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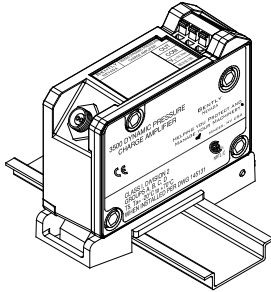
Описание на датчики нестабильности горения газовой турбины. Модель 350500



BENTLY
Nevada

350500 Dynamic Pressure Charge Amplifier

Bently Nevada* Asset Condition Monitoring



Description

The 350500 Dynamic Pressure Charge Amplifier (DPCA) is a component in a dynamic pressure sensing system. This sensing system, which monitors pressure pulsations that result from combustion instability in gas turbine engines, consists of a charge-coupled piezoelectric pressure sensor, low noise interconnect cable, 350500 charge amplifier, and monitoring device.

The dynamic pressure sensor should be a high temperature piezoelectric type that converts dynamic pressure to an output signal scaled in pico-coulombs per unit of pressure. The 350500 charge amplifier design allows its use with a number of sensors designed to monitor combustion instability.

The interconnect cable, which connects the sensor with the charge amplifier, is a specially designed low-noise, environmentally robust cable. The 350500 DPCA offers two interconnect cable options.

The 350500 charge amplifier converts the sensor charge signal to a low impedance voltage output signal. This signal is suitable for Bently Nevada monitors such as the 3500/64 Dynamic Pressure Monitor. The electrical interface from the monitor to the charge amplifier, which consists of -24 Vdc power, common, and signal, is the same as that for a Bently Nevada Proximity*. Appropriate safety barriers can be used between the charge amplifier and the monitoring device.



imagination at work

Specifications

All Specifications are at 23 °C ± 2 °C, (73.4 °F ± 3.6 °F)

Installation

Install per Installation Drawing 145131 in a safe area or CSA\NRTL\C Class I Division 2, Group A, B, C, or D hazardous area or Class 1 Zone 2 IIC.

Install per Drawing 146821 for Intrinsically Safe Division 1 or Class 1 Zone 0 IIC applications.

350500 Electrical Specifications

Power:

Supply Voltage (at the module)

- 19.60 Vdc to - 26 Vdc when no safety barriers are used

-17.75 Vdc to - 26 Vdc when safety barriers are used.

Supply Current

14.68 mA maximum with no load
11.69 mA typical with no load

Signal:

Input Sensitivity

Ordered option:

13.8 pC/psi (200 pC/bar)

16 pC/psi (232 pC/bar)

1200 pC/psi (17,404 pC/bar)

12 pC/psi (174 pC/bar)

60 pC/psi (870 pC/bar)

Expected Sensor Pole-to-Pole Capacitance for different Input Sensitivities	Input Sensitivity Option in pC/psi:	Nominal Pole-Pole Capacitance in picofarads:
	13.8	320
	16	60 to 90
	1200	6,300
	12	100
	60	300

Output Sensitivity

Ordered option:
100 millivolt/psi (1.45 Volt/bar)±
2% @ 150 Hz

Dynamic Range

±50 psi pk

Common Mode Rejection

-40 dB or better in the passband.

Output Resistance Frequency Response

50 ohm typical

Ordered option: High Low
(See Figure 1)

Physical

Dimensions:

See figures 3 and 4

Weight:

246 grams (8.7 oz)

Mounting:

Panel mount and 35 mm DIN rail mount options. (See Figures 3 and 4)

Power/Signal Connector and Wiring:

Three-conductor SpringLoc terminal strip for power, instrument common, and signal output. Accepts wire sizes of: 0.2 mm² to 1.5 mm² (16 to 24 AWG) without ferrules, and 0.25 mm² to 0.75 mm² (18 to 23 AWG) with ferrules. Recommended field wiring is a three-conductor shielded triad. Maximum length of 305 metre (1000 feet) between the charge amplifier and the monitor.

**Sensor
Connector:**

Two-pin LEMO EXG.0B.302.HLN
(mates to LEMO FGG.0B.302 or
equivalent)
or
Three-pin MIL Connector
MS31128-3P
(mates to MS3116F8-3S or
equivalent)

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 and
Storage
Humidity:**

0% to 95% relative non-
condensing

Hazardous Area Approvals

North America:

Class I Division 2, Groups A, B, C, D
Class I Division 1, Groups A, B, C, D
CSA Class I Zone 0 Ex ia IIC T4
(-20°C ≤ Ta ≤ +70°C)
Class I Zone 2 Ex nA IIC T5
(-20°C ≤ Ta ≤ +70°C)

Europe:

Ex ia IIC T5 Ga
(-20°C ≤ Ta ≤ +70°C)
Ex nA IIC T5 Gc
(-20°C ≤ Ta ≤ +70°C)

International:

Ex ia IIC T5 Ga
(-20°C ≤ Ta ≤ +70°C)
Ex nA IIC Gc
(-20°C ≤ Ta ≤ +70°C)

Compliance and Certifications

EMC:

European Community Directives:
EMC Directive 2004/108/EC
Standards:
EN 61000-6-2:2005
EN 61000-6-4:2007

145536 Interconnect Cable Specifications

Unless noted otherwise all Specifications are at 23°
±2°C, (73.4°F ±3.6° F)

The 145536 Interconnect Cable is a double shielded,
double jacketed, low noise treated, twisted pair cable
designed specifically for use with the 350500 DPCA.

**Sensor
Connector:**

MS3106F-10SL-4S
(Mil spec two pin connector)
or
MS31128-3P
(Mil spec three pin connector)

**Charge Amp
Connector:**

LEMO FGG.0B.302.CLAD.56
or
Three-pin MIL Connector
MS31128-3P

**Cable Operating
Temperature:**

150° Celsius maximum (302° F)

**Conductor to
conductor
capacitance:**

30 pF/ft nominal

145693 Interconnect Cable Specifications

Unless noted otherwise all Specifications are at 23°
±2 °C, (73.4 °F ±3.6 °F)

The 145693 Interconnect Cable is a double shielded,
double jacketed, low noise treated, twisted pair cable
designed specifically for use with the 350500 DPCA.
It can be ordered in lengths from 1 to 15 metres in 1-
metre increments.

**Sensor
Connector:**

M83723/95G10207
(Mil spec two pin connector)
or
MS3116F8-3S
(Mil spec three pin connector)

**Charge Amp
Connector:**

LEMO FGG.0B.302.CLAD.56
or
Three-pin MIL Connector
MS31128-3P

**Cable Operating
Temperature:**

200 °C maximum (392° F)

**Conductor to
conductor
capacitance:**

70 pF/ft nominal

Housing Specifications

330181 Housing.
See Data Sheet 141195-01 for
Specifications and Ordering
Information. This housing is used
with 3300 XL Proximitor and can
also be used for the 350500.
Up to six (6) DPCA's can be
mounted in panel mount
configuration and up to eight (8)
in DIN mount configuration.

Ordering Information

Dynamic Pressure Charge Amplifier

350500-AA-BB-CC-DD-EE-FF

A: Input Sensitivity Option

00 16 pC/psi (232 pC/bar)
01 1200 pC/psi (17,404 pC/bar)

02 13.8 pC/psi (200 pC/bar)
03 12 pC/psi (174 pC/bar)
04 60 pC/psi (870 pC/bar)

B: Low Pass Frequency Option

00 High
01 Low
(See Figure 1)

C: Output Sensitivity Option

00 100 mV/psi (1.45 V/bar)

D: Mounting Option

00 Panel Mount, LEMO Connector
01 35 mm DIN Mount, LEMO
Connector
02 No Mounting Hardware, LEMO
connector
***10** Panel Mount, MIL Connector
***11** Din Mount, MIL Connector
***12** No Mounting Hardware, MIL
Connector

*Ordering options 10, 11 or 12 for D
limits the input sensitivity option
(ordering option A) to be either 00 (16
pC/psi (232 pC/bar) or 04 (60 pC/psi (870
pC/bar)).

E: Approvals

00 No Approvals
01 CSA/NRT/L Class 1 Div 2,
Groups A,B,C,D
05 Multi Agency Approvals

Interconnect Cables

145536 -01

This cable is 15.24 metres long (50
feet) and has a MS3106F-10SL-4S
sensor connector.

145536 -02

Identical to -01 with overmold on
the sensor side connector.

145693 - AA

This cable has a
M83723/95G10207 sensor side
connector and can be ordered in
lengths from 1 metre to 15 metre
in 1-metre increments

A: Length option

01 to 15 metres in 1-metre increments

Frequency Response Plots

Typical Low Frequency Corner vs. External Capacitance (Low Pass filter option set to 'High')

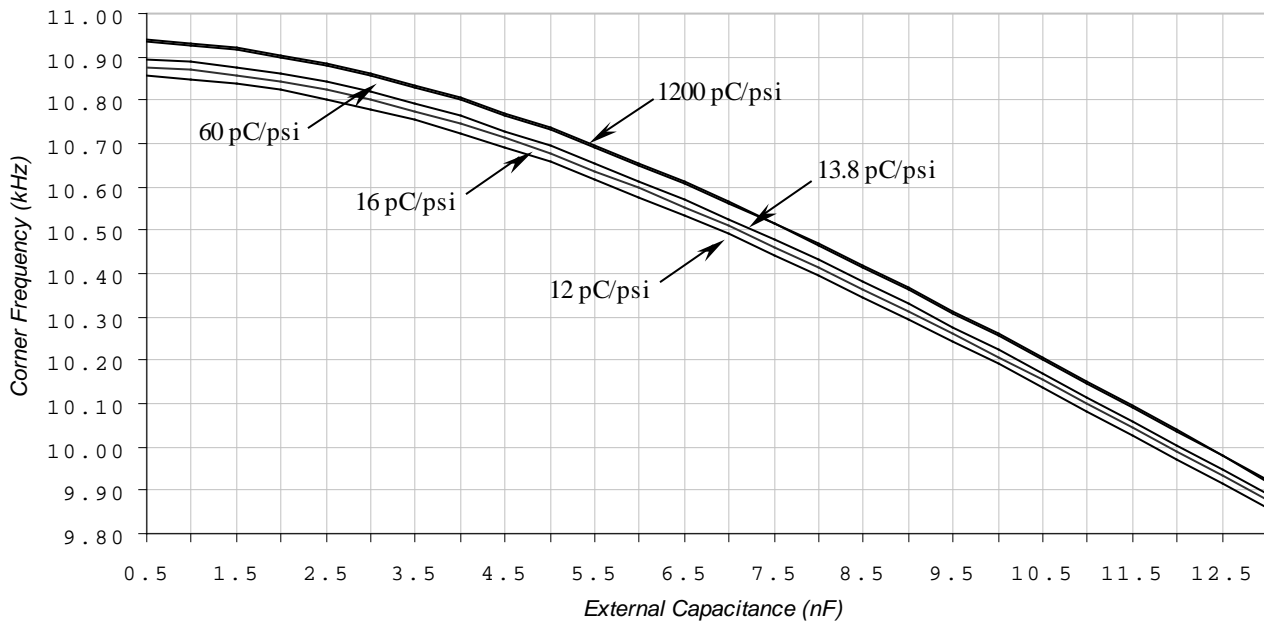


Figure 1: Low-Pass Filter option set to 'High'. 'External Capacitance' is the pole-to-pole cable capacitance plus the capacitance of the sensor

Typical Low Frequency Corner vs. External Capacitance (Low Pass filter option set to 'Low')

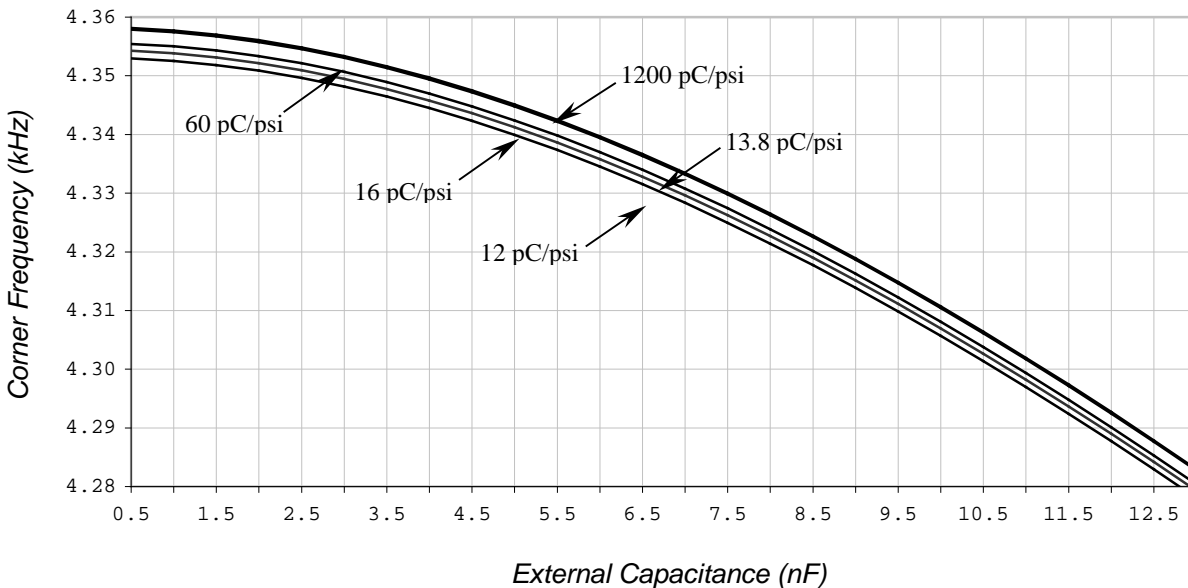


Figure 2: Low-Pass Filter option set to 'Low'. 'External Capacitance' is the pole-to-pole cable capacitance plus the capacitance of the sensor

Dimensional Drawings

(Dimensions in inches)

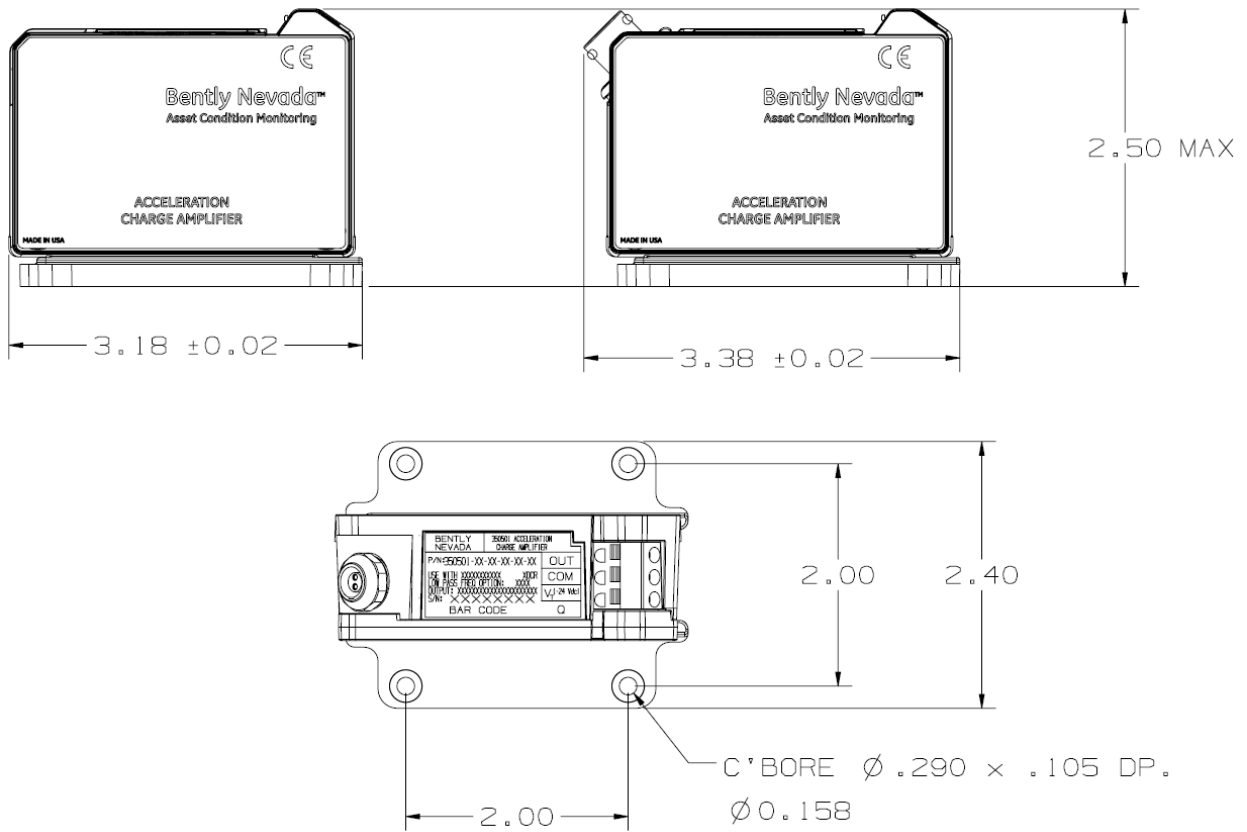


Figure 3: 350500 Panel Mount Option

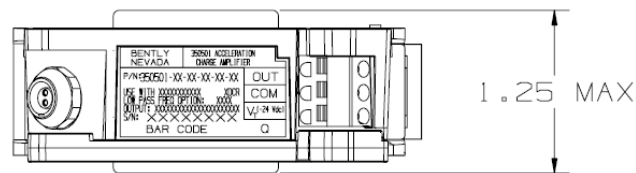
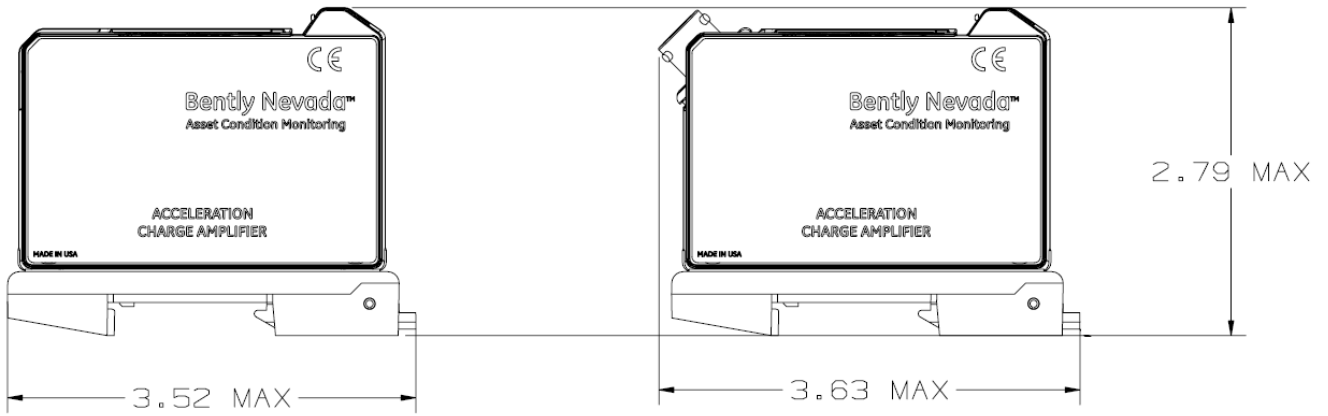


Figure 4: 350500 DIN Mount Option

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