp
0 - 20 psi pp
0 - 40 psi pp
0 - 350 mbar pp
0 - 700 mbar pp
0 - 1400 mbar pp
0 - 2700 mbar pp
0 - 3400 mbar pp

RMS Dynamic Pressure:

0 - 0.5 psi rms
0 - 1 psi rms
0 - 2 psi rms
0 - 5 psi rms
0 - 10 psi rms
0 - 15 psi rms
0 - 20 psi rms
0 - 150 mbar rms
0 - 350 mbar rms
0 - 700 mbar rms
0 - 1400 mbar rms

Barrier Options

- Internal galvanically isolated barrier (requires the 1701/06 Isolator Terminal Base).
- External Zener Barrier
- External galvanically isolated barrier

Supported Transducer I/O Module

170180-01-xx with Modification 147631-01

Dual Proximitor® Sensor/Accelerometer I/O Module with modification for interfacing to the 350500 Dynamic Pressure Charge Amplifier

External Transducer Options

350500 (100 mV/psi output sensitivity only)

Dynamic Pressure Charge Amplifier. 100 mV/psi

Control I/O

- Channel On/Off
- Monitor Reset
- Channel Inhibit
- Trip Multiply: Enabled, Disabled

Specifications at 25°C (77°F)

Direct Accuracy (exclusive of filters)

1% of full-scale for full-scale ranges with voltage spans > 200mVp.

2.0% of full-scale for full-scale ranges with voltage spans ≤ 200 mVp

Direct Resolution

0.1% of full-scale

Power Input:

-24 V, + 5 V,

from 1701 Power Supply

Power Consumption

1.5 W (not including transducers)

Setpoint Resolution

0.5% of full-scale

Flex Adapter Read/Write Rate:

≥ 25 millisec (monitor to Flex adapter)

Buffered Output

Note: Buffered signal is unprocessed transducer signal.

30 m (100 ft) cable at 60pF/ft, not isolated

Output impedance: 200 Ω.

Physical

Dimensions

(HxWxD):

127 mm x 21.6 mm x 105 mm

(5.00 in x 0.85 in x 4.15 in)

Weight:

314 g (0.69 lbm)

Environmental Limits

Operating Temperature

-20 °C to + 70 °C (-4 °F to +158 °F)

Storage Temperature

-40 °C to + 85 °C (-40 °F to +185 °F)

Operating Humidity

5% to 95% non-condensing relative humidity

Storage Humidity

5% to 95% non-condensing relative humidity

1701/30 Dynamic Pressure Monitor / Dual Channel Mode

Programmable Options

Proportional Values

Returns 1 per channel:

- direct pp dynamic pressure
- direct rms dynamic pressure
- direct, derived peak dynamic pressure
- direct, derived pp dynamic pressure
- filtered pp dynamic pressure
- filtered rms dynamic pressure
- filtered derived peak dynamic pressure
- filtered derived pp dynamic pressure

Alarms

Alarm 1 (Alert), Alarm 2 (Danger)

Over Alarm 1 and Over Alarm 2 on single proportional value

Alarm Time Delays

0.15, 0.2, 0.3, 0.5, 0.6, 1.0, 2.0, 3.0, 5.0, 6.0, 10.0, and 20.0 seconds

Latching / Non-Latching Alarms

Non-latching only

Trip Multiply

None, 1.5x, 2x, 3x

OK Mode

Non-latching only

Timed OK Channel Defeat

Enabled or Disabled

Alarm Hysteresis

0.5% of full-scale

Bandwidth/Filtering

Filters

Programmable band-pass 12th-order, minimum rolloff each side: -36 dB/ octave

Direct Option

4 Hz to 4000 Hz

Band-Pass Options

4 Hz to 3220 Hz

4 Hz to 1220 Hz

235 Hz to 1065 Hz

Full-scale Ranges

Peak-to-Peak Dynamic Pressure

0 - 4 psi pp
0 - 6 psi pp
0 - 10 psi pp
0 - 15 psi pp
0 - 20 psi pp
0 - 40 psi pp

0 - 350 mbar pp
0 - 700 mbar pp
0 - 1400 mbar pp
0 - 2700 mbar pp
0 - 3400 mbar pp

RMS Dynamic Pressure

0 - 2 psi rms
0 - 5 psi rms
0 - 10 psi rms
0 - 15 psi rms
0 - 20 psi rms

0 - 150 mbar rms
0 - 350 mbar rms
0 - 700 mbar rms
0 - 1400 mbar rms

Derived Peak Dynamic Pressure

Note: Monitor calculates derived peak by multiplying true rms value by 1.414.

0 - 5 psi dpk
0 - 10 psi dpk
0 - 15 psi dpk

Derived Peak-to-Peak Dynamic Pressure

Note: Monitor calculates derived peak-to-peak by multiplying true rms value by 2.828.

0 - 5 psi dpp
0 - 10 psi dpp
0 - 15 psi dpp
0 - 20 psi dpp

Barrier Options

- Internal galvanically isolated barrier (requires the 1701/06 Isolator Terminal Base).
- External Zener Barrier
- External galvanically isolated barrier

Supported Transducer I/O Module

170180-01-xx with Modification 147631-01

Dual Proximitor Sensor/Accelerometer I/O Module with modification for interfacing to the 350500 Dynamic Pressure Charge Amplifier

External Transducer Options

350500 (100 mV/psi output sensitivity only)

Dynamic Pressure Charge Amplifier. 100 mV/psi

Control I/O

- Channel On/Off
- Monitor Reset
- Channel Inhibit
- Trip Multiply: Enabled, Disabled

Specifications at 25°C (77°F)

Direct accuracy

(exclusive of filters)

1% of full-scale for full-scale ranges with voltage spans > 200mVp.

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Direct Resolution

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Power input

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from 1701 Power Supply

Power Consumption

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Setpoint Resolution

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Flex Adapter Read/Write Rate:

≥ 25 millisec (monitor to Flex adapter)

Buffered Output

Note: Buffered signal is unprocessed transducer signal.

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Output impedance: 200 Ω.

Physical

Dimensions

(HxWxD):

127 mm x 21.6 mm x 105mm

(5.00 in x 0.85 in x 4.15 in)

Weight:

314 g (0.69 lbm)

Environmental Limits

Operating Temperature

-20 °C to + 70 °C (-4 °F to +158 °F)

Storage Temperature

-40 °C to + 85 °C (-40 °F to +185 °F)

Operating Humidity

5% to 95% non-condensing relative humidity

Storage Humidity:

5% to 95% non-condensing relative humidity

Ordering Information

FieldMonitor™ Dynamic Pressure Monitor

1701/30-01

Hazardous Area Approvals

North America

Ex nA IIC T4

Class I, Zone 2

Class I, Div 2

Groups A, B, C, D

T4 @ -30°C = Ta = +70°C

Per drawing # 139255

Certification Number

CSA 1166985

European/ATEX

II 3G EEx nA [L] IIC T4

LCIE 00ATEX6016X

T4 @ -30°C = Ta = +70°C

II 1/3 G EEx nA[ia] ia IIC T4

LCIE 00ATEX6017X

T4 @ -30°C = Ta = +70°C

Brazil

Br-Ex nA [nL] IIC T4

MC, AEX-8304-X

T4 @ -30°C = Ta = +70°C

Documentation:

144504-01

1701/30 User Manual.

144505

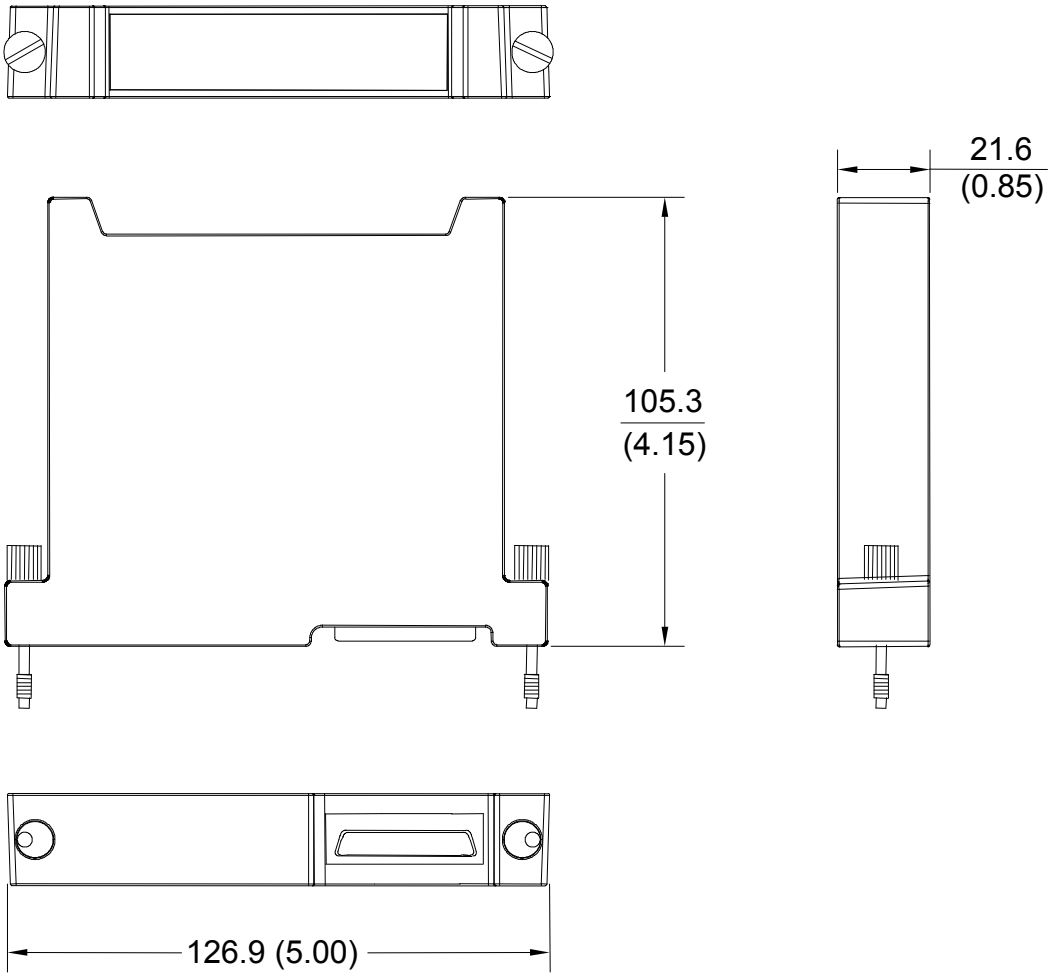
1701/30 Field Wiring Drawing.

139256-01

FieldMonitor System User Manual.

Dimensional Drawing

Note: All dimension in millimetres (inches) unless noted otherwise.



По вопросам продаж и поддержки обращайтесь: btn@nt-rt.ru www.bently.nt-rt.ru

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