

## Series VTU73 Pressure Transducer

Piezoresistive pressure transmitter

### Features

- Heavy Industrial CE Approval
- 10 V/m EMI Protection
- Reverse Polarity Protection on Input
- Short Circuit Protection on Output
- Up to  $\pm 0.1\%$  Accuracy
- Up to  $\pm 0.5\%$  Total Error Band
- Compact Outline
- $-40^{\circ}\text{C} \dots +125^{\circ}\text{C}$  Operating Temperature  $-20^{\circ}\text{C} \dots +85^{\circ}\text{C}$  Compensated Temperature



### Specification

- Superior Accuracy and Total Error Band
- Compact
- Variety of Pressure Ports and Electrical Configurations
- Optional damper
- CE Compliant and Weatherproof
- Gage, Compound
- Excellent Stability



### Applications

- Military/Aerospace Test Stands
- Automotive Test Stands
- Calibration Equipment
- High Accuracy Applications
- Stationary Motor Fuel Control
- High End Industrial Machinery

#### Accuracy

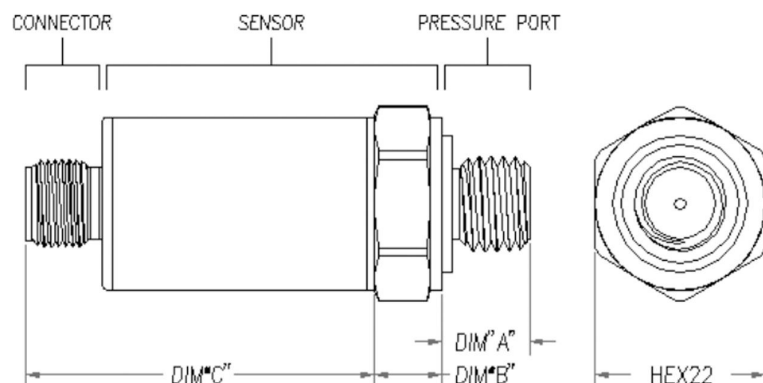
$\pm 0.1\%$  FS

#### Total error band

$\pm 0.5\%$  FS @  $-20 \dots +85^{\circ}\text{C}$

#### Pressure ranges

$-1 \dots 1$  to  $0 \dots 70$  bar



## Series VTU73 Pressure Transducer

### Standard pressure ranges

#### Standard Ranges

| Measuring Method                                   | Range (psi)                            | Range (Bar) | Gage | Sealed | Absolute | Compound |  |
|----------------------------------------------------|----------------------------------------|-------------|------|--------|----------|----------|--|
| Piezoresistive pressure sensor (Relative pressure) | -14.5...+14.5                          | -1 ... +1   |      |        |          |          |  |
|                                                    | 0...10                                 | 0...0.7     |      |        |          |          |  |
|                                                    | 0...15                                 | 0...1       |      |        |          |          |  |
|                                                    | 0...30                                 | 0...1.5     |      |        |          |          |  |
|                                                    | 0...100                                | 0..7        |      |        |          |          |  |
|                                                    | 0...150                                | 0...10      |      |        |          |          |  |
|                                                    | 0...300                                | 0...20      |      |        |          |          |  |
|                                                    | 0...500                                | 0...35      |      |        |          |          |  |
|                                                    | 0...100                                | 0... 7      | •    |        |          |          |  |
|                                                    | 0...150                                | 0...10      | •    |        |          |          |  |
|                                                    | 0 ...250                               | 0...16      | •    |        |          | •        |  |
|                                                    | 0 ...500                               | 0 ...35     | •    |        |          | •        |  |
|                                                    | 0...1000                               | 0 ...70     | •    |        |          | •        |  |
|                                                    | Consult manufacture to custom order,•S |             |      |        |          |          |  |

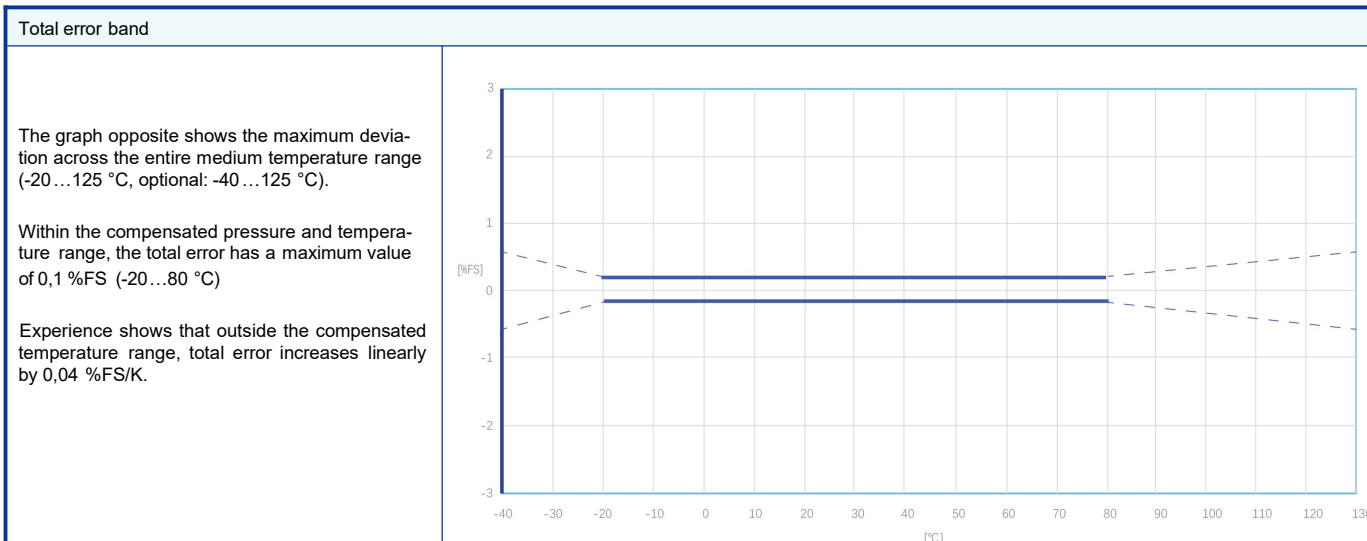
## Performance

### Pressure

| PARAMETERS                                                       | MIN                                                                    | TYP  | MAX  | UNITS       | NOTES                              |
|------------------------------------------------------------------|------------------------------------------------------------------------|------|------|-------------|------------------------------------|
| Accuracy (Combined Non-linearity, hysteresis, and repeatability) | -0.1                                                                   | ±0.1 | 0.1  | %F.S. BFSL  | @ 25°C                             |
| Zero Error                                                       | -0.1                                                                   | ±0.1 | 0.1  | %F.S. BFSL  | @25°C                              |
| Full Scale Error                                                 | -0.1                                                                   | ±0.1 | 0.1  | %F.S. BFSL  | @25°C                              |
| Isolation, Body to any Lead                                      | 100                                                                    |      |      | MΩ          | @250VDC                            |
| Pressure Cycles                                                  | 1X10 <sup>7</sup>                                                      |      |      | 0~FS Cycles |                                    |
| Proof Pressure                                                   | 2X                                                                     |      |      |             | Rated                              |
| Burst Pressure                                                   | 3X                                                                     |      |      |             | Rated                              |
| Long Term Stability (1 year)                                     | -0.1                                                                   |      | 0.1  | %F.S.       |                                    |
| Total Error Band                                                 | -0.5                                                                   | ±0.5 | 0.5  | %F.S.       | Over compensated temperature range |
| Compensated Temperature                                          | -20                                                                    |      | 85   | °C          |                                    |
| Operating Temperature                                            | -40                                                                    |      | +125 | °C          | Except cable 105°C MAX             |
| Storage Temperature                                              | -40                                                                    |      | +125 | °C          | Except cable 105°C MAX             |
| Load Resistance (RL)                                             | RL > 100k                                                              |      |      | Ω           | Voltage Output                     |
| Load Resistance (RL)                                             | < (Supply Voltage -9V) / 0.02A                                         |      |      | Ω           | Current Output                     |
| Current Consumption                                              |                                                                        |      | 10   | mA          | Voltage Output                     |
| Rise Time (10% to 90%)                                           | <2ms (Voltage Output); <3ms (Current Output); Without Snubber          |      |      |             |                                    |
| Pressure Port Material                                           | SUS 316L                                                               |      |      |             |                                    |
| Shock                                                            | 50g, 11msec Half Sine Shock per MIL-STD-202G, Method 213B, Condition A |      |      |             |                                    |
| Vibration                                                        | ±20g, MIL-STD-810C, Procedure 514.2-2, Curve L                         |      |      |             |                                    |

Note: For custom configurations, please consult the factory.

For pressure ranges below 0...70 bar, the customer must ensure that the mating connector allows venting to the atmosphere.



## Series VTU73 – Specifications

| CODE | CONNECTION TYPE | DIM C (MAX) |
|------|-----------------|-------------|
| 1    | Cable           | 1.97 [50.0] |
| 2    | Packard A       | 2.10 [53.5] |
| 3    | Packard B       | 2.10 [53.5] |
| 4    | M12             | 1.71 [43.5] |
| 5    | Form A          | 1.93 [49.0] |
| 6    | Form C          | 1.97 [50.0] |
| 7    | AMP             | 2.52 [64.0] |

| CODE | OUTPUT SIGNAL | SUPPLY VOLTAGE   |
|------|---------------|------------------|
| 1    | 0.5-4.5V      | 5±0.25V          |
|      | Ratiometric   | Protected to 16V |
| 2    | 1-5V          | 8-36V            |
| 3    | 4-20mA        | 9-36V            |
| 4    | 0-5V          | 8-36V            |
| 5    | 0-10V         | 13-36V           |
| 6    | 1-6V          | 8-36V            |
| 7    | 0.5-4.5V      | 7.5-36V          |

| CODE | PRESSURE PORT TYPE                                                            |              |           |
|------|-------------------------------------------------------------------------------|--------------|-----------|
|      | PORT                                                                          | DIMA         | DIM B     |
| 1    | G1/4 JIS B2351                                                                | 0.472[12.00] | 0.3 [8.0] |
| 2    | M20x1.5 mm ISO 6149-2                                                         | 0.661[16.8]  | 0.3[8.0]  |
| 3    | 1/4-18 NPT                                                                    | 0.600[15.24] | 0.3 [8.0] |
| 4    | 7/16-20UNFFEMALE SAE J513<br>STRAIGHT THREAD WITH<br>INTEGRAL VALVE DEPRESSOR | 0.687[17.5]  | 0.3 [8.0] |
| 5    | M14x1.5 mm ISO 6149-2                                                         | 0.433[11.0]  | 0.3 [8.0] |
| 6    | 1/8-27 NPT                                                                    | 0.390 [9.91] | 0.3[8.0]  |
| 7    | M12x1.5 mm ISO 6149-2                                                         | 0.433[11.0]  | 0.3[8.0]  |
| 8    | M10x1.0 mm ISO 6149-2                                                         | 0.374 [9.5]  | 0.3[8.0]  |
| 9    | G1/4 DIN 3852 FORME<br>GASKETDIN3869-14 NBR                                   | 0.512[13.00] | 0.3[8.0]  |

The following wiring definition is commonly used in Mainland China and will need to be determined individually with the European, the UK and the US customers.

| CURRENT OUTPUT WIRING |         |         |          |          |                        |
|-----------------------|---------|---------|----------|----------|------------------------|
| CONNECTION            | +SUPPLY | -SUPPLY | NC. PINS |          | P REF VENT             |
| Packard, A            | A       | B       | C        |          | Hole Through Connector |
| Packard, B            | B       | A       | C        |          |                        |
| FORM A                | 1       | 2       | 3,4      |          |                        |
| M12                   | 1       | 2       | 3,4      |          |                        |
| CABLE                 | RED     | BLK     |          |          | Pipe In Cable          |
| VOLTAGE OUTPUT WIRING |         |         |          |          |                        |
| CONNECTION            | +SUPPLY | +OUTPOT | COMMON   | NC. PINS | P REF VENT             |
| Packard, A            | A       | C       | B        |          | Hole Through Connector |
| Packard, B            | B       | C       | A        |          |                        |
| FORM A                | 1       | 3       | 2        | 4        |                        |
| M12                   | 1       | 3       | 2        | 4        |                        |
| CABLE                 | RED     | WHT     | BLK      |          | Pipe In Cable          |

**Compensated Temperature:**

This is the temperature range within which the product will produce an output proportional to pressure, while remaining within the specified performance limits.

**Operating Temperature:**

This is the temperature range within which the product will produce an output proportional to pressure, but it may not remain within the specified performance limits.

**Storage Temperature:**

This is the temperature range within which the product can be safely stored without pressure applied or power input, while still maintaining its rated performance. Exposure to temperatures beyond this range may cause permanent damage to the product.

All configurations are designed with protection against reverse supply voltage and output short circuits.

**CE Compliance (just for reference)**

EN 55022 Emissions Class A & B

IEC 61000-4-2 Electrostatic Discharge Immunity (8kV contact/15kV air)

IEC 61000-4-3 Radiated, Radio-Frequency Electromagnetic Field Immunity (10V/m, 80M-1GHz)

IEC 61000-4-4 Electrical Fast Transient Immunity (1kV)

IEC 61000-4-5 Surge Immunity (V+ to V-:  $\pm 2\text{KV}/42\Omega$ ; L to Case:  $\pm 1\text{KV}/12\Omega$ ; V- to V0:  $\pm 1\text{KV}/42\Omega$ )

IEC 61000-4-6 Immunity to Conducted Disturbances Induced by Radio Frequency Fields (150K-80MHz, 10V level for voltage output models, 3V level for current output model)

IEC 61000-4-9 Pulse Magnetic Field Immunity (100A/m peak)

For all CE compliance tests, max allowed output deviation  $\pm 1.5\%$  F.S. (Just Factory Testing)

**Weather-Proof Rating**

| Connection    | P Code |
|---------------|--------|
| Packard A / B | IP66   |
| Cable         | IP67   |
| M12           | IP67   |
| Form A        | IP65   |
| Form C        | IP66   |
| AMP           | IP66   |

**Mechanical data**

Materials in contact with media

|                                     |                                                        |
|-------------------------------------|--------------------------------------------------------|
| Pressure connection                 | Stainless steel 17-4                                   |
| Pressure transducer diaphragm       | Stainless steel 17-4 PH +SST304 or 17-4 Integral Screw |
| Pressure transducer seal (internal) | None                                                   |
| Pressure connection seal (external) | None, metalically sealed                               |

**Electrical connections**

| Round plug                                                                          | 2-wire    | 3-wire   | Valve plug                                                                           | 2-wire    | 3-wire   |
|-------------------------------------------------------------------------------------|-----------|----------|--------------------------------------------------------------------------------------|-----------|----------|
| M12 × 1                                                                             | 4...20 mA | 0...10 V | Form A                                                                               | 4...20 mA | 0...10 V |
|  | 1 +Vs     | 1 +Vs    |  | 1 n.c.    | 1 GND    |
|                                                                                     | 2 n.c.    | 2 n.c.   |                                                                                      | 2 OUT/GND | 2 +OUT   |
|                                                                                     | 3 OUT/GND | 3 +OUT   |                                                                                      | 3 +Vs     | 3 +Vs    |
|                                                                                     | 4 n.c.    | 4 GND    |                                                                                      | ↓ Case    | ↓ Case   |
|                                                                                     |           |          |                                                                                      |           |          |

## Series VTU73 – Thread Dimensions and options

### Available pressure connections

For reference only

| G1/4 "Mano" with centring pin | 1/4-18NPT male    | 7/16-20UNF 2B female |
|-------------------------------|-------------------|----------------------|
|                               |                   |                      |
| DIN EN837                     | ASME/ANSI B 120.1 | Autoclave SF250CX20  |
| G1/4 "Mano" with centring pin | 1/4-18NPT male    | 7/16-20UNF 2B female |
|                               |                   |                      |
| DIN EN837                     | ASME/ANSI B 120.1 | Autoclave SF250CX20  |

## Series VTU73 – Ordering Information

|                                             |                |                          |   |   |   |   |   |   |    |   |
|---------------------------------------------|----------------|--------------------------|---|---|---|---|---|---|----|---|
| Example                                     | VTU733410155BG | VTU73                    | 3 | 4 | 1 | 0 | 1 | 5 | 5B | G |
| <b>Model Code</b> VTU73 Pressure Transducer |                |                          |   |   |   |   |   |   |    |   |
| <b>Output</b>                               | 1              | 0.5-4.5V RATIOMETRIC     |   |   |   |   |   |   |    |   |
|                                             | 2              | 1-5V                     |   |   |   |   |   |   |    |   |
|                                             | 3              | 4-20mA                   |   |   |   |   |   |   |    |   |
|                                             | 4              | 0-5V                     |   |   |   |   |   |   |    |   |
|                                             | 5              | 0-10V                    |   |   |   |   |   |   |    |   |
|                                             | 6              | 1-6V                     |   |   |   |   |   |   |    |   |
|                                             | 7              | 0.5-4.5V                 |   |   |   |   |   |   |    |   |
|                                             | x              | Customization            |   |   |   |   |   |   |    |   |
| <b>Connection</b>                           | 1              | Cable                    |   |   |   |   |   |   |    |   |
|                                             | 2              | Packard A                |   |   |   |   |   |   |    |   |
|                                             | 3              | Packard B                |   |   |   |   |   |   |    |   |
|                                             | 4              | M12                      |   |   |   |   |   |   |    |   |
|                                             | 5              | FORM A                   |   |   |   |   |   |   |    |   |
|                                             | 6              | FORM C                   |   |   |   |   |   |   |    |   |
|                                             | 7              | AMP                      |   |   |   |   |   |   |    |   |
|                                             | 8              | Customization            |   |   |   |   |   |   |    |   |
| <b>Port Material</b>                        | 1              | 304Screw+ 17-4 Diaphragm |   |   |   |   |   |   |    |   |
|                                             | 2              | 17-4 Integral Screw      |   |   |   |   |   |   |    |   |
|                                             | X              | Customization            |   |   |   |   |   |   |    |   |
| <b>Snubber</b>                              | 0              | No Snubber               |   |   |   |   |   |   |    |   |
|                                             | 1              | With Snubber             |   |   |   |   |   |   |    |   |
| <b>Label</b>                                | 0              | No Label (OEM)           |   |   |   |   |   |   |    |   |
|                                             | 1              | AdhesiveLabel            |   |   |   |   |   |   |    |   |
|                                             | 2              | Laser Marking            |   |   |   |   |   |   |    |   |
| <b>Pressure Port</b>                        | 1              | G1/4 JIS B2351           |   |   |   |   |   |   |    |   |
|                                             | 2              | M20 x 1.5                |   |   |   |   |   |   |    |   |
|                                             | 3              | 1/4-18 NPT               |   |   |   |   |   |   |    |   |
|                                             | 4              | 7/16-20UNF FEMALE SAE    |   |   |   |   |   |   |    |   |
|                                             | 5              | M14 x 1.5                |   |   |   |   |   |   |    |   |
|                                             | 6              | 1/8-27 NPT               |   |   |   |   |   |   |    |   |
|                                             | 7              | M12 x 1.5                |   |   |   |   |   |   |    |   |
|                                             | 8              | M10 x 1.0                |   |   |   |   |   |   |    |   |
|                                             | 9              | G1/4 DIN 3852            |   |   |   |   |   |   |    |   |
|                                             | A              | G3/8 JIS B2351           |   |   |   |   |   |   |    |   |
|                                             | X              | Customer Specia          |   |   |   |   |   |   |    |   |
| <b>Pressure Range</b>                       | B              | Bar                      |   |   |   |   |   |   |    |   |
|                                             | M              | Mpa                      |   |   |   |   |   |   |    |   |
|                                             | P              | PSI                      |   |   |   |   |   |   |    |   |
|                                             | K              | Kpa                      |   |   |   |   |   |   |    |   |
| <b>Pressure Type</b>                        | G              | Gauge                    |   |   |   |   |   |   |    |   |
|                                             | S              | Sealed (>500PSI)         |   |   |   |   |   |   |    |   |
|                                             | C              | Compound                 |   |   |   |   |   |   |    |   |