



INTELLIGENTE VALVE POSITIONER

FY300 SERIES

- Automatic Setup
- Non-contact position measurement
- Valve position reading from a magnetic Hall Effect sensor
- More usual Characteristic Curves and outlined by user
- Position sensor available for remote mounting
- Applications in severe vibration and high temperatures
- Easy to be mounted in most of the control valves
- Universal and customized mounting brackets for various control valves manufacturers
- Local adjustment without need to open the housing
- For linear and rotary applications of single or double action
- Supports DD and FDT/DTM



Actuation and Control

FY300 Series

It is the line of intelligent positioners for control valves that receives the setpoint from the main process controller and acts on the valve, moving it exactly to the ideal position, providing better process performance using a non-contact position sensor (based on the Hall Effect).

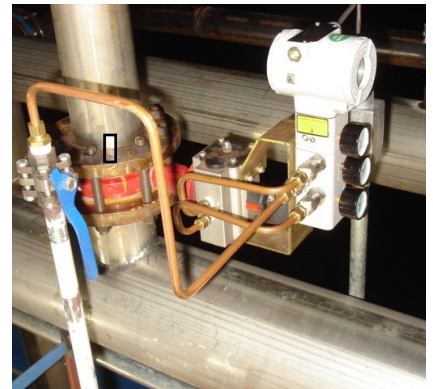
smar
Technology Company

The valves control positioners FY300 Series are available in 4 to 20 mA and for systems with HART®, FOUNDATION™ fieldbus and PROFIBUS PA protocol.

FY300 Series positioner provides an output pressure to the control valve actuator, positioning it according to the input received from the output of a controller.

Digital technology used in **FY300 Series** provides an easy interface between the field and the control room, reducing considerably the cost of installation, operation and maintenance.

- Suitable for most brands and models valves;
- A wide variety of customized mounting brackets are available;
- Linear stroke from 3 mm up to 100 mm (for bigger strokes, please consult our ACP 300 Series catalog and BFY-CL mounting brackets);
- Rotary movement from 30° to 120°;
- Configurable either locally or remotely using HART® 4 to 20 mA, FOUNDATION™ fieldbus and PROFIBUS PA protocols;
- Friendly-user rotative display;
- Easy installation, quick commissioning and setup;
- On line continuous diagnostics to reduce troubleshooting time, and unnecessary maintenance;
- Built-in transient protection;
- Histogram and step response combined with asset management applications;
- Trend and load factor also available for diagnosis;
- Configurable valve characteristic curves most used;
- Customized 16 points characteristic curve;
- User Configurable display;
- Configuration password protection;
- Multidrop operation mode;
- Non-contact position sensor;
- Remote mounting available for severe vibration and high temperature applications;
- 20 up to 100 psi air supply pressure;
- Hazardous Area Certification, directives according to EC (European Community);
- Electromagnetic Compatibility according to IEC 61000-6-2:2005, IEC 61000-6-4:2006 and IEC 61326:2-3:2006;



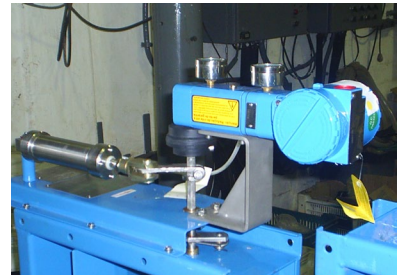
HART® - 4 to 20 mA

- Local adjustment with magnetic tool no need to open the housing;
- DEVCOMDROID (Android DDL Interpreter) software, used with HART interfaces, such as the HI331 (Bluetooth Interface) to configure FY301.
- Remote Parameterization and automatic setup;
- FDT/DTM (Field Device Tool / Device Type Manager) capability and connectivity;
- Connectivity with many Asset Management Applications, including Smar AssetView (consult Smar for other applications);
- Supports DTM and DD;
- Multidrop operation mode.



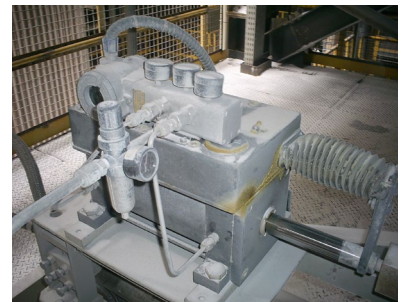
FOUNDATION™ fieldbus

- Connectivity via PC, local or remote network;
- Local configuration with magnetic tool, without needing to open the housing;
- Current consumption of 12 mA;
- Dynamic block instantiation;
- Registered in Foundation Fieldbus™ and approved by ITK version 4.6;
- Number of VCRs: 44;
- LAS (Link Active Scheduler) capability;
- 14 function blocks.



PROFIBUS PA

- Basic configuration can be done using a magnetic tool, no need to open the housing;
- Full Configurable via remote configurator (Smar ProfibusView or Siemens Simatic PDM);
- Function blocks for analog output and valve diagnostics;
- Current consumption of 12 mA;
- Supports DTM and DD.



Product Highlight



Universal mounting brackets
(Linear or Rotary).



Positioner with gauge
for pressure monitoring

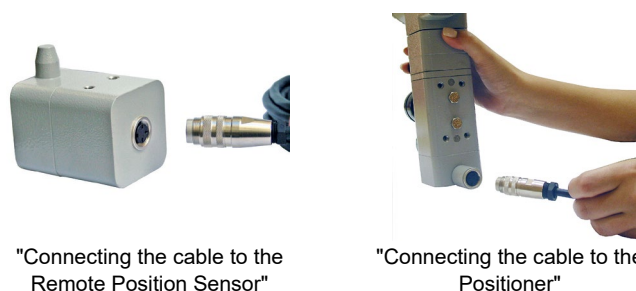


Rotary magnet for 30 to 120° movement and
Linear magnet for 3 to 100 mm stroke.



The Remote Sensor Position is a recommended accessory for high temperatures applications (up to 105 °C), for excessive vibration or even difficult local access. It avoids equipment excessive wear and, consequently, increases the equipment lifetime.

The remote sensor cable is shielded and therefore provides excellent protection against electromagnetic interference.



"Connecting the cable to the Remote Position Sensor"

"Connecting the cable to the Positioner"

Remote position sensor

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

Information about certifications, manuals, catalogues, and applications are available at www.smar.com

Functional Description

The FY300 digital positioner uses the most advanced microprocessor to perform an accurate and quick valve positioning. It is a controller which receives a setpoint from the process main controller and move the valve exactly to the ideal position for better process performance.

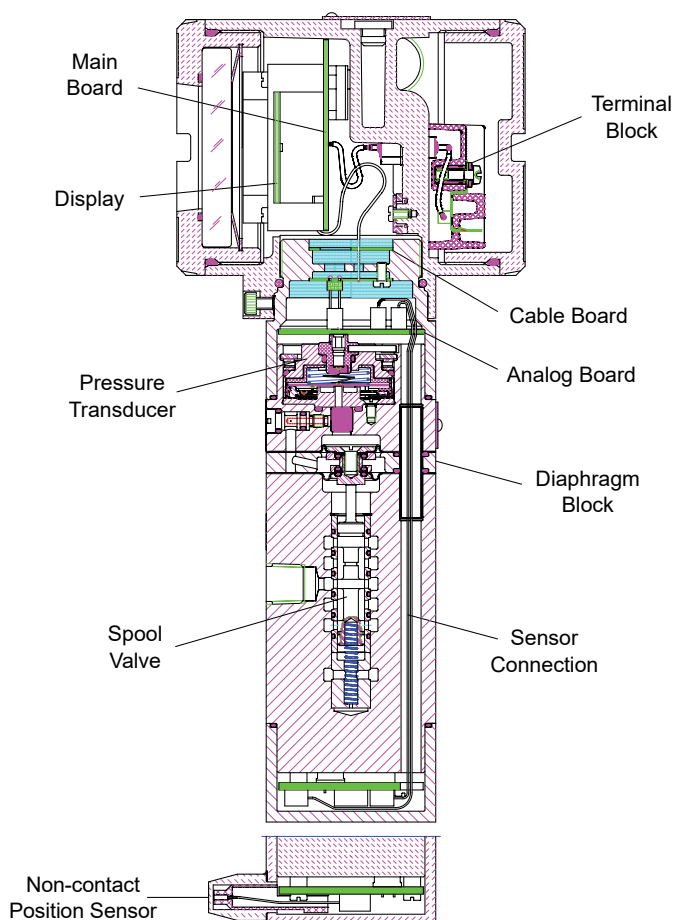
The FY300 senses the actual stem valve position and it takes the corrective action according to a fully user configurable strategy. The "non-contact" position sensor (Hall effect based) prevents the inadequacy mechanical levers.

The signal from the controller is processed at the main digital circuit board. The analog board gets the information from the main circuit board and generates a low power voltage signal to a piezoelectric disc in the pressure transducer. It results in a inflection in such disc, moving it nearer or further away from a nozzle in the pressure transducer. This inflection provides a (pilot) pressure variation proportional to the loop controller.

The diaphragm block amplifies the force related to the pilot pressure and pushes down the spool valve, allowing the supply pressure into the valve actuator. On the other hand, the spool valve movement may relieve the pressure from the valve actuator to the atmosphere.

The valve stem will move in response to the spool valve movement up to the correct position. The actual valve position is read by the magnet sensor (Hall effect) and feedback to the main circuit board. With the position information (readback signal), the microprocessor will drive a signal to the analog circuit, correcting the valve position.

FY300 schematic cut view

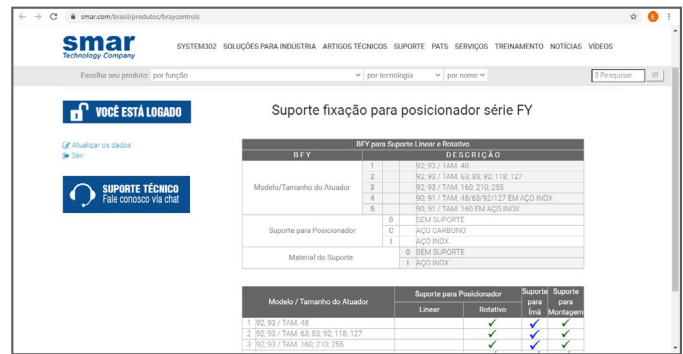


The microprocessor uses the control algorithm to eliminate the valve position error. The controller parameters are easily tuned automatically through a single command given locally via magnetic tool or a hand held programmer. It is also possible to configure the **FY300 Series** with applications based on the FDT/DTM technology.

Smar **FY300 Series** is designed for easily assembling in the field or inside the workshop. There are universal mounting brackets (in carbon and stainless steel) for both rotary and linear actuators.

Additionally, a wide variety of customized mounting brackets are available.

Check the availability and select the mounting bracket that meets the needs of your process on the Smar website.



Smar's internet page for customized mounting brackets selection

Positioner Models

Linear

Configurable via software, from 3 mm up to 100 mm stroke, selected from the linear magnet and mounting bracket choices according to the required stroke.

Rotary

Configurable via software (local or remotely) from 30° to 120° with rotary magnet and proper mounting bracket.

Local Non-contact Position Sensor

Regular positioner with integrated position sensor.

Remote Non-contact Position Sensor

Most appropriate on applications involving high temperature and vibration. Also suitable for places with difficult access. Available from 5 m to 20 m cable length.

Pressure Sensors

In addition to the regular information on the valve and positioner status, the pressure sensors are also useful for advanced diagnosis.

Double and Action Single

With the same positioner, it is possible to control the double action valves position or with a return spring.



FY300 Series is available in **HART®**, **FOUNDATION™ Fieldbus** e **PROFIBUS PA** technology. These instruments can be configured with Smar software and other manufacturer configuration tools. Local adjustment is available in all **FY300 Series**. It is possible to configure the valve type and characteristics, manual or automatic setup, local or remote setpoint, tight-shut-off and other control functions using the magnetic tool.

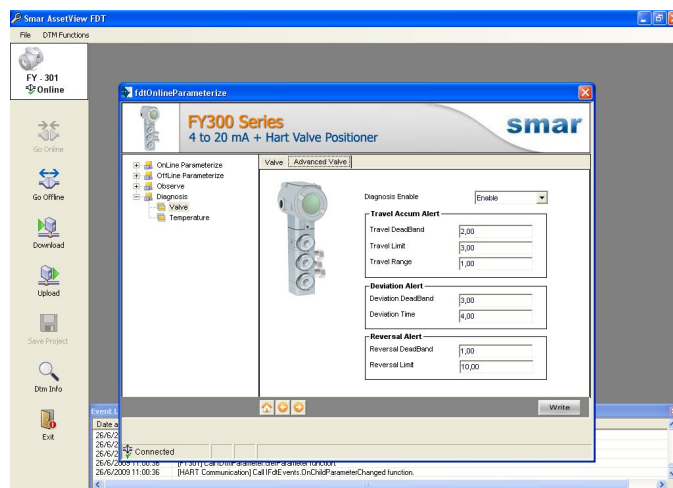
Smar has developed the AssetView, a management application software, which is an user-friendly Web Tool, accessed from anywhere and at anytime using an internet browser. The AssetView has incorporated the advantages of FDT technology. It is designed for management and diagnostics of field devices, to ensure reactive, preventive, predictive and proactive maintenance.

HART® FY301

FY301 with HART® protocol can be configured by:

- DEVCOMDROID Smar software, used with HI331 (Bluetooth Interface);
- Other manufacturers' configuration tools based on DD (Device Description), AMST™, Simatic PDM, and FDT/DTM, such as, FieldCare™, PACTware™, HHT275 and HHT375, PRM Device Viewer.

For FY301 management and diagnostics, AssetView ensures continuous information monitoring.



FOUNDATION™ Fieldbus FY302

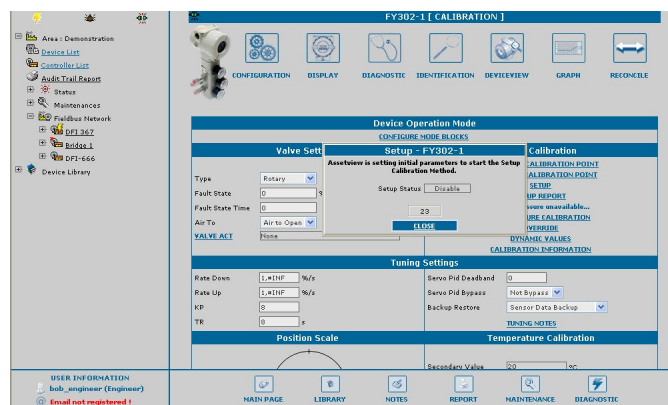
FY302 utilize the Foundation™ Fieldbus H1 protocol, an open technology that allows any H1 enable configuration tool to configure this device.

Smar 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.

Configuration tools such as AMST™, FieldCare™ and HHT375 can configure FY302 devices. DD (Device Description) and CF (Capability File) files can be downloaded at either the Smar or FieldComm Group websites.

FY302 supports complex strategies configurations due to the high capacity and variety of dynamic instantiable function blocks.

Fourteen different types of function blocks are supported, and up to twenty function blocks can be running simultaneously. Maintenance procedures with AssetView diagnostics and status information from Foundation™ fieldbus result in a safer plant with higher availability.



PROFIBUS PA FY303

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

FY303 (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.

Files EDDL (Electronic Device Description Language) and DTM are available on the Smar website.



Functional Specifications

Travel	Linear Motion: 3 - 100 mm. Rotary Motion: 30° - 120° Rotation Angle.
Input and Communication Protocol	HART® Two-wire, 4-20 mA controlled according to NAMUR NE43 specification, with super-imposed digital HART® Protocol. FOUNDATION™ fieldbus and PROFIBUS PA Digital only. Fieldbus, according to IEC 61158-2 (H1) 31.25 Kbits/s with bus power.
Power Supply	HART® 4 mA to 20 mA Input via controller. Voltage Drop equivalent to 550 Ω. Input protected against reverse polarity and transient suppressor. FOUNDATION™ fieldbus and PROFIBUS PA Bus powered: 9-32 Vdc. Current consumption quiescent: 12 mA.
Indicator	Rotative LCD, with 4½-numerical digit and 5-character alphanumerical. Function and status icons.
Gage	For pressure monitoring and output supply. 0 to 160 psi scale. Acrylic display, 304 Stainless Steel connections and flexible parts in Brass.
Hazardous Area Certifications	HART®, FOUNDATION™ Fieldbus and PROFIBUS PA INMETRO certification (CEPEL), FM, ATEX and IECEx (Nemko-Presafe and Dekra-Exam) for intrinsically safe and explosion proof, INMETRO (CEPEL) and FM for dust ignition proof. FOUNDATION™ Fieldbus and PROFIBUS PA FISCO Field Device Ex ia IIC T4 Ga FISCO Field Device Ex n1 IIC T4 Gc
European Directive Information	FY300 is in compliance with the related directives. It was designed and manufactured in accordance with good engineering practices using ANSI, ASTM, DIN and JIS standards. Quality Management System audited by BVQI (Bureau Veritas Quality International) for the Management Systems certification. EMC Directive (2014/30/EU) - Electromagnetic Compatibility The EMC test was performed according to standard: IEC61326-1. ATEX Directive (2014/34/EU) - Explosive Atmosphere, Hazardous Location The EC-Type Examination Certificate had been released by DNV GL Presafe (CE2460) and DEKRA GmbH (CE0158), according to European Standards. The certification body for Production Quality Assurance Notification (QAN) and Quality Assessment Report (QAR) is Nemko AS (CE0470).
Flow Characterization	Linear, Equal Percentage, Quick Opening, 16-point freely configurable table.
Temperature Limits	Operation: -40 to 85 °C (-40 to 185 °F). Storage: -40 to 90 °C (-40 to 194 °F). Display: -10 to 75 °C (14 to 167 °F) operation. -40 to 85 °C (-40 to 185 °F) without damage. Remote Sensor Operation: -40 to 105 °C (-40 to 221°F).
Voltage Drop	11 Vdc Max / 20 mA (equivalent to 550 Ω).

Configuration	<p>HART® Through digital communication, using DevComDroid configuration software (Android DDL Interpreter), used with HART interfaces, such as HI331 bluetooth interface. However, the old Palm with HPC301 or CONF401, which are obsolete, are still operable with the latest versions of HART transmitters. The FY300 HART® can also be configured using third-party configuration tools, and can be partially configured through local adjustment using the Smar magnetic tool.</p> <p>FOUNDATION™ fieldbus and PROFIBUS PA Basic configuration can be done through of setting place with magnetic tool only if the equipment has a display. The full configuration is possible only using the configuration softwares.</p>
Humidity Limits	0 to 100% RH (Relative Humidity non-condensable).
Current	<p>HART® 3.8 mA (minimum).</p> <p>FOUNDATION™ Fieldbus and PROFIBUS PA Bus power: 9 - 32 Vdc. Current consumption quiescent: 12 mA.</p>
Position Sensor	Non-contact Hall effect sensor. Available in remote and integral versions.
Pressure Supply	1.4 - 7 bar (20-100 psi). Free of oil, dust and water, as per ANSI/ISA S7.0.01-1996.

Performance Specifications

Resolution	< 0.1% F.S.
Pressure Supply Effect	Negligible.
Repeatability	< 0.1% F.S.
Consumption	0.35 Nm³/h (0.20 SCFM) at 1.4 bar (20 psi) supply. 1.10 Nm³/h (0.65 SCFM) at 5.6 bar (80 psi) supply.
Ambient Temperature Effect	0.8%/20 °C of span.
Output Capacity	13.6 Nm³/h (8 SCFM) at 5.6 bar (80 psi) supply.
Vibration Effect	<p>± 0.3 % /g of span during the following conditions: 5 -15 Hz at 4 mm constant displacement. 15 -150 Hz at 2g. 150 - 2000 Hz at 1g. Comply with SAMA PMC 31.1 - 1980, Sec. 5.3, Condition 3, Steady State.</p>
Electro-Magnetic Interference Effect	According to the IEC61326-1 standard.


Physical Specifications

Electrical Connection See Note (*)	<p>½ - 14 NPT M20 X 1.5 PG 13.5 DIN</p>	<p>¾ - 14 NPT (with 316 SST adapter for ½ - 14 NPT). ¾ - 14 BSP (with 316 SST adapter for ½ - 14 NPT). ½ - 14 BSP (with 316 SST adapter for ½ - 14 NPT).</p>
Pneumatic Connections	<p>Supply and output: ¼ -18 NPT. Gage: - 1/8 - 27 NPT.</p>	
Material of Construction	<p>Injected low copper aluminum with polyester painting or 316 Stainless Steel housing, with Buna N O-Rings on cover (NEMA 4X, IPW 66). Identification Plate: 316 SST.</p>	
Mounting	<p>Universal brackets for rotary motion and linear strokes (See BFY ordering code). Optional customized brackets for most of the market valves and final elements (Consult www.smar.com for availability and brackets selection). Additional "L" shape bracket, in carbon and Stainless Steel for 2" pipe mounting (remote sensor version).</p>	
Approximate Weights	<p>Without display and mounting bracket: 5.8 kg (316 SST). 2.7 kg (aluminum).</p> <p>Remote sensor: 0.58 kg in aluminum 1.5 kg in SST</p> <p>Cable and connectors of remote sensor 0.045 kg/m of cable 0.05 kg for each connector</p>	
Pressure Sensors	<p>For air supply, output 1 and output 2 measurements. (Optional Consult Smar for applications in classified areas).</p>	

(*) Consult Smar for applications in classified areas.

MODEL	SMART VALVE POSITIONER																	
FY301 FY302 FY303	HART® & 4 to 20 mA FOUNDATION™ fieldbus PROFIBUS PA																	
CODE		Local Indicator																
0		Without Indicator																
1		With Digital Indicator																
CODE		Mounting Bracket (8)																
0		Without Bracket																
1		With Bracket																
CODE		Electrical Connections																
0		1/2" - 14 NPT (4)										3		1/2" - 14 NPT X 1/2 BSP (316 SS) - with adapter (3)				
1		1/2" - 14 NPT X 3/4 NPT (316 SS) - with adapter (5)										A		M20 X 1.5 (4)				
2		1/2" - 14 NPT X 3/4 BSP (316 SS) - with adapter (3)										B		PG 13.5 DIN (3)				
CODE		Type of Actuator																
1		Rotary - Single Action										A		Linear Stroke Up to 30 mm - Single Action				
2		Rotary - Double Action										B		Linear Stroke Up to 30 mm - Double Action				
5		Linear Stroke Up to 50 mm - Single Action										C		Without magnet (for linear actuator) - Single Action				
6		Linear Stroke Up to 50 mm - Double Action										D		Without magnet (for linear actuator) - Double Action				
7		Linear Stroke Up to 100 mm - Single Action										Z		Others Specify				
8		Linear Stroke Up to 100 mm - Double Action																
CODE		Indication Gage																
0		Without Gage										9		Whit 2 Gage (Acrylic, Stainless steel and wetted parts in brass) - Output 1 and 2				
6		With 1 Gage (Acrylic, Stainless steel and wetted parts in brass) - Input										A		With 3 Gage (Acrylic, Stainless steel and wetted parts in brass)				
7		With 1 Gage (Acrylic, Stainless steel and wetted parts in brass) - Output 1										Z		Others Specify				
8		With 2 Gage (Acrylic, Stainless steel and wetted parts in brass) - Input and Output 1																
SPECIAL OPTIONS (Leave it blank for no optional items)																		
CODE		Housing																
H0		Aluminum (IP/TYPE)										H3		316 Stainless Steel for saline atmosphere (IPW/TYPE X) (2)				
H1		316 Stainless Steel (IP/TYPE)										H4		Copper Free Aluminum (IPW/Type X) (2)				
H2		Aluminum for saline atmosphere (IPW/TYPE X) (2)																
CODE		Identification Plate																
I1		FM: XP, IS, NI, DI (USA)										I6		Without certification				
I4		ATEX (EX-I, EX-D) GAS										IO		INMETRO (EX-T) DUST				
I5		INMETRO (EX-D, EX-I) GAS																
CODE		Painting																
P0		Gray Munsell N 6.5 Polyester																
P8		Without Painting																
P9		Blue Safety Epoxy – Electrostatic Painting																
PD		Blue smooth diamond RAL5010 - Epoxy																
CODE		TAG Plate																
J0		With TAG																
J1		Blank																
J2		According to user's notes																
CODE		Sensor Mounting (1) (6)																
R0		Full Mounting																
R1		Remote sensor - 5 m cable																
R2		Remote sensor - 10 m cable																
R3		Remote sensor - 15 m cable																
R4		Remote sensor - 20 m cable																
R9		Remote Mounting (adapted for Remote Sensor, without cable and remote extension set)																
RZ		Special - See notes																
CODE		Special Sensor																
K0		Without special sensor																
K1		With pressure sensors for diagnostic																
K2		With 4-20 mA Position Feedback (open collector) - FY301																
CODE		Special																
ZZ		Leave it blank for no optional items																
FY301	1	1	0	8	A	H0	/	I6	/	P0	/	J1	/	R0	/	K0	/	*
FY302	1	1	0	8	A	H0	/	I6	/	P0	/	J1	/	R0	/	*	/	*
FY303	1	1	0	8	A	H0	/	I6	/	P0	/	J1	/	R0	/	*	/	*

TYPICAL MODEL NUMBER

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NOTES:

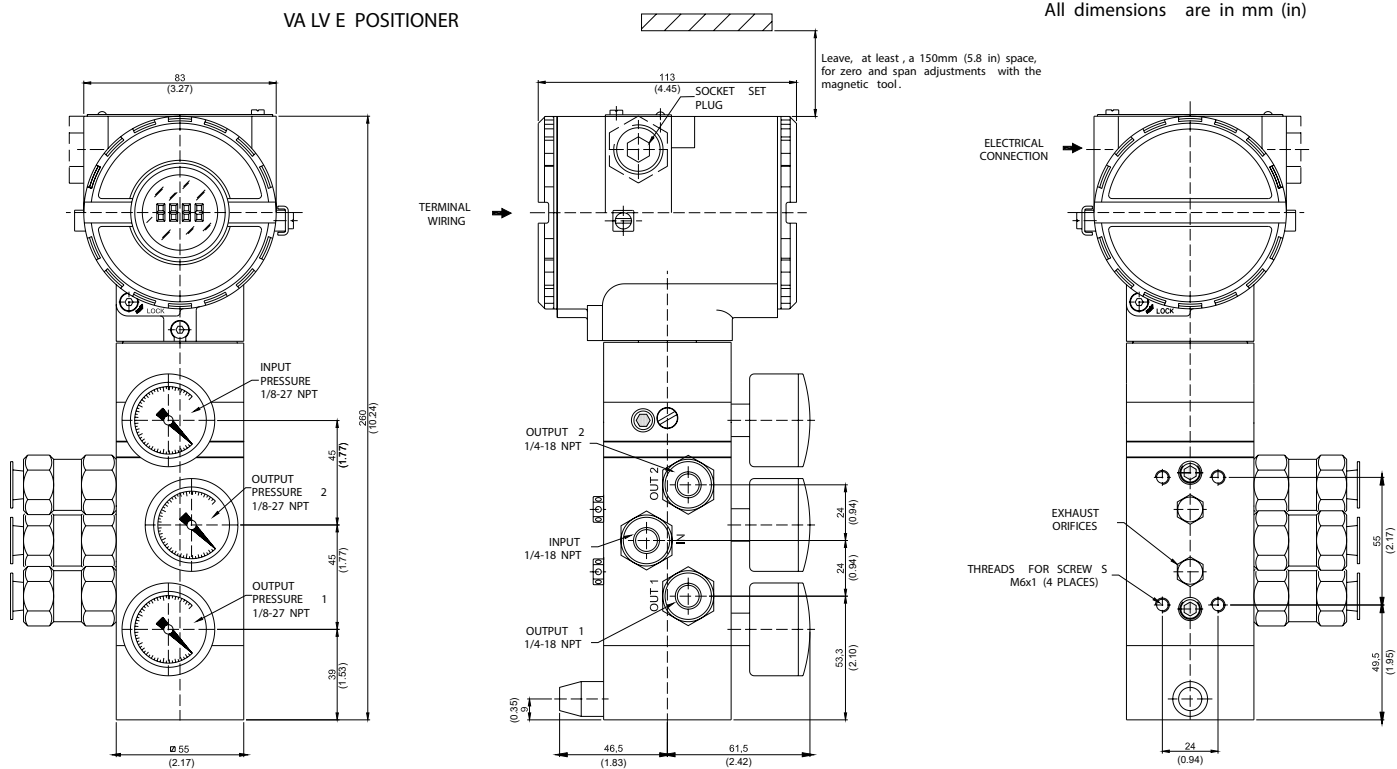
- (1) Consult Smar for applications in classified areas.
 (2) IPW/TYPEX tested for 200 hours according to NBR 8094 / ASTM B 117 standard.
 (3) Options not certified for Hazardous Locations.
 (4) Certification Ex-d for FM, ATEX, IECEx and INMETRO.
 (5) Certification Ex-d for INMETRO.
 (6) When choosing the Remote Sensor version, an additional "L" form support for a 2" tube will be included for fixing the FYRemote. To fix the Remote Sensor to the actuator, it is necessary to specify the BFY according to the ordering code.

MODEL									
BFY		BRACKET (1)							
		CODE	Positioner Mounting Bracket (1)						
		0	Without Bracket						
		1	Universal Rotary						
		2	Universal Linear (Yoke and Pillar Type)						
		3	Linear - Yoke Type						
		4	Linear - Pillar Type						
		Z	Others - Specify						
		CODE	Magnet Mounting Bracket						
		0	Without Bracket						
		1	Rotary						
		2	Linear up to 30 mm						
		3	Linear up to 50 mm						
		4	Linear up to 100 mm						
		Z	Others - Specify						
		CODE	Positioner Mounting Bracket Material						
		7	Carbon Steel Bracket and Accessories in SST						
		C	Carbon Steel Bracket						
		I	Stainless Steel Bracket						
		N	Not applicable						
		Z	Others - Specify						
		CODE	Magnet Bracket Material						
		C	Carbon Steel Bracket						
		I	Stainless Steel Bracket						
		N	Not applicable						
		Z	Others - Specify						
		CODE	Optional Items						
		ZZ	Leave it blank for no optional item						

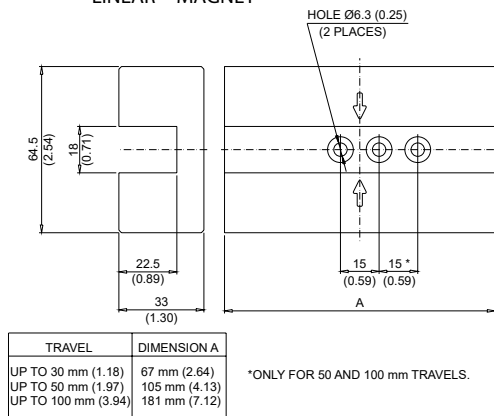
BFY - 2 4 - C I / * ← TYPICAL MODEL NUMBER

(1) For customized mounting bracket, for different brands and models, please, consult www.smar.com.

VA L V E POSITIONER

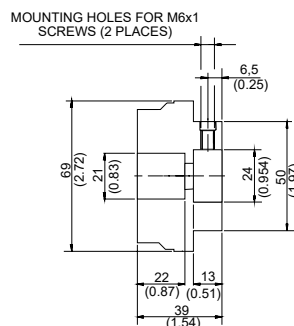


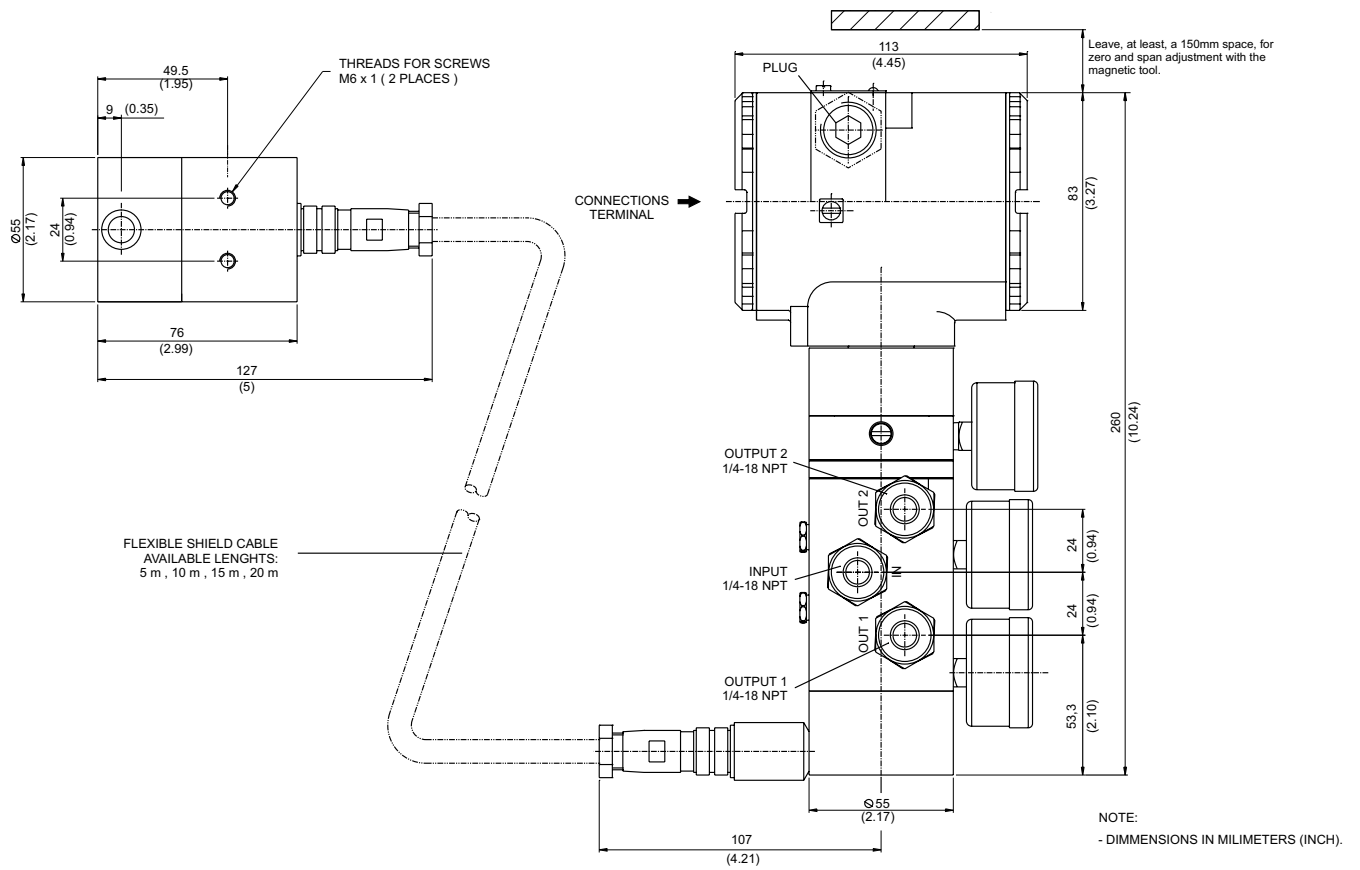
LINEAR MAGNET



*ONLY FOR 50 AND 100 mm TRAVELS.

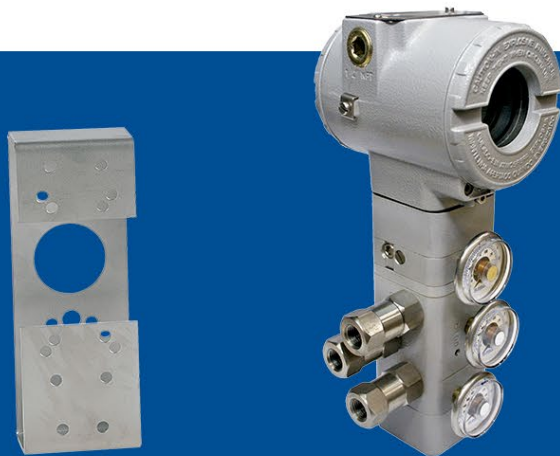
ROTARY MAGNET





FY300 Series

Valve Positioner for Actuation and Control



Universal
mounting bracket
(Linear or Rotary)

Positioner with pressure
gauges for monitoring
pressures.



Rotary magnet for movement
30° to 120° and linear magnet
for movement 3 to 100mm



Remote Position Sensor
(non-contact)



Local Position Sensor
(non-contact)

Contact us



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