

## Description

The DSS Series of Smart flush diaphragm pressure transmitters are specifically designed for use on viscous fluids or dirty liquids with solids in suspension. These transmitter employ the latest micro processor electronics technology together with our proven inductive over-pressure protected pressure sensing technique to provide a rugged transmitter. All DSS transmitter types can have an optional linearised output function which for example can be used to compute the true volume for an odd shaped tank from the level signal. On site zero and span adjustment may be undertaken by means of the configuration terminal, which also allows the optional non-linear output function to be enabled.

The following transducer types are available:

### TG type:

Gauge pressure transducer with 2" BSPT male process connection and flush measurement diaphragm. This type has the largest area sensing diaphragms to improve accuracy in applications where the transducer is liable to have deposited material problems.

### TP type:

Gauge pressure transducer with 1" BSPP male process connection and flush measurement diaphragm. This lower cost sensor may be used for all applications where material deposition is not significant problem.

### Factory Enabled Options

Customer specified or standard output stage linearisation functions can be programmed into the transmitter during manufacture.

All transmitter types may have customer specified digitally set filter response times and filter jump out. The jump out feature disables the filter for step changes in the input pressure, this allows a faster response to large changes but provides a filtered response for variations smaller than the jump out value. Time constants from zero to 16 seconds and jump out values from 1% to 100% of FS may be specified.

All factory configured options can be enabled or changed retrospectively by returning the transmitter to our works or an authorised agent.



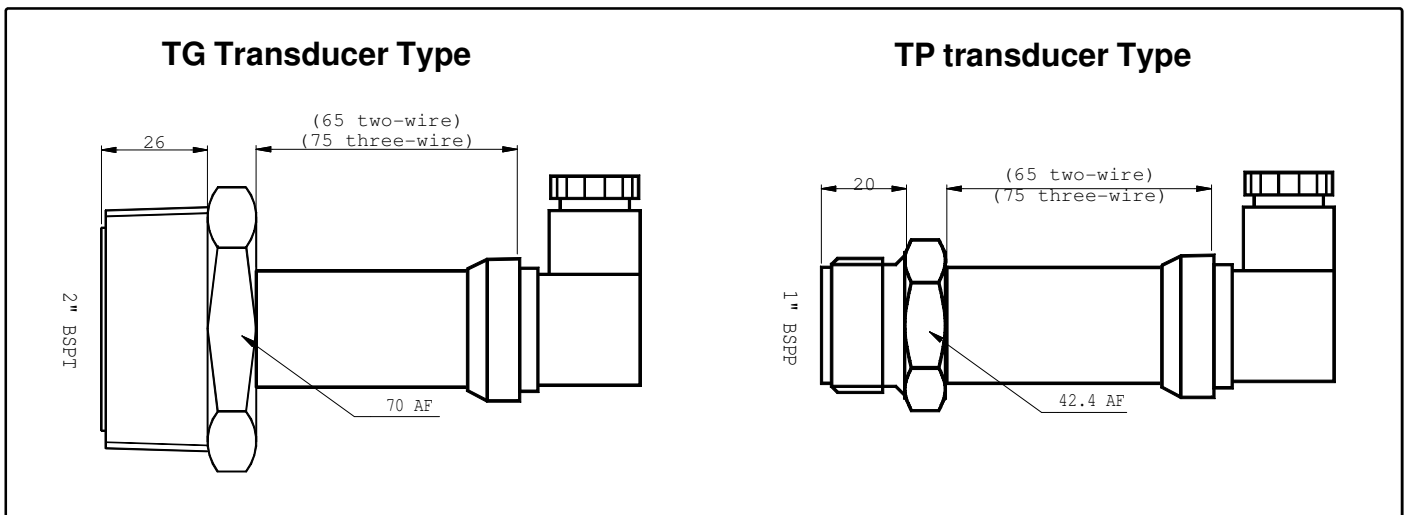
DSS Transmitter, TG Transducer type shown

## Features

- ◆ Flush diaphragm design
- ◆ Over-range protected
- ◆ Simple calibration & configuration
- ◆ All welded stainless steel transducer

## Applications

- ◆ Dirty or viscous liquids
- ◆ Level measurement
- ◆ Pressure measurement
- ◆ Processes with suspended solids



Outline drawings and dimensions. All dimensions in mm unless otherwise noted.

# DSS Series

## Voltage and Current Output Smart Flush Diaphragm Pressure Transmitters

### Specifications

#### Over-Pressure Limits

The over-pressure limit is defined as the maximum over or suction pressure that will cause no permanent transducer damage, the typical zero shift following an over-pressure condition is less than  $\pm 5\%$  of transducer FSD range.

**NOTE:** All transmitters are despatched from the works having been positively over-pressured. To recover from an accidental excessive suction (vacuum) condition, apply an over-pressure to the transducer.

#### The following limits apply:

Over-pressure: Up to 2.4bar FSD range, 10x FSD  
6bar FSD range and above, 4x FSD

Suction: Up to 1bar FSD range, 50% FSD  
All other ranges, full vacuum

#### Operating Temperature Limits

Transmitter electronics:  $-10^{\circ}\text{C}$  to  $+70^{\circ}\text{C}$ .

Process Temperature Limits:  $-40^{\circ}\text{C}$  to  $+95^{\circ}\text{C}$  continuous ( $+120^{\circ}$  intermittent for approximately 10mins per day)

Note: If the process temperatures are outside the electronics operating range, the transmitter body (tube) must be adequately cooled or heated to ensure the electronics maximum and minimum operating temperatures are not exceeded.

#### Transmitter Performance

Non-Linearity and Hysteresis:  $\pm 0.25\%$  of max span.

Repeatability:  $\pm 0.1\%$  of max span.

Zero Stability:  $\pm 0.25\%$  of max span per year at constant temperature ( $20^{\circ}\text{C}$  nominal).

**Note:** The figures quoted are typical values for a 160mbar FSD transmitter with our standard heat treated stainless steel sensing element, other ranges may vary, please refer to our sales office for a more detailed specification if required.

#### Thermal Performance (Temperature Coefficient)

Specified over the compensated temperature range of  $0^{\circ}\text{C}$  to  $+60^{\circ}\text{C}$

**Zero:**  $\pm 0.02\%$  of max span/ $^{\circ}\text{C}$  typical.

**Span:**  $\pm 0.02\%$  of max span/ $^{\circ}\text{C}$  typical.

#### Analogue Signal Output

See Product Order Code, Output over-current limit set at a nominal 28mA. Output compliance for Three-wire electronics types is supply voltage minus 5volt nominal.

#### Power Supply

**Two-wire Type:** Min operating voltage: 8Vdc.  
Max operating voltage: 30Vdc.

**Three-wire Type:** Min operating voltage: 15Vdc.  
Max operating voltage: 30Vdc.

#### Zero and Span Adjustment

**Zero:**  $-100\%$  FSD suppression to  $+100\%$  FSD elevation.

**Span:** 10:1 max to min span range. The transmitter may be calibrated to give zero to full scale output for inputs to the transducer from  $-100\%$  to  $+100\%$  of full scale range to any 20% segment of the full scale range.

#### Damping

Fixed approx. 0.4 sec analogue RC time constant. 1 Second digitally set RC response time set as standard with 10% Filter Jump out. Other digital filter time constants and jump out settings to order.

#### Electrical Connection

DIN 43 650 male plug. Transmitters are supplied with a mating DIN socket, which is fitted with terminal blocks for electrical connection.

#### Connection details:

**Two-wire Type:** Pin 1, Loop positive.  
Pin 2, Loop negative.  
Pin 3, Configuration Terminal.  
Pin 4, Cable Screen

**Three-wire Type:** Pin 1, Positive supply.  
Pin 2, Negative supply, Signal Output -ve.  
Pin 3, Signal Output +ve.  
Pin 4, Configuration Terminal.

### Ordering Information:

| Code | Description                              |
|------|--|
|      | <b>Transmitter Type</b>                  |
| DSS  | Smart Flush Diaphragm Transmitter        |
|      | <b>Electronics Type</b>                  |
| D    | Two-wire (4-20mA output only)            |
| T    | Three-wire Voltage or Current Output*    |
|      | <b>Signal Output</b>                     |
| 0    | 4-20mA (Two-wire Electronics Only)       |
| 1    | 0-10mA (Three-wire Electronics Only)*    |
| 2    | 0-20mA (Three-wire Electronics Only)*    |
| 3    | 4-20mA (Three-wire Electronics Only)*    |
| 4    | 0-5V (Three-wire Electronics Only)*      |
| 5    | 0-10V (Three-wire Electronics Only)*     |
| 6    | 1-5V (Three-wire Electronics Only)*      |
|      | <b>Threaded Transducer Type</b>          |
| TG   | 2" BSPT flush diaphragm, gauge pressure* |
| TP   | 1" BSPP flush diaphragm, gauge pressure  |
|      | <b>FSD Range</b>                         |
| 840  | 40mbar [All Types]                       |
| 851  | 160mbar [All Types]                      |
| 860  | 400mbar [All Types]                      |
| 870  | 1000mbar [All Types]                     |
| 872  | 2.4bar [All Types]                       |
| 881  | 6.0bar [All Types]                       |
| 891  | 16bar [TP only]                          |
| 900  | 40bar [TP only]                          |
|      | <b>Transducer Body Material</b>          |
| B    | 316L Stainless steel,                    |
|      | <b>Sensing Diaphragm Material</b>        |
| E    | Heat treated stainless steel (standard)  |
| B    | 316L stainless steel (option *)          |
| H    | Hastelloy C276 (option *)                |
|      | <b>Sensor Pressure Seals</b>             |
| X    | All welded pressure seals                |
|      | <b>Factory Configuration Options</b>     |
| /NL4 | Customer Specified Non-Linear output     |
| /Rxx | xx Filter response time in Secs          |
| /Jnn | nn Filter Jump out in %FSD               |

\* Consult the sales office for availability.

Note: Not all ranges are possible in the optional material types

Visit the website: [www.impress-sensors.co.uk](http://www.impress-sensors.co.uk)

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