Field Devices For Measurement and Instrumentation

Valve Positioner Product Guide

invensys

Foxboro Eckardt™

About our Company

The names Foxboro and Eckardt stand for two world technology leaders in the field of process automation.

Foxboro and Eckardt, founded in 1908 and 1873 respectively, have made substantial contributions towards a safer and more economical operation in numerous plants around the world with state-of-the-art automation systems. Our success is based on a relationship of mutual trust with our customers.

Our company is part of Invensys and is located in Germany (Stuttgart) and France (Soultz near Basel). Engineering and Development is researched in Stuttgart, while production is completed in France where we manufacture more than 60,000 control valve positioners per year.

Foxboro Eckardt™ Control Valve Positioners, Gauge, Absolute and Differential Pressure Transmitters, Level Transmitters, Flow Transmitters, and Analytical Devices are in operation at more than a million different facilities throughout the world.

Foxboro Eckardt is well known as a high quality instrumentation manufacturer. We are certified in accordance with DIN EN ISO 9001. In production we focus on high quality and reliable products that will exceed our quality control testing before leaving the factory.

Certified to manufacture control valve positioners with ATEX, FM, CSA, INMETRO, GOST or NEPSI certification, Foxboro Eckardt provide solutions for HART®, FF H1, Profibus PA communication and SIL3 certified positioners for applications with safety valve (Partial Stroke Testing).

We have been producing control valve positioners of the highest quality since 1961 and offer the widest range of valve positioners to complement any application in any industry.

For more information on our products, please visit our website www.foxboro-eckardt.com

Valve Positioners

Modularity

PST

High Efficiency

User Friendly

Profibus PA

HART

High Reliability

FDT-DTM

FF H1

Contents

Universal Positioner SRD960

SRD960 - Intelligent Valve Control - Ex d

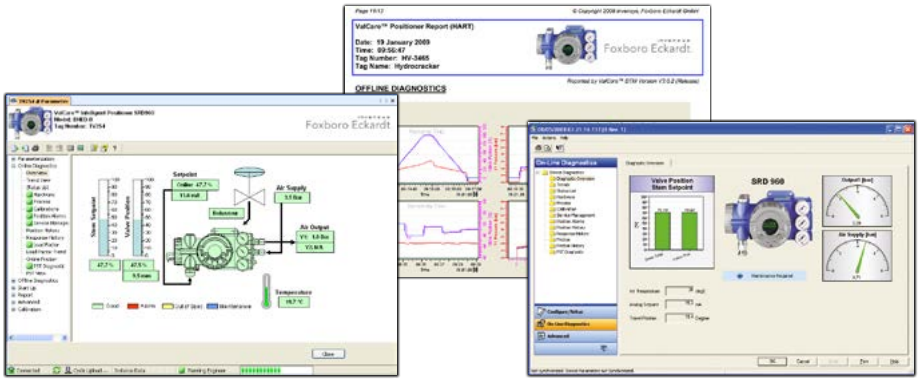
- Easy to operate, menu-driven with graphical LCD
- Multilingual full text display, backlit for easy reading
- All parameters can be configured locally by push buttons
- Advanced Diagnostics for valve Predictive Maintenance
- Premium Diagnostics for valve footprint, on-line friction
- Certified for safety applications up to SIL 3
- Partial Stroke Test (PST) for emergency shutdown applications
- ATEX and FM approval for Ex d - “flameproof”/“explosionproof”
- HART Protocol
- PROFIBUS-PA
- FOUNDATION™ Fieldbus H1 with PID, AO, 4xDI, DO, IS, OS, AI, MAI function blocks and LAS functionality
- Easy mounting to all linear and rotary actuators
- Options:
  - Limit switches or position transmitter
  - Integrated gauges and volume boosters
  - Pressure sensors for supply air and outputs
  - WirelessHART module

Operation

Configuration

Diagnosis report

Positioner Report created
with VALcare™ DTM



DTM VALcare™

Enhanced EDD

Example for mounting on rotary actuators.

The SRD960 offers the most advanced technology available on the market today.
This includes an infrared interface for wireless operation and configuration and a multilingual full-text graphic LCD, all available within the various process automation applied communication protocols.

The SRD960 offers enhanced applications and methods to analyze recorded stroke data.

All the diagnostic features can be easily configured and displayed by the Positioner DTM (VALcare™). The Positioner DTM enables the operator to edit a complete 'health' report of the valve with all data for configuration and diagnostics.
The SRD960 also has the capability to control a Partial Stroke Test (PST) which gives operators a tool to identify the trouble-proof function of ESD (Emergency Shut Down) valves.

Technical Data

Advanced Diagnostics		• Autostart • Custom Characterization
		• Autodiagnostic • Alarm Management
		• Alarm Output for Switching (with Optionboard)
		• Status List acc. NE107 • Position History
		• Response History
Premium Diagnostics		• On Line Friction • Stepping Signature
		• Ramping Signature • Sensitivity Signature
		• Valve Footprint • PST
		• PST Predictive Maintenance
SRD960 with Communication		HART Setpoint 4 to 20 mA
		Load 420 Ohm
		PROFIBUS PA and FOUNDATION Fieldbus H1
		Base current 10.5 mA ± 0.5 mA + FISCO
		FDE (Fault Disconnection Electronic)
		Certified DTMs for HART, Profibus PA and FF H1
Display		Multilingual Graphical LCD with full text display
Air Supply		1.4 to 6 bar (20 to 90 psig), or
		1.4 to 7 bar (20 to 105 psig) with "spool valve"
Stroke Range		8 to 260 mm (0.3 to 10.2 in)
Angle of Rotation		Up to 95 degree angle, optional up to 300 degree
Protection Class		IP 66 or NEMA 4X
Electrical Classification	ATEX	II 2 G Ex d T4 / T6 (flameproof)
	FM	Cl. I, Div. 1, Groups A, B, C, D (explosionproof)
Electrical Connection		M20 x 1.5 or $^1/_2$-14 NPT (others with Adapter AD...)
Pneumatic Connection		G$^1/_4$ or $^1/_4$-18 NPT
Ambient Temperature		-40 to +80 °C (-40 to +176 °F)
Weight		2.7 kg / 3.7 lbs (double acting: 3 kg / 4.4 lbs)
Optional Features		Inductive Limit Switches (2- or 3-wire)
		Mechanical Switches (Micro Switches)
		Position Transmitter (4 to 20 mA)
		Binary Inputs or Binary Outputs or
		Binary Inputs/Outputs dedicated to SIS logic solvers*
		External potentiometer (*e.g. TRICONEX®)
Attachment to linear actuators		Acc. to IEC 534 part 6 (NAMUR) and VDI/VDE 3847
rotary actuators		Acc. to VDI/VDE 3845 and VDI/VDE 3847
any other linear or rotary actuator by means of extensive attachment kit offering		

Intelligent Valve Positioner SRD991

SRD991 – Intelligent Valve Control

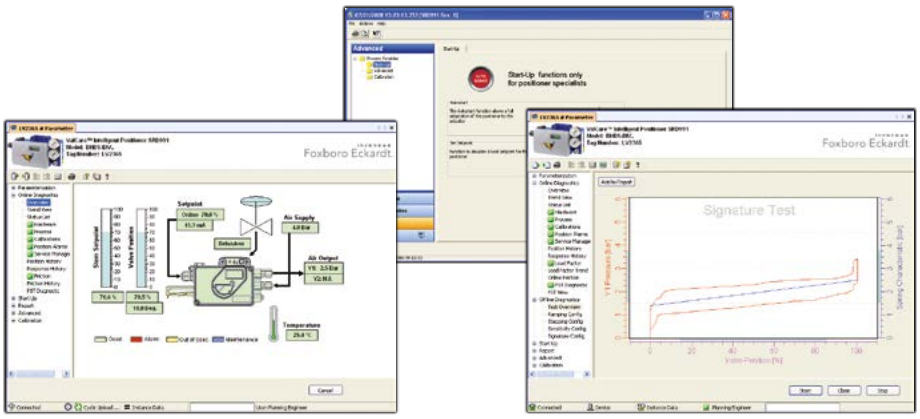
- Easy to operate, menu-driven graphical LCD
- Multilingual full text display, visible also with cover closed
- All parameters can be configured locally by push buttons
- Advanced Diagnostics for valve Predictive Maintenance
- Premium Diagnostics for valve footprint, on-line friction
- Suitable for safety applications up to SIL 3
- Partial Stroke Test (PST) for emergency shutdown applications
- HART-Protocol
- PROFIBUS-PA
- FOUNDATION Fieldbus H1 with PID, AO, 4xDI, DO, IS, OS, AI, MAI function blocks and LAS functionality
- Easy mounting to all linear and rotary actuators
- Options:
  - Housing in stainless steel
  - Limit switches and position transmitter
  - Gauge manifolds and volume boosters
  - Pressure sensors for supply air and outputs
  - WirelessHART module

Operation

Configuration

Diagnosis report

Enhanced EDD



DTM VALcare™

Positioner Report created with VALcare™ DTM

Example for mounting on rotary actuators.

The SRD991 offers the most advanced technology available on the market today.

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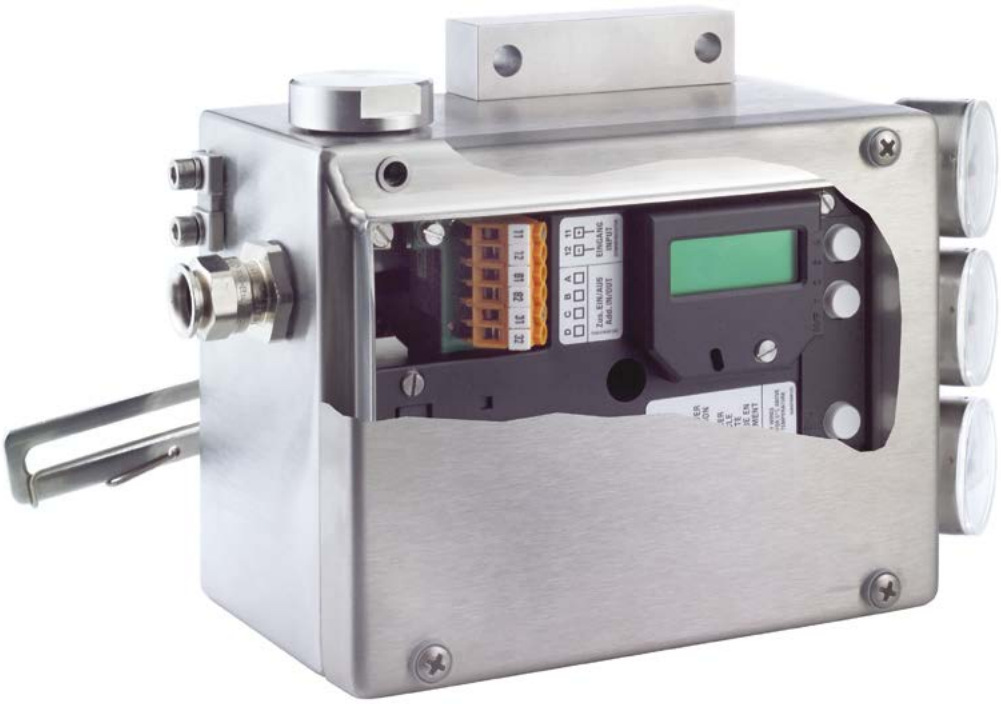
All the diagnostic features can be easily configured and displayed by the Positioner DTM (VALcare). Moreover, the Positioner DTM enables the operator to edit a complete "health" report of the valve with all data for configuration and diagnostics.

The SRD991 also has the capability to control a Partial Stroke Test (PST) that offers operators a tool to identify the trouble-proof function of ESD (Emergency Shut Down) valves.

Technical Data

Advanced Diagnostics	• Autostart	• Custom Characterization
	• Autodiagnostic	• Alarm Management
	• Alarm Output for Switching (with Optionboard)	
	• Status List acc. NE107	• Position History
	• Response History	
Premium Diagnostics	• On Line Friction	• Stepping Signature
	• Ramping Signature	• Sensitivity Signature
	• Valve Footprint	• PST
	• PST Predictive Maintenance	
SRD991 without Communication	Setpoint 4 to 20 mA	
	Load 300 Ohm	
with Communication HART	Setpoint 4 to 20 mA	
	Load 420 Ohm	
	PROFIBUS PA and FOUNDATION Fieldbus H1	
	Base current 10.5 mA ± 0.5 mA + FISCO	
	FDE (Fault Disconnection Electronic)	
	Certified DTMs for HART, Profibus PA and FF H1	
Display	Multilingual Graphical LCD with full text display	
	Mechanical Indicator (Standard)	
Air Supply	1.4 to 6 bar (20 to 90 psig), or	
	1.4 to 7 bar (20 to 105 psig) high air capacity version	
Stroke Range	8 to 260 mm (0.3 to 10.2 in) with standard lever	
Angle of Rotation	up to 95 degree angle (optional up to 300 degree)	
Protection Class	IP 66 or NEMA 4X	
Electrical Classification ATEX	"Intrinsic safety" II 2 G Ex ia IIC T4 / T6	
	"intrinsic safety for dust" II 1 D Ex iaD 20	
FM / CSA	"Intrinsic safety" Class I, Div. 1, Groups A, B, C, D	
Electrical Connection	M20 x 1.5 or $^1/_2$-14 NPT (others with Adapter AD...)	
Pneumatic Connection	G$^1/_4$ or $^1/_4$-18 NPT	
Ambient Temperature	–40 to +80 °C (–40 to +176 °F)	
Weight	1.7 kg / 3.7 lbs (double acting: 2 kg / 4.4 lbs)	
Optional Features (plug & play)	Inductive Limit Switches (2 or 3-wire)	
	Mechanical Switches (Micro Switches)	
	Position Transmitter (4 to 20 mA)	
	Binary Inputs or Binary Outputs or	
	Binary Inputs/Outputs dedicated to SIS logic solvers*	
	External potentiometer (*e.g. TRICONEX)	
Attachment to linear actuators	Acc. to IEC 534 part 6 (NAMUR) and VDI/VDE 3847	
rotary actuators	Acc. to VDI/VDE 3845 and VDI/VDE 3847	
any other linear or rotary actuator by means of extensive attachment kit offering		

Stainless Steel Housing for Positioners SRD991-SRI990



Rugged and Compact Design

Both positioners come in a rugged stainless steel housing and an extensive choice of electronic boards for SRI990 or SRD991.
Electronic board for the SRD991 digital valve positioner:

- Easy to operate, menu-driven graphical LCD
- Multilingual full text display
- HART Protocol
- PROFIBUS-PA
- FOUNDATION Fieldbus H1 with PID, AO, 4xDI, DO, IS, OS, AI, MAI function blocks and LAS functionality

Electronic board for the SRI990 analog valve positioner:

- Analog valve control with fast control behavior
- Electrical adaption of zero and span by potentiometers

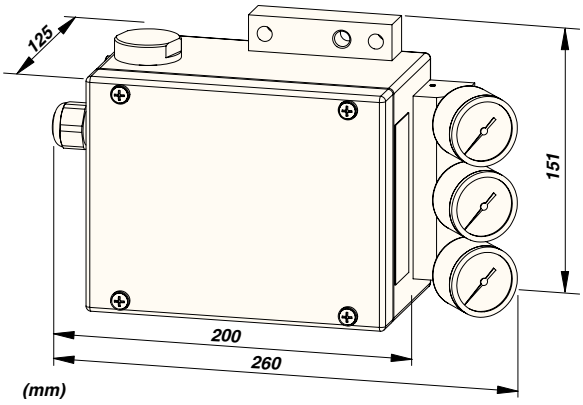
The modular concept of the positioners SRI990 - SRD991:

- Easy mounting to all linear and rotary actuators
- Options:
  - Position transmitter
  - Gauge manifolds
  - Pressure sensors for outputs (SRD991)

Operation

Configuration

Diagnosis report



Example for mounting on rotary actuators.

Special corrosion resistant design for offshore applications and for food and beverage industries.

How to order -
Select “option -Z” in SRI990 or SRD991 model code.

The SRD991 offers the most advanced technology available on the market today.

This includes a multi-lingual full-text graphic LCD all available within the various process automation applied communication protocols.

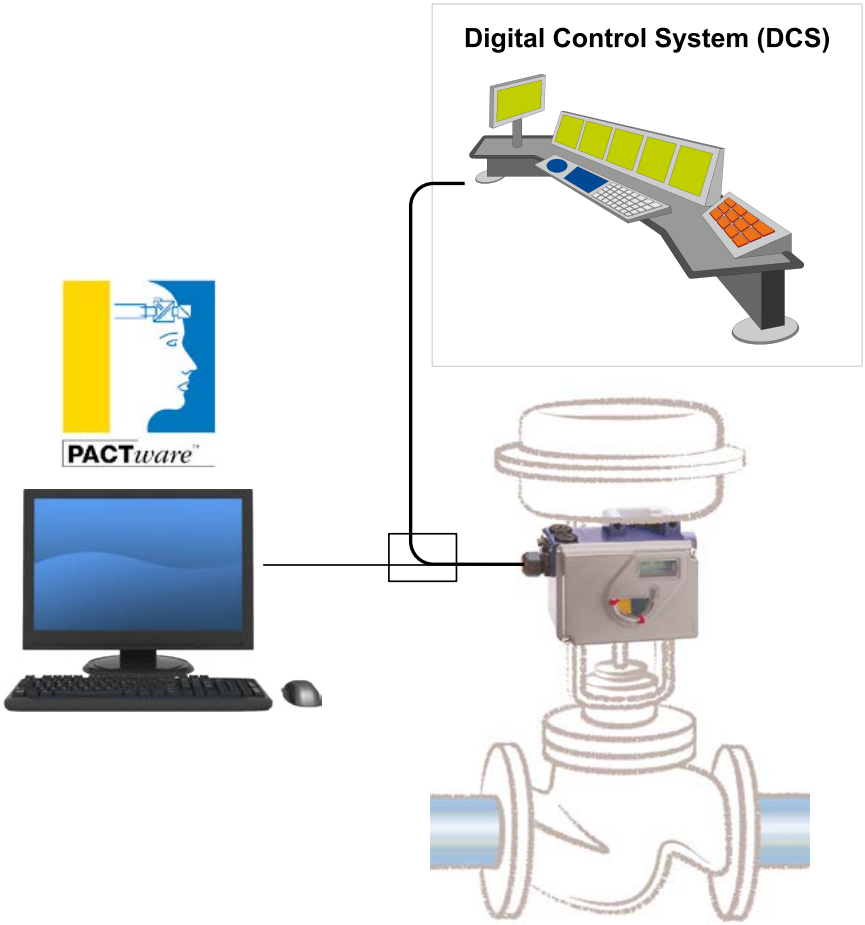
The SRD991 offers enhanced applications and methods to analyze recorded stroke data.

The advanced diagnostic can be partially shown on the local LCD of the positioner or fully on a PC or a DCS workstation such as the I/A Series® System thanks to DTM based software VALcare.

Technical Data

- Stainless Steel Housing			
Material			Stainless Steel 1.4404 / 316, 1.25 mm
Protection class			IP 66 acc. to EN 60529
Impact resistance			7 Joule acc. to EN 50014
Seals			VMQ (Silicone)
Weight (complete positioner)			3.5 kg
Pneumatic connection			1/4-18 NPT on manifold, prepared for gauges (option)
Electrical Connection			M20 x 1.5 or 1/2-14 NPT (others with Adapter AD...)
- with SRD991 electronic			
Intelligent			Autostart with self calibration
			Advanced diagnostics for valve predictive maintenance
			Multilingual Graphical LCD with full text display
			Configuration of characteristic curves
	without Communication		Setpoint 4 to 20 mA
			Load 300 Ohm
	with Communication	HART	Setpoint 4 to 20 mA
			Load 420 Ohm
		PROFIBUS PA and FOUNDATION Fieldbus H1	
			Fieldbus Protocol acc. to IEC 1158-2 (FISCO)
			Base current 10.5 mA ± 0.5 mA
			FDE (Fault Disconnection Electronic)
Optional Features			Position Transmitter (4 to 20 mA)
(plug & play)			Binary Inputs or Binary Outputs or
			External potentiometer
- with SRI990 electronic			
Analog			Setpoint 4 to 20 mA
			Load 300 Ohm
Characteristic of setpoint			Linear
DIP switches for			Direction of rotation, Signal range, Split range ...
- General technical data			
Air Supply			1.4 to 7 bar (20 to 105 psig),
			For high pressure, option K:
			4 to 10 bar (60 to 150 psig):
Stroke Range			8 to 260 mm (0.3 to 10.2 in) with standard lever
Angle of Rotation			Up to 95 degree angle (optional up to 300 degree)
Electrical Classification	ATEX		“Intrinsic safety” II 2 G Ex ia IIC T4 / T6
Ambient Temperature			–40 to +80 °C (–40 to +176 °F)
Attachment to linear actuators			Acc. to IEC 534 part 6 (NAMUR) and VDI/VDE 3847
rotary actuators			Acc. to VDI/VDE 3845 and VDI/VDE 3847
any other linear or rotary actuator by means of extensive attachment kit offering			

Stainless Steel Housing for Positioners SRD991-SRI990



Intelligent Valve Diagnostics for Predictive Maintenance

The valve diagnostic software is available as Device Type Manager (DTM) for integration into control systems based on the Field Device Tool (FDT) technology such as the Foxboro I/A Series® System. It is designed to support methods for evaluation of valve health, operation and configuration. The DTMs support the communication protocols HART, Profibus PA and FOUNDATION Fieldbus H1.

- Predictive Maintenance capabilities
- Intelligent Alarm management
- Self-Surveillance in accordance with NE107
- Service Management
- Histograms for valve position and response history
- Data collected up to 60 months
- Data stored inside positioner memory
- Determination of Stem Friction to prevent leakage and stuck stem
- Histogram for friction-history
- Partial Stroke Test function for ESD applications

Operation

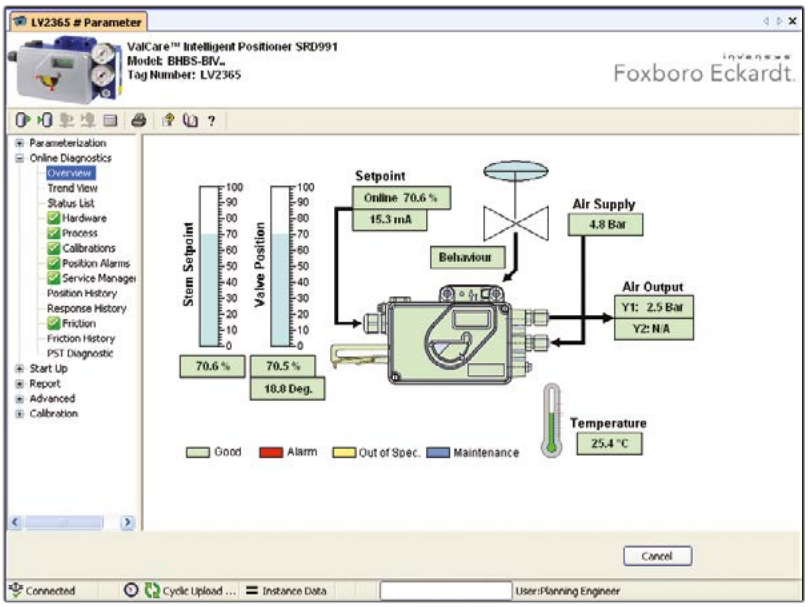
Configuration

Diagnosis report

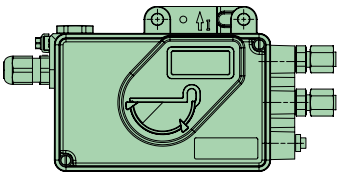
Easy to Use Easy to Understand One Glance

Ease of use and easy to understand are the principal characteristic of the DTM interface.

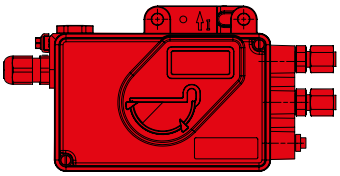
With one glance, users can identify if the equipment is running well (in green), needs maintnance (in blue), or indicates a failure (in red). The color code complies with NAMUR NE107 standard:

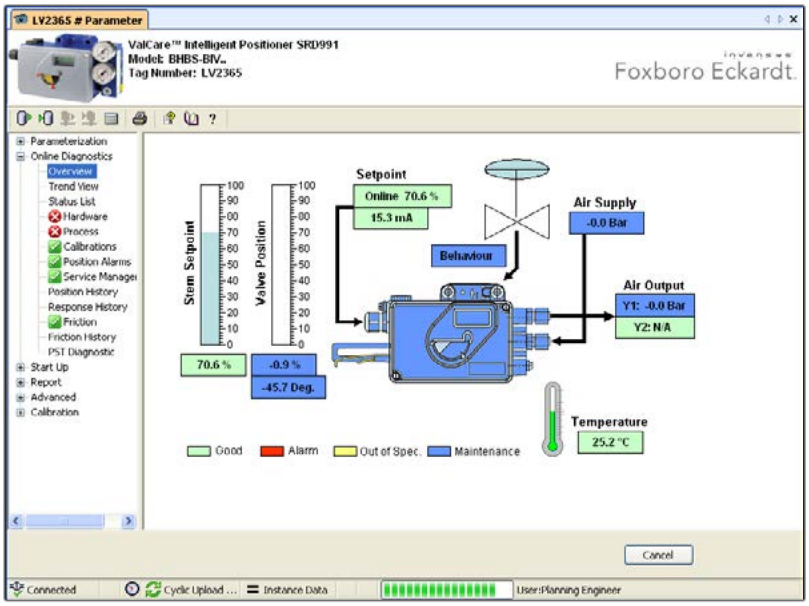


Good

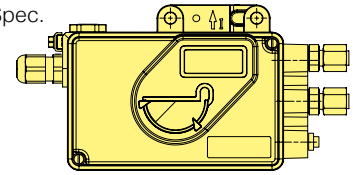


Alarm

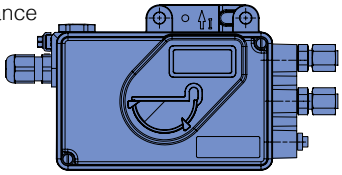


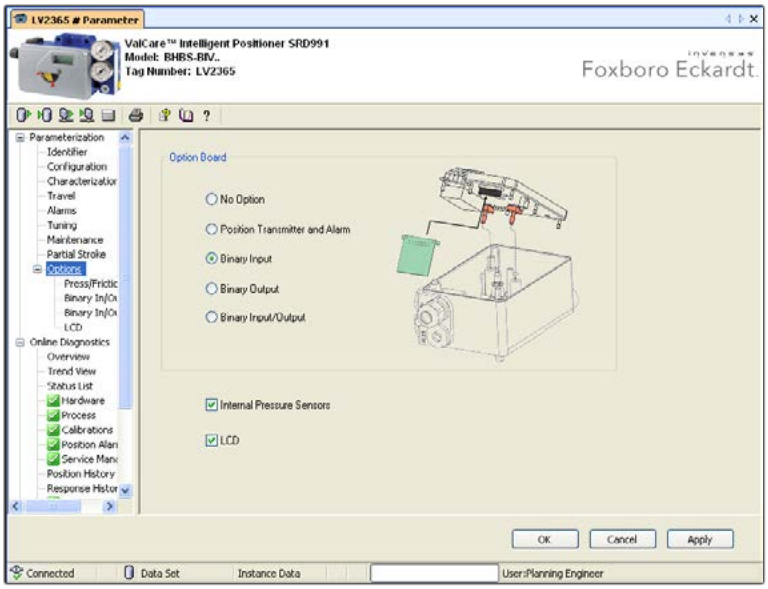


Out of Spec.



Maintenance





Simple Configuration

This is the easiest way to configure a valve positioner. All configuration screens have been optimized with intuitive input and graphical elements that make it easy for anyone to configure a valve positioner while minimizing configuration errors.

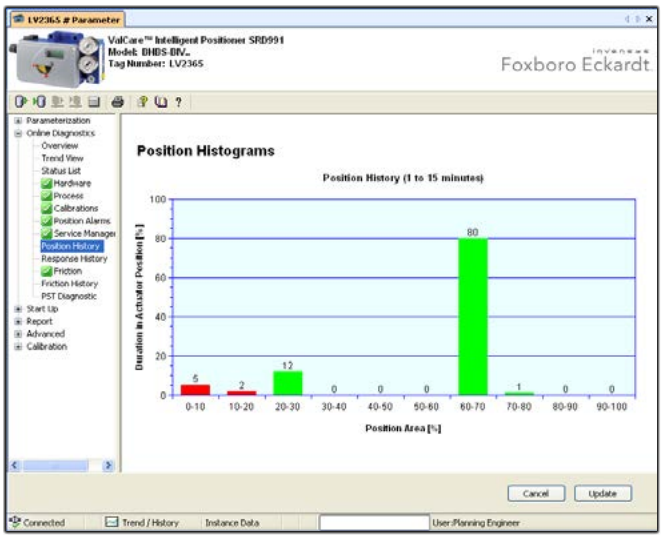
Predictive Maintenance

The DTM goes beyond the typical function of displaying a setpoint and measured values as it offers enhanced internal applications and methods to analyze valve data. The onboard functionality automatically retrieves and stores all important valve performance data collected by the positioner during operation.

Diagnostic valve data is refreshed every 200 ms which enables software to run on demand. As a result it is not required to run continuously on the control system and therefore can reduce unnecessary traffic on the communication signal.

The internal diagnostic routines continuously evaluate the state of the valve and inform an operator of any irregularities by executing a status alarm or diagnostic message. The self-surveillance mechanism complies with NAMUR – N107 standard.

Total hours of operation of the device can be displayed, and service intervals can be timed accordingly using the Service Management screen.



A set of histograms show Valve Position History and Valve Response History which can depict a valve performance over time. The Stem Friction histogram is an additional tool that can be used to identify valve stickiness which is a common valve problem.

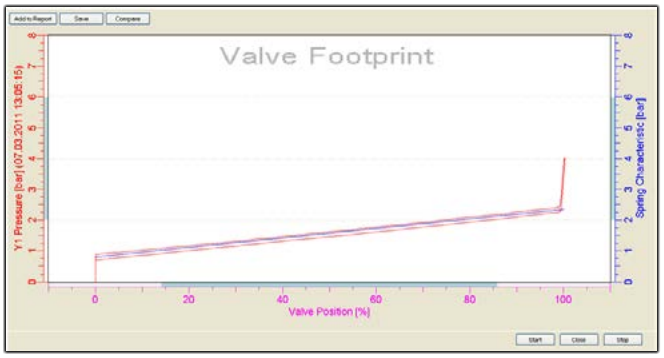
Valve Friction

Stem Friction greatly impacts valve performance. As such, tracking valve friction has become indispensable information in order to accurately develop predictive maintenance schemes for any control valve. Tracing valve friction allows identification of possible pneumatic leakages or stuck valves while preventing dangerous spills, injuries to personnel, or damage to plant equipment. Internal pressure sensors measure the output pressure for each setpoint change. In milliseconds, the microprocessor of the positioner calculates the friction of the stem against the packing. The actual friction value is then displayed as 'Measured' and 'Average-Value' with additional drag-pointers for the 'Maximum' and 'Minimum Value'.

Valve Signatures

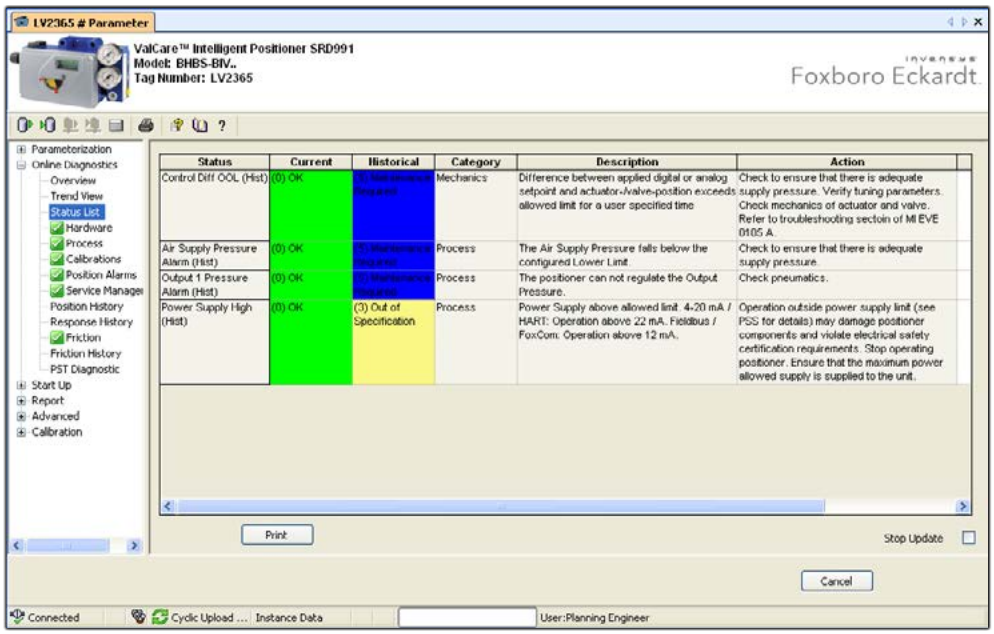
Valve Footprint is an off-line function that defines the reference behaviour of the valve/actuator/positioner entity. Several types of signatures are available to define precisely the overall characteristic of the final control element such as:

- Stepping signature
- Ramping signature
- Sensivity signature
- Valve Footprint



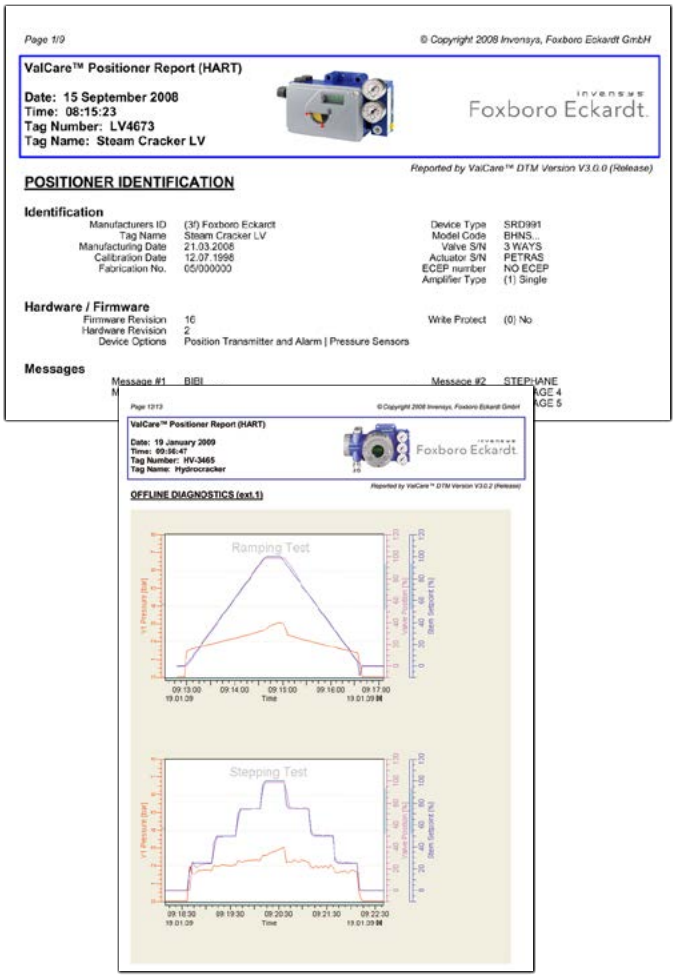
Unified Self-Surveillance (NE107)

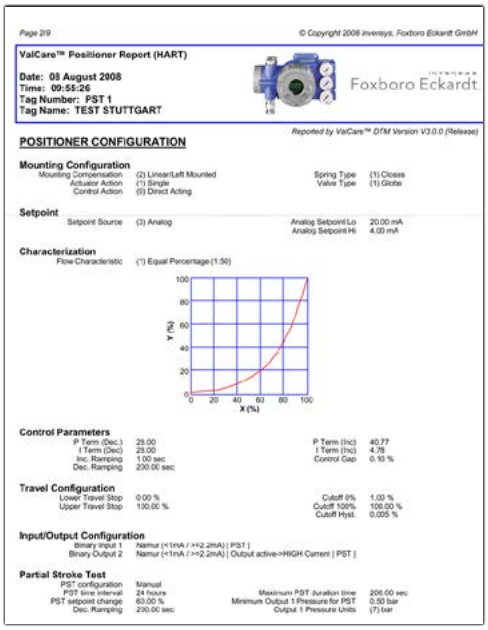
The Status List screen is a conglomeration of all status messages of the field device. All messages comply with the NAMUR – NE107 standard which helps users adhere to a consistent visual format and allows integration with external alarm systems. The available information provides a clear indication of activate alarms, possible root cause, and corrective actions to restore normal operating state. All alarms are generated in the positioner and can be uploaded at any time.



Positioner Report

With two simple clicks, you can generate a comprehensive and functional valve/positioner report. The 8-page report covers all information regarding the identification, configuration, status, and diagnostic state of the positioner/valve combination. For ease of portability and archiving, this report can be printed or stored in PDF format for future reference.





Partial Stroke Testing Solutions with SRD991 and SRD960 Positioners

Intelligent Valve Solutions for Safety Systems and Emergency Shutdown (ESD) Applications

- SRD991 and SRD960 positioners SIL 3 certified for Shutdown
- PST Activation:
  - Automatically
  - Manually
  - By means of LCP960 Local Control Panel
  - By means of a separate Binary Input for SIS Logic Solver
- PST Status through communication, LCD display and Binary Output
- Extended diagnostic through certified DTM in HART/PROFIBUS PA/FF
- Break Pressure and re-inflate time trends for Predictive Maintenance
- LCP960 Local Control Panel for monitoring of PST
  - LCP960 with Ex d (Explosion Proof) certification
  - One push button to launch PST
  - Backlit LCD with clear messages
  - Timer for last PST done
- SOV monitoring with pressure dip detection
- FST (Full Stroke Test) monitoring with trigger capabilities

PST running

PST good

PST failed or stuck valve

Partial Stroke Testing Solution

Final control elements in Emergency Shutdown (ESD) applications such as ON-OFF, Blow Down and Venting Valves remain in one position over a long time without any mechanical movement. These valves have a tendency to get stuck and as a result may not operate on demand. This can have a severe impact on the functionality of a Safety System and could result in adverse conditions to operating personnel, plant equipment and the environment.

Partial Stroke Test (PST) offers operators a tool to identify the troubleshooting function of ESD valves. The test can be easily executed via the FDT-DTM based configuration and diagnostic tools VALcare and Valve Monitor. The test can also be requested by an SIS Logic Solver and the result of the test can be read by the Logic Solver. This architecture has been developed in conjunction with Triconex® and eliminates the possibility of human error while reaching a high level of safety as described by IEC 61508 and IEC 61511.

Sequence of events inside the Triconex memory, for a safe traceability of all completed tests.

Triconex Sequence of Events Recorder - [SOE Retrieve: PST.SED]

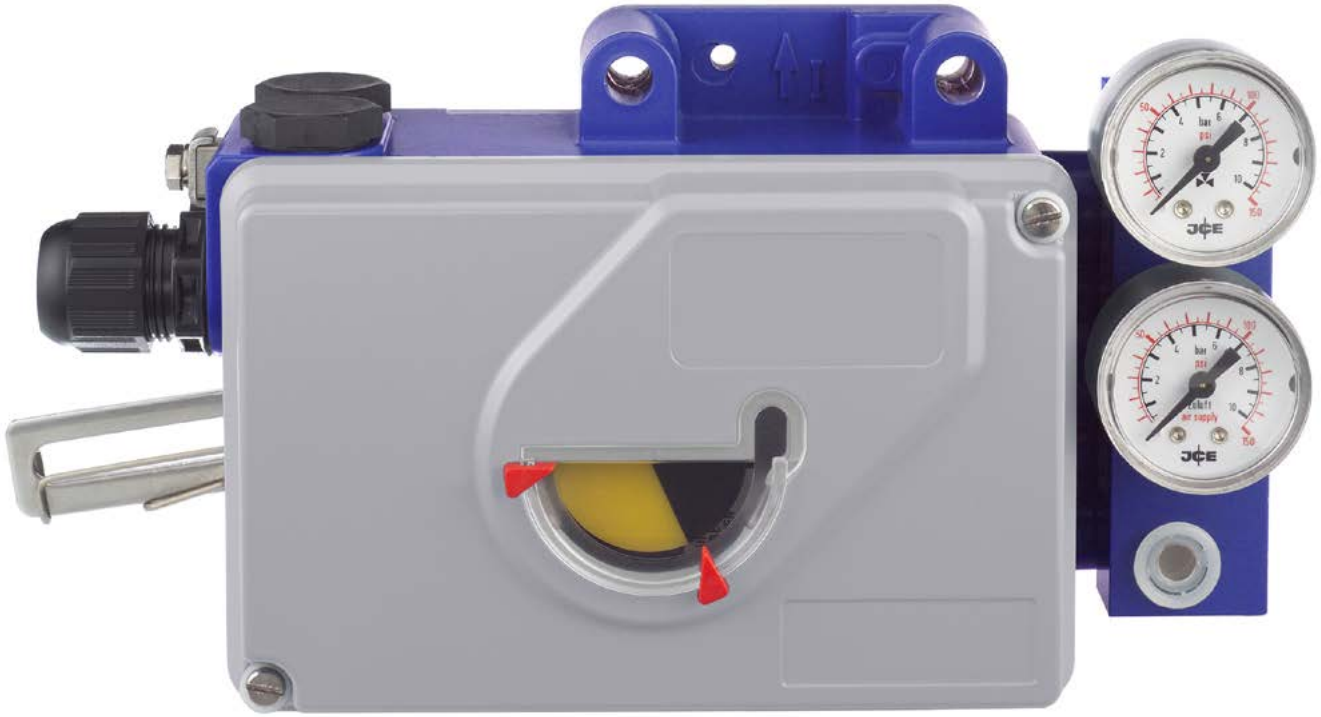
Date	Time	Alias	TagName	Variable State	Node
12/07/2006	11:58:13.805	10003	PST_LAUNCH	TRUE	01 - trinode01
12/07/2006	11:58:26.456	10003	PST_LAUNCH	FALSE	01 - trinode01
12/07/2006	11:58:26.856	10001	PST_STATUS	TRUE	01 - trinode01
12/07/2006	11:58:26.856	15001	PST_COMPLETED	TRUE	01 - trinode01
12/07/2006	11:58:33.906	15001	PST_COMPLETED	FALSE	01 - trinode01

LCP960 Local Control Panel for PST

Features of Partial Stroke Test

PST Activation	Manually
	Automatically
	By means of separate Binary Input for SIS Logic Solver
Configuration	Test Interval
	Setpoint Change
	Maximum Wait Time
	Minimum Pressure
	Soft PST
	PST Setpoint Change • Fixed • Random
Action	PST for single or double acting actuator
Audit trail	In DCS by means of communication
	In SOE of Triconex by means of a digital output
Alarms	Minimum Pressure
	Time to perform PST
Trends	Break Pressure
	Time to re-inflate
Local Control Panel LCP960	With push button to launch PST
	LCD with PST Status
	Timer for last PST done

Analog Positioner SRI990



SRI990 - Easy Operation and Compact Design

- Analog valve control with fast control behaviour
- Easy local operation and adjustments
- Valve action and rotation configurable by DIP switches
- Electrical adaptation of zero and span by potentiometers
- Gain and Damping independently adjustable
- Switch for pneumatic test
- Load 300 Ohm
- Easy mounting to all linear and rotary actuators
- Optional Features:
    - Housing in Stainless Steel
    - Limit Switches (inductive or Micro switches)
    - Position feedback 4 to 20 mA
    - Manifolds for gauges and boosters

Optional Stainless Steel housing.

Example for mounting on rotary actuators.

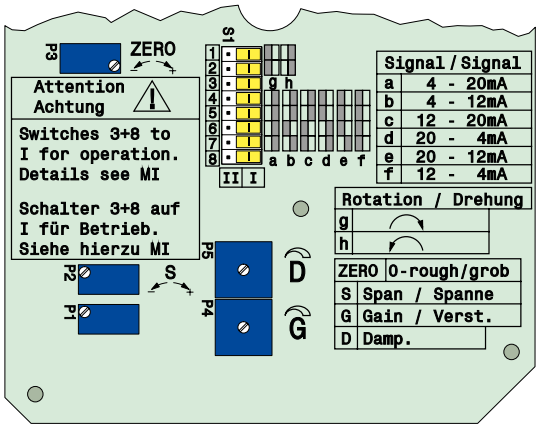
The analog Positioner SRI990 with analog input 4 to 20 mA is designed to operate pneumatic valve actuators.

It offers easy adjustment by means of switches and potentiometers.

The modular structure of this positioner series enables conversion from an analog to an “intelligent” positioner by exchanging the electronics.

Technical Data

Analog	Setpoint 4 to 20 mA
	Load 300 Ohm
Characteristic of setpoint	Linear
Adjustments by dip switches for	Direction of rotation,
	Signal range, Split range,
	direct or reverse action
Adjustments by potentiometers for	Zero and span,
	Gain and damping
Pneumatic test	By DIP switch
Display	Mechanical Indicator (Standard)
Air Supply	1.4 to 6 bar (20 to 90 psig), or
	1.4 to 7 bar (20 to 105 psig) with “spool valve”
Stroke Range	8 to 260 mm (0.3 to 10.2 in)
Angle of Rotation	up to 95 degree Angle (optional up to 300 degree)
Protection Class	IP 66 or NEMA 4X
Electrical Classification ATEX	“Intrinsic safety” II 2 G Ex ia IIC T6
	“Intrinsic safety for dust” II 1 D Ex iaD 20
FM	“Intrinsic safety” Class I, Div. 1, Groups A, B, C, D
Electrical Connection	M20 x 1.5 or $^1/_2$-14 NPT (others with Adapter AD...)
Pneumatic Connection	G$^1/_4$ or $^1/_4$-18 NPT
Ambient Temperature	–40 to +80 °C (–40 to +176 °F)
Weight	1.7 kg / 3.7 lbs (double acting: 2 kg / 4.4 lbs)
Options	Inductive Limit Switches (2- or 3-wire)
	Or Mechanical switches (Micro switches)
	Position Transmitter (4 to 20 mA)
	Gauge Manifold, Volume Booster
Attachment to linear actuators	Acc. IEC 534 Teil 6 (NAMUR) and VDI/VDE 3847
to rotary actuators	Acc. VDI/VDE 3845 and VDI/VDE 3847
to any other linear or rotary actuator by means of extensive attachment kit offering	



Local operation and configuration.

Electro-Pneumatic Positioner
SRI983

SRI983 - The Classic Explosion Proof Application

- Analog valve control with fast control behaviour
- Input 4 to 20 mA
- Load only 260 Ohm - ideal for split range
- Easy local mechanical configuration
- Mechanical adaptations by setting-screws
- Independent adjustment of zero and span
- Gain and Damping independently adjustable
- Electrical I/P converter separate from pneumatic unit
- Mounting to all linear and rotary actuators
- Options:
    - Integrated gauges
    - Volume boosters (independent from positioner)
    - Fail Freeze block relay

Example for mounting on linear valves, version with integrated gauges.

Example for mounting on rotary valves.

The SRI983 Positioner is designed for operation of pneumatic valve actuators from control systems and electrical controllers with electric control signals.

It is used to reduce the adverse effects of valve friction, for higher thrust and shorter positioning time.

Technical Data

Analog		Setpoint: 4 to 20 mA
		Load 260 Ohm
Characteristic of setpoint		Linear, equal-percentage or invers-equal-percentage
		(by cams)
Split Range		Up to 3-fold
Valve Action		Direct or reverse adjustable
Zero and Span		Independently adjustable
Gain and Damping		Independently adjustable
Air Supply		1.4 to 6 bar (20 to 90 psig)
Stroke Range		8 to 200 mm (0.3 to 8.0 in)
Angle of Rotation		30 to 180 degree angle
Protection Class		IP 65 (ATEX) / NEMA 4X (FM and CSA)
Electrical Classification	ATEX	"Flameproof" II 2 G Ex d IIC T6
	FM and CSA	"Explosionproof" Class I, Div. 1, Groups B, C, D
		"Dust-ignition proof" Class II, Div. 1, Groups E, F, G
Electrical Connection		M20 x 1.5 or $^1/_2$-14 NPT
Pneumatical Connection		$^1/_4$-18 NPT
Ambient Temperature		–40 to +80 °C (–40 to +176°F)
Humidity		Up to 100 %
Weight		1.5 kg / 3.3 lbs (double acting: 1.7 kg / 3.7 lbs)
Options		Manifold with staggered connection
		Integrated gauges
		Volume boosters (external mounted)
		Fail Freeze block relay
Attachment	to linear actuators	Acc. to IEC 534 Part 6 (NAMUR)
	to rotary actuators	Acc. to VDI/VDE 3845
any other linear or rotary actuator by means of extensive attachment kit offering		

Electro-Pneumatic Positioner
SRI986

SRI986 - More than 1 Million applications worldwide!

- Analog valve control with fast control behaviour
- Input 4 to 20 mA / 0 to 20 mA or 0 to 10 V
- Load only 200 Ohm - ideal for split range
- Easy local mechanical configuration
- Mechanical adaptations by setting-screws
- Independent adjustment of zero and span
- Gain and Damping independently adjustable
- Mounting to all linear and rotary actuators
- Options:
    - Position Transmitter 4 to 20 mA
    - Limit switches (inductive or Micro switches)
    - Gauge Manifold
    - Volume boosters

Example for mounting on linear valves.

Example for mounting on rotary valves.

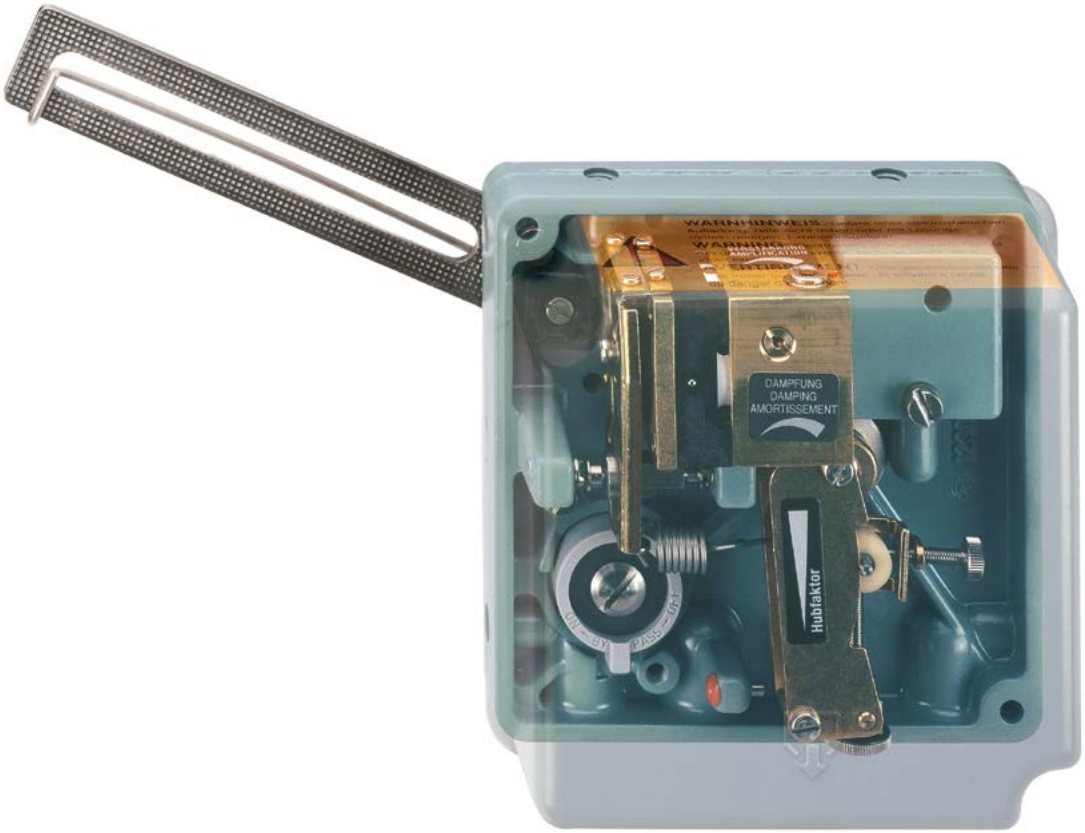
The SRI986 Positioner is designed for operation of pneumatic valve actuators from control systems and electrical controllers with electric control signals.

It is used to reduce the adverse effects of valve friction, for higher thrust and shorter positioning time.

Technical Data

Analog	Setpoint: 4 to 20 mA / 0 to 20 mA / 0 to 10 V
	Load 200 Ohm
Characteristic of setpoint	Linear, equal-percentage or invers-equal-percentage
	(by cams)
Split Range	Up to 3-fold
Valve Action	Direct or reverse adjustable
Zero and Span	Independently adjustable
Gain and Damping	Independently adjustable
Air Supply	1.4 to 6 bar (20 to 90 psig)
Stroke Range	8 to 200 mm (0.3 to 8.0 in)
Angle of Rotation	30 to 180 degree angle
Protection Class	IP54, optional IP 65
Electrical Classification ATEX	"Intrinsic safety" II 2 G Ex ia IIC T6
FM and CSA	"Intrinsic safety" Class I, Div. 1, Groups A, B, C, D
For use on ships or vessels	Lloyd's registered
Electrical Connection	M20 x 1.5 or $^1/_2$-14 NPT (others with Adapter AD...)
Pneumatical Connection	G1/8
Ambient Temperature	-40 to +80 °C (-40 to +176°F)
Humidity	Up to 100 %
Weight	1.5 kg / 3.3 lbs (double acting: 1.8 kg / 3.9 lbs)
Options	Inductive Limit Switches (2- or 3-wire)
	Micro switches
	Position Transmitter (4 to 20 mA)
	Manifold with staggered connection
	Manifold with gauges
	Volume boosters
Attachment to linear actuators	Acc. to IEC 534 Part 6 (NAMUR)
to rotary actuators	Acc. to VDI/VDE 3845
any other linear or rotary actuator by means of extensive attachment kit offering	

Pneumatic Positioner SRP981



SRP981 - The result of 40 years experience with pneumatic positioners

- Pure pneumatic valve control, input 0.2 to 1 bar (3 to 15 psig)
- Low air consumption
- Split range up to 4-fold possible
- Basic device without electrical parts
- Valve control with fast control behaviour
- Easy local mechanical configuration
- Mechanical adaptations by setting-screws
- Independent adjustment of zero and span
- Gain and Damping independently adjustable
- Easy mounting to all linear and rotary actuators
- ATEX approved
- Options:
    - Electrical Position Transmitter 4 to 20 mA
    - Limit switches (inductive or Micro switches)
    - Manifold with gauges
    - Pneumatic Volume boosters

Example for mounting on linear valves, version with integrated gauges.

Example for mounting on rotary valves.

The SRP981 Positioner is designed for operation of pneumatic valve actuators with pneumatic control signals.

It is available in the version ATEX-Constructive Safety and in connection with the options in Ex ia/intrinsic safety.

It is used to reduce the adverse effects of valve friction, for higher thrust and shorter positioning time.

Extraordinary reliability and ecomony is reached with our durable pneumatic components, even under difficult climatic conditions.

Technical Data

Control Signal		Setpoint: 0.2 to 1 bar (3 to 15 psig)
Characteristics		Linear, equal-percentage or invers-equal percentage (with cams)
Split range		Up to 4-fold possible (up to dw=0.2 bar / 3 psig)
Zero and Span		Independently adjustable
Gain and Damping		Independently adjustable
Valve Action		Direct or reverse adjustable
Bypass switch		Connects input w directly with output y
Air Supply		1.4 to 6 bar (20 to 90 psig)
Stroke range		8 to 200 mm (0.3 to 8.0 in)
Angle of Rotation		30 to 180 degree angle
Protection Class		IP54, optional IP 65
Electrical Classification		
Base Unit	ATEX	Constructive safety II 2 G Ex c IIC T6
Accessories	ATEX	"Intrinsic safety" II 2 G Ex ia IIC T6
	FM and CSA	"Intrinsic safety" Class I, Div. 1, Groups A, B, C, D
Pneumatic Connection		G1/8
Electrical Connection (f. Accessories)		M20 x 1.5 or $^1/_2$-14 NPT (others with Adapter AD...)
Ambient Temperature		-40 to +80 °C (-40 to +176°F)
Humidity		Up to 100 %
Weight		0.7 kg / 1.5 lbs (double acting: 0.9 kg / 2.0 lbs)
Optional Features		Inductive Limit Switches (2- or 3-wire)
		Micro Switches
		Electrical Position Transmitter (4 to 20 mA)
		Manifold with staggered connection
		Gauges
		Pneumatic Volume Boosters
		Stainless Steel housing (with linear mounting)
Attachment to linear actuators		Acc. to IEC 534 part 6 (NAMUR)
rotary actuators		Acc. to VDI/VDE 3845
any other linear or rotary actuator by means of extensive attachment kit offering		

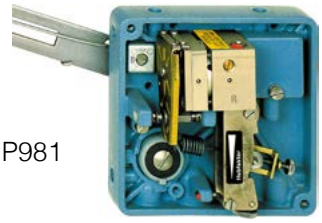
Position Transmitters

Limit switch unit
Intrinsically Safe Certification SGE985
Explosion Proof Certification SRD960-TxT/U/R/V
Inductive NAMUR
Inductive NAMUR increased safety (SIL3)
3 wires type PNP
Micro switches
For rotary actuator up to 180° rotation
For linear actuator up to 260 mm stroke with standard lever

SGE985

Pneumatic 3-15 psi (0.2-1 bar) position feedback
SMP981
Output 3-15 psi / 0.2-1 bar
For rotary actuator up to 120° rotation
For linear actuator up to 250 mm stroke with standard lever
Optional stainless steel housing (with linear actuator)

SMP981



4 to 20 mA position feedback
Intrinsically Safe Certification SMI983 and SRI990-TxQ
Explosion Proof Certification SRD960-TxQ
Output 4 to 20 mA
For rotary actuator up to 180° rotation
For linear actuator up to 260 mm stroke with standard lever

SMI983

SRD960-TxQ

Additional equipment

I/P converter
With Intrinsically Safe Certification IP24
Input 4 to 20 mA
Output 3-15 psi / 0.2-1 bar
'In Field' housing up to IP65
Optional stainless steel housing

Filter regulators
FRS02, FRS03 and FRS923
Input up to 15 bar
Output 0-6 bar
Special application for pure oxygen possible (FRS923)
Stainless steel version available (FRS03)

Lightning protection, manifolds,
Volume booster
High Flow Volume booster
LEXG-F / G / X / Y
Available with SIL 3 certification

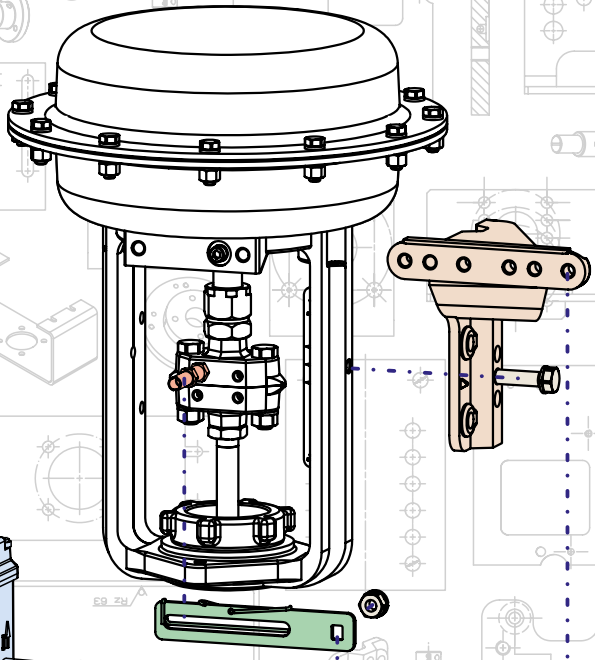
Lock-in/Fail Freeze unit
LEXG-VRx
Fail in place unit in case of lost air supply (Lock-in)
Fail in place unit in case of lost of air supply and electrical signal (Fail Freeze)
Certified Intrinsically Safe/to be used with an analog positioner

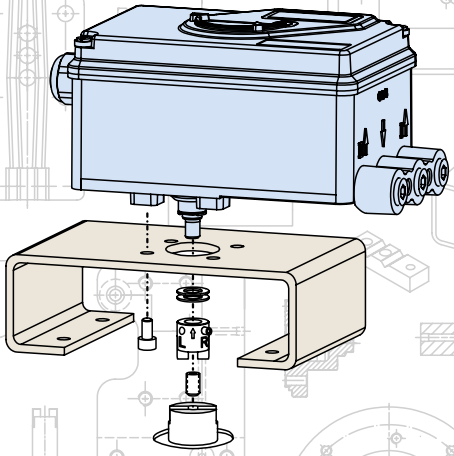
Attachment kits

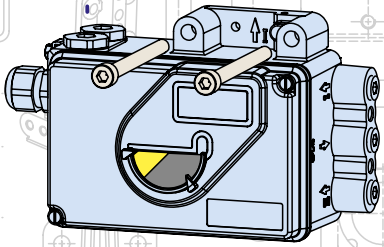
Foxboro Eckardt positioners can be mounted onto any actuator/valve thanks to a wide range of attachment kits.

We have the right solution for all linear actuators (diaphragm, piston, cylinder).

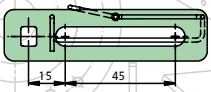
For any rotary actuator we can provide the coupling part and mounting bracket.



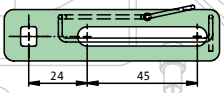




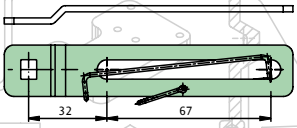
EBZG-A2
Extra short feedback lever for stroke 5 to 15 mm



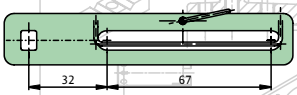
EBZG-A4
Short feedback lever for stroke 8 to 35 mm



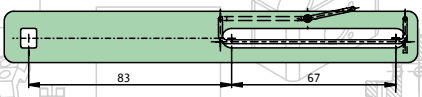
EBZG-A3
Feedback lever for stroke 8 to 70 mm



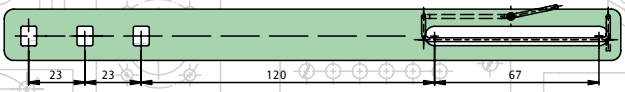
EBZG-A
Feedback lever for stroke 8 to 70 mm



EBZG-B
Long feedback lever for stroke 60 to 120 mm



EBZG-A1
Extended feedback lever for stroke 110 to 260 mm



Special versions

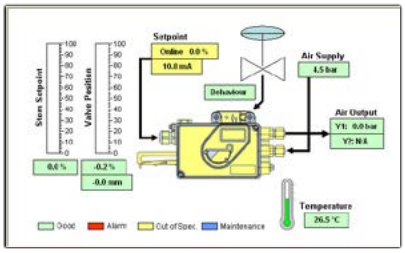
WirelessHART module for PST monitoring

Features
- WirelessHART with Intrinsically Safe or Explosionproof Certification (ATEX and FM)
- Fastpipe function
- 24 V DC loop power - no battery

Features
- Connection to the optionboard B (binary inputs)
- Available for SRD991 or SRD960 with optionboard B
- No need for additional external supply
- ATEX certified
- Solution patented by Foxboro US 6,112,638

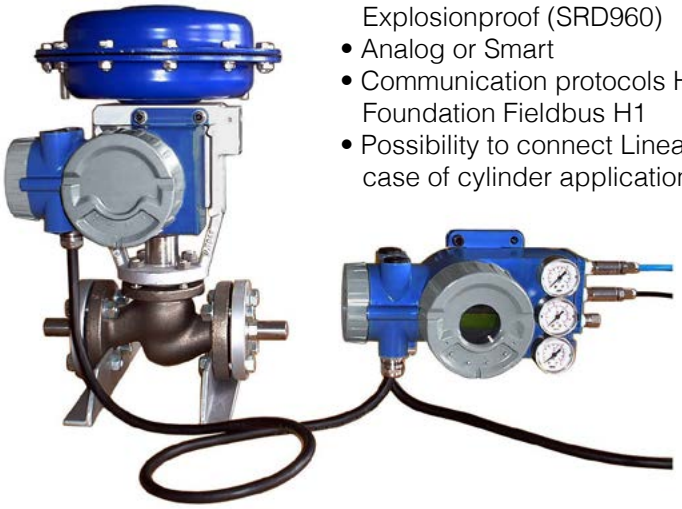
Fugitive Emission Monitoring

Fugitive Emission Monitoring is the solution to avoid any serious emission from the packing. In conjunction with a pressure switch gauge, the positioner is able to detect any damaging leakage. The diagnostic is provided with a clear overview in the DTM.



Remote mounting

This remote application is used in applications with high temperatures, high magnetic fields or vibrations. The Positioner (remote unit) is mounted far away from the valve or cylinder in a safe environment. The Potentiometer unit is mounted on the valve.



Features
- Intrinsic Safety (SRD991 or SRI990) or Explosionproof (SRD960)
- Analog or Smart
- Communication protocols Hart, Profibus PA or Foundation Fieldbus H1
- Possibility to connect Linear Potentiometer in case of cylinder application

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