Pressure Product Line

Measurement made easy in space, on the ocean floor and everywhere in between
Product Line Overview
ABB Measurement & Analytics
Pressure Measurements - Key facts

- > 150,000 Transmitters delivered per year
- 4 million Installed Pressure Transmitters
- Providing Pressure Solution for over 80 years
- 48 Hours Quick ship Program

ABB Ability

Plant Enterprise
Automation Systems
Devices and Sensors

6 Global Factories

Bartlesville, OK USA
Warminster, PA USA
Dammam, Saudi Arabia
Bangalore, India
Ossuccio, Italy
Shanghai, China

ABB
January 10, 2022
| Slide 3
ABB Measurement & Analytics

Pressure Measurement Made Easy – Three main series

Pxx100 – Essential Pressure Transmitter

261 - Compact Pressure Transmitter

266 - Process Pressure Transmitter

ABB offering is tailored to deliver the right product for the right market
ABB Measurement & Analytics – Pressure Portfolio

**Value for customer**

<table>
<thead>
<tr>
<th>Product</th>
<th>Performance</th>
<th>Portfolio Selling Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>261</td>
<td>Up to 0.1% Accuracy</td>
<td>3 process variables: Pressure, Static and Temp + Compensated Flow/Level</td>
</tr>
<tr>
<td>266xxT</td>
<td>Ultra Accuracy</td>
<td>Through The Glass</td>
</tr>
<tr>
<td>266xxH</td>
<td>Up to 0.06% Accuracy</td>
<td>Predictive maintenance through PILD</td>
</tr>
<tr>
<td>Pxx100</td>
<td>Up to 0.075% Accuracy</td>
<td>Wi: Fast connection to any existing net with 10y of std battery</td>
</tr>
<tr>
<td>266 MV</td>
<td>Up to 0.04% Accuracy</td>
<td>SIL2/SIL 3 for safety loop applications</td>
</tr>
<tr>
<td></td>
<td>Piezo Tech</td>
<td>All wireless remote seal technology</td>
</tr>
<tr>
<td></td>
<td>Resonant Inductive &amp; Piezo Tech</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Level / Flow Internal Calculations</td>
<td></td>
</tr>
</tbody>
</table>

**NOTES**

AP, GP, DP: Absolute, Gauge and Differential Pressure

- Up to 0.075% Accuracy
- Piezo Tech - AP, GP
- 600 mbar – 100 bar
- S26 Remote seal portfolio
- Dedicated F&B models
- 4…20mA, HART 7

- Up to 0.04% Accuracy
- Piezo Tech
- AP, GP, DP
- 400 mbar – 100 bar
- Full Remote Seal portfolio
- HART, FF, PA

- Up to 0.025% Accuracy
- Piezo tech
- GP, DP
- 10mbar – 600 bar
- Full Remote Seal portfolio
- HART, FF, PA

- Up to 0.04% Accuracy
- Piezo tech
- AP, GP, DP
- 10mbar – 1050 bar
- Full Remote Seal portfolio
- HART, FF, PA

- Up to 0.075% Accuracy
- Piezo Tech - AP, GP
- 600 mbar – 100 bar
- S26 Remote seal portfolio
- Dedicated F&B models
- 4…20mA, HART 7
# ABB Measurement & Analytics
## Pressure Portfolio – Model outlook

<table>
<thead>
<tr>
<th>Pxx100 SERIES</th>
<th>261 SERIES</th>
<th>266 SERIES</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ABSOLUTE</strong></td>
<td><strong>GAUGE</strong></td>
<td><strong>ABSOLUTE</strong></td>
</tr>
<tr>
<td><strong>PAS100</strong></td>
<td><strong>PGS100</strong></td>
<td><strong>261AS</strong></td>
</tr>
<tr>
<td>266NSH</td>
<td>266HSH</td>
<td>266DSH</td>
</tr>
<tr>
<td><strong>PAF100</strong></td>
<td><strong>PGF100</strong></td>
<td><strong>261AC</strong></td>
</tr>
<tr>
<td><strong>PAD100</strong></td>
<td><strong>PGD100</strong></td>
<td><strong>261GG</strong></td>
</tr>
<tr>
<td></td>
<td>261GC</td>
<td>261GN</td>
</tr>
</tbody>
</table>

- **Regular Installation**
- **Remote Seal**

©ABB
266 Series Deep Dive
## Design standards

<table>
<thead>
<tr>
<th>Design Standards</th>
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</tr>
</thead>
<tbody>
<tr>
<td>IEC</td>
<td>NAMUR</td>
</tr>
<tr>
<td>EN</td>
<td>NORSOK</td>
</tr>
<tr>
<td>ISO</td>
<td>3A Sanitary Standard</td>
</tr>
<tr>
<td>ISA</td>
<td>Hart</td>
</tr>
<tr>
<td>ANSI</td>
<td>Fieldbus Foundation</td>
</tr>
<tr>
<td>NEMA</td>
<td>Profibus PA</td>
</tr>
<tr>
<td></td>
<td>FCC</td>
</tr>
<tr>
<td></td>
<td>IC</td>
</tr>
</tbody>
</table>
ABB Measurement & Analytics
Pressure Measurement Made Easy – Approvals

Approval standards

- SIL2 (1oo1) and SIL3 (1oo2) for ranges up to 15,000 psi (1034 bar). (SFF) : 93%, (DC) : 85%, λDU : 67 FIT, PFDavg : 2.93 x 10^-3 10 y
- Hazardous area (explosion proof and intrinsic safe) approvals for use in every part of the world:
  - ATEX (Europe)
  - cFMus (Canada & US)
  - IECEx (world wide)
  - InMetro (Brazil)
  - NEPSI (China)
  - EAC (Russia, Kazak, Belarus)
  - PESO (India)
Advanced Construction Concept and Validation Tests

Tests and verifications:

- Hydrostatic pressure test
- Helium leakage test
- Dye penetrant test
- PMI
- Huey test (Urea application)
- EN 10204 - 3.1b material traceability
Remote Seals

- The entire assembly sensor-capillary-diaphragm seal does not feature gaskets or threaded joints.

- All welded parts and hydraulic circuits are helium leakage tested.

- The "All-welded technology" is worldwide recognized for delivering performance stability over time and delivered by default at no extra-price.
ABB Measurement & Analytics
Pressure Measurement Made Easy – Top Quality Design

Own Manufactured & Engineered Diaphragm Seals

- Stainless Steel 316L
- Hastelloy C276
- Tantalum
- Hastelloy C2000
- Super Duplex UNS S32750 to ASTM SA479
- Inconel 625
- Inconel 718
- Monel 400
- Stainless Steel PFA (Teflon) Coated
- Stainless Steel Gold plated
- Diaflex (anti abrasion treatment)
- Tailor-made design items

**FLANGES ACCORDING TO:**

<table>
<thead>
<tr>
<th>Type</th>
<th>ASME</th>
<th>EN</th>
<th>JIS</th>
<th>ISO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diaphragm seal with fixed flange</td>
<td>S26FA</td>
<td>S26FE</td>
<td>S26JN</td>
<td>S26BN</td>
</tr>
<tr>
<td>Diaphragm seal with offline flange</td>
<td>S26MA</td>
<td>S26ME</td>
<td>S26KN</td>
<td>S26CN</td>
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<tr>
<td>Diaphragm seal with rotating flange</td>
<td>S26RA</td>
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<td>S26SS</td>
<td>S26PN</td>
</tr>
<tr>
<td>Wafer / Pancake style diaphragm seal with side handle.</td>
<td>S26RA</td>
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<td>S26SS</td>
<td>S26PN</td>
</tr>
<tr>
<td>Ring Joint Connection flanged diaphragm seal</td>
<td>S26RR</td>
<td>S26WE</td>
<td>S26TT</td>
<td>S26UN</td>
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**Pressure Measurement Made Easy – Top Quality Design**

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</table>

**Button diaphragm seal**

**Chemical tee diaphragm seal**

**In-line diaphragm seal**

**Urea service diaphragm seal**

**Threaded diaphragm seals for Pulp & Paper applications**

**Sanitary diaphragm seal according to 3-A.**

**Off-line threaded diaphragm seal.**

**Union Connection diaphragm seal**

**Off-line Socket and Saddle diaphragm seal**

S26BN S26CN S26JN S26PN S26KN S26SS S26TT S26UN S26VN
Cooling System

The Cooling System acts as a barrier to protect the electronics of the transmitter from a high process temperature. Some of the benefits are the following:

- Prevents the transmitter from becoming overheated
- Maintains fill fluid within operating viscosity and temperature limits.
- Sustains pressure transmitter overall high performance capabilities.
- Averts down-time due to extreme temperature related failures.
Diaflex

Innovative solution: extremely high hardness and low friction mechanical characteristics:

- Stable up to 600°C
- Nano-structured coating
- Titanium base composite
- PVD Physical Vapor Deposition - Larc technology
- Thickness: 3-4 µm
- 4000 HV rating on Vicker Hardness scale
H-Shield

Innovative solution, extremely high resistance against Hydrogen permeation effect:

- Temperature up to 420°C
- Nano-structured coating
- Titanium composite
- PVD Physical Vapor Deposition - Larc technology
- Thickness: 2-5 µm

<table>
<thead>
<tr>
<th>Material</th>
<th>Ppm @ 230°C</th>
<th>Ppm @ 350°C</th>
<th>Ppm @ 420°C</th>
</tr>
</thead>
<tbody>
<tr>
<td>HC</td>
<td>0.0011</td>
<td>0.0091</td>
<td>0.0199</td>
</tr>
<tr>
<td>AU</td>
<td>0.0009</td>
<td>0.006</td>
<td>0.0133</td>
</tr>
<tr>
<td>HSHI</td>
<td>0.00</td>
<td>0.00</td>
<td>0.0005</td>
</tr>
</tbody>
</table>
The red PFA coating is suitable for:
- anti-stick and anti-corrosion effect
- superior chemical resistance at high temperatures 482°F/250°C
- Advanced technology of PFA coating allows to apply a thickness up to 160μm

The grey PFA coating is suitable for:
- an anti-stick effect, it is applied on an AISI 316 L ss or Hastelloy C-276
- Outstanding properties of dry lubrication and surface hardness
- Thickness up to 25μm
Available functions

- Linear for differential, gauge and absolute pressure or level measurements
- Sq. Root (x) for flow measurements using restriction type primary element, like orifice plate, integral orifice, Venturi or Dall tube and similar
- Sq. Root (x^3/x^5) for open channel flow measurements using rectangular or trapezoidal weir / V-notch (triangular) weir
- Bidirectional Flow
- 22 points custom linearization table
- Cylindrical lying tank
- Spherical tank
PILD – A predictive function for optimized maintenance

266 line has built-in advanced diagnostic functions to detect blockages in impulse lines called PILD (Plugged Impulse Line Diagnostic) for all communication protocols.

The transmitter will register an alarm and send a digital message or analogue alert when a preset blockage level is reached, in accordance to NAMUR standard.

Impulse lines can be blocked by solids in the process, increase in viscosity or the process freezing.

Blocked impulse lines can result in expensive plant shutdowns.
266 Additional Temperature Check

ABB 2600T devices certified by TUV are capable to retain functional safety capabilities after exposure to ambient temperature lower or higher than the functional limits (-40 / +85°C) with improved diagnostic:

Example:

- HART signal to send diagnostic alert message (example -10°C).
- ABB SIL 2/3 devices drives signal into alarm condition threshold are exceeded -40°C (or +85°C).

Performance always recovers stated accuracy when device return within standard operating conditions.
# ABB Measurement & Analytics
266 Series - All-Rounder Pressure Transmitter

## Software features

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Additional temperature check</td>
<td></td>
</tr>
<tr>
<td>Embedded transfer functions</td>
<td></td>
</tr>
<tr>
<td>Predictive maintenance through PILD</td>
<td></td>
</tr>
</tbody>
</table>

## Functional advantages

<table>
<thead>
<tr>
<th>Advantage</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>True DP dual sensor (Static)</td>
<td></td>
</tr>
<tr>
<td>Up to 600bar static pressure resistance</td>
<td></td>
</tr>
<tr>
<td>Ultra / Top Accuracy (0.025% / 0.04%)</td>
<td></td>
</tr>
<tr>
<td>Low Voltage structure</td>
<td></td>
</tr>
</tbody>
</table>

## Wide environmental & measurement conditions:

<table>
<thead>
<tr>
<th>Condition</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Multiple HazLoc Certifications</td>
<td></td>
</tr>
<tr>
<td>Diaflex and H-Shield* seal nanocoating</td>
<td></td>
</tr>
<tr>
<td>SIL2/SIL 3 for safety loop applications</td>
<td></td>
</tr>
<tr>
<td>All-welded remote seal tech &amp; tailor made designs (SR)</td>
<td>S26</td>
</tr>
</tbody>
</table>

## Configuration features

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Through The Glass</td>
<td></td>
</tr>
<tr>
<td>Easy set up, even via external pushbuttons</td>
<td></td>
</tr>
<tr>
<td>Multiple communication protocols &amp; modular electronics</td>
<td></td>
</tr>
</tbody>
</table>

## Customer benefits

<table>
<thead>
<tr>
<th>Benefit</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low maintenance cost</td>
<td>due to modular electronic and easy access terminal boards. Less operator time spent in the field</td>
</tr>
<tr>
<td>Higher productivity</td>
<td>from capability to configure in field via TTG or external pushbuttons (R1) even in hazardous areas</td>
</tr>
<tr>
<td>Lower cost of ownership</td>
<td>thanks to process resistance (Diaflex/H-Shield, all welded remote seals, SR designs)</td>
</tr>
<tr>
<td>Improved productivity</td>
<td>as failures can be anticipated/avoided (PILD, additional Temp check)</td>
</tr>
</tbody>
</table>

* AVAILABLE IN THE REMOTE SEAL CONFIGURATION VIA SR
ABB Measurement & Analytics
266 Series - Wireless Pressure Transmitter

**Multiple power options**
- 10 years of standard battery
- Harvester compatible*

**Wide environmental & measurement conditions:**
- Ex Intrinsically safe
- Diaflex and H-Shield*** seal nano-coating
- Multiple Pressure measurement (Abs, Gauge and Differential)

**Installation – fast & easy**
- Fast connection to any existing net
- Retrofitting & no electrical background needed

**Configuration features**
- Through The Glass
- FIM, DD & DTM

**Customer benefits**
- Longest battery life in the market resulting in lower cost of ownership
- Standard battery D-Cell type resulting in lower cost of ownership
- No need for cables % related activities, resulting in lower cost of ownership (30% lower**)
- Plug & Play behavior in installation allow operators to increase their productivity. Even in HazLoc!
266 Multivariable Deep Dive
The 4-in-1 solution

Measurement of 3 process values
- Differential pressure
- Absolute pressure
- Temperature

Integrated calculation functionality of a flow computer
- Calculation of flow with compensation
- Compensated level measurement for gases, steam and liquids

DP accuracy up to 0.04%
Pabs accuracy of 0.1%
Volumetric flow does not take into account density, which is the main contributor to inaccurate measurement.
Standard approach to flow measurement

Multivariable approach to flow measurement
### ABB Models offering

266Jxx (3 in 1 solution without calculation)
- Multiple measurement of process values
- Differential pressure
- Absolute (line) pressure
- Process temperature

266Cxx Calculation functionality (flow computer) included
- Mass flow for gases, steam, and liquids by means of dynamic compensation
- Heat flow for water and steam
- Level measurement with density compensation
- Boiler drum level

### Measuring ranges

<table>
<thead>
<tr>
<th>Process variable</th>
<th>Measured value</th>
</tr>
</thead>
<tbody>
<tr>
<td>DP</td>
<td>0.05 kPa to 10 MPa</td>
</tr>
<tr>
<td>DP</td>
<td>0.2 inch H2O to 1450 psi</td>
</tr>
<tr>
<td>P</td>
<td>up to 41MPa / 5945 psi</td>
</tr>
<tr>
<td>T&lt;sub&gt;Process&lt;/sub&gt;</td>
<td>-200 °C to 850 °C</td>
</tr>
<tr>
<td>T&lt;sub&gt;Process&lt;/sub&gt;</td>
<td>-328 °F to 1562 °F</td>
</tr>
</tbody>
</table>
ABB Measurement & Analytics
266 Series - Multivariable Transmitter

OGP & Chemical  Pulp & Paper  Food & Beverage  Power

©ABB


**ABB Measurement & Analytics**

266 Series - Multivariable Transmitter advantages

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**Accurate, reliable and convenient**

Combined with manifold, connection hardware and/or primary elements into a single package, it reduces capital expenditures by 55%.

**Simplicity with reduced costs**

Simplifies the piping and greatly reduces the number of leak paths, by as much as 70%.

**"Right first time" installations**

Factory assembled, tested, configured and provided with a factory calibration certificate.

---

**Simple to use with easy features**

User friendly HMI, allowing "Through-the-glass" control.

**Reliable measurements**

Process diagnostics continuously monitor for impulse line plugging or freezing.

**Safety by design**

Product is designed according to safety principles, both from mechanical and FW point of view, such as the SIL or the Explosion proof requirements.
Reduced cost of ownership and installation due to multiple transmitter avoidance. As well all accessory costs (i.e. valves, wet legs, electrical connections) for standard flow/level calculation are zeroed.

Increased productivity thanks to advanced issue detection by PILD and longer seal life with Diaflex on abrasive, sticky or hard processes.

Lower commissioning cost due to full local configurability and hence potential HHT avoidance.

Increased productivity of plant delivering high performances in demanding applications like high static line pressure pipes, high temperature processes or hazardous locations.
261 Series Deep Dive
Key Arguments

- Gauge and absolute pressure measurement
- Measuring spans from 3 mbar to 600 bar
- Standard accuracy of 0.10%
- Turn down of 1:20
- Distinctive display / HMI
- Output signal 4…20 mA / HART
- Small housing, made from stainless steel 316L
- Compliant to the FDA, 3A requirements
- Base: ‘piezo’ silicon pressure sensors
- Cover out of stainless steel or stainless steel and plastic (Window out of Macrolon®)
- Ingress protection IP67 (on request IP68, IP69K)
- Sealed electronic unit: the most protected electronic housing in the market
- Great variety of process connections
ABB Measurement & Analytics
261 Series - Compact class pressure transmitters

- NSF Certified
- FM Approved
- SIL2
- NEMA
- ATEX
- PED
- CE
- ANACE
- Chemical
- Food & beverage
- Pharmacy
- Water & Waste W
- Intrinsic Safety EEx ia
- Front bonded diaphragm
- Housing IP67
- Stainless steel housing
- Materials in accordance to NACE
- CIP / SIP-capability
- FDA-approved filling liquids
# ABB Measurement & Analytics

## 261 Series – Model variants

<table>
<thead>
<tr>
<th>Standard Versions</th>
<th>Remote Mount Diaphragm Seal</th>
<th>Direct Mount Diaphragm Seal</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>GS/AS</strong></td>
<td><strong>GR</strong></td>
<td><strong>GC/AC</strong></td>
</tr>
<tr>
<td>Suitable for Water &amp; Wastewater, Pulp and Paper market</td>
<td>Suitable for Water &amp; Wastewater, Chemical, Pulp and Paper market</td>
<td>Suitable for Chemical market</td>
</tr>
</tbody>
</table>

**MODEL VARIANTS**

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261AX: P Absolute  |  261GX: P Gauge
Base accuracy= .10%
Application Specific Connections

**DRD**

- Suitable for Food and Beverages market, Chemical, Dairy (DIN 11851) or SMS (Swedish standard unit for dairy)

**GG**

- RJT connection
- Dairy (DIN 11851) or SMS
- “ri-clamp
- Varivent

**GN**

- SR designs PMC 1 inch, PMC 1.5 inch
- Suitable for Water & Wastewater, Pulp and Paper market

- Ball-Valve
ABB Measurement & Analytics
261 Series – Highlights for F&B and Pharma

• Fully welded process connections / Hygienic connections: Tri-Clamp, Varivent, Dairy DIN 11851, Neumo-Biocontrol, DRD, APV-RTJ, Neumo, SMS, in-line diaphragm seal, etc.
• Rugged, compact stainless steel housing with Ingress protection IP67 (or IP68, IP69K- *on request*)
• CIP/ SIP-capable (up to 180 °C)
• FDA-approved materials and filling fluids (standard or vacuum-proof)
• SIL2-classified acc. to IEC 61508 / 61511
• Cover out of stainless steel or stainless steel and plastic (Window out of Macrolon®)
ABB Measurement & Analytics
261 Series – Highlights for Pulp & Paper

GN & GS/AS

- Front bonded process connections for Pulp / Paper
- Ball-Valve connection for specific valve requirements (Valmet, Satron)
- High temperature resistance
- Available SR design with Diaflex and Super Duplex.
ABB Measurement & Analytics
261 Series – Highlights for Water & Wastewater

GS/AS & GR

- Stainless steel design
- Completely welded without inner sealings
- Compact and robust
- Broad range of measuring cells
- Due to different diaphragm materials compatible to a lot of chemicals being used in Water and Wastewater applications
- Local HMI for configuring the device on site in the application
# ABB Measurement & Analytics

## 261 Series – Configuration options

<table>
<thead>
<tr>
<th>Local / HMI</th>
<th>Handheld configurator</th>
<th>Software / PC</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Menu control via 4 keys incl.</td>
<td>Hand Held Terminals (HART Transmitter) like DHH805</td>
<td>• FIM</td>
</tr>
<tr>
<td>• Zero / Span Button</td>
<td></td>
<td>• Asset Vision Basic</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Any third party Frame applications with implemented 2600T DD from ABB</td>
</tr>
</tbody>
</table>
Corrosion Resistance

Hygienic / Compact

Robustness

261 Series – Application demands
ABB Measurement & Analytics
261 Series - Compact Pressure Transmitter

Resistant and reliable

- Compact stainless steel housing
- Resistance to vibration, condensation and intrusion up to IP69K

Wide environmental & measurement conditions:

- Ex Intrinsically safe
- SIL2/SIL 3 for safety loop applications
- Availability of remote seals offering S261

Focused features

- Hygienic connections and FDA filling
- Front bonded connection for viscous processes (P&P)

Configuration features

- FIM, DD & DTM
- Local configuration via HMI

Customer benefits

- High productivity thanks to the sector-driven connections and local configurability in case of non-DCS interaction.
- Higher productivity due to proven-in-use longevity. Readiness for cleaning and/or sanitization in place.
- Lower cost of ownership thanks to resistance to ambient conditions and reduced intervention by operators thanks to remote configurability (FIM)
PxS100 – The Standard Essential transmitter
PxS100 – The Essential Pressure Transmitter

Positioning Outlook | Target markets for PxS100 are:

WATER & WASTEWATER

CEMENT & MINING

PULP & PAPER*

ANCILLARY (POWER & METALS)

OEM & MACHINE BUILDERS

*together with PxP100 dedicated model
PxS100 – The Essential Pressure Transmitter

Features and Benefits

- **Wide choice of pressure ranges**
- **Robust front-bonded connection**
- **Easy operation**
- **High visibility touch HMI with backlight option**
- **Flexible process connections**
- **Compact Stainless-Steel housing**
- **Fast delivery**
- **Configuration and interoperability**
  - ABB unique technologies against abrasion and permeation

©ABB
PxS100 – The Essential Pressure Transmitter

New high visibility HMI with backlit display

The new HMI has:
• high visibility thanks to
  • Wide display dimensions (2 inches)
  • Backlight option
• improved touch response for best interaction

Display menu is constructed with intuitive and easy interaction logic similar to the existing ABB navigation standards.

On top, the multiple-teeth HMI board grants full flexibility in setting any position for display readability, with a +180°/-180° rotation available.
**PxS100 – The Essential Pressure Transmitter**

Flexible process connections: Threaded Adapters Modularity

<table>
<thead>
<tr>
<th>Double threaded connection</th>
<th>Threaded adapters</th>
<th>Equivalent models</th>
</tr>
</thead>
</table>

One single sensor can drive up to more than **300** equivalent models combining adapters, turndown and certification options.
PxS100 – The Essential Pressure Transmitter

Flexible process connections: Threaded Flanges Modularity

Front bonded connection  Threaded flanges  Direct mount seal equivalent models

One single sensor can drive up to more than 400 equivalent direct mount seals combining flanges, turndown and certification options
PxS100 – The Essential Pressure Transmitter
How to maximize the capability to fit different processes?

M26 COMPATIBILITY

PxS100 with NPT process connection can be coupled with manifolds to ease up process management and maintenance.

Leverage the materials and performances of the consolidated offering of ABB M26 selection.
PxS100 – The Essential Pressure Transmitter

Compact Stainless-Steel housing

PxS100 housing has been designed in stainless steel to be:
- Compact
- Sturdy
- Corrosion resistant
- Easy to clean (IP69K – Cleaning in Place)

On top, PxS100 has been tested and successfully delivers:

IP66 / IP67 / IP68 / IP69K
PxS100 – The Essential Pressure Transmitter

Robust front-bonded connection

Front bonded process connection is perfectly fitting in:
- Pulp & Paper
- Viscous processes

PxS100 front bonded connection will have:
- Stainless steel design
- Compact and robust geometry
- Broad range of measuring cells applicability
- AISI and HC diaphragm materials
- Availability of H-shield coating on AISI
- Availability of Diaflex coating on AISI and HC
PxS100 – The Essential Pressure Transmitter

Wide choice of pressure ranges

- **Gauge and Absolute Pressure Measurement**
  - 5 main ranges:
    - 400 mbar
    - 2.5 bar
    - 10 bar
    - 40 bar
    - 100 bar
  - 4 main process connections:
    - \(\frac{1}{2}\) NPT M + \(\frac{1}{4}\) NPT F
    - \(\frac{1}{2}\) NPT F
    - G \(\frac{1}{2}\) B
    - Front Bonded

- **Analog 4..20 mA & HART 7 Protocols**
  - Intrinsically Safe Certified under
    - ATEX
    - IECEx
    - CSA (CA & US)
  - Turndown up to 100:1

All the specifications of PxS100 enable a perfect fit on essential measurement points
PxS100 – The essential pressure transmitter

Safety & Performances

**DRINKING WATER APPROVALS**

In municipalities and applications where water is made available for people to be consumed, country approvals for drinking compatibility as sign of quality and safety. PxS100 is compliant with 2 country standards:

- DM 174 (Italy)
- WRAS (UK)*

**FDA APPROVED FILLING**

FDA approval is the American standard that a filling fluid for a pressure device needs to comply with so as protect people health in case of contact. PxS100 is equipped with Mineral FDA-approved oil option.

**EXTRA ACCURACY**

Possibility of extended accuracy options in case of more accurate process measure requirements:

- 0,1% of measured span
- 0,075% of measured span
PxS100 – The Essential Pressure Transmitter

Easy operation

Easy Set up menu

A simple, smartphone-like approach, for the configuration menu*. Essential and of easy interpretation.

QR code functionalities

3 QR codes available for advanced operation on the device:

- Documentation QR Code
- DAD – Digital Advanced Diagnostic QR Code
- Channel Partner QR Code

*Easy Set up menu available on the HART version
**PxS100 – The Essential Pressure Transmitter**

**Easy operation**

<table>
<thead>
<tr>
<th>Documentation QR Code</th>
<th>Digital Advance Diagnostics</th>
<th>Channel Partner Support QR Code</th>
</tr>
</thead>
</table>
| The QR code on the product nameplate grants a direct access to PxS100 webpage. | In case of failure / warning, a QR code will pop up. Upon scan, it will lead to an on-line doc with:  
- **Resolution tips**  
- **Condition details and potential causes**  
The specific set of info is constructed to provide more insights to on-field operators, reducing resolution time. | When purchased through ABB Channel Partners*, customers can find CP’s contact details by accessing this QR code* inside the Easy Set Up menu.  
Availability of such details (i.e name, address, phone, mail, etc.) make the difference when in need for immediate support. |

---

*Please ask your ABB Channel Partner contact if the option is available from their end.*
PxS100 – The Essential Pressure Transmitter

ABO unique technologies

**Diaflex**

Extremely high hardness and low friction mechanical characteristics:
- Stable up to 600°C.
- Nano-structured coating
- Titanium base composite
- PVD Physical Vapor Deposition - LARC technology
- Thickness: 3-4 µm
- 4000 HV rating on Vicker Hardness scale

Diaflex is available on front bonded connection, either with AISI or HC diaphragm substrate.

**H-Shield**

Extremely high resistance against Hydrogen permeation effect:
- Temperature up to 420°C.
- Nano-structured coating
- Titanium composite
- PVD Physical Vapor Deposition - LARC technology
- Thickness: 2-5 µm

H-shield is available on the front bonded connection, the double threaded one and the ½ NPT Female.

Elevate performances of ABB technologies grant device’s longer operational life.
PxS100 – The Essential Pressure Transmitter

Interoperability - Configurability options

**HMI**
- Setting via 2 button touch display

**Handheld**
- Handheld Terminals (HART Transmitter)
- Setting via internal push buttons (Zero/Span) + SW write protect

**Software / PC**
- FIM
- DTM
- Any third-party Frame featuring ABB DD
PxS100 – The essential pressure transmitter

Features and Benefits

**FUNCTIONAL ADVANTAGES**
- Backlit Touch display
- Digital Access Diagnostics (Dynamic QR Code)
- Label QR code for easier documentation access

**WIDE ENVIRONMENTAL & MEASUREMENT CONDITIONS:**
- Ex Intrinsically safe & Drinking water approvals
- Diaflex and H-Shield* seal nano-coating
- IP66/67/68/69K, sturdy and compact AISI Housing

**GO-TO-MARKET ADVANTAGES**
- Double-threaded connection & adapters
- Threaded G Flanges for direct mount seal-equivalent installation
- M26 manifold compatibility

**CONFIGURATION AND COMMUNICATION**
- FIM, DD & DTM
- 4...20 mA / HART & I/O Link protocol
- Full local configuration via display

**CUSTOMER BENEFITS**
- Higher competitiveness thanks to the targeted price / feature ratio fitting even aggressive price tiers.
- Lower cost of ownership due to ABB nano coatings increasing resistance to abrasion and diaphragm inflation
- Increased productivity thanks to the flexibility in process connections coupled to standard off-shelf device
- Increased productivity thanks to the fast availability on the market and Digital Access Diagnostics
PxF100 – The Essential transmitter for F&B
PxF100 – The Essential Pressure Transmitter in F&B
Safety & Performances

**3A**
The 3-A Sanitary Standards are American standards related to the design and production of equipment intended for contact with food.

**FDA APPROVED FILLING**
FDA approval is the American standard that a filling fluid for a pressure device needs to comply with so as protect people health in case of contact. PxF100 is equipped with Mineral & Vegetal FDA-approved oil option.

**EHEDG**
EHEDG (European Hygienic Engineering and Design Group) is a European-based certification that can be obtained if a product is designed and produced according to hygienic principles.

**1935/2004**
1935/2004 is a regulation of the European Parliament and and of the Council on materials and articles intended to come into contact with food.
PxF100 – The Essential Pressure Transmitter in F&B

Environmental conditions

RESISTENT & STURDY

PxF100 housing has been designed in AISI to be:
Compact
Sturdy
Corrosion resistant
Easy to clean

PxF100 has been tested and successfully delivers:

**IP66 / IP67 / IP68 / IP69K**

PxF100 features an option to ensure proper performances during vacuum conditions.
PxF100 metal components (e.g., process connection) are processed in a vacuum oven to remove any gaseous element that might be released by vacuum conditions and affect fill fluid behavior.
PxF100 – The Essential Pressure Transmitter in F&B

Specific fittings

TRI-CLAMPS
- Tri-Clamp ISO2852 DN 25 (1 in), DIN32676 DN25 32
- Tri-Clamp ISO2852 DN 38 (1 1/2 in), DIN 32676 DN40
- Tri-Clamp ISO2852 DN 51 (2 in), DIN 32676 DN 50
- Tri-Clamp ISO2852 DN 76.1 (3 in), DIN 32676 DN65*
- Tri-Clamp ISO2852 DN 101.6 (4 in) DIN 32676 DN 100*

DAIRY 11851
- Diary 11851 DN40 PN40
- Diary 11851 DN50 PN25
PxF100 – The Essential Pressure Transmitter in F&B

Specific fittings

**DAIRY 11864**
- Dairy DIN 11864-1 type A DN40 PN16
- Dairy DIN 11864-1 type A DN50 PN16

**VARINLINE**
- Varinline® F DN25
- Varinline® N DN40
Specific fittings

**NEUMO**
- Neumo Biocontrol® D50
- Neumo Biocontrol® D65

**DRD**
- DRD 65mm (DN 50)

**SMS**
- SMS 1 1/2 in PN40 (diameter 35)
- SMS 2 in PN40 (diameter 45)
Px F100 – The Essential Pressure Transmitter in F&B

Abrasions resistance

**DIAFLEX**

ABB’s unique technology solution.

Extremely high hardness and low friction mechanical characteristics:

- Stable up to 600°C.
- Nano-structured coating
- Titanium base composite
- PVD Physical Vapor Deposition - LARC technology
- Thickness: 3-4 µm
- 4000 HV rating on Vicker Hardness scale

Diaflex is available on front bonded connection, either with AISI or HC diaphragm substrate. Diaflex has been tested against the requirements of 1935/2004 for food contact
Cleaning & Sanitization

**TEMPERATURE RESISTANCE FOR CIP/SIP**

As per Wikipedia:

- «Clean-in-place (CIP) is a method of automated cleaning the interior surfaces of pipes, vessels, equipment, filters and associated fittings, without major disassembly. CIP is commonly used for equipment such as piping, tanks, and fillers….Industries that rely heavily on CIP are those requiring high levels of hygiene, and include dairy, beverage, brewing, processed foods, pharmaceutical, and cosmetics.”

- Sanitization in place (SIP) involves also the use of steam and both cleaning methods are needed to ensure the correct hygiene level of a plant / machinery.

As a result, a device that needs to be suitable for such a process, mainly in relation to the temperature that it can withstand, usually between 100°C and 150°C.

PxF100 has been designed to withstand process media temperatures up to 180°C in its standard configuration thanks to temperature dissipation neck.
Cleaning & Sanitization - Temperature behavior example

CIP cleaning process

- Water
- Alcalis
- Water
- Acids
- Water
- Steam
- Product
**COST OPTIMIZATION AND INCREASED AVAILABILITY**

Front bonded universal connection has been designed to fit multiple hygienic adapters to minimize the number of devices on stock and flexibly manage installations.

Universal connection can be ordered with diaphragm in:
- AISI 316L
- HC 276
- Diaflex on AISI
- Diaflex on HC

The combination of Universal Connection and ABB hygienic adapters is approved under 3A and EHEDG.*

ABB hygienic adapters can be ordered as single items like PxS100’s flanges and threaded adapters.

---

*Universal connection and adapters fulfill 3A and/or EHEDG approvals when coupled.*
PxF100 – The Essential Pressure Transmitter in F&B

Features and Benefits

**FUNCTIONAL ADVANTAGES**
- Backlit Touch display
- Digital Access Diagnostics (Dynamic QR Code) & documentation QR code
- 3A, EHEDG, FDA, 1935/2004 compliant connections

**GO-TO-MARKET ADVANTAGES**
- Universal connection and hygienic adapters for CIP/SIP for up to 180 °C
- Robust Stainless-steel housing and competitive plastic housing
- Standard accuracy of 0.1% and 0.075% extended option

**WIDE ENVIRONMENTAL & MEASUREMENT CONDITIONS:**
- Ex Intrinsically safe & SIL 2/3
- Diaflex nano-coating
- IP66/67/68/69K, sturdy and compact AISI Housing

**CONFIGURATION AND COMMUNICATION**
- FIM, DD & DTM
- 4...20 mA / HART & I/O Link protocol
- Full local configuration via display

**CUSTOMER BENEFITS**
- Longer transmitter lifetime thanks to stainless steel housing and resistance to CIP / SIP
- Lower cost of ownership due to ABB nano coating, high resistance to abrasion and opportunity for competitiveness on plastic housing
- Increased productivity thanks to the flexibility delivered by hygienic adapters coupled to the universal connections
- Increased productivity thanks to Digital Access Diagnostics and availability of I/O Link protocol

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PxD100 – The Essential transmitter for remote seal installations
What is PxD100?

PxD100 is the compact remote seal solution leveraging the advantages of the Pxx100 series and the efficiency of the S26 remote seals connections.
PxD100 – The Essential Remote Seal Pressure Transmitter

What is PxD100?

**Px100 Features**
- High resistance stainless steel housing
- HMI on Backlit display
- High Interoperability
- Digital diagnostics & support
- Extended performances & competitiveness

**S26 Features**
- All-welded leakage-free technology
- Wide selection of geometries
- Wide selection of materials and fillings
- Possibility of customization (Special Requests)
## PxD100 – The Essential Remote Seal Pressure Transmitter

### Extended Performances and Competitiveness

<table>
<thead>
<tr>
<th>FDA APPROVED FILLING</th>
<th>EXTRA ACCURACY</th>
<th>SAFETY</th>
</tr>
</thead>
</table>
| FDA approval is the American standard that a filling fluid for a pressure device needs to comply with so as protect people health in case of contact. PxS100 is equipped with Mineral FDA-approved oil option. | Possibility of extended accuracy options in case of more accurate process measure requirements:  
- 0.1% of measured span  
- 0.075% of measured span | Capability of being installed in safety loops thanks to the SIL 2/3 certification* |

*SIL 2/3 approval expected by August 2022
PxD100 – The Essential Remote Seal Pressure Transmitter
Superior construction technology

The entire assembly sensor-capillary-diaphragm seal does not feature gaskets or threaded joints.

All welded parts and hydraulic circuits are helium leakage tested.

The "All-welded technology" is worldwide recognized for delivering performance stability over time and delivered by default at no extra-price.
PxD100 – The Essential Remote Seal Pressure Transmitter

Superior construction technology

**MATERIALS & AVAILABLE GEOMETRIES**

- Stainless Steel 316L
- Hastelloy C276
- Tantalum
- Hastelloy C2000
- Super Duplex UNS S32750 to ASTM SA479
- Inconel 625
- Monel 400
- Stainless Steel PFA (Teflon) Coated
- Stainless Steel Gold plated
- Diaflex (anti abrasion treatment)
- Tailor-made design items

**FLANGES ACCORDING TO:**

<table>
<thead>
<tr>
<th>ASME</th>
<th>EN</th>
<th>Wafer / Pancake style diaphragm seal with side handle.</th>
</tr>
</thead>
<tbody>
<tr>
<td>S26FA</td>
<td>S26FE</td>
<td>Diaphragm seal with fixed flange</td>
</tr>
<tr>
<td>S26RA</td>
<td>S26RE</td>
<td>Diaphragm seal with rotating flange</td>
</tr>
<tr>
<td>S2WA</td>
<td>S26WE</td>
<td></td>
</tr>
</tbody>
</table>

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PxD100 – The Essential Remote Seal Pressure Transmitter

Product Look and Feel
PxD100 – The Essential Remote Seal Pressure Transmitter

Product Look and Feel
PxD100 – The Essential Remote Seal Pressure Transmitter

Abrasion resistance

**DIAFLEX**

ABB’s unique technology solution.

Extremely high hardness and low friction mechanical characteristics:
- Stable up to 600°C.
- Nano-structured coating
- Titanium base composite
- PVD Physical Vapor Deposition - LARC technology
- Thickness: 3-4 µm
- 4000 HV rating on Vicker Hardness scale

Diaflex is available on front bonded connection, either with AISI or HC diaphragm substrate.
PxD100 – The Essential Remote Seal Pressure Transmitter
Hydrogen permeation resistance

**H-SHIELD**

ABB’s unique technology solution.

Extremely high resistance against Hydrogen permeation effect:
- Temperature up to 420°C.
- Nano-structured coating
- Titanium composite
- PVD Physical Vapor Deposition - LARC technology
- Thickness: 2-5 µm

H-shield is available on the front bonded connection, the double threaded one and the ½ NPT Female one.

<table>
<thead>
<tr>
<th>Material</th>
<th>Ppm @ 230°C</th>
<th>Ppm @ 350°C</th>
<th>Ppm @ 420°C</th>
</tr>
</thead>
<tbody>
<tr>
<td>HC</td>
<td>0,0011</td>
<td>0,0091</td>
<td>0,0199</td>
</tr>
<tr>
<td>AU</td>
<td>0,0009</td>
<td>0,006</td>
<td>0,0133</td>
</tr>
<tr>
<td>HSHI</td>
<td>0,00</td>
<td>0,00</td>
<td>0,0005</td>
</tr>
</tbody>
</table>
**PxD100 – The Essential Remote Seal Pressure Transmitter**

Viscous fluids

**PFA**

The red PFA coating is suitable for:
- anti-stick and anti-corrosion effect
- superior chemical resistance at H-temperatures 482°F/250°C
- Advanced technology of PFA coating allows to apply a thickness up to 160μm

The grey PFA coating is suitable for:
- an anti-stick effect. it is applied on an AISI 316 L ss or Hastelloy C-276
- Outstanding properties of dry lubrication and surface hardness
- Thickness up to 25μm
Remote Indicators Deep Dive
Remote indicator

Indication accuracy
- Digital: ±0,10% of span (16 mA) ± 1 digit
- Bar graph: ±1% Resolution
- 16 bit conversion Ambient temperature effect
- ±0,15% of span (16 mA)

By applying an appropriate input scaling, JDF200 shows:
- Current
- Pressure
- Temperature
- Level
- Mass and Volume Flow
- Heat Transfer Rate
- Custom variable
Macro specs

- 2600T family look and feel
- L1 display with common HMI operational logics, including Easy Setup
- Hazardous Area Certified
  - ATEX
  - IECEx
  - FM
- IP67 protection
- C4 corrosion protection painting
- Additional external push-button for haz-loc configuration
## Remote Visibility

- **Multivariable display visibility**
  - Up to 8 variables, including measure goodness
  - Single variable (P) displayed multiple times
  - Set of variables (P, T, flow) displayed in sequence

- **Local display configuration**
  - Tailored for specific visualization

- **Multipurpose bracket system**
  - One bracket for wall & pipe installation

## Delocalized Control

- **Library of function block available**
  - 1 Arithmetic (+, -, average, etc)
  - 1 Input selector (returns output based on rules on input received)
  - 1 Control selector (as ‘input selector’ but with input from control blocks)
  - 2 PID (Proportional, integral, derivative)

- **Backup LAS capability (Link Active Scheduler)**
  - JDF300 is able to auto-activate schedule of the planned activities on the network

## FF Network Fit

- **FOUNDATION™ Fieldbus architecture**
  - Allows JDF300 to process/receive any variable from existing FF network devices including:
    - Pressure
    - Temperature
    - Flow
    - Setpoint
    - PID output (control variable %)

From both ABB and competitors’ products
ABB Measurement & Analytics
JDF300 – Customer benefits

Cost Saving

- Lower operating cost: monitoring system can be designed in a simpler way
- Lower installation cost: store one bracket code for pipe and wall installation
- Lower cost of ownership: combined certification and modular spare parts reduce immobilized capital

Improved Control

- Faster in field diagnostic improved by multiple simultaneously available data
- System failure recovery and stops avoidance through LAS capability

Enhanced Productivity

- No operators running around: more data in the same place
- No costs for training: operating the devices is the same as ABB 266 models
- Improved operators’ safety level due to elimination of need to reach difficult measurement points