

# Paine Miniature-Satellite Series Pressure Transmitter

VDC, Space Qualified, Miniature, +60 °C, Ranges from 0–500 to 0–5,000 PSIA (0–34 to 0–344 BAR)



Rated to an operating pressure of 0-500 to 0-5,000 PSIA (34 to 344 BAR) and designed with Class 'S', QML-V/ELDRS free electronics to meet EEE INST-002/MSFCSTD- 3012 Level 1 standards, the Miniature-Satellite Series is designed to meet the extreme demands of space flight and orbital operations.

The Miniature-Satellite Series pressure transmitter is a very low mass (only 75 grams), all welded stainless steel construction that provides high measurement performance, accuracy and reliability in mission critical applications.

Paine pressure transmitters have been in space for decades on many satellite and spacecraft programs. From sophisticated booster rocket adjustments on a journey to Jupiter, to orbital positioning controls used to maneuver to the space station, the Miniature-Satellite Series is utilized as a reference and baseline for engineers creating new space rated measurement solutions.

## Solutions

- Low and High Pressure Options
  - 212-30-010-01 and 212-30-010-02 Series: 0-500 psia (34 bar)
  - 212-35-070-01 and 212-35-070-02 Series: 0-5,000 psia (344 bar)
- Orbital environment ready
- EEE INST-002/MSFCSTD-3012 Grade 1 standard electronics
- Low mass, 75 grams
- Radiation hardening to 100KRad (Si) total dose
- Immunity to Single Event Latch up (SEL)
- Secondary containment to 5,000 PSIA (344 BAR)

## Potential applications

- Fuel tank pressure
- Thrustor pressure
- Pressure regulator systems
- Oxygen pressure monitoring
- Space probe servo valve controls
- ROV Maneuvering controls

## Features

- **Accuracy:** ± 1.5% of the full scale over the calibrated temperature range
- **Operating temperature:**
  - 212-30-010-01: -40 °F to 140 °F (-40 °C to 60 °C)
  - 212-30-010-02: -40 °F to 122 °F (-40 °C to 50 °C)
  - 212-35-070-01: -40 °F to 140 °F (-40 °C to 60 °C)
  - 212-35-070-02: -40 °F to 122 °F (-40 °C to 50 °C)
- **Pressure range:**
  - 212-30-010-01 & 212-30-010-02: 0-500 psia (34 bar)
  - 212-35-070-01 & 212-35-070-02: 0-5,000 psia (344 bar)
- **Input voltage:**
  - 212-30-010-01: ± 12-15 VDC
  - 212-30-010-02: ± 24-32 VDC
  - 212-35-070-01: ± 12-15 VDC
  - 212-35-070-02: ± 24-32 VDC
- **Operating media:** Any compatible with 15-5 PH CRES & 321 CRES
- **Mass:** 2.64 oz (75 grams) maximum

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## Specifications

**Calibration:** Calibration Certificates are supplied with each unit and available on-line.

### Performance

**Accuracy:**  $\pm 1.5\%$  of the Full Scale over the calibrated temperature range

**Full scale output:**

- 212-30-010-01:  $+5.000 \pm 0.075$  VDC
- 212-30-010-02:  $+5.100 \pm 0.075$  VDC
- 212-35-070-01:  $+5.000 \pm 0.075$  VDC
- 212-35-070-02:  $+5.100 \pm 0.075$  VDC

**Zero pressure output:** ( $10^{-2}$  TORR or less)

- 212-30-010-01:  $+0.000 \pm 0.075$  VDC
- 212-30-010-02:  $+0.100 \pm 0.075$  VDC
- 212-35-070-01:  $+0.000 \pm 0.075$  VDC
- 212-35-070-02:  $+0.100 \pm 0.075$  VDC

### Environmental

**Operating temperature range:**

- 212-30-010-01:  $-40^{\circ}\text{F}$  to  $140^{\circ}\text{F}$  ( $-40^{\circ}\text{C}$  to  $60^{\circ}\text{C}$ )
- 212-30-010-02:  $-40^{\circ}\text{F}$  to  $122^{\circ}\text{F}$  ( $-40^{\circ}\text{C}$  to  $50^{\circ}\text{C}$ )
- 212-35-070-01:  $+0.000 \pm 0.075$  VDC
- 212-35-070-02:  $+0.100 \pm 0.075$  VDC

**Compensated temperature range:**

$24^{\circ}\text{F}$  to  $122^{\circ}\text{F}$  ( $-4^{\circ}\text{C}$  to  $50^{\circ}\text{C}$ )

## Mechanical

**Pressure Range:** Contact factory for additional pressure ranges.

Pressure table			
Standard part number	Pressure range PSIA (BAR)	Proof pressure PSIA (BAR)	Burst pressure PSIA (BAR)
212-30-010-01	0-500 (0-34)	750 (51)	1,250 (86)
212-30-010-02	0-500 (0-34)	750 (51)	1,250 (86)
212-35-070-01	0-5,000 (0-344)	7,500 (517)	12,500 (861)
212-35-070-02	0-5,000 (0-344)	7,500 (517)	12,500 (861)

**External leakage:** Less than  $1 \times 10^{-6}$  SCC/SEC of HE at proof pressure

**Double barrier secondary containment:** To 5,000 PSIA (344 BAR)

**Operating media:** Any compatible with 15-5 PH CRES and 321 CRES

**Pressure tube:** Weld-able, Type 321 CRES

**Total ionizing doze:** 100K Rad minimum

**Weight/mass:** 2.64 oz. (75 grams) maximum

## Electrical

### Input voltage:

- 212-30-010-01:  $\pm 12-15$  VDC
- 212-30-010-02:  $\pm 24-32$  VDC
- 212-35-070-01:  $\pm 12-15$  VDC
- 212-35-070-02:  $\pm 24-32$  VDC

### Input power:

- 212-30-010-01: 350 mW maximum
- 212-30-010-02: 800 mW maximum
- 212-35-070-01: 350 mW maximum
- 212-35-070-02: 800 mW maximum

**Output impedance:** Less than 1000  $\Omega$

**Output load:** unit shall operate with a resistive load of 1M  $\Omega$  or greater

**Output voltage:** .1 to 5.1 Vdc

**Output ripple:** Less than 10.0 mV RMS, DC to 10kHz

**Output capacitance:** Less than 1000pF

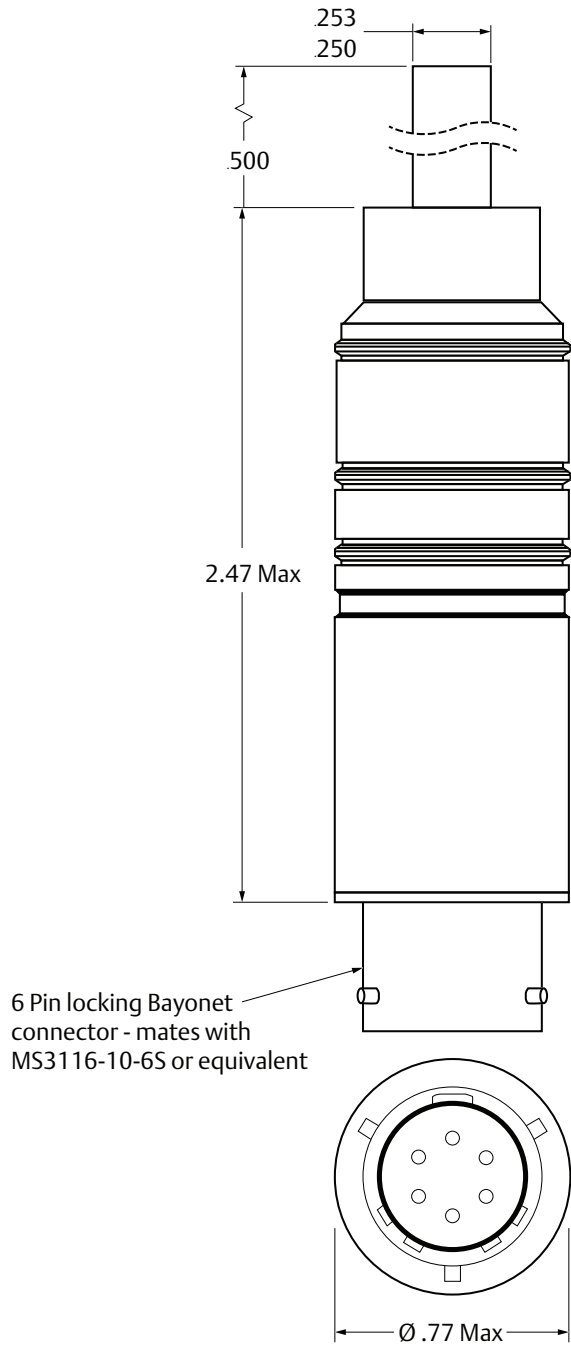
**Frequency response:** 10Hz minimum

**Insulation resistance:** All pins (except F) to case, 100M  $\Omega$  minimum at + 50VDC for 30 seconds

**Electrical connections:** Mates with MS3116-10-6S or equivalent, sold separately

# Dimensional Drawings

Figure 1. Miniature-Satellite Series



**Connection:**

PIN	212-30-010-01 212-35-070-01 (±12-15 VDC)	212-30-010-02 212-35-070-02 (±24-32 VDC)
A	+ 12V Input	+ 24V Input
B	Input return	Input return
C	- 12V Input	DO NOT CONNECT
D	Signal return	Signal return
E	Signal output	Signal output
F	Case ground	Case ground

Dimensions are inches.

## Product Name

212-Miniature-Satellite-DS, Rev J

## Product Data Sheet

February 2017

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