



FP300 Series

302-303

SIGNAL PNEUMATIC CONVERTER

INTERFACE FOR CONTROL SYSTEM FOR VALVES AND PNEUMATIC ACTUATORS

- Available for both FOUNDATION™ fieldbus and PROFIBUS PA communication protocols
- 3 to 15 psi or 3 to 30 psi output
- Low air consumption
- Field calibration
- Auto diagnosis
- Extensive capacity for Function Blocks execution
- Instantiable Function Blocks
- Local adjustment available
- Local digital indicator
- No need to open the housing for local adjustment
- Rotary display for easy reading
- Pressure gages for input and output monitoring
- Mounting Bracket for 2" mounting on the wall or panel
- Reversal polarity protection
- Transient suppressor Protection
- According to PROFIBUS DP-V1 version
- Supports DD, EDDL for FDT/DTM applications
- Hazardous Areas Certified, including "IPW" for offshore installations



smar

The FP300 Series converters are used on a FOUNDATION™ fieldbus - FP302, or PROFIBUS-PA - FP303 - systems providing an pneumatic output according to the digital commands coming from the network.

The FP300 series technology allows an easy interface between the field and the control room, including data transfers, reducing the installation, startup, and maintenance operations costs of industrial processes.

The Function Blocks concept makes easier the user programming, who can build up and visually check complex control strategies.

The Functions Blocks are flexible enough to allow logical block combinations and re-combinations with no need of field wiring changes or any hardware revision.

The FP300 Series allows local basic configuration via a magnetic tool, without opening the electronic housing and without any local push buttons, improving the plant safety.

Using the magnetic tool for basic configuration, the FP300 Series eliminates the handheld configurators, reducing initial installation costs.

The FP300 Series is presented for 3 to 15psi or 3 to 30 psi output ranges.

For full configuration, the FP300 Series allows remote connection with software applications according to FOUNDATION™ fieldbus or PROFIBUS-PA standards.

Smar offers software applications for both communication protocols, where pneumatic actuators are used or even in old plants migrating from pneumatic to digital technologies.

The FP300 Series is designed for IP66 weather proof installations, explosion proof and intrinsically safe for hazardous areas.

- Suitable for both FOUNDATION™ fieldbus or PROFIBUS protocols;
- 3 to 15 psi (0.2-1.0 kg/cm²) or 3 a 30 psi (0.2-2.1 kg/cm²) output;
- Field calibration for 3 to 15 psi or 3 to 30 psi;
- Local basic configuration;
- EMC (Electromagnetic Compatibility) according to IEC61326-1:2006, IEC61326-2-3:2006, IEC61000-6-4:2006, IEC61000-6-2:2005;
- Write protection function;
- Alphanumerical LCD indication;
- Remote calibration and parameterization;
- Output flow capacity: 6.7 Nm³/h (4 scfm);
- Accuracy: 0.4 % of span;
- Bus powered 9-32 Vcc;
- Quiescente current consumption of 12 mA.



FOUNDATION™ fieldbus

- 9 different types of function blocks for control strategies and advanced diagnostics;
- It allows control strategies changes without any change on the wiring or firmware ;
- Full configuration via Personal Computer in combination with compatible FOUNDATION™ fieldbus application software;
- Local basic configuration via magnetic tool or handheld configurator;
- 12 mA consumption;
- Dynamic block instantiation improves interchangeability;
- DD compatible with FOUNDATION™ fieldbus ITK;

PROFIBUS PA

- According to the PROFIBUS DP-V1;
- 12 mA consumption:
- Function Blocks for analog output, transducer and displays among others;
- Configuration via:
 - Magnetic tool - basic configuration;
 - Remote full configuration using Smar ProfibusView or Simatic PDM;
- Supports DTM and EDDL.

**Services and Support**

SMAR offers customers first-class technical support and services with a highly specialized, experienced team. We guarantee the maintenance of your system by supplying quality spare parts and services rapidly, in all stages of the project and plant maintenance.

The FP300 output module main parts are: pilot, servo, pressure sensor, and output control circuit.

The pneumatic section is based on the pneumatic relay and the baffle nozzle set.

When the system requires the output pressure value to increase or decrease, the baffle, made by a piezo-electric material, get closer to the nozzle or the reverse. This baffle movement produce a pressure modulation on the pneumatic relay, changing the output pressure. Pressure sensors measure the output pressure and feedback the control circuit to correct the baffle position, if necessary.

The FP300 is powered by the FOUNDATION™ fieldbus or PROFIBUS PA bus.

The communication controller manages the databus activity, modulating and demodulating the communication signals.

The central processing unit (CPU) manages the block operation, self-diagnosis and communications. The CPU memory keeps resident software and temporary data. In case of communication failure, the converter has a non volatile memory, in which important data are saved such as calibration, configuration parameters, device identification etc.

The display controller receives data from the CPU and send them to the LCD according to the user configuration.

Adjustments and local basic configuration are performed through two switches sensitive to the magnetic tool, with no external contact and no need to open the electronic housing.

The D/A block converts the CPU signal into a analogic voltage for the control block.

The output pressure is managed by the control circuitry, which supply a proper voltage for the piezo electric baffle to move in response to the data received from the CPU and compare it with the feedback signal coming from the output pressure sensor.

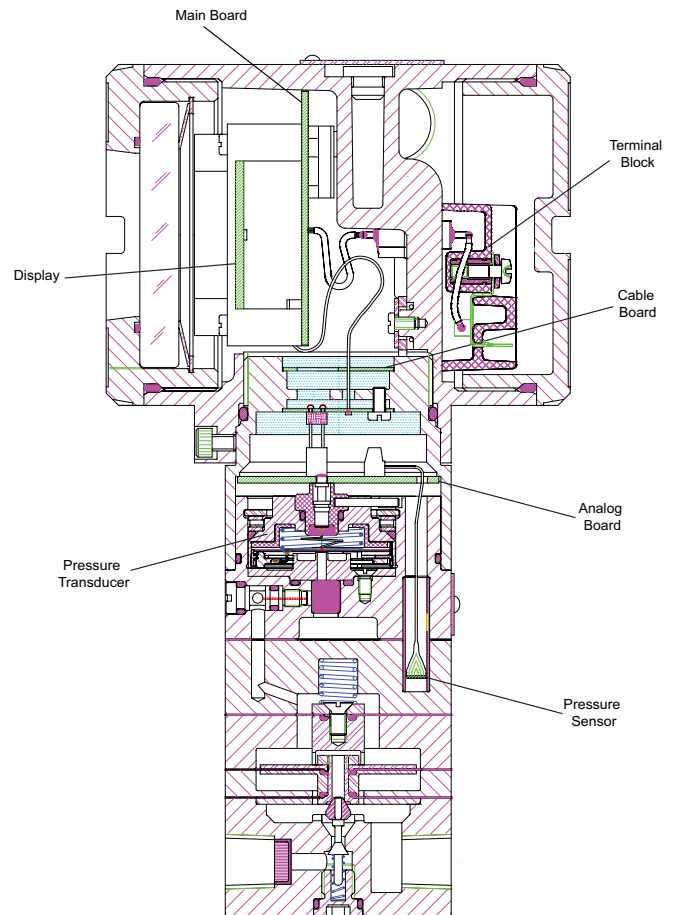
The temperature sensor measures the temperatura of the transducer board for possible temperatura compensation, if necessary.

The data saved into the non volatile EEPROM memory is used for the FP300 re-start procedure.

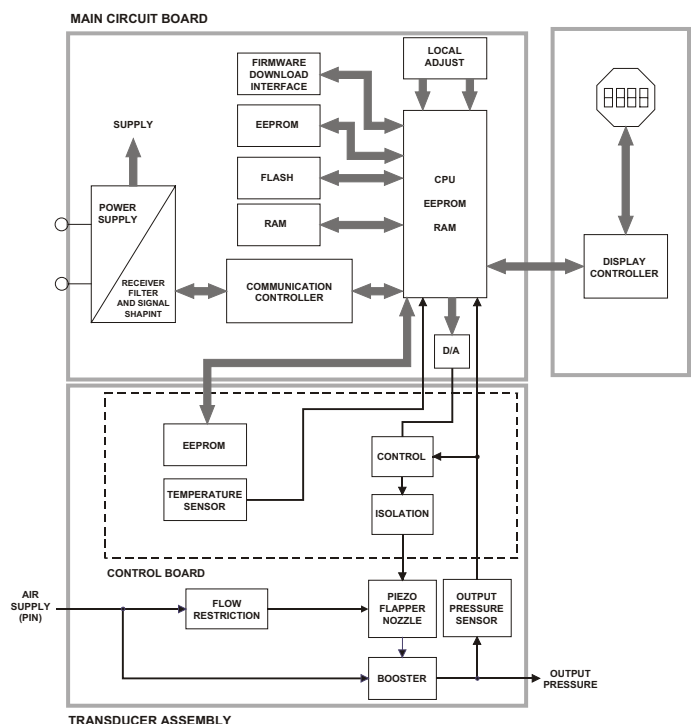
The restriction is necessary to a guarantee smooth pressure for the baffle-nozzle set.

The booster amplifies the pressure changes into the pressure outlet.

FP300 Scheme



Functional Eletronic Description



The FP300 Series converter is available for both FOUNDATION™ fieldbus and PROFIBUS PA communication protocols. The FP300 basic local configuration is easily made with the magnetic tool, and it is not necessary to open the electronic housing for this. For a full configuration FP300 Series, it is necessary to use configuration application software by Smar or from a third party applications and configurators.

Additionally, Smar offers the AssetView application software, a web tool, friendly user interface, available from any internet navigator, at any time, including the FDT/DTM feature. The AssetView is a management software not only dedicated for corrective, preventive and pro-active maintenance tasks, but also provides an easy way to configure field devices.

FOUNDATION™ fieldbus

FP302 utilizes the FOUNDATION™ fieldbus H1 protocol, an open technology that allows any H1 enabled configuration tool to configure this device.

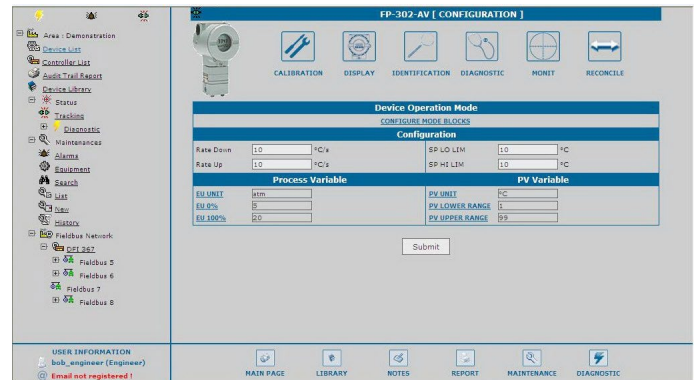
Syscon is a software tool used to configure, maintain and operate the field devices. Syscon offers efficient and friendly interaction with the user, using Windows .

Configuration tools such as AMS™, FieldCare™ and HHT375 can configure FP302 devices. DD (Device Description) and CF (Capability File) files can be downloaded at either the Smar or Fieldbus FOUNDATION™ website.

FP302 supports complex strategies configurations due to the high capacity and variety of dynamic instantiable function blocks.

Nine different types of function blocks are supported.

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



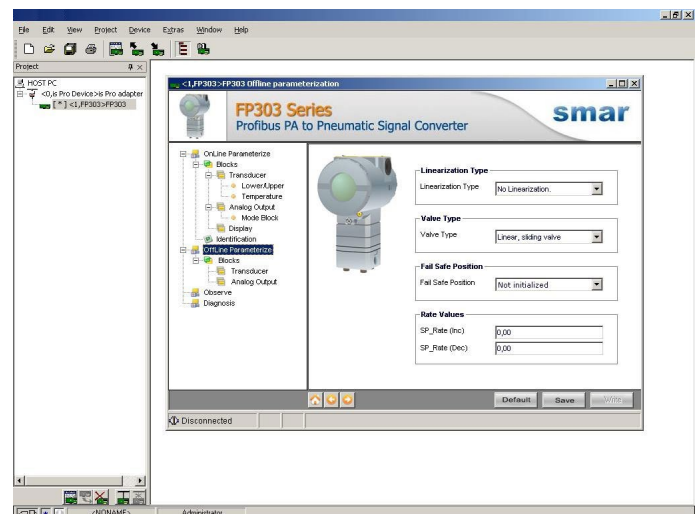
PROFIBUS PA

FP303 (PROFIBUS PA protocol) can be configured using Smar ProfibusView or Simatic PDM and by the FDT (Field Device Tool) and DTM (Device Type Manager) concept tools, such as FieldCare™ and PACTware™.

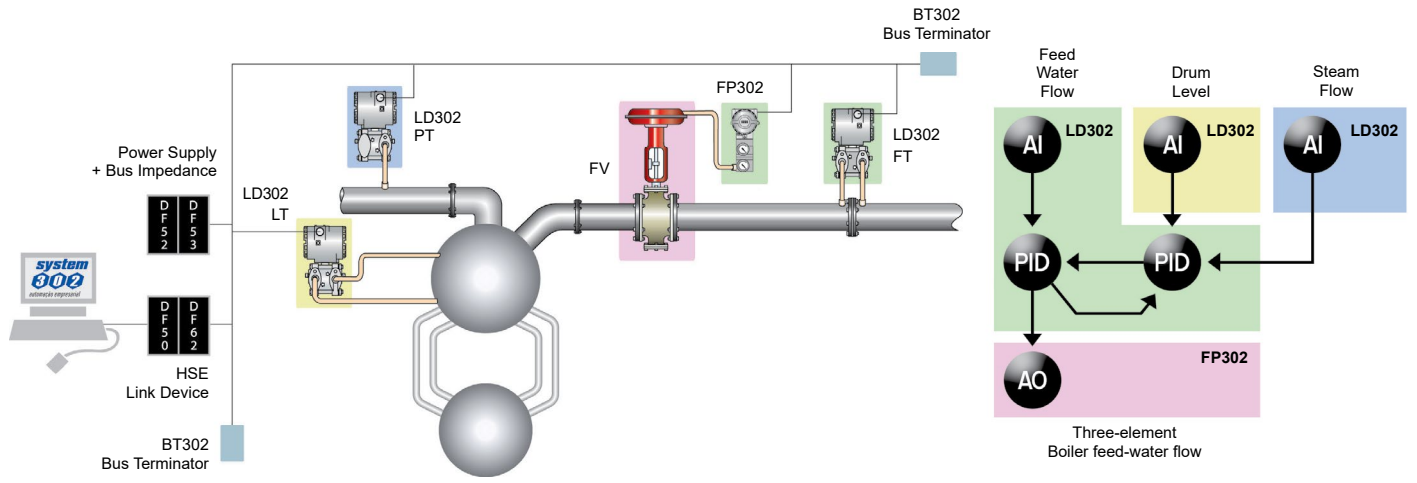
It can also be integrated by any PROFIBUS System using the GSD file.

PROFIBUS PA also has quality and diagnostic information, improving plant management and maintenance.

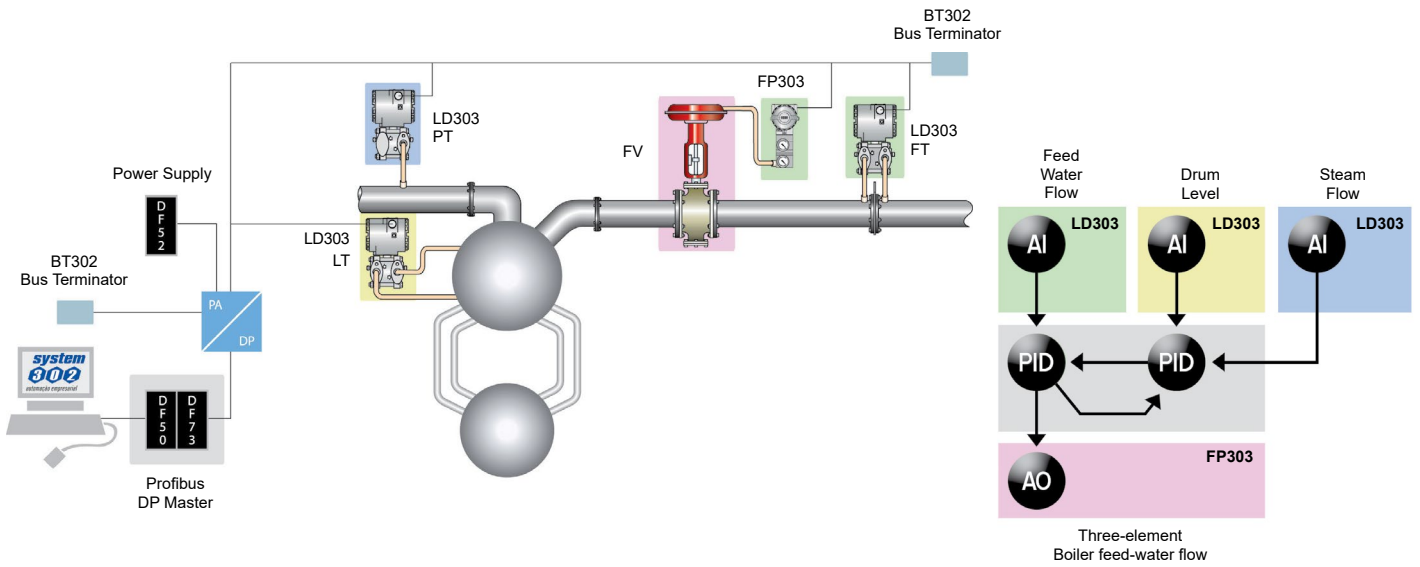
EDDL (Electronic Device Description Language), GSD files, and DTM are freely downloaded from www.smar.com.



FOUNDATION™ fieldbus - FP302



PROFIBUS PA - FP303



Functional Specifications

Output Signal	Standard: 3 to 15 psi (0.2 to 1.0 Kgf/cm ²); Extended: 3 to 30 psi (0.2 to 2.0 Kgf/cm ²).	
Input Signal	FOUNDATION™ fieldbus Digital only, 31.25 Kbit/s voltage mode, bus powered. PROFIBUS PA Digital, according to the IEC 1158-2 (H1) standard, voltage mode 31.25 Kbit/s, bus powered.	
Power Supply/ Current Consumption	Bus powered:	9-32 Vdc (reverse polarity protection; transient protection);
	Quiescent Current Consumption:	12 mA;
	Output Impedance: Non intrinsically safe: Intrinsically safe:	@ 7,8 KHz to 39 KHz; > 3 kΩ; >400 Ω.
Air Supply	18 -100 psi (1.24 – 7 Kgf/cm ²) – free of water, oil and dirt.	
Local Display	Digital Indicator (LCD) 4½ numeric and 5 alphanumeric digits.	
Hazardous Area	Explosion and weather proof; intrinsic safe as per FISCO.	
Temperature Limits	Ambiente:	-40 to 85 °C -40 to 185 °F
	Storage:	-40 to 90 °C -40 to 194 °F
	Process:	-10 to 60 °C -14 to 140 °F Operation.
	Digital Display:	-40 to 85 °C -40 to 185 °F Without damage.
Humidity Limit	0 to 100% RH (Relative Humidity).	
Turn-on Time	Around 10 seconds.	
Update Time	Approximately 0.5 sec.	
Configuration	FOUNDATION™ fieldbus Local adjustment via FOUNDATION™ fieldbus System302-7 or any other FF (FOUNDATION™ fieldbus) configurator. PROFIBUS PA Local basic configuration via magnetic tool for converters with local display. Complete configuration with remote configurator (Ex.: ProfibusView, by Smar or Simatic PDM, by Siemens).	

Performance Specifications

Accuracy	0.4% of Span; including histeresys and stability effects.	
Air Cosumption	0.30 Nm ³ /h (0.18 scfm) @ 1.24 bar (18 psi) air supply; 0.45 Nm ³ /h (0.26 scfm) @ 2.8 bar (40 psi) air supply; 0.80 Nm ³ /h (0.47 scfm) @ 7 bar (100 psi) air supply.	
Air Flow Capacity	3.40 Nm ³ /h (2 scfm) @ 1.24 bar (18 psi) air supply; 6.80 Nm ³ /h (4 scfm) @ 2.8 bar (40psi) air supply; 15.30 Nm ³ /h (9 scfm) @ 7 bar (100 psi) air supply.	
Ambient Temperature Effect	Error_Sp (pressure sensor) =	$\frac{\text{Temperature Range (}^{\circ}\text{C)} \times K (0,07) \times \text{Pressure Range psi}}{100}$
	Erro_Ps (output pressure) =	$\frac{\text{Temperature Range (}^{\circ}\text{C)} \times K (0,06) \times \text{Pressure Range psi}}{100}$
Air Supply Effect	Negligible.	
Vibration Effect	± 0.3%/g of span under the following conditions: 5 - 15 Hz for 4 mm constant displacement; 15 - 150 Hz @ 2g; 150 - 2000 Hz @ 1g; According to the IEC60770-1 standard.	
Electromagnetic Interference Effect	Designed according to the IEC 801 and European EN50081 and EN50082 standards.	

Physical Specifications

Electrical Connections	1/2 - 14 NPT, PG 13.5 DIN; M20 x 1.5 or ½ -14 NPT x ¾ NPT (Al316) with adapter.	
Pneumatic Connections	Air supply and output: ¼ - 18 NPT. Gauges: 1/8 – 27 NPT.	
Material	Injected aluminum with polyester painting, epoxy painting or 316 SST - CF8M (ASTM - A351) housing. Buna N for cover.	
Mounting	Universal mounting bracket for surface or vertical/horizontal 2"-pipe.	
Approximate Weight	No display and no mounting bracket:	2.0 Kg (aluminum);
		4.3 Kg (stainless steel).
	Add for the display:	0.1 Kg.
	Add for mounting bracket:	0.6 Kg (carbon steel);
1.3 Kg (stainless steel).		

FOUNDATION™ Fieldbus
PROFIBUS PA

MODEL	FOUNDATION™ fieldbus & PROFIBUS PA PNEUMATIC CONVERTER
FP302 FP303	FOUNDATION™ fieldbus PROFIBUS PA
COD. Digital Indicator	
0	Without indicator
1	With indicator
COD. Mounting Bracket	
0	Without bracket
1	Carbon Steel bracket and accessories
2	316SST bracket and accessories
7	Carbon Steel bracket, 316SST accessories
COD. Electrical Connection	
0	1/2" - 14 NPT (3)
1	1/2" - 14 NPT X 3/4 NPT (316SST) - with adapter (4)
2	1/2" - 14 NPT X 3/4 BSP (316SST) - with adapter (2)
3	1/2" - 14 NPT X 1/2 BSP (316SST) - with adapter (2)
A	M20 X 1.5 (3)
B	PG 13.5 DIN (2)
SPECIAL OPTIONS	
COD. Housing Material	
H0	Aluminum (Default) (IP/TYPE)
H1	SS 316 (IP/TYPE)
H2	Aluminium for saline atmospheres (IPW/TYPE X) (1)
H3	316 SST for saline atmospheres (IPW/TYPE X) (1)
H4	Aluminium Copper Free for saline atmospheres (IPW/Type X) (1)
COD. Identification Plate	
I4	EXAM (DMT): EX-IA, NEMKO: Ex-d (ATEX - GAS)
I5	CEPEL: Ex-D, Ex-ia (INMETRO - GAS)
I6	Without certification
IJ	NEMKO: EEX-D
IO	CEPEL (INMETRO - DUST)
COD. Painting	
P0	Gray Munsell N 6,5
P3	Black Polyester
P7	Beige Epoxy
P8	Without Painting
P9	Safety Blue Epoxy - Electrostatic Painting
COD. Manufacturing Standard	
S0	SMAR
COD. TAG Plate	
J0	With TAG
J1	Blank
COD. Special	
ZZ	See notes
COD. Range	
G0	3 (min) to 15 (max) psi
G1	3 (min) to 30 (max) psi

FP302 - 1 | 1 | 0 - H0 | I6 | P0 | S0 | P0 - * | GO
 FP303 - 1 | 1 | 0 - H0 | I6 | P0 | S0 | P0 - * | G1

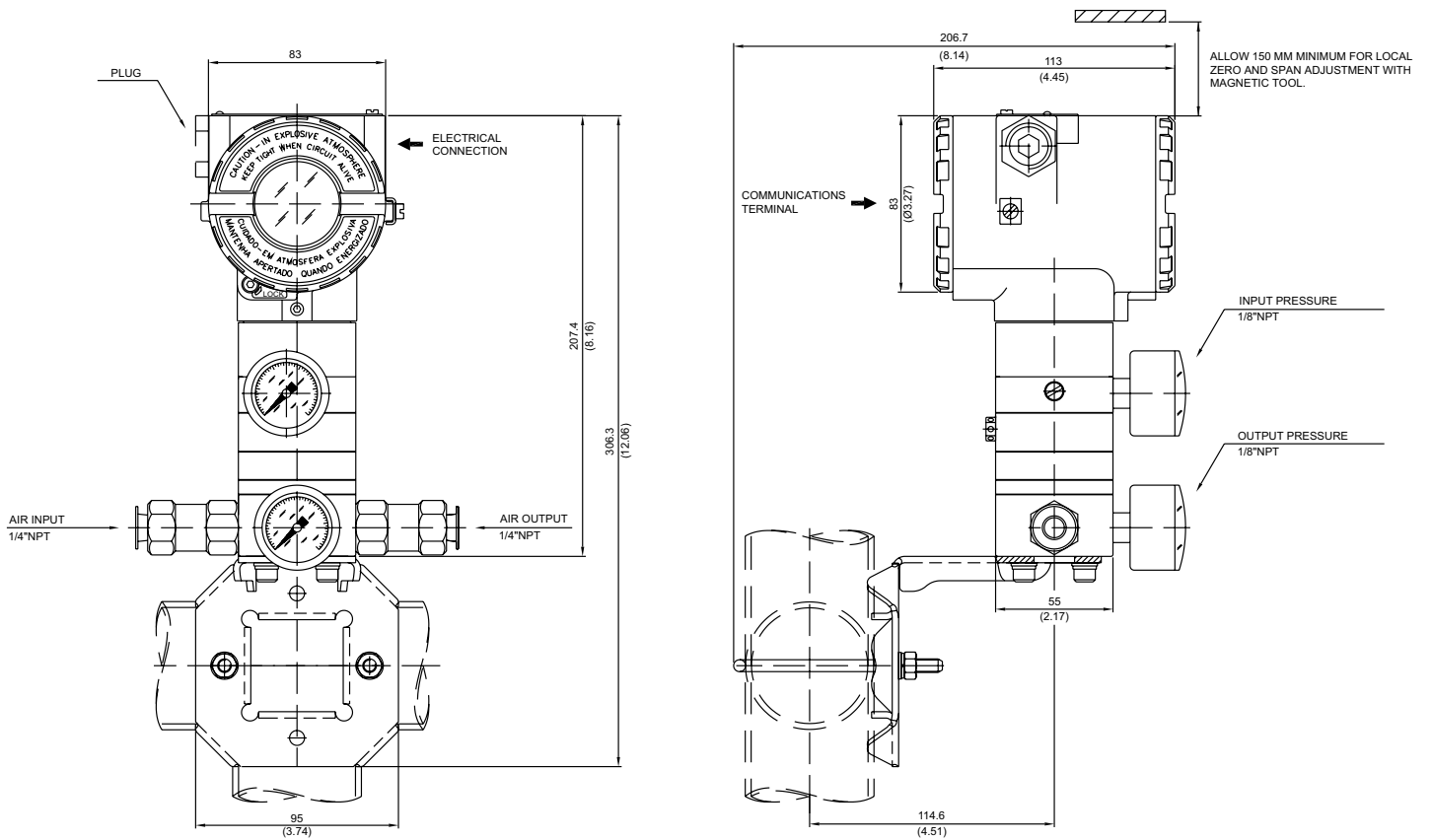
← TYPICAL ORDERING CODE

* Leave blank for no Special Option.

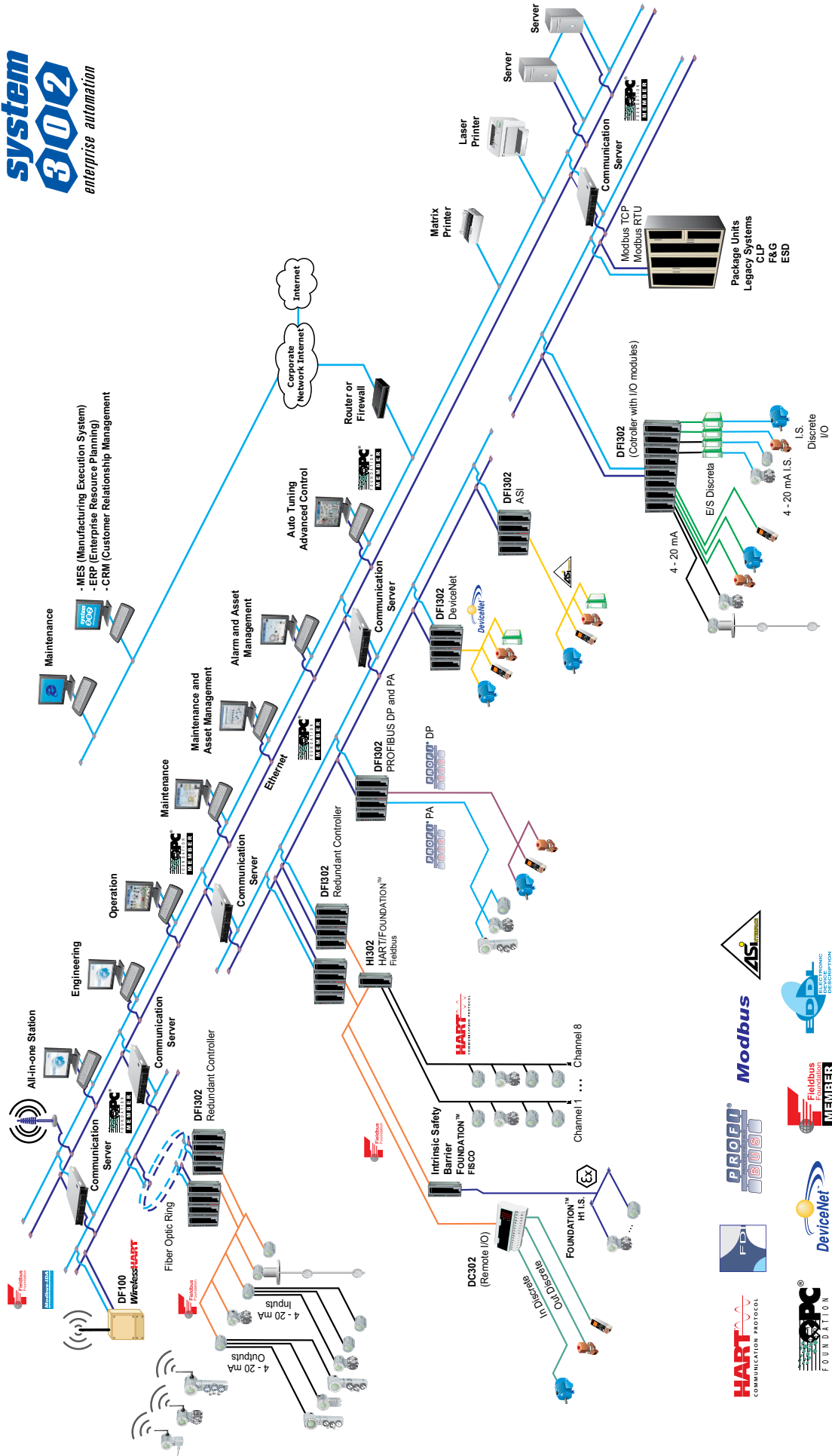
NOTE	
(1) IPW/TYPEX tested for 200 hours according to NBR 8094 / ASTM B 117 standard.	(3) Certification Ex d for FM / ATEX / IECEx / INMETRO.
(2) Options not certified for Hazardous Locations.	(4) Certification Ex d for INMETRO



Dimensional Drawing



system
302
enterprise automation



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Specifications and information are subject to change without notice.
Up-to-date address information is available on our website.

web: www.smar.com/contactus.asp

