

---

## 11 201 Differential Pressure Transmitter

---



---

### Description

*The 11 201 is an economical alternative to established differential pressure transmitters. It combines state of the art electronics and a high performance sensor; with a minimized need of material.  
The result is a transmitter that can be used for all kind of industrial applications.*

---

### Features

- Smart two-wire, 4-20 mA loop powered differential pressure transmitter.
  - Ranges from 1.25 mbar up to 20 bar.
  - Overpressure protection up to 160 bar.
  - Fully configurable by HART-communication.
-

The purpose of this document is to assist with the setup, installation, operation and maintenance of the 11 201 as well as providing technical specifications and basic data, for further information about this product can be found at [www.springres.com](http://www.springres.com)

---

## Table of Contents

---

1 - Funcional Description	02
2 - Parameterization and Configuration	03
3 - Functional Specification	03
4 - Performance Specifications	04
5 - Physical Specifications	05
6 - Ordering Code	06

---

## 1 Functional Description

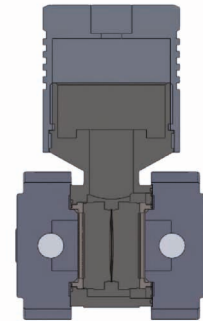
---

11 201 offers the best solution for all field applications and those demanding a economical solution with high performance.

11 201 offers:

- $\pm 0.5\%$  accuracy;
- $\pm 0.5\%$  of URL stability guarantee for 12 years;
- Up to 12:1 rangeability;
- Compactness and lightweight;
- Safe and reliable operation.

11 201 uses the field-proven technique of capacitance cell sensor measurement.



The sensor is shown in the picture on the side. The sensing diaphragm is at the center of the cell. The diaphragm deflects as a result of the difference between the pressures applied to the left and right sides of the sensor. Pressure is directly applied to the isolating diaphragms which provide resistance against process fluid corrosion.

The pressure is transmitted to the sensing diaphragm through the filling fluid. The sensing diaphragm is a moving capacitor plate while the two metallized surfaces are fixed plates. The sensing diaphragm deflection results in capacitance variations between the moving and fixed plates.

The electronic resonance circuit reads capacitance variation between the moving and fixed plates. The CPU conditions the measurement and communicates according to protocol. As there is no A/D conversion, errors and drifts during conversions are eliminated. A temperature sensor provides temperature compensations, which combined with the sensor precision, results in high accuracy and stability. The process variable, as well as monitoring and diagnostics information, is provided by digital communication protocol.

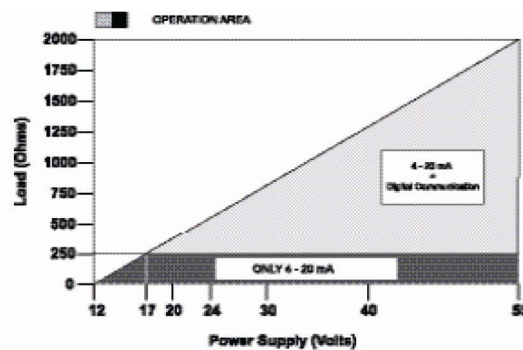
## 2 Parameterization and Configuration

For use of all features of the 11 201 demand a configuration tool able to retrieve all information from the EEPROM of the 11 201, modify and send it back without causing process disruption. For this important task we suggest the use of Springfield HART communicators such as HART Pocket Configurator (HPCOM), or HART Tablet Configurator (HTCOM), or our HART LapTop Configurator (HLCOM).



## 3 Functional Specifications

<b>Process Fluid</b>	Liquid, gas or steam.
<b>Output</b>	Two-wire, 4-20 mA controlled according to NAMUR NE43 specification, with super-imposed digital HART® Protocol.
<b>Communication</b>	
<b>Power Supply</b>	12 to 55 Vdc. Input without polarization.
<b>EC-Information</b>	<p><b>PED Directive (97/23/EC) - Pressure Equipment Directive</b> This product is in compliance with the directive. It was designed and manufactured in accordance with sound engineering practices using standards from ANSI, ASTM, DIN and JIS.</p> <p><b>EMC Directive (2004/108/EC) - Electromagnetic Compatibility</b> The EMC test was performed according to IEC standard: IEC61326-1:2006, IEC61326-2-3:2006, IEC61000-6-4:2006, IEC61000-6-2:2005. For use in environment only.</p>
<b>Zero Adjustments</b>	Non-interactive, via digital communication.
<b>Load Limitation</b>	Maximum Load Resistance= $[46.07 * (\text{Supply Voltage} - 10.5)]$ Ohms



<b>Failure Alarm (Diagnostics)</b>	Detailed diagnostics through communication. Sensor failure indication and overpressure indication. In case of sensor or circuit failure, the self-diagnostics drives the output to 3.6 or 21.0 mA, according to the user's choice and NAMUR NE43 specification.
<b>Temperature Limits</b>	Ambient: -40 to 85 oC ( -40 to 185 oF) Process: -40 to 100 oC ( -40 to 212 oF) Storage: -40 to 100 oC ( -40 to 212 oF)
<b>Configuration</b>	By digital communication using the configuration software CONF401, HLCOM or HPCOM. 11 201 can be configured using third-party configuration tools.
<b>Overpressure and Static Pressure Limits</b>	From 3.45 kPa absolute (0.5 psi) to: 8 MPa (1150 psi) for range 2 16 MPa (2300 psi) for ranges 3, 4, 5, 6 and 7 The above pressures will not damage the transmitter, but a new calibration may be necessary.
<b>Turn-on Time</b>	Performs within specifications in less than 3 seconds after power is applied to the transmitter.
<b>Humidity Limits</b>	0 to 100% RH (Relative Humidity).
<b>Volumetric Displacement</b>	Less than 0.15 cm <sup>3</sup> (0.01 in <sup>3</sup> ).
<b>Damping Adjustment</b>	User configurable from damping from 0 to 128 seconds (via digital communication).

---

#### 4 Performance Specifications

---

<b>Reference Conditions</b>	Span starting at zero, temperature of 25 °C (77 °F), atmospheric pressure, power supply of 24 Vdc, Halocarbon or Silicone oil fill fluid, isolating diaphragms in 316L SST and digital trim equal to lower and upper range values.
<b>Accuracy</b>	± 0.5% of URV
<b>Stability</b>	<b>For ranges 3, 4, 5, 6 and 7:</b> ± 0.5% of URL for 2 years <b>For range 2:</b> ± 0.75% of URL for 12 years For ± 20 °C temperature changes, 0-100% relative humidity, up to 100 kPa (1 bar) line pressure, installation according to the best practices and adequate assembling for processes in which atoms of hydrogen can be generated (hydrogen migration).

<b>Power Supply Effect</b>	± 0.005% of calibrated span per Volt.
<b>Vibration Effect</b>	± 0.1% URL for field with high vibration level or pipeline with high vibration, according to IEC 60770-1 specification: 10-60 Hz, 0.21 mm peak displacement / 60-2000 Hz, 29.4 m/s <sup>2</sup> acceleration amplitude.
<b>Temperature Effect</b>	<p><b>For ranges 3, 4, 5, 6 and 7:</b>  <b>0.1 URL &lt; span &lt; URL:</b> ± [0.7% URL + 0.24% span] per 20 °C (68 °F)  <b>span &lt; 0.1 URL:</b> ± [0.06% URL + 0.22% span] per 20 °C (68 °F)</p> <p><b>For range 2:</b>  <b>0.1 URL ≤ span ≤ URL:</b> ± [0.15% URL + 0.24% span] per 20 °C (68 °F)  <b>span &lt; 0.1 URL:</b> ± [0.165% URL + 0.09% span] per 20 °C (68 °F)</p>
<b>Static Pressure Effect</b>	<p><b>Zero Error:</b>  <b>For range 3, 4, 5, 6 and 7*:</b> ±0.075% URL (± 0.3% for Tantalum diaphragm) per 7 MPa (1000 psi)  <b>For range 2:</b> 0.15 % URL per 1.7 MPa (250 psi)  The zero error is a systematic error that can be eliminated by calibrating at the operating static pressure.</p> <p><b>Span Error:</b>  <b>For ranges 3, 4, 5, 6 and 7:</b> Correctable to ± 0.3% of reading per 7 MPa (1000 psi)  <b>For range 2:</b> Correctable to ± 0.3% of reading per 1.7 MPa (250 psi)</p>
<b>Mounting Position Effect</b>	Zero shift of up to 250 Pa (1 inH <sub>2</sub> O) which can be calibrated out. No span effect.

## 5 Physical Specifications

<b>Electrical Connection</b>	open cable, length 1.5 m; material PVC.
<b>Process Connection</b>	Process Connection: ¼ - 18 NPT.
<b>Wetted Parts</b>	<p><b>Isolating Diaphragms:</b> 316L SST.  <b>Drain/Vent Valves and Plug:</b> 316 SST.  <b>Flanges:</b> 316 SST.  <b>Wetted O'Ring:</b> Viton™</p>
<b>Nonwetted Parts</b>	<p><b>Electronic Housing:</b> Aluminum.  <b>Fill Fluid:</b> Silicone oil.  <b>Cover O'Ring:</b> Buna-N.  <b>Mounting Bracket:</b> Plated Carbon Steel or 316 SST.  <b>Flange Bolts and Nuts:</b> 316 SST.</p>

<b>Mounting</b>	<p>a) Optional universal mounting bracket for surface or vertical/horizontal 2"-pipe (DN 50).</p> <p>b) Manifold Valve integrated to the transmitter.</p> <p>c) Directly on piping for closely coupled transmitter/orifice flange combinations.</p> <p>Mounting thread for manifolds and mounting bracket is 7/16 UNF</p>
<b>Approximate Weights</b>	2,2 kg (5 lbs): all models

## 6 Ordering Code

MODEL	DIFFERENTIAL AND MANOMETRIC PRESSURE TRANSMITTER								
11201	Smart Differential Pressure Transmitter								
:	<b>COD.</b>	<b>Type</b>	<b>Span Limits</b>			<b>Span Limits</b>			<p><b>Note:</b> The range can be extended up to 0.75 LRL* and 1.2 URL** with small degradation of accuracy.</p> <p>*LRL = Lower range limit **URL = Upper range limit</p>
:			<b>Min</b>	<b>Max</b>	<b>Unit</b>	<b>Min</b>	<b>Max</b>	<b>Unit</b>	
:	<b>D2</b>	Differential Pressure Sensor	<b>0.125</b>	<b>1.5</b>	<b>Kpa</b>	<b>1.25</b>	<b>15</b>	<b>mbar</b>	
:	<b>D3</b>	Differential Pressure Sensor	<b>1.3</b>	<b>7.5</b>	<b>Kpa</b>	<b>13</b>	<b>75</b>	<b>mbar</b>	
:	<b>D4</b>	Differential Pressure Sensor	<b>6.2</b>	<b>37.4</b>	<b>Kpa</b>	<b>62</b>	<b>374</b>	<b>mbar</b>	
:	<b>D5</b>	Differential Pressure Sensor	<b>31</b>	<b>186.8</b>	<b>Kpa</b>	<b>310</b>	<b>1868</b>	<b>mbar</b>	
:	<b>D6</b>	Differential Pressure Sensor	<b>117</b>	<b>390</b>	<b>Kpa</b>	<b>1.17</b>	<b>3.90</b>	<b>bar</b>	
:	<b>D7</b>	Differential Pressure Sensor	<b>345</b>	<b>2068</b>	<b>Kpa</b>	<b>3.45</b>	<b>20.68</b>	<b>bar</b>	
:	<b>COD.</b>	<b>Diaphragm Material and Fill Fluid</b>							
:	<b>1</b>	316L SST	Silicone Oil						
:		Other on request							
:	<b>COD.</b>	<b>Flange and Drain/Vent Valves Material</b>							
:	<b>I</b>	316 SST	CF8M (ASTM A351)						
:		Other on request							
:	<b>COD.</b>	<b>Wetted O'Ring Materials</b>							
:	<b>V</b>	Viton							
:		Other on request							
:	<b>COD.</b>	<b>Drain/Vent Position</b>							
:	<b>0</b>	Without Drain/Vent							
:	<b>A</b>	Drain/Vent (Opposite to Process Connection)							
:	<b>COD.</b>	<b>Process Connection</b>							
:	<b>0</b>	1/4 - 18 NPT							
:	<b>Z</b>	On request with user's specification							
:									
11201	<b>D3</b>	<b>1</b>	<b>I</b>	<b>T</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	

---

*Springfield Research reserves the right to make changes to design and functionality of any product without notice. Springfield Research does not assume any liability arising out of the application or use of any product. Springfield Research logo is registered trademarks of Springfield Research. HART is a registered trademark of the HART Communication Foundation. © 2015 Springfield Research Corp. All rights reserved*

---



**Springfield Research Corporation**

3350 NW 22nd Terrace Suite 500 • Pompano Beach, FL USA 33069

Tel: +1 (954) 657.8849 • Fax: +1 (954) 657.8895 • [sales@springres.com](mailto:sales@springres.com) • [www.springres.com](http://www.springres.com)

