



LD290 Series

290-291-292-293

PRESSURE TRANSMITTERS

- 0 ~ 125 Pa to 0 ~ 25 MPa
- 0 ~ 0.5 inH₂O to 0 ~ 3600 psi
- ± 0.075% Accuracy
- 40:1 Rangeability
- Wetted parts in 316 SS, Hastelloy
- Totally digital; including sensor, electronics and communication (Except LD290)
- Digital LCD display
- Weather proof, explosion proof and intrinsically safe
- Self diagnostics
- Four options of technology



smar

4-20 mA

- Updating time of output current in 100 ms;
- With high performance mathematical co-processor;
- Digital electronics and sensor;
- Weather proof, explosion proof and intrinsically safe;
- FMEDA (failure Modes, Effects and Diagnostic Analysis);
- MTBF (Mean Time Between Failures) of 239 years;
- MTTR (Mean Time to Repair) of 18 minutes;
- MTTF (Mean Time to Failure) of 239 years;
- Applicable in safety areas according to SIL (Safety Integrity Level) requirements;
- Write protection by hardware;
- Designed and manufactured according to ISO 9001 standards.

HART® 4-20 mA

- Updating time of output current in 100ms;
- Improved performance due to dedicated math co-processor;
- FMEDA (Failure Modes, Effects and Diagnostic) Analysis;
- MTBF (Mean Time Between Failures) of 239 years;
- MTTR (Mean Time to Repair) of 18 minutes;
- MTTF (Mean Time to Failure) of 239 years;
- Applicable in safety areas according to SIL (Safety Integrity Level) requirements;
- Write protection by hardware;
- Designed and manufactured according to ISO 9001 standards;
- Zero, span and damping adjustment through HART® local switches (only if fitted with display);
- Easy update for FOUNDATION™ fieldbus and PROFIBUS PA technologies.

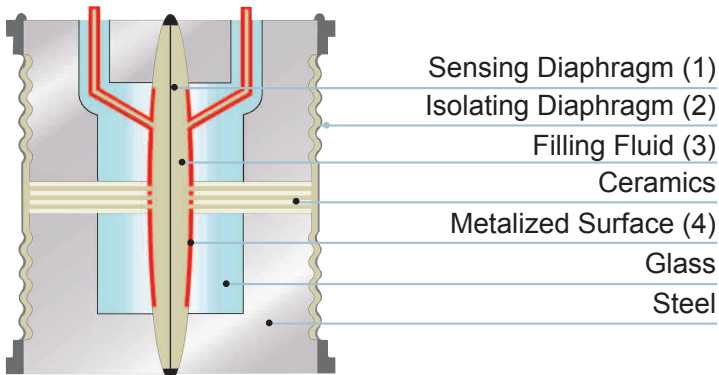
FOUNDATION™ fieldbus

- Instantiation and deletion of function blocks;
- Network master capability;
- Easy update for HART® and Profibus PA technologies.

PROFIBUS PA

- Use of the Analog Input function;
- Easy firmware upgrade (via Flash Memory Interface);
- Easy update to FOUNDATION™ fieldbus and HART® protocol.





The **LD290 Series** are an economical alternative gauge pressure transmitter. It is based on a field-proven capacitive sensor that provides reliable operation and high performance.

This lightweight design eliminates the need for mounting brackets and transmitter supports in many applications. Its microprocessor-based electronics allows total interchangeability with Smar capacitive sensors. It is automatically corrects sensors characteristics changes caused by temperature fluctuations.

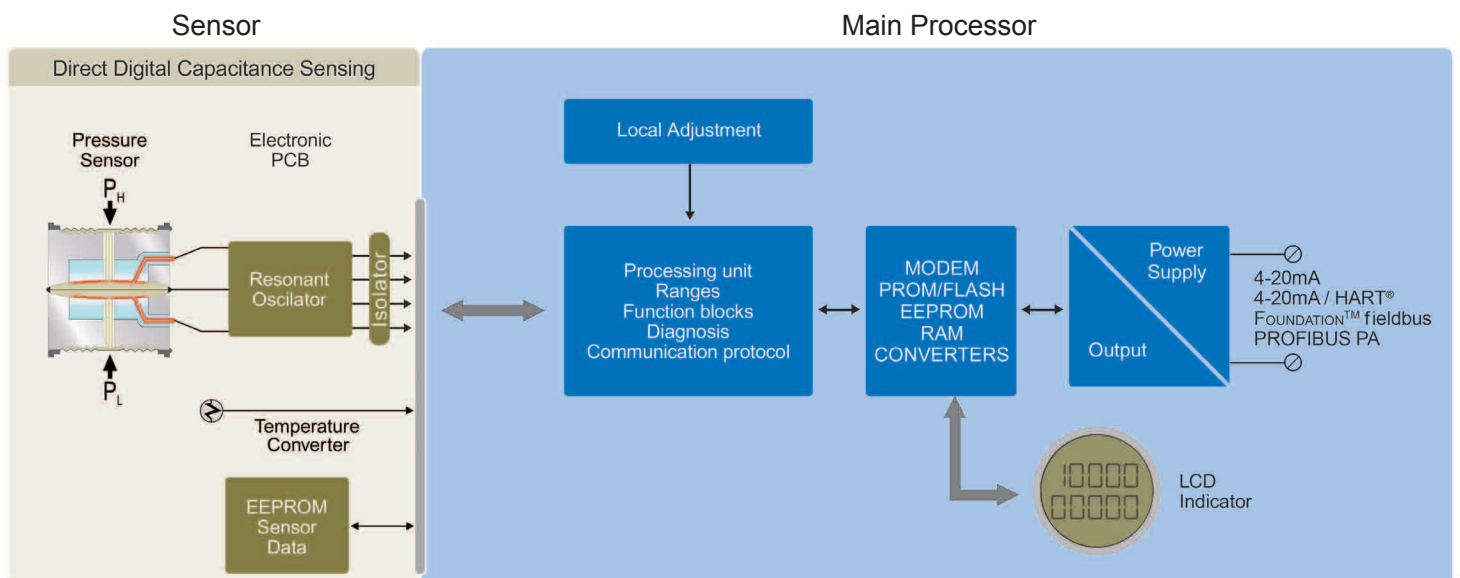
The sensor is shown in the picture above. The sensing diaphragm (1) is at the cell center. The diaphragm deflects as a result of the difference between the pressures applied to the left and right sides of the sensor. Pressure is directly applied to the isolating diaphragms (2), which provide resistance against process fluid corrosion. The pressure is transmitted to the sensing diaphragm through the filling fluid (3). The



sensing diaphragm is a moving capacitor plate while the two metallized surfaces (4) 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 rangeability for the **LD290 Series**.

The process variable, as well as monitoring and diagnostics information, are provided by digital communication protocol. The available protocol options are: HART®, FOUNDATION™ fieldbus and PROFIBUS PA.



Gage Pressure - LD290

The model **LD290** is a pure 4-20 mA transmitter. Even though it has only analog input, its microprocessor-based electronics allow for total interchangeability with Smar capacitive sensors. It automatically corrects sensor characteristics changes caused by temperature fluctuations.

Gage Pressure - LD291, LD292 and LD293

The models **LD291**, **LD292** and **LD293** offer digital communication based in HART®, FOUNDATION™ fieldbus and PROFIBUS PA - protocols, simplifying calibration and providing remote diagnostics. Their microprocessor-based electronic circuit allows for total interchangeability with Smar capacitive sensors.

Sanitary Transmitter - LD290S, LD291S, LD292S and LD293S

LD290S, **LD291S**, **LD292S** and **LD293S** are specially designed for food and other applications where sanitary connections are required. With threaded or “tri-clamp” connections, it allows for easy and quick maintenance and cleaning.

Tri-clamp and other connections are compliant to 3A-7403 standard for food grade applications.

For further information, see the Smar SR301 Series Catalog.

Flanged Pressure Transmitter - LD290L, LD291L, LD292L e LD293L

The **LD290L**, **LD291L**, **LD292L** e **LD293L** transmitters have a flange mounted unit for direct installation on vessels. Extended diaphragms are also available.

**Manifold Valves**

Smar manifold valves provide all of the necessary safety for field maintenance of **LD290 Series** transmitters. Working at pressures up to 6,000 psi, they are easy to handle and lighter than others in the market. Pressure and leakage tests carried out in 100% of the valves, also for models mounted on the transmitter. For further information, please see the Smar Manifold Valves Catalog.

**Parameterization and Diagnostics**

LD290 Series are available in four different technologies: 4-20 mA (**LD290**), HART® (**LD291**), FOUNDATION™ fieldbus (**LD292**) and PROFIBUS PA (**LD293**).

These instruments can be configured with Smar software and other manufacturers' configuration tools.

Local adjustment is available in all **LD290 Series**. It is possible to configure zero and span, and

other functions using the magnetic tool. Smar has developed AssetView, which is a user-friendly Web Tool that can be accessed anywhere and anytime using an Internet browser. It is designed for management and diagnostics of field devices to ensure reactive, preventive, predictive and proactive maintenance.

4-20 mA - LD290

Only configurable using magnetic tool if device is fitted with display.



HART® - LD291

LD291 (HART® protocol) can be configured by:

- Smar CONF401 for Windows;
- Smar DDCON100 for Windows;
- Smar HPC301 and HPC401 for several models of Palms*;
- Other manufacturers' configuration tools based on DD (Device Description) or DTM (Device Type Manager), such as AMS™, FieldCare™, PACTware™, HHT275 and HHT375, PRM Device Viewer. For **LD291** management and diagnostics, AssetView ensures continuous information monitoring.

* Requires HPI311.



CONF401



HPC401

FOUNDATION™ fieldbus - LD292

LD292 utilizes the FOUNDATION™ fieldbus H1 protocol, an open technology that allows any H1 enabled configuration tool to configure this device.

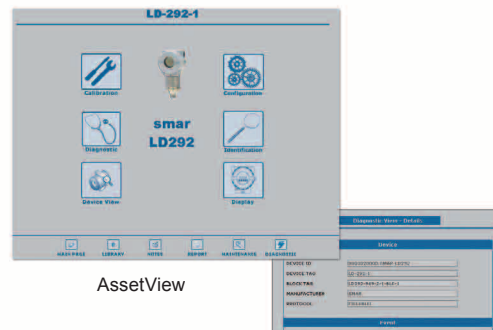
Syscon (System Configuration Tool) is a software tool used to configure, maintain and operate the field devices. Syscon offers efficient and friendly interaction with the user, using Windows NT version 4.0 or later, Windows 2000 and Windows XP.

Configuration tools such as AMS™, FieldCare™ and HHT375 can configure **LD292** devices. DD (Device Description) and CF (Capability File) files can be downloaded at either the Smar or Fieldbus FOUNDATION™ website.

LD292 supports complex strategies configurations due to the high capacity and variety of dynamic instantiable function blocks. Seventeen different types of function

blocks are supported, and up to 20 function blocks can be running simultaneously.

Maintenance procedures with AssetView diagnostics and status information from FOUNDATION™ fieldbus result in a safe plant with higher availability.

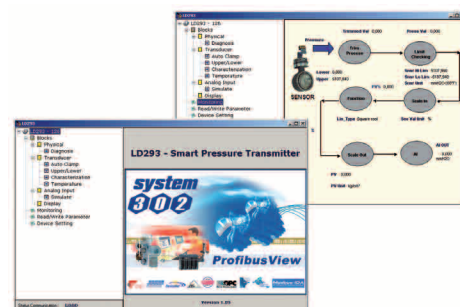


AssetView

PROFIBUS PA - LD293

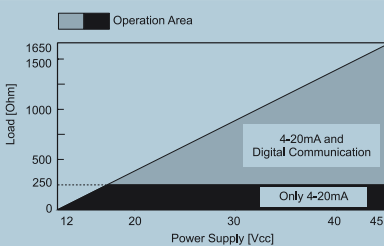
LD293 (PROFIBUS PA protocol) can be configured using Smar ProfibusView and Simatic PDM and by the FDT (Field Device Tool) and DTM (Device Type Manager) concept tools, such as FieldCare™ and PACTware™. It can also be integrated by any PROFIBUS System using the GSD file.

PROFIBUS PA also has quality and diagnostic information, improving plant management and maintenance. The EDDL and DTM are available in Smar website. Conforms to profile 3.0.



ProfibusView

Functional Specifications

Process Fluid	Liquid, gas or steam
Output and Communication Protocol	4-20 mA Two-wire, 4-20 mA controlled according to NAMUR NE43 Specification. HART® Two-wire, 4-20 mA according to NAMUR NE43 specification, with superimposed digital communication (HART® Protocol). FOUNDATION™ fieldbus and PROFIBUS PA Digital only. Complies with IEC 61158-2:2000 (H1): 31.25 kbit/s voltage mode, bus powered.
Power Supply / Quiescent Current	4-20 mA and HART® 12 to 45 Vdc. FOUNDATION™ fieldbus and PROFIBUS PA Bus powered: 9 to 32 Vdc. Quiescent current consumption: 12 mA Output impedance: nonintrinsic safety from 7.8 kHz - 39 kHz should be greater or equal to 3 kOhm. Intrinsic safety output impedance (assuming an IS barrier in the power supply) from 7.8 kHz - 39 kHz should be greater or equal to 400 Ohm. 
Indicator	4 1/2 - digit numerical and 5-character alphanumeric LCD indicator (optional).
Hazardous Area Certifications	Intrinsic Safe (FM, CSA, Nemko, Dekra/EXAM, Cepel and NEPSI), non-incendive (FM, CSA and Cepel), explosion proof (FM, Nemko and Cepel) and dust ignition proof (FM).
European Directive Information	PED Directive (97/23/EC) - Pressure Directive This product is in compliance with the directive and was designed and manufactured in accordance with sound engineering practice using several standards from ANSI, ASTM, DIN and JIS. Quality Management System certified by BVQI (Bureau Veritas Quality International). EMC Directive (2004/108/EC) - Eletromagnetic Compatibility The EMC test was performed according to IEC satndard: IEC61326-1:2006, IEC61326-2-3:2006, IEC61000-6-4:2006, IEC61000-6-2:2005. For use in industrial environment only. Keep the shield insulated at the instrument side, connecting the other one to the ground if necessary to use shielded cable. Authorized representative in European Community Smar Gmbh-Rheingastrasse 9-55545 Bad Kreuzanach. ATEX Directive (94/9/EC) - Equipment and protective systems intended for use in potentially explosive atmospheres This product is certified according to the European Standards at NEMKO and EXAM European Standards.
Temperature Limits	Ambient: -40 to 85°C (-40 a 185 °F) Process: -40 to 100°C (-40 a 212 °F) (Silicone Oil) 0 to 85°C (32 a 185 °F) (Inert Fluorolube Oil) -25 to 85 °C (-13 to 185 °F) (Viton O'Ring) -40 to 150 °C (-40 to 302 °F) (LD290L) Storage: -40 to 100°C (-40 to 212 °F) Display: -20 to 80°C (-4 to 176 °F) -10 to 60 °C (14 to 140 °F) (In Operation) -40 to 85°C (-40 to 185 °F) (Without Damages)
Turn-on Time	4-20 mA and HART® Performs within specifications in less than 5 seconds after power is applied to the transmitter. FOUNDATION™ fieldbus and PROFIBUS PA Performs within specifications of less than 10 seconds after power is applied to the transmitter.
Overpressure Limits	14 MPa (2000 psi) for ranges 2, 3 and 4 31 MPa (4500 psi) for range 5 For ANSI/DIN Level flanges (LD290L models): 150 #: 6 psia to 235 psi (-0.6 to 16 bar) at 199.4 °F (93 °C) 300 #: 6 psia to 620 psi (-0.6 to 43 bar) at 199.4 °F (93 °C) 600 #: 6 psia to 1240 psi (-0.6 to 85 bar) at 199.4 °F (93 °C) PN10/16: -60 kPa to 1.02 MPa at 212 °F (100 °C) PN25/40: -60 kPa to 2.55 MPa at 212 °F (100 °C) These overpressures will not damage the transmitter, but a new calibration may be necessary.
Volumetric Displacement	Less than 0.15 cm ³ (0.01 in ³)
Damping Adjustment	4-20 and HART® Through magnetic tool: adjustable for any value from 0 to 128 seconds, added to the sensor response time (0.2 s). FOUNDATION™ fieldbus and PROFIBUS PA From any value between 0 and 32 seconds plus intrinsic sensor response time (0.2 s).

Configuration and Zero and Span Adjustments	4-20 mA Only zero and span via local adjustment if device is fitted with display. HART® By digital communication (HART® protocol) using the Configuration Interface CONF301 or the Hart Pocket Configurator HPC301. Basic configuration may be done using local adjustment magnetic tool if device is fitted with display. FOUNDATION™ fieldbus and PROFIBUS PA Basic configuration may be done using local adjustment magnetic tool if device is fitted with display. Complete configuration is possible using remote, SYSCON (LD292), Smar ProfibusView and Simatic PDM (LD293).
Humidity Limits	0 to 100% RH (Relative Humid).

Performance Specifications

Accuracy	For ranges 2, 3, 4 or 5: $\pm 0.075\%$ of span (for span ≥ 0.1 URL) $\pm [0.0375 + 0.00375 \text{ URL/SPAN}] \%$ of span (for span < 0.1 URL) For Level Transmitter: $0.16 \text{ URL} \leq \text{span} \leq \text{URL}: \pm 0.08 \%$ of span $0.025 \text{ URL} \leq \text{span} < 0.16 \text{ URL}: \pm [0.0504 + 0.0047 \text{ URL/span}] \%$ of span $0.0083 \text{ URL} \leq \text{span} < 0.025 \text{ URL}: \pm [0.005 + 0.0059 \text{ URL/span}] \%$ of span
Stability	$\pm 0.15\%$ of URL per 5 years
Temperature Effect	$\pm [0.02 \text{ URL} + 0.06\% \text{ of span}]$, per 20°C (68°F) for span ≥ 0.2 URL $\pm [0.023 \text{ URL} + 0.045\% \text{ of span}]$, per 20°C (68°F) for span < 0.2 URL For LD290L: 6 mmH₂O per 20 oC for 4" and DN100 17 mmH₂O per 20 oC for 3" and DN80 Consult for other flange dimensions and fill fluid.
Power Supply Effect	$\pm 0.005\%$ of calibrated span per volt
Mounting Position Effect	Zero shift of up to 250 Pa (1 inH ₂ O) which can be calibrated out. No span effect.
Electromagnetic Interference Effect	Approved according to IEC61326-1:2006, IEC61326-2-3:2006, IEC61000-6-4:2006, IEC61000-6-2:2005.

Physical Specifications

Electrical Connection	See options in Ordering Code.
Process Connection	See options in Ordering Code.
Wetted Parts	316L SST, Hastelloy C276 Diaphragm for sanitary models available in Monel 400 and Tantalum too.
Nonwetted Parts	Electronic Housing Injected aluminum with polyester painting or 316 SST. According to NEMA Type 4X or Type 4, IP66, IP66W*. *The IP66W sealing test (immersion) was performed at 1 bar for 24 hours. For any other situation, please consult Smar. IP66W tested for 200h to according NBR 8094 / ASTM B 117 standard. Level Flange (LD290L): 316 SST, 304 SST and Plated Carbon Steel. Fill Fluid Silicone Oil or Inert Fluorolube Oil. Cover O-Rings Buna-N Mounting Bracket Plated Carbon Steel or 316 SST. Accessories (bolts, nuts, washers and U-clamps) in Carbon Steel or 316 SST. Identification Plate 316 SST.
Approximate Weights	< 2.0Kg (4lb): aluminum housing without mounting bracket.

MODEL	GAGE PRESSURE TRANSMITTERS									
LD290M	4-20 mA									
LD291M	HART® & 4-20 mA									
LD292M	FOUNDATION™ fieldbus									
LD293M	PROFIBUS PA									
CODE	Type	Range Limits				Range Limits				
		Min	Max	Unit		Min	Max	Unit		
2	Gage	12.5	500	mbar		5.02	201.9	inH ₂ O		
3	Gage	62.5	2500	mbar		25.13	1005.45	inH ₂ O		
4	Gage	0.625	25	bar		157.1	10054.5	inH ₂ O		
5	Gage	6.25	250	bar		90.65	3625.94	psi		
CODE	Diaphragm Material			Fill Fluid						
1	316L SST			Silicone Oil						
2	316L SST			Inert Fluorolube Oil (2)						
3	Hastelloy C276			Silicone Oil (1)						
4	Hastelloy C276			Inert Fluorolube Oil (2)						
D	316L SST			Inert Krytox Oil (2)						
E	Hastelloy C276			Inert Krytox Oil (2)						
Q	316L SST			Inert Halocarbon 4.2 Oil (2)						
R	Hastelloy C276			Inert Halocarbon 4.2 Oil (2)						
CODE	Process Connections Material									
H	Hastelloy C276 (1)					I	316L SST			Z User's specifications
CODE	Local Indicator									
0	Without Indicator					1	With Indicator			
CODE	Process Connections									
1	1/2 - 14 NPT - Female					M	1/2 - 14 NPT - Male			X 1" NPT Sealed (316L Diaphragm, DC200/20 Silicone Fill Fluid)
A	M20 X 1.5 Male					R	Remote Seal			Z User's specifications
G	G 1/2 A DIN 16288 - Form B					U	1/2 BSP – Male			
H	G 1/2 DIN 16288 - Form D					V	Valve Manifold integrated to the transmitter			
CODE	Electrical Connection									
0	1/2 - 14 NPT (3)(4)(5)(6)					A	M20 X 1.5 (3)(4)(5)			
1	1/2 - 14 NPT X 3/4 NPT (316 SST) - with adapter (3)(5)(6)					B	PG 13.5 DIN (3)(4)			
2	1/2 - 14 NPT X 3/4 BSP (316 SST) - with adapter					Z	User's specifications			
3	1/2 - 14 NPT X 1/2 BSP (316 SST) - with adapter									
4	1/2 - 1/2 NPTF (316 SST) - with adapter									
5	1/2 - 3/4 NPTF (316 SST) - with adapter									
CODE	Mounting Bracket									
0	Without Mounting Bracket					2	316 SST Mounting Bracket with 316 SST accessories			
1	Carbon Steel Mounting Bracket with Carbon Steel accessories					7	Carbon Steel Mounting Bracket with 316 SST accessories			

LD290M	2	I	N	0	D	A	0	*
LD291M	2	I	N	0	D	A	0	*
LD292M	2	I	N	0	D	A	0	*
LD293M	2	I	N	0	D	A	0	*

← Typical Model Number

* Leave blank for no optional items.

Note

- (1) Meets NACE material recommendation per MR-01-75.
 (2) Inert fluid: safe for oxygen service.
 (3) This adapter has certified for use in Explosion Proof (CEPEL).

- (4) This adapter has certified for use in Explosion Proof (NEPSI, NEMKO, EXAM).
 (5) This adapter has certified for use in Explosion Proof (FM).
 (6) This adapter has certified for use in Explosion Proof (CSA).

Note

Hastelloy is a trademark of the Cabot Corp.
 Monel is a trademark of International Nickel Co.
 Viton and Teflon are trademarks of E. I. DuPont de Nemours & Co.

Fluorolube is a trademark of Hooker Chemical Corp.
 HART® is a trademark of HART® Communication Foundation
 Foundation is a trademark of Fieldbus Foundation.
 Profibus is a trademark of Profibus International.

Smar Pressure Transmitters are protected by US patent number 6,433,791

MODEL	PRESSURE SANITARY TRANSMITTERS										
LD290S	4-20 mA										
LD291S	HART® & 4-20 mA										
LD292S	FOUNDATION™ fieldbus										
LD293S	PROFIBUS PA										
CODE	Type	Range Limits				Range Limits					
		Min	Max	Unit		Min	Max	Unit			
2	Sanitary	12.5	500	mbar		5.02	201.09	inH ₂ O			
3	Sanitary	62.5	2500	mbar		25.13	1005.45	inH ₂ O			
4	Sanitary	0.625	25	bar		157.1	10054.5	inH ₂ O			
5	Sanitary	6.25	55.15	bar		90.65	799.89	psi			
CODE	Diaphragm Material										
H	Hastelloy										
I	316L SST										
M	Monel										
T	Tantalum										
CODE	Fill Fluid										
D	Silicone DC-704 Oil										
F	Inert Fluorolube MO-10 Oil (1)										
K	Inert Krytox Oil (1)										
N	Propileno Glicol Neobee M20 Oil (Approved 3A) (2)										
S	Silicone DC-200/20 Oil										
T	Syltherm 800 Oil										
CODE	Local Indicator										
0	Without Indicator										
1	With Indicator										
CODE	Process Connections										
B	Thread IDF - 2"					H	DN40 - DIN 11851				
C	Thread RJT - 2"					P	Tri-Clamp - 2" HP				
D	Tri-Clamp - 2"					Q	Tri-Clamp - 1 1/2" HP				
E	Thread SMS - 2"					Z	User's specifications				
F	Tri-Clamp - 1 1/2"										
CODE	Electrical Connections										
0	1/2 - 14 NPT (3)(4)(5)(6)					A	M20 X 1.5 (3)(4)(5)				
1	1/2 - 14 NPT X 3/4 NPT (316 SST) - with adapter (3)(5)(6)					B	PG 13.5 DIN (3)(4)				
2	1/2 - 14 NPT X 3/4 BSP (316 SST) - with adapter					Z	User's specifications				
3	1/2 - 14 NPT X 1/2 BSP (316 SST) - with adapter										
4	1/2 - 1/2 NPTF (316 SST) - with adapter										
5	1/2 - 3/4 NPTF (316 SST) - with adapter										
CODE	O'Ring Material										
0	Without O'Ring					V	Viton (Approved 3A) (2)				
B	Buna-N					Z	User's specifications				
T	Teflon										
CODE	Adaptation Sleeve										
0	Without Sleeve										
1	With Adaptation Sleeve in 316 SST										
CODE	Tri-Clamp Connection										
0	Without Clamp										
2	With Tri-Clamp in 304 SST										
CODE	Diaphragm Material (Sanitary Connection)										
H	Hastelloy										
I	316L SST										
CODE	Fill Fluid (Sanitary Connection)										
D	Silicone DC-704 Oil										
F	Inert Fluorolube MO-10 Oil (1)										
N	Propileno Glicol Neobee M20 Oil (Approved 3A) (2)										
S	Silicone DC-200/20 Oil										
T	Syltherm 800 Oil										
Z	User's specifications										
CODE	Optional Items										
H0	Aluminum Housing										
ZZ	User's specifications										

LD290S	-	2		I		N		1		D		O		V		1		2		I		D		+
LD291S	-	2		I		N		1		D		O		V		1		2		I		D		+
LD292S	-	2		I		N		1		D		O		V		1		2		I		D		+
LD293S	-	2		I		N		1		D		O		V		1		2		I		D		+

* Leave blank for no optional items.

Note

- (1) Meets NACE material recommendation per MR-01-75.
 (2) Inert fluid: safe for oxygen service.
 (3) This adapter has certified for use in Explosion Proof (CEPEL).

- (4) This adapter has certified for use in Explosion Proof (NEPSI, NEMKO, EXAM).
 (5) This adapter has certified for use in Explosion Proof (FM).
 (6) This adapter has certified for use in Explosion Proof (CSA).

MODEL	LOW COST FLANGED PRESSURE TRANSMITTER									
LD290L	4-20 mA									
LD291L	HART® & 4-20 mA									
LD292L	FOUNDATION™ fieldbus									
LD293L	PROFIBUS PA									
CODE	Type	Range Limits		Unit		Range Limits		Unit		
		Min	Max			Min	Max			
2	Level	12.5	500	mbar		5.02	201.9	inH ₂ O		
3	Level	62.5	2500	mbar		25.13	1005.45	inH ₂ O		
4	Level	0.625	25	bar		157.1	10054.5	inH ₂ O		
5	Level	6.25	250	bar		90.65	3625.94	psi		
CODE	Diaphragm Material (Sensor)									
I	316 SST									
Z	User's specifications									
CODE	Fill Fluid (Sensor)									
D	Silicone DC-704 Oil (1)									
F	Inert Fluorolube MO-10 Oil (2) (9)									
K	Inert Krytox Oil (9)									
N	Neobee M20 Oil									
T	Syltherm 800 Oil									
S	Silicone DC-200/20 Oil (1)									
CODE	Local Indicator									
0	Without Indicator									
1	With Digital Indicator									
CODE	Process Connection									
1	3" 150 # (ANSI B16.5)									
2	3" 300# (ANSI B16.5)									
3	4" 150# (ANSI B16.5)									
4	4" 300# (ANSI B16.5)									
6	DN80 PN25/40									
7	DN100 PN10/16									
8	DN100 PN25/40									
9	2" 150# (ANSI B16.5)									
A	2" 300# (ANSI B16.5)									
B	2" 600# (ANSI B16.5)									
C	3" 600# (ANSI B16.5)									
D	4" 600# (ANSI B16.5)									
E	DN50 PN10/40									
O	1½" 150# (ANSI B16.5)									
P	1½" 300# (ANSI B16.5)									
Q	1½" 600# (ANSI B16.5)									
Z	User's specifications									
CODE	Electrical Connection									
0	1/2 - 14 NPT (3)									
1	1/2 - 14 NPT X 3/4 NPT (AI 316) - with adapter (4)									
2	1/2 - 14 NPT X 3/4 BSP (AI 316) - with adapter									
3	1/2 - 14 NPT X 1/2 BSP (AI 316) - with adapter									
4	1/2 - 1/2 NPTF (AI 316) - with adapter									
5	1/2 - 3/4 NPTF (AI 316) - with adapter									
A	M20 X 1.5 (5)									
B	PG 13.5 DIN (6)									
Z	User's specifications									
CODE	Type and Material Flange									
4	304 SST (slip-on flange)									
5	316 SST (slip-on flange)									
6	Carbon Steel (slip-on flange)									
Z	User's specifications									
CODE	Extension Length									
0	0 mm (0")									
1	50 mm (2")									
2	100 mm (4")									
3	150 mm (6")									
4	200 mm (8")									
Z	User's specifications									
CODE	Diaphragm Material (Process Connection)									
I	316 L SST									
H	Hastelloy C276									
M	Monel 400									
T	Tantalum (7)									
Z	User's specifications									
CODE	Fill Fluid (Process Connection)									
S	Silicone DC-200/20 Oil									
F	Inert Fluorolube MO-10 Oil (8)									
D	Silicone DC-704 Oil									
K	Krytox Oil									
H	Halocarbon 4.2 Oil									
N	Propileno Glicol (Neobee) Oil									
T	Syltherm 800 Oil									
Z	User's specifications									
CODE	Lower Housing Material									
0	Without Lower Housing									
1	316L SST									
2	Hastelloy C276									
3	Super Duplex (UNS 32750)									
4	Duplex (UNS 31803)									
5	304L SST									
Z	User's specifications									
CODE	Gasket Material									
0	Without Gasket									
C	Copper									
G	Grafoil (Flexible Lead)									
I	316L SST									
T	Teflon (PTFE)									
Z	User's specifications									

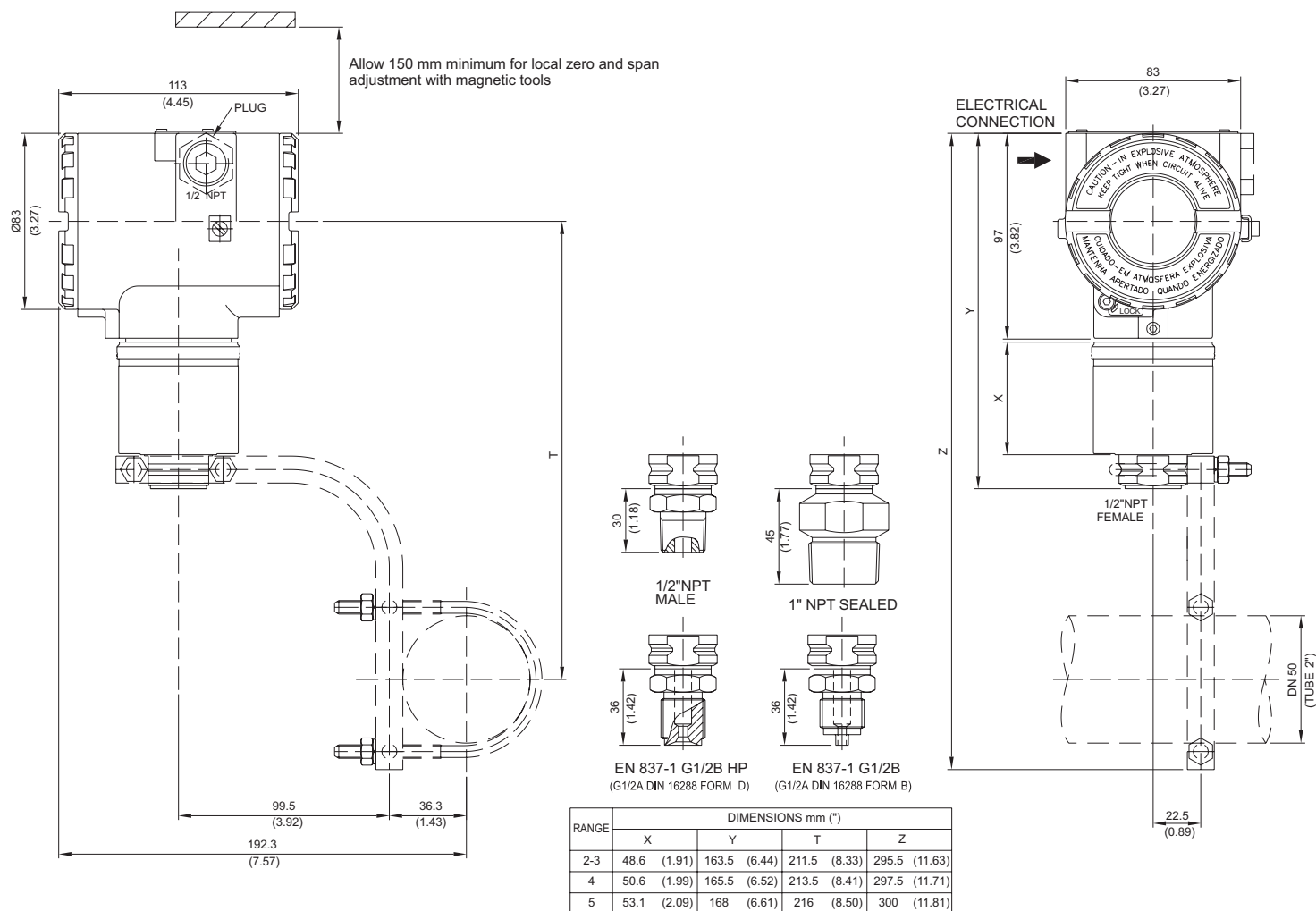
 Typical Model Number

LD290L	-	2	I	D	1	1	O	6	2	I	S	1	T
LD291L	-	2	I	D	1	1	O	6	2	I	S	1	T
LD292L	-	2	I	D	1	1	O	6	2	I	S	1	T
LD293L	-	2	I	D	1	1	O	6	2	I	S	1	T

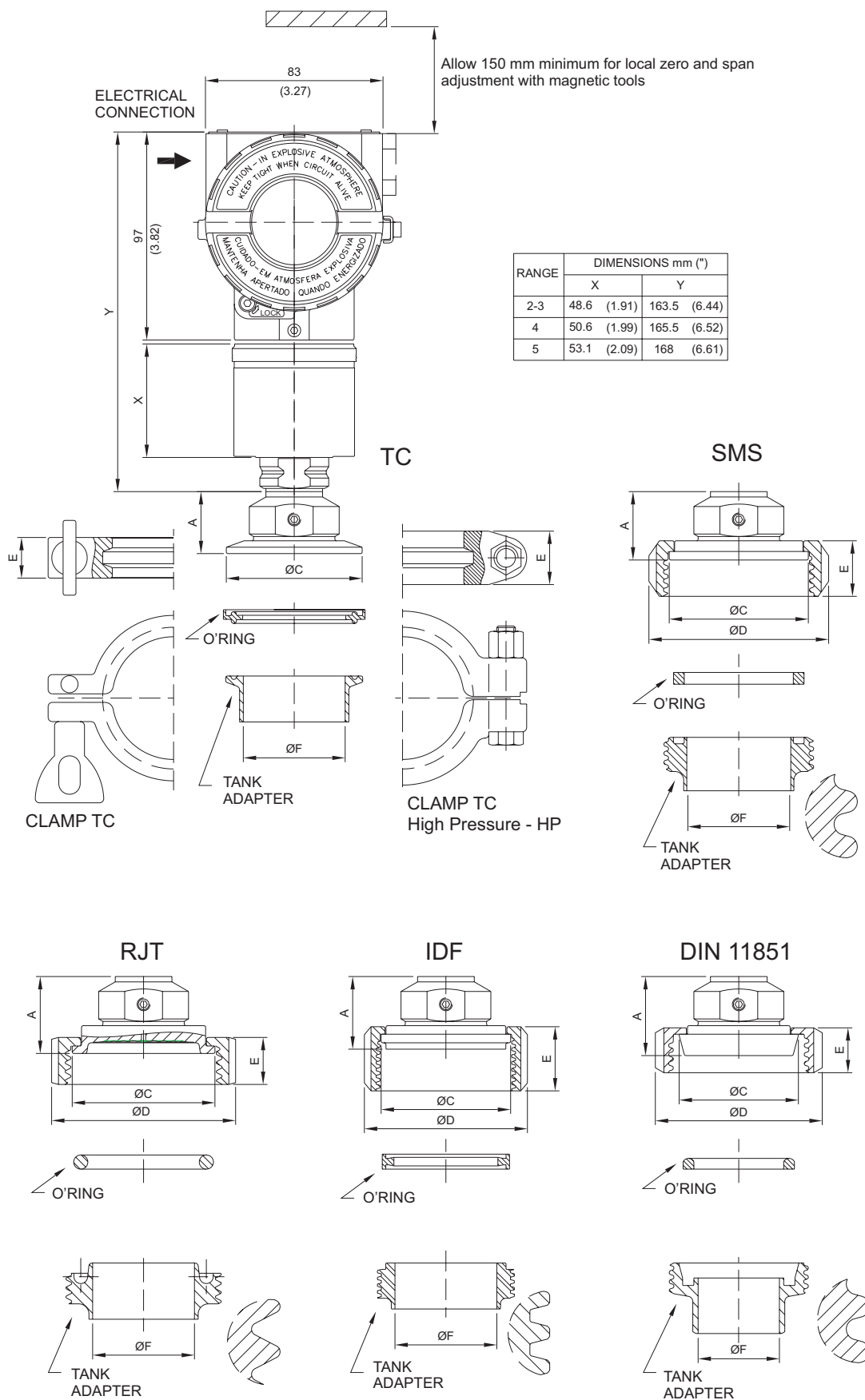
Note

- (1) Silicone Oils not recommendations for Oxygen (O₂) or Chlorine service.
 (2) Not applicable for vacuum service.
 (3) Certificate for use in Hazardous Locations (CEPEL, NEPSI, NEMKO, EXAM, FM, CSA).
 (4) Certificate for use in Hazardous Locations (CEPEL, FM, CSA).
 (5) Certificate for use in Hazardous Locations (CEPEL, NEPSI, NEMKO, EXAM, FM).
 (6) Certificate for use in Hazardous Locations (CEPEL, NEPSI, NEMKO, EXAM).
 (7) Not recommended with extension.
 (8) Fluorolube fill fluid is not available for Monel diaphragm.
 (9) Inert Fluid: Safe for oxygen service.

LD290M - Gage Pressure Transmitters



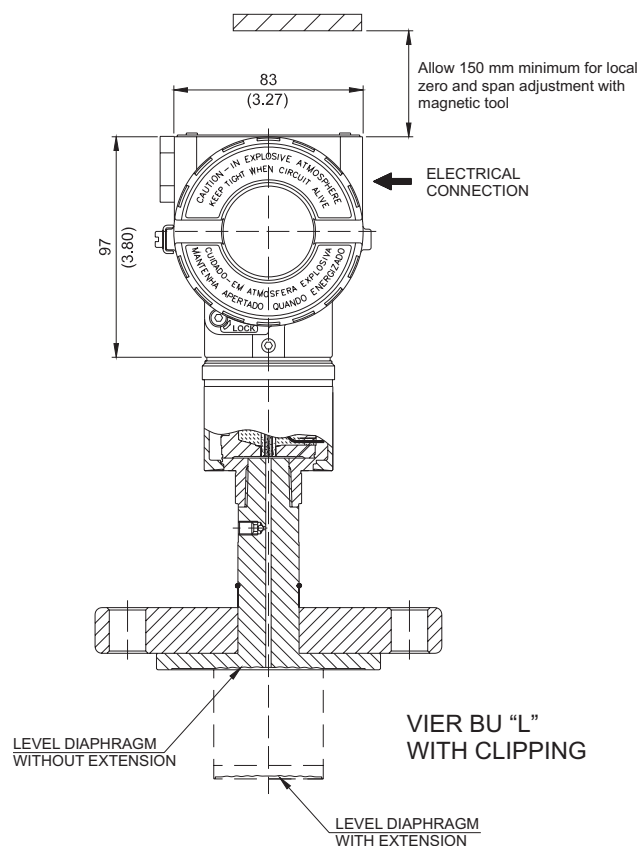
LD290S - Pressure Sanitary Transmitters



CONNECTION WITHOUT EXTENSION	Dimensions in mm (inche)				
	A1	ØC	ØD	E	ØF
Tri-Clamp - 1 1/2"	27 (1.06)	50 (1.96)	61 (2.40)	18 (0.71)	35 (1.38)
Tri-Clamp - 1 1/2" HP	27 (1.06)	50 (1.96)	66 (2.59)	25 (0.98)	35 (1.38)
Tri-Clamp - 2"	29 (1.14)	63.5 (2.50)	76.5 (3.81)	18 (0.71)	47.6 (1.87)
Tri-Clamp - 2" HP	29 (1.14)	63.5 (2.50)	81 (3.19)	25 (0.98)	47.6 (1.87)
Threaded DN40 - DIN 11851	37 (1.46)	56 (2.20)	78 (3.07)	21 (0.83)	38 (1.50)
Threaded DN50 - DIN 11851	38 (1.50)	68.5 (2.70)	92 (3.62)	22 (0.86)	50 (1.96)
Threaded SMS - 1 1/2"	31 (1.22)	55 (2.16)	74 (2.91)	25 (0.98)	35 (1.38)
Threaded SMS - 2"	32 (1.26)	65 (2.56)	84 (3.30)	26 (1.02)	48.6 (1.91)
Threaded RJT - 2"	35 (1.38)	66.7 (2.63)	86 (3.38)	22 (0.86)	47.6 (1.87)
Threaded IDF - 2"	34 (1.34)	60.5 (2.38)	76 (2.99)	30 (1.18)	47.6 (1.87)

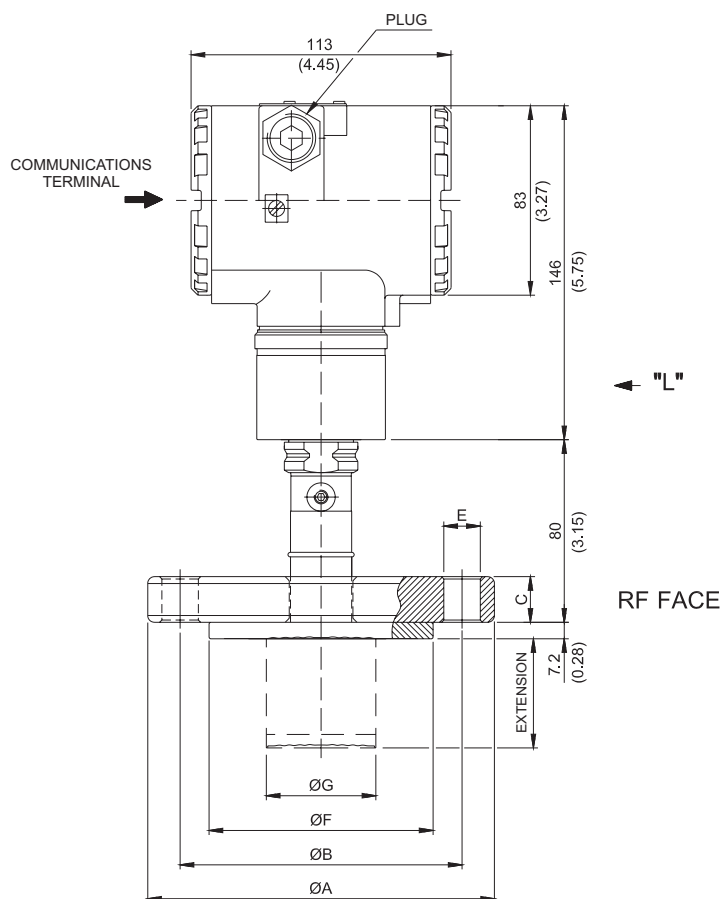
Table 1 - LD290S - Table relative to dimension drawing from page 12

LD290L - Flanged Pressure Transmitter

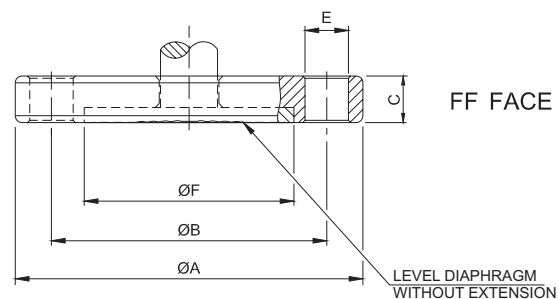


NOTES:

- EXTENSION LENGTH mm (in): 0, 50 (1.96), 100 (3.93), 150 (5.9) or 200 (7.87)
-DIMENSIONS ARE mm (in)

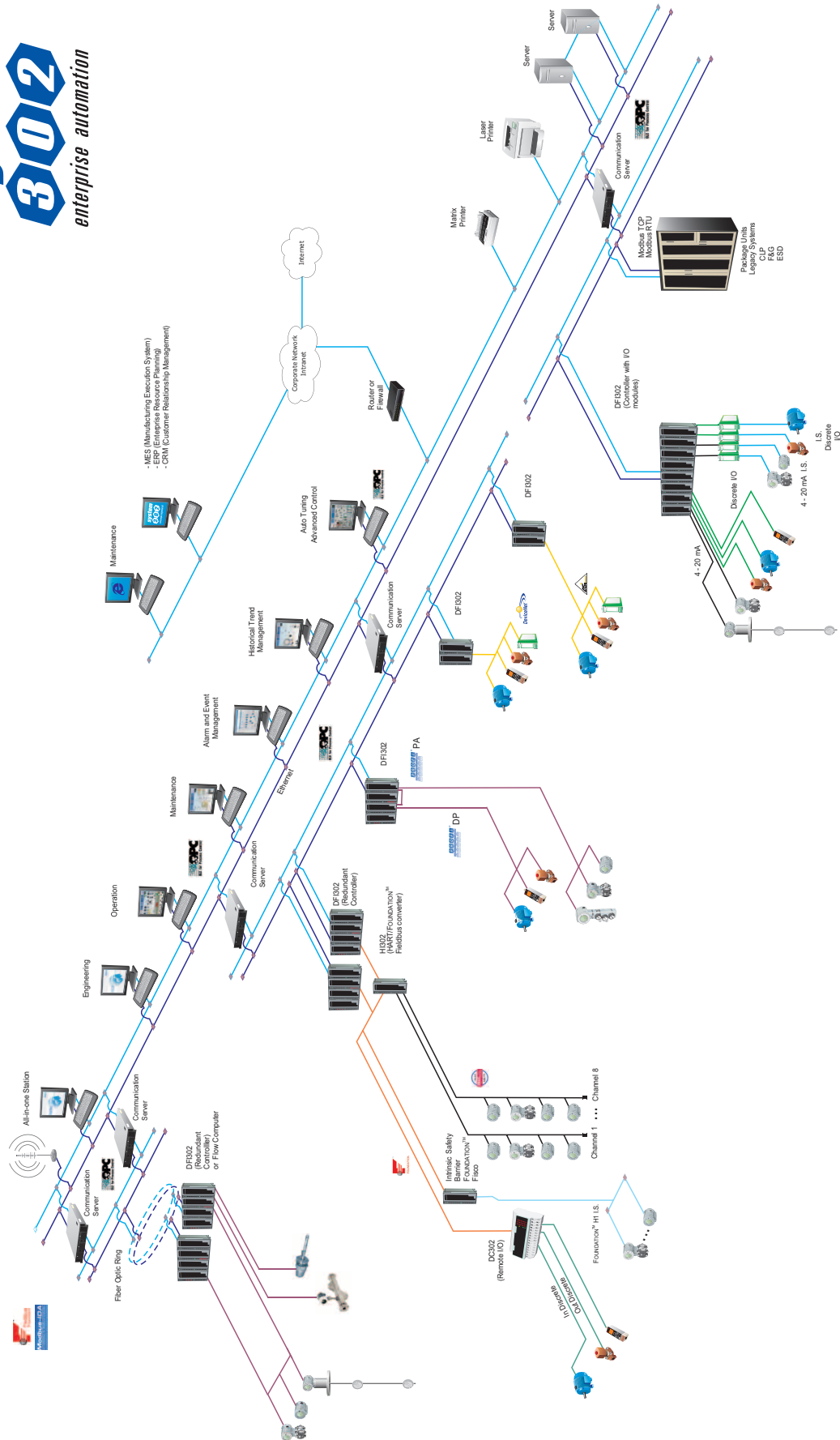


ANSI-B 16.5 DIMENSIONS								
DN	CLASS	A	B	C	E	F (RF) (FF)	G	HOLES
1.1/2"	150	127 (5)	98.6 (3.88)	20 (0.78)	16 (0.63)	73.2 (2.88)	40 (1.57)	4
	300	155.4 (6.12)	114.3 (4.5)	21 (0.83)	22 (0.87)	73.2 (2.88)	40 (1.57)	4
	600	155.4 (6.12)	114.3 (4.5)	29.3 (1.15)	22 (0.87)	73.2 (2.88)	40 (1.57)	4
2"	150	152.4 (6)	120.7 (4.75)	17.5 (0.69)	19 (0.75)	92 (3.62)	48 (1.89)	4
	300	165.1 (6.5)	127 (5)	20.7 (0.8)	19 (0.75)	92 (3.62)	48 (1.89)	8
	600	165.1 (6.5)	127 (5)	25.4 (1)	19 (0.75)	92 (3.62)	48 (1.89)	8
3"	150	190.5 (7.5)	152.4 (6)	22.3 (0.87)	19 (0.75)	127 (5)	73 (2.87)	4
	300	209.5 (8.25)	168.1 (6.62)	27 (1.06)	22 (0.87)	127 (5)	73 (2.87)	8
	600	209.5 (8.25)	168.1 (6.62)	31.8 (1.25)	22 (0.87)	127 (5)	73 (2.87)	8
4"	150	228.6 (9)	190.5 (7.5)	22.3 (0.87)	19 (0.75)	158 (6.22)	89 (3.5)	8
	300	254 (10)	200 (7.87)	30.2 (1.18)	22 (0.87)	158 (6.22)	89 (3.5)	8
	600	273 (10.75)	215.9 (8.5)	38.1 (1.5)	25 (1)	158 (6.22)	89 (3.5)	8



EN 1092-1 / DIN2501 DIMENSÕES								
DN	PN	A	B	C	E	F	G	HOLES
40	10/40	150 (5.9)	110 (4.33)	20 (0.78)	18 (0.71)	88 (3.46)	40 (1.57)	4
50	10/40	165 (6.50)	125 (4.92)	20 (0.78)	18 (0.71)	102 (4.01)	48 (1.89)	4
	63	180 (7.09)	135 (5.31)	26 (1.02)	22 (0.87)	102 (4.01)	48 (1.89)	4
	100	195 (7.68)	145 (5.71)	28 (1.12)	26 (1.02)	102 (4.01)	48 (1.89)	4
80	63	215 (8.46)	170 (6.69)	28 (1.12)	22 (0.87)	138 (5.43)	73 (2.87)	8
	100	230 (9.06)	180 (7.09)	32 (1.26)	26 (1.02)	138 (5.43)	73 (2.87)	8
	25/40	200 (7.87)	160 (6.30)	24 (0.95)	18 (0.71)	138 (5.43)	73 (2.87)	8
	10/40	200 (7.87)	160 (6.30)	24 (0.95)	18 (0.71)	138 (5.43)	73 (2.87)	8
100	10/16	220 (8.67)	180 (7.08)	20 (0.78)	18 (0.71)	158 (6.22)	89 (3.5)	8
	25/40	235 (9.25)	190 (7.50)	24 (0.95)	22 (0.87)	162 (6.38)	89 (3.5)	8

system 302 enterprise automation



Pressure

4-20 mA LD290



LD291

LD292

LD293

Pressure Transmitter

LD1.0



Gauge Economic Capacitive Pressure Transmitter

Pressure, Level and Flow

LD400



Pressure Transmitter with high performance



LD301

LD302

LD303

Pressure Transmitter

Level



RD400

Level Transmitter

Density/Concentration



DT301

DT302

DT303

Intelligent Density / Concentration Transmitter

Position



FY301

FY302

FY303

Valve Positioner



FY400

Valve Positioner with self tuning



FY301

FY302

FY303

Valve Positioner with remote sensor



TP301

TP302

TP303

Position Transmitter

Temperature



TT301

TT302

TT303

Temperature Transmitter



TT411

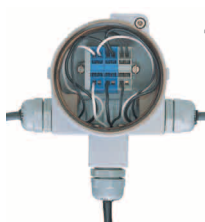
Panel Mounting Temperature Transmitter



TT421

Head Mounting Temperature Transmitter

Junction Box



4-20 mA

3 Ways Junction Box JM1



4-20 mA

4 Ways Junction Box JM400

Configurators



HART® Configurator Interface CONF401



HART® Configurator Interface DDCON 100



HART® Configurator for Palm HPC301

Interfaces



HART-RS232 Interface HI311



HART-USB Interface HI321

Converters



FOUNDATION
FIELD
bus
smar
FP302
FP303

Fieldbus to Pneumatic
Signal Converter



FOUNDATION
FIELD
bus
smar
IF302
IF303

Current to Fieldbus
Converter



FOUNDATION
FIELD
bus
smar
FI302
FI303

Fieldbus to Current
Converter



HART® / Fieldbus
Interface HI302



HART® / Current
Converter HCC301

Controllers



Programmable Logical
Controller
LC700

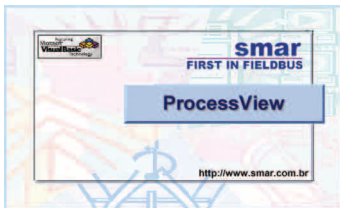


Digital Controller
CD600Plus



Interface Universal Fieldbus
DFI302

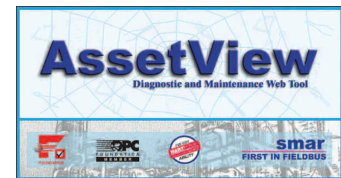
Systems



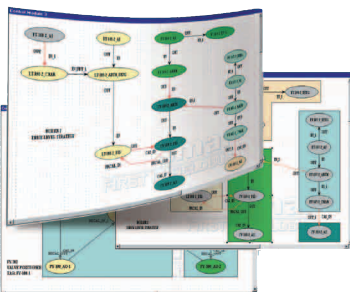
ProcessView
Process Visualization Tool



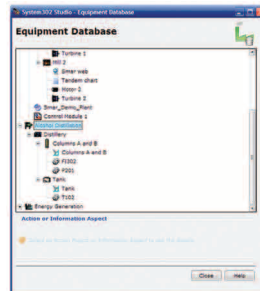
Studio302
System302 Management Tool



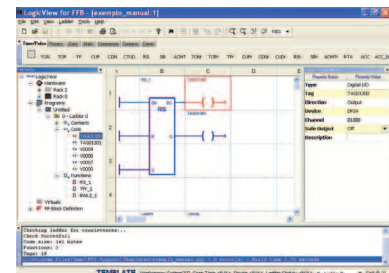
AssetView
On Line Plant Asset
Management Tool



Syscon
System Configurator



Equipment Database
Plant Information Management



LogicView
IEC61131
Programming Tool