



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.

Online Support

We provide information and technical support via the Internet at <http://www.smar.com/liveperson.asp>, where customers can find detailed information about SMAR products and services. Registered users may submit technical questions and visit the Most Frequent Asked Questions section. Responses are quick, usually in less than 24 hours, via chat, e-mail or telephone (except on weekends and holidays). Our support team is made up of qualified engineers and technicians who provide basic consultation and assistance for initial configurations and engineering.

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.

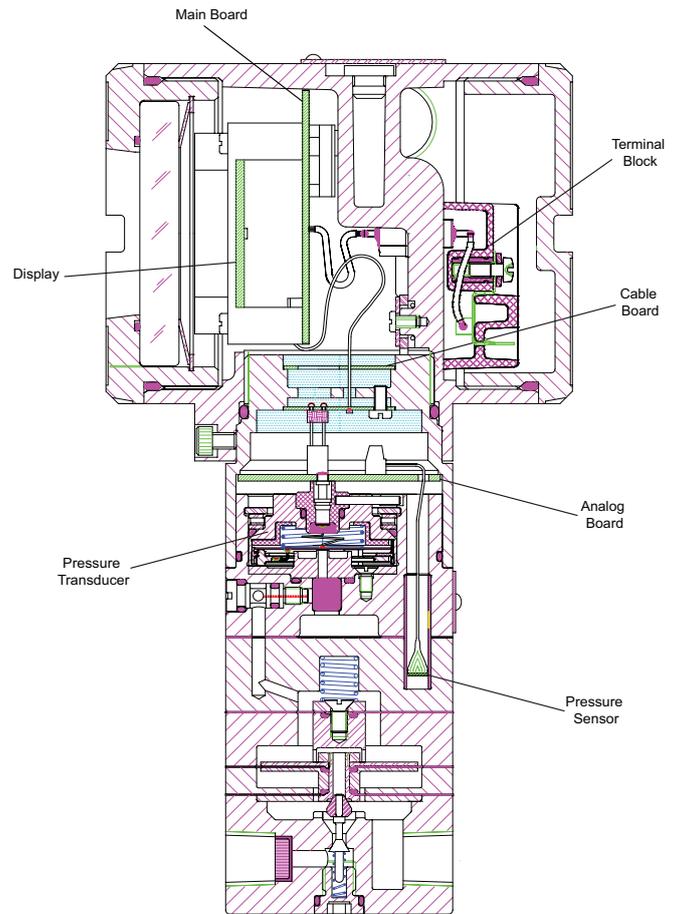
The temperature sensor measures the temperatura of the transducer board for possible temperatura compensation, if necessary.

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

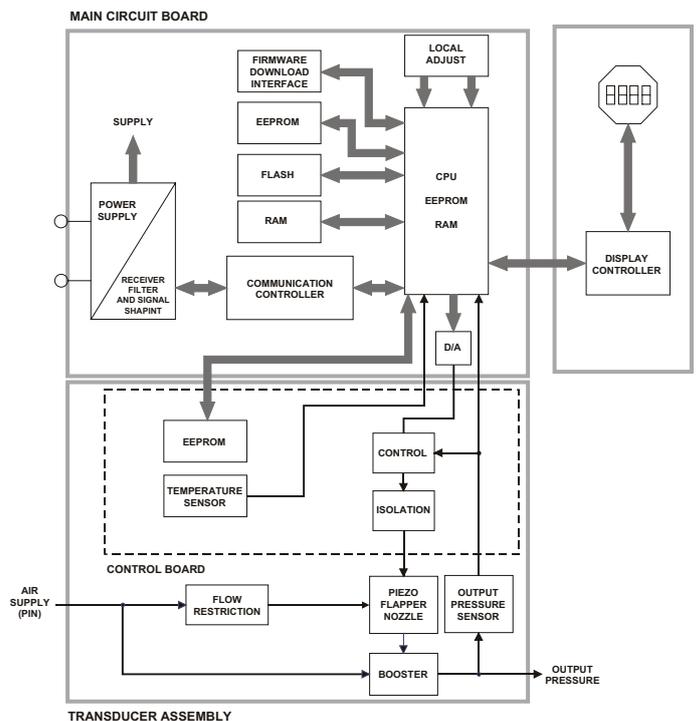
The restriction is necessary to a guarantee smooth pressure for the baffle-nozzle set.

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.

Syscon302 (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 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.

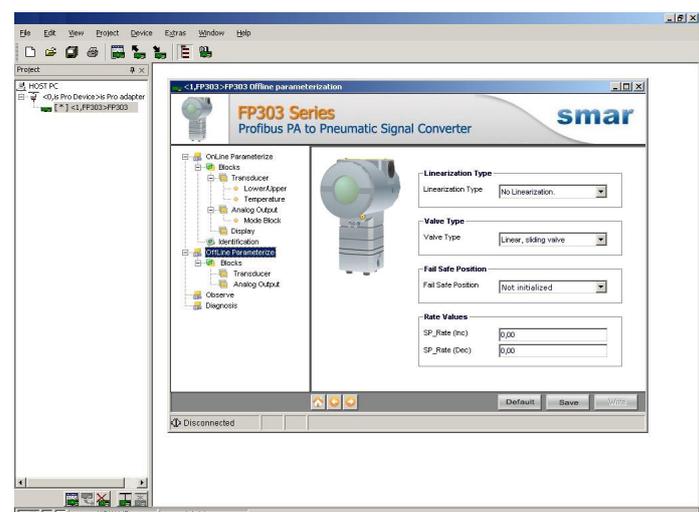
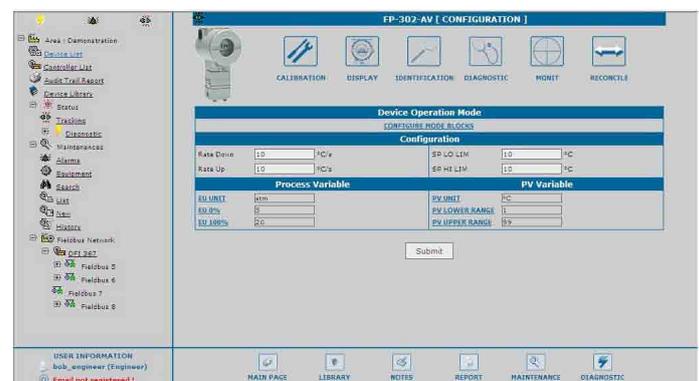
PROFIBUS PA

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™.

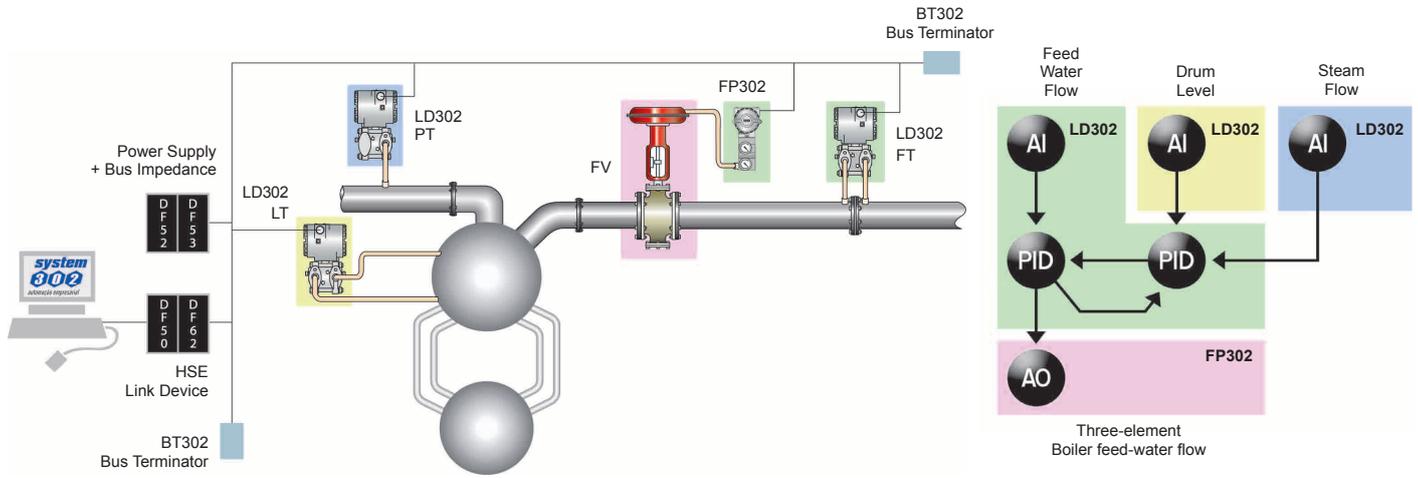
It can also be integrated by any PROFIBUS System using the GSD file.

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

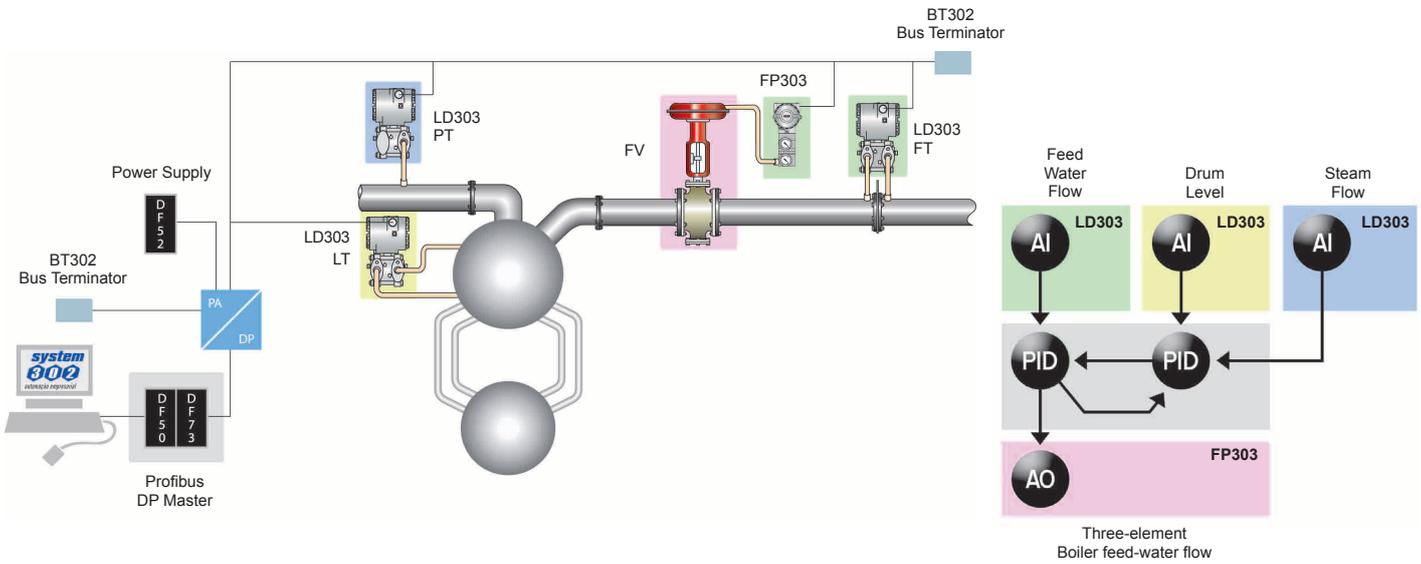
EDDL (Electronic Device Description Language), GSD files, and DTM are freely downloaded from www.smar.com.



FOUNDATION™ fieldbus - FP302



PROFIBUS PA - FP303



Functional Specifications

Output Signal	Standard: 3 to 15 psi (0.2 to 1.0 Kg/cm ²); Extended: 3 to 30 psi (0.2 to 2.0 Kg/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 Kg/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) =	$\frac{\text{Temperature Range (}^{\circ}\text{C)} \times \text{K (0,07)} \times \text{Pressure Range psi}}{100}$
	Erro_Ps (output pressure) =	$\frac{\text{Temperature Range (}^{\circ}\text{C)} \times \text{K (0,06)} \times \text{Pressure Range psi}}{100}$
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	SS316 bracket and accessories		
COD. Electrical Connection			
0	1/2" - 14 NPT (3)		
1	1/2" - 14 NPT X 3/4 NPT (Al316) - with adapter (3)		
2	1/2" - 14 NPT X 3/4 BSP (Al316) - with adapter (2)		
3	1/2" - 14 NPT X 1/2 BSP (Al316) - with adapter (2)		
A	M20 X 1.5 (5)		
B	PG 13.5 DIN (4)		
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			
I1	FM: XP, IS, NI, DI	I7	EXAM (DMT): Ex-ia; NEMKO: Ex-d
I3	CSA: XP, IS, NI, DI	ID	NEPSI: Ex-ia, Ex-d
I4	EXAM (DMT): EX-IA, NEMKO: Ex-d	IE	NEPSI: Ex-ia
I5	CEPEL: Ex-D, Ex-ia	IM	BDSR - GOST: Ex-d, Ex-ia
I6	Without certification		
COD. Painting			
P0	Gray Munsell N 6,5		
P3	Black Polyester		
P8	Without Painting		
P9	Safety Blue Epoxy - Electrostatic Painting		
COD. TAG Plate			
J0	With TAG		
J1	Blank		
J2	According to the user's note		
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		I1		P0		J1	-	*		GO
FP303	-	1		1		0	-	H2		I2		P0		J1	-	*		G1

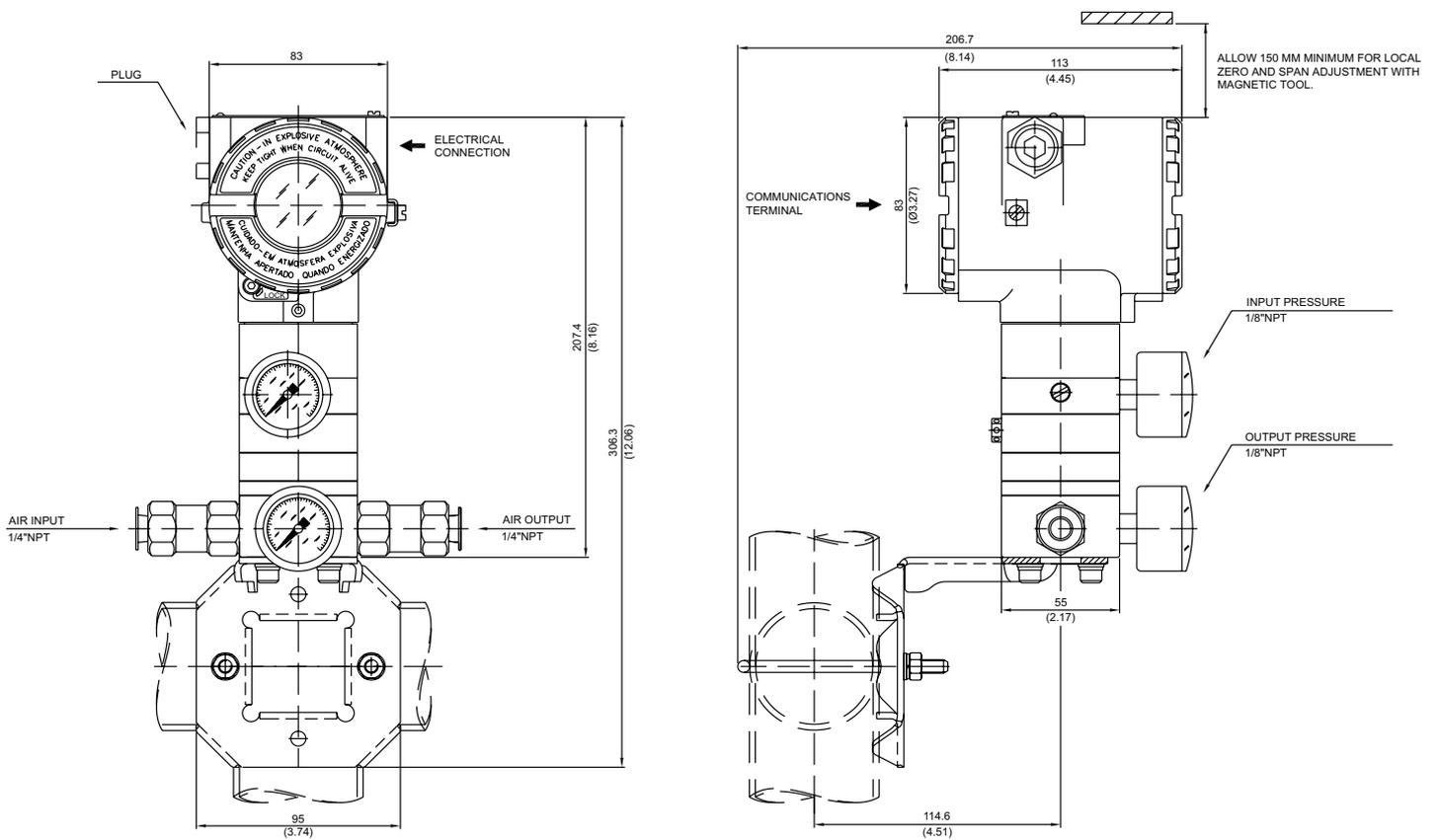
← TYPICAL ORDERING CODE

* Leave blank for no Special Option.

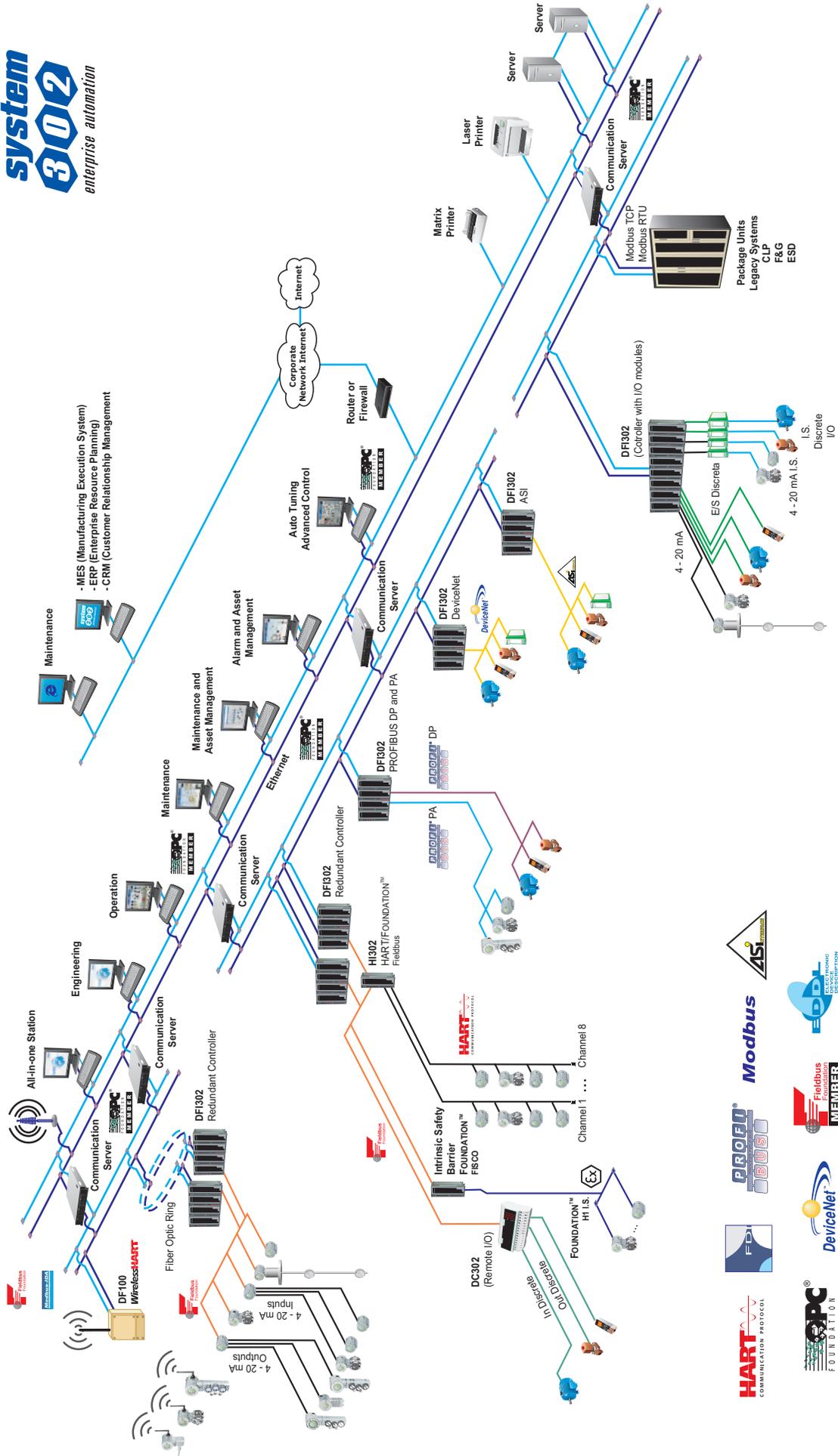
NOTE	
(1) IPW/TYPEx tested for 200 hours according to NBR 8094 / ASTM B 117 standard.	(4) Certificate for use in Hazardous Locations (CEPEL).
(2) Options not certified for Hazardous Locations.	(5) Certificate for use in Hazardous Locations (CEPEL e FM).
(3) Certificate for use in Hazardous Locations (CEPEL, CSA e FM).	



Dimensional Drawing



system 302
enterprise automation



Pressure



4-20 mA LD290
LD291
LD292
LD293

Pressure Transmitter



Gauge Economic Capacitive Pressure Transmitter



Pressure Transmitter



Pressure Transmitter with high performance

Pressure, Level and Flow

Level

Density/Concentration

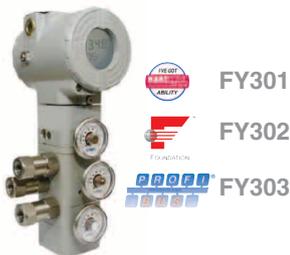


Level Transmitter



Intelligent Density / Concentration Transmitter

Position



Valve Positioner



Valve Positioner with auto tuning



Valve Positioner with remote sensor



Position Transmitter

Temperature

Junction Box



Temperature Transmitter



Panel Mounting Temperature Transmitter



Head Mounting Temperature Transmitter



3 Ways Junction Box JM1



4 Ways Junction Box JM400

Configurators

Interfaces



HART® Configurator Interface CONF401



HART® Configurator Interface DDCON 100



HART® Configurator for Palm HPC301



HART-RS232 Interface HI311



HART-USB Interface HI321

Converters



FOUNDATION
 FP302
 DeviceNet
 FP303

Fieldbus to Pneumatic
 Signal Converter



FOUNDATION
 IF302
 DeviceNet
 IF303

Current to Fieldbus
 Converter



FOUNDATION
 FI302
 DeviceNet
 FI303

Fieldbus to Current
 Converter



FOUNDATION
 HI302

HART® / Fieldbus
 Interface HI302



FOUNDATION
 HCC301

HART® / Current
 Converter HCC301

Controllers



FOUNDATION
 DeviceNet
 LC700

Programmable Logical
 Controller
 LC700



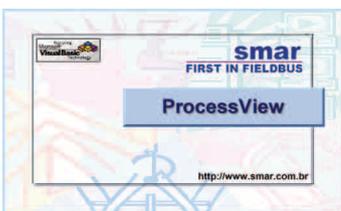
Digital Controller
 CD600Plus



FOUNDATION
 DeviceNet
 DFI302

Interface Universal Fieldbus
 DFI302

Systems



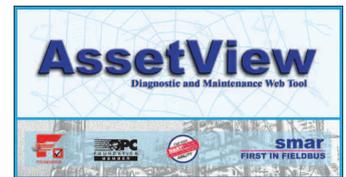
FOUNDATION
 DeviceNet
 ProcessView

ProcessView
 Process Visualization Tool



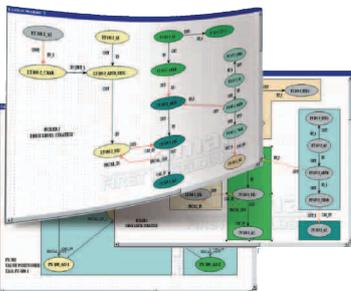
FOUNDATION
 DeviceNet
 Studio302

Studio302
 System302 Management Tool



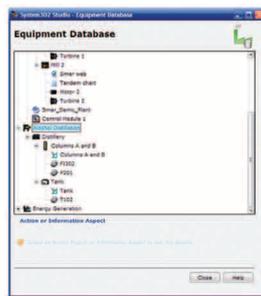
FOUNDATION
 AssetView

AssetView
 On Line Plant Asset
 Management Tool

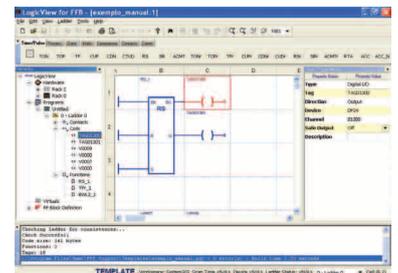


FOUNDATION
 DeviceNet
 Syscon

Syscon
 System Configurator



Equipment Database
 Plant Information Management



LogicView
 IEC61131
 Programming Tool

smar
www.smar.com

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

