Foxboro Eckardt

Valve Positioners

Modularity

PST

High Efficiency

Profibus PA

User Friendly

High Reliability

HART

FDT-DTM

FF H1

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 the Invensys Operations Management and is located in Germany (Stuttgart) and France (Soultz nearby Basel). Engineering and Development is achieved in Stuttgart, while production is completed in France where we manufacture more than 60,000 control valve positioners a 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 manufacture. We are certified in accordance to 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.

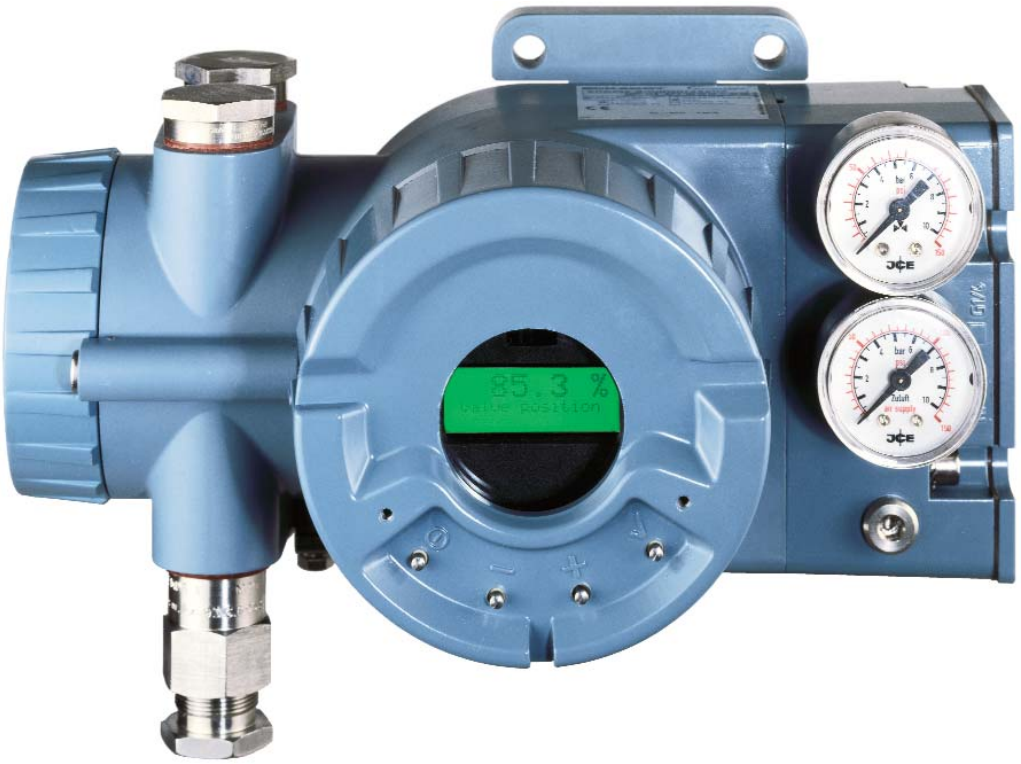
Certified to manufacture control valve positioners with ATEX, FM, CSA, INMETRO, GOST or NEPSI certification, Foxboro Eckardt provide solutions for the HART, FF H1, Profibus PA communication and SIL3 certified positioners for application on safety valve (Partial Stroke testing).

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

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

Contents

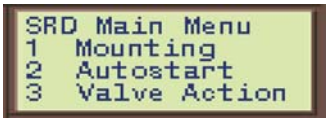
Universal Positioner SRD960



SRD960 - Intelligent Valve Control - Ex d

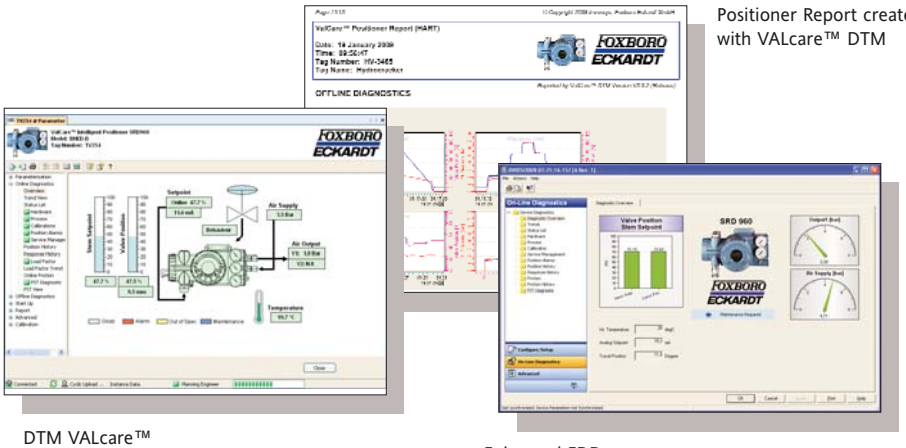
- Easy to operate, menu-driven with graphical LCD
- Multilingual full text Display, backlit for easy reading
- All parameters can be configured locally by push buttons
- Advanced Diagnostics for Valve predictive maintenance
- Premium Diagnostics for Valve Signatures, On-Line Friction
- Certified for Safety Applications up to SIL 3
- Partial Stroke Test (PST) for emergency shutdown applications
- ATEX and FM aproval for EEx d - “flameproof”/“explosionproof”
- HART Protocol
- PROFIBUS-PA
- FOUNDATION Fieldbus H1
  with PID, AO, 2xDI, DO 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

Operation



Configuration

Diagnosis report



DTM VALcare™

Enhanced EDD

Positioner Report created with VALcare™ DTM

Example for mounting on rotary actuators.

The SRD960 offers the most advanced technology available on the market today.
This includes among others an infrared interface for wireless operation and configuration, a multi-lingual full-text graphic LCD and an availability with the choice of all in the process automation applied communication protocols. It offers enhanced applications and methods to analyze recorded stroke data.
All the diagnostics features can be easily configured and display by the Positioner DTM (VALcare). The Positioner DTM enables to edit a complete "health" report of the valve with all data of configuration and diagnostics.
The SRD960 has also 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

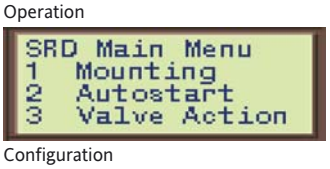
Advanced Diagnostics		• Autostart • Custom Characterization
		• Autodiagnostic • Alarm Management
		• Alarm Output for Switching (with Optionboard)
		• Status List acc. NE107 • Position History
		• Response History
Premium Diagnostics		• On Line Friction • Stepping Signature
		• Ramping Signature • Sensitivity Signature
		• Valve Footprint • PST
		• PST Predictive Maintenance
SRD960 with Communication		HART Setpoint 4-20 mA
		Load 420 Ohm
		PROFIBUS PA and FOUNDATION Fieldbus H1
		Base current 10.5 mA ± 0.5 mA + FISCO
		FDE (Fault Disconnection Electronic)
		FoxCom Digital
		certified DTMs for HART, Profibus PA and FF H1
Display		Multilingual Graphical LCD with full text display
		LEDs
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 EEx 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

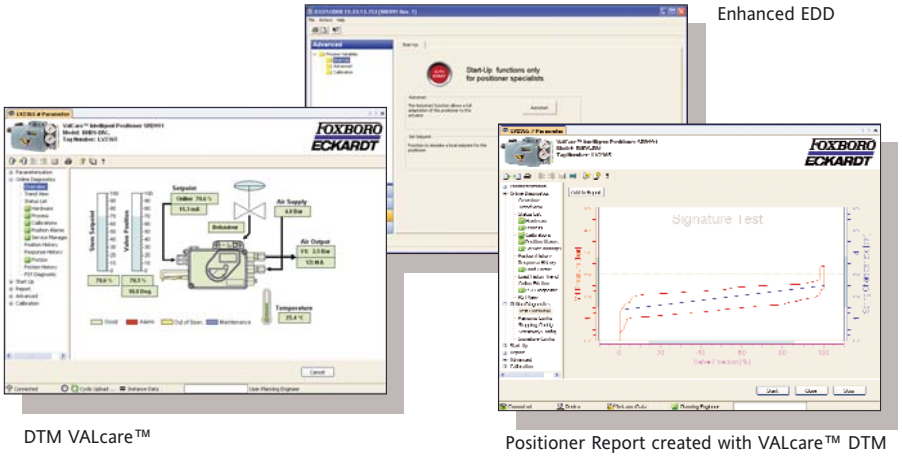
- Easy to operate, menu-driven graphical LCD
- Multilingual full text display, visible also with cover closed
- All parameters can be configured locally by push buttons
- Advanced Diagnostics for Valve predictive maintenance
- Premium Diagnostics for Valve Signatures, On-Line Friction
- Suitable for safety applications up to SIL 3
- Partial Stroke Test (PST) for Emergency Shutdown applications
- HART-Protocol
- PROFIBUS-PA
- FOUNDATION Fieldbus H1
  with PID, AO, 2xDI, DO 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

Operation



Configuration

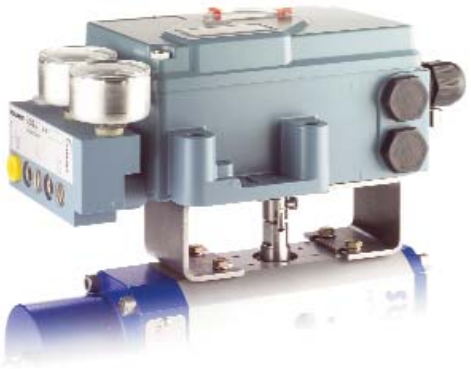
Diagnosis report



Enhanced EDD

DTM VALcare™

Positioner Report created with VALcare™ DTM



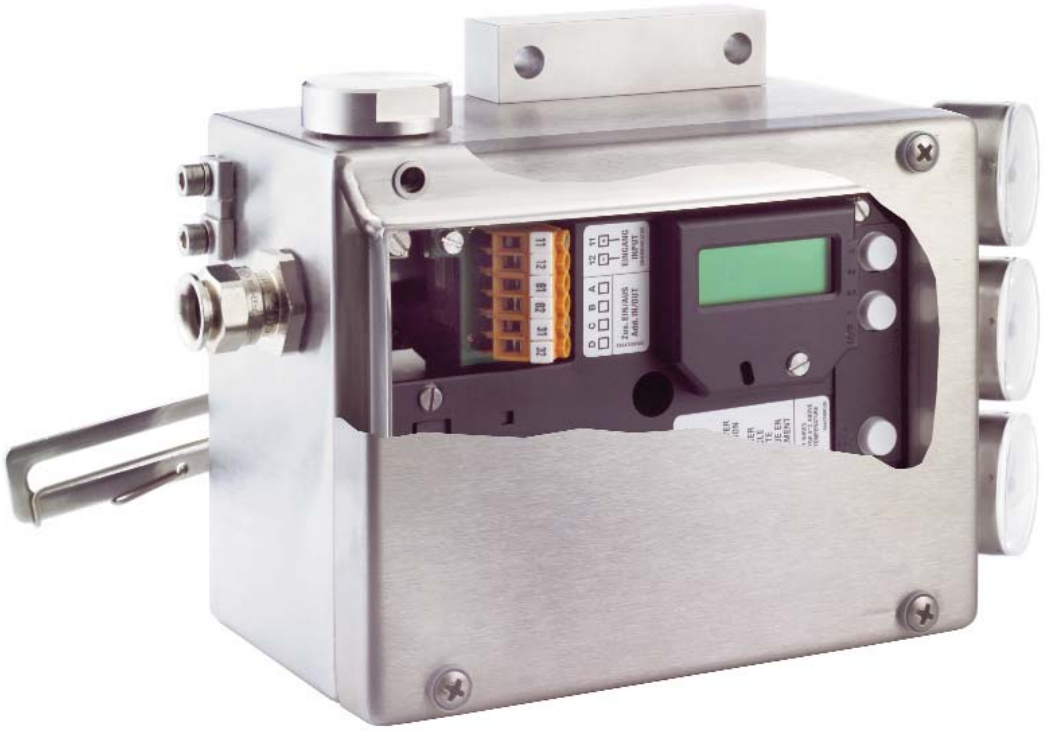
Example for mounting on rotary actuators.

Technical Data

The SRD991 offers the most advanced technology available on the market today.
This includes among others an infrared interface for wireless operation and configuration, a multi-lingual full-text graphic LCD and an availability with the choice of all in the process automation applied communication protocols. It offers enhanced applications and methods to analyze recorded stroke data.
All the diagnostics features can be easily configured and display by the Positioner DTM (VALcare). Moreover, the Positioner DTM enables to edit a complete "health" report of the valve with all data of configuration and diagnostics.
The SRD991 has also 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.

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 4-20 mA
			Load 300 Ohm
	with Communication	HART	Setpoint 4-20 mA
			Load 420 Ohm
		PROFIBUS PA and FOUNDATION Fieldbus H1	
			Base current 10.5 mA ± 0.5 mA + FISCO
			FDE (Fault Disconnection Electronic)
		FoxCom Digital	
		certified DTMs for HART, Profibus PA and FF H1	
Display		Multilingual Graphical LCD with full text display	
		LEDs	
		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 EEx 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		G1/4 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

Positioner in a rugged stainless steel housing and an extensive choice of electronic boards from SRI990 or SRD991.
Electronic board from 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, 2xDI, DO function blocks and LAS functionality

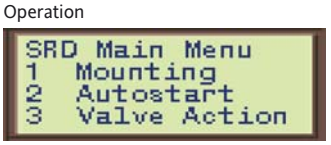
Electronic board from the SRI990 analog valve positioner:

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

The modular concept of the positioners SRI990 - SRD991:

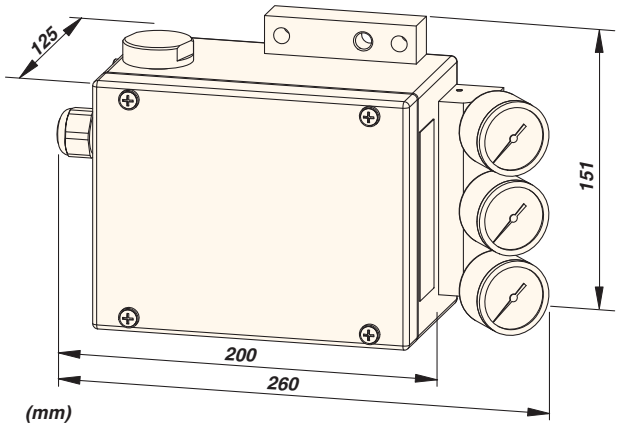
- Easy mounting to all linear and rotary actuators
- Options: ○ Position transmitter ○ Gauge manifolds
  ○ Pressure sensors for outputs (SRD991)

Operation



Configuration

Diagnosis report



Example for mounting on rotary actuators.

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

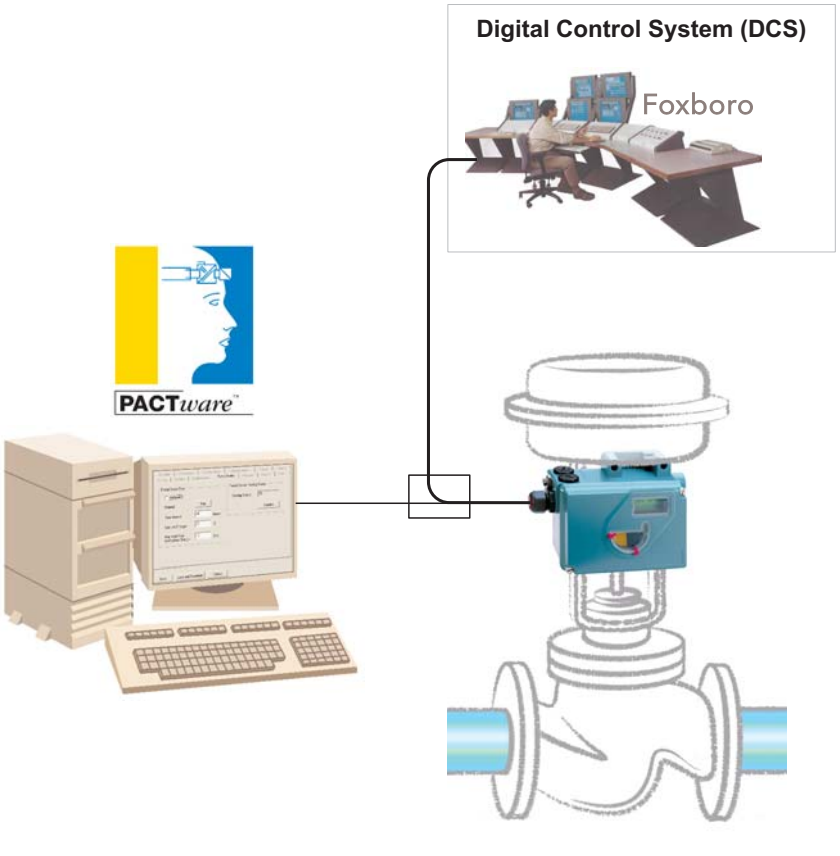
How to order
Select “option -Z” in SRI990 or SRD991 model code.

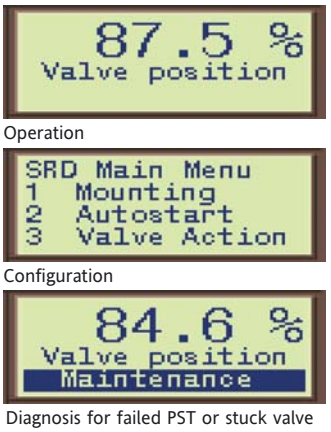
The SRD991 offers the most advanced technology available on the market today.
This includes among others a multi-lingual full-text graphic LCD and an availability with the choice of all in the process automation applied communication protocols. It offers enhanced applications and methods to analyze recorded 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 like IA 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
			Self-diagnostics
			Advanced diagnostics for valve predictive maintenance
			Multilingual Graphical LCD with full text display
			Configuration of characteristic curves
			Travel-stop and cut-off functions
	without Communication		Setpoint 4-20 mA
			Load 300 Ohm
	with Communication	HART	Setpoint 4-20 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)
			FoxCom Digital
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)
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 EEx 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			

Advanced Diagnostics / Premium Diagnostics for Positioners SRD960 / SRD991





Intelligent Valve Diagnostics for Predictive Maintenance

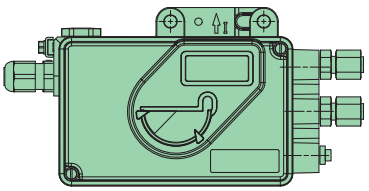
The valve diagnostic software is available as Device Type Manager (DTM) for integration into control systems based on the Field Device Tool (FDT) technology such as the Foxboro I/A™ Series System. It is designed to support methods for evaluation of the valve health, operation and configuration. The DTMs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

- 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

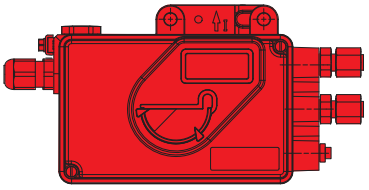
All-in-one glance

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 maintenance (in blue), or indicates a failure (in red). The color code complies with NAMUR NE107 standard:

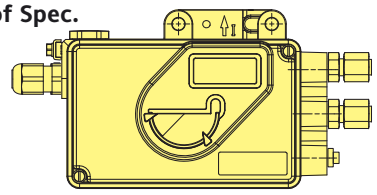
Good



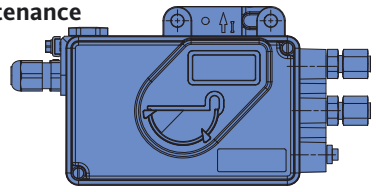
Alarm

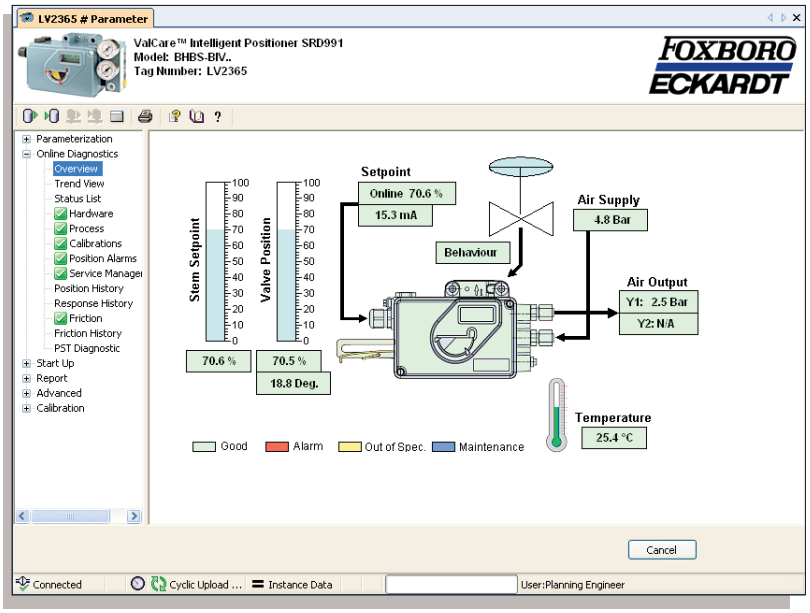


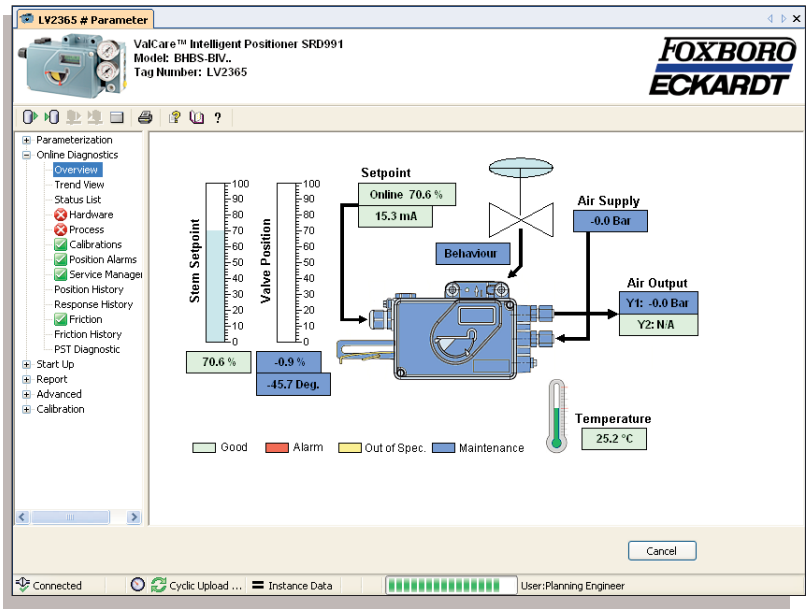
Out of Spec.

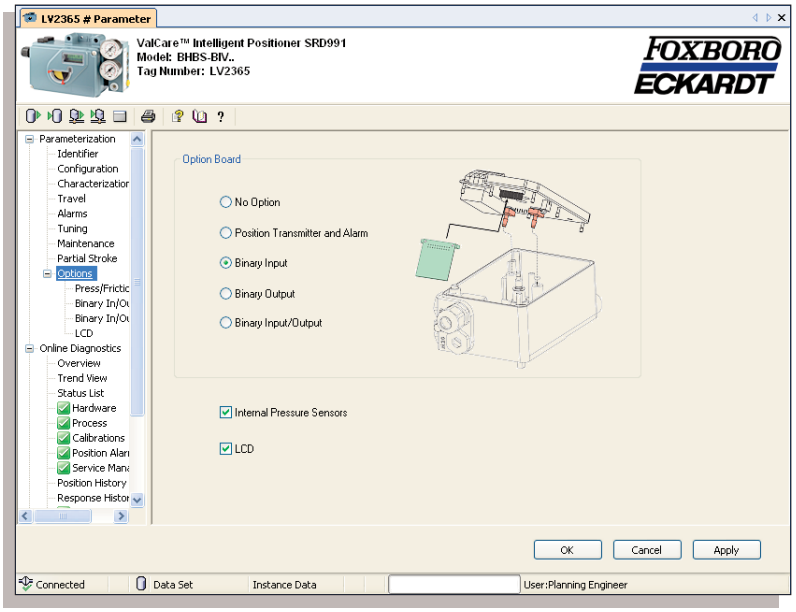


Maintenance









Simple Configuration

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.

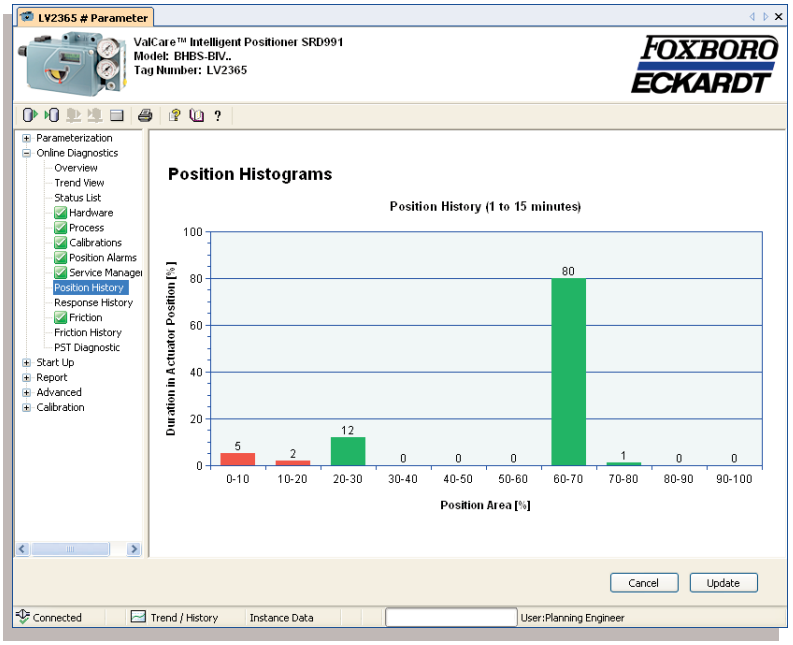
Predictive Maintenance

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 200ms 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 the 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

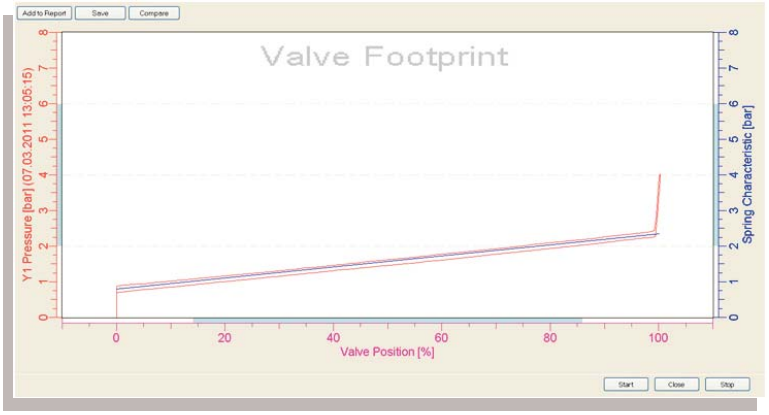
Stem friction greatly impacts valve performance. As such, tracking valve friction has become indispensable information in order to accurately develop predictive maintenance schemes for any control valve. Tracing valve friction allows identification of possible pneumatic leakages or stuck valves while 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

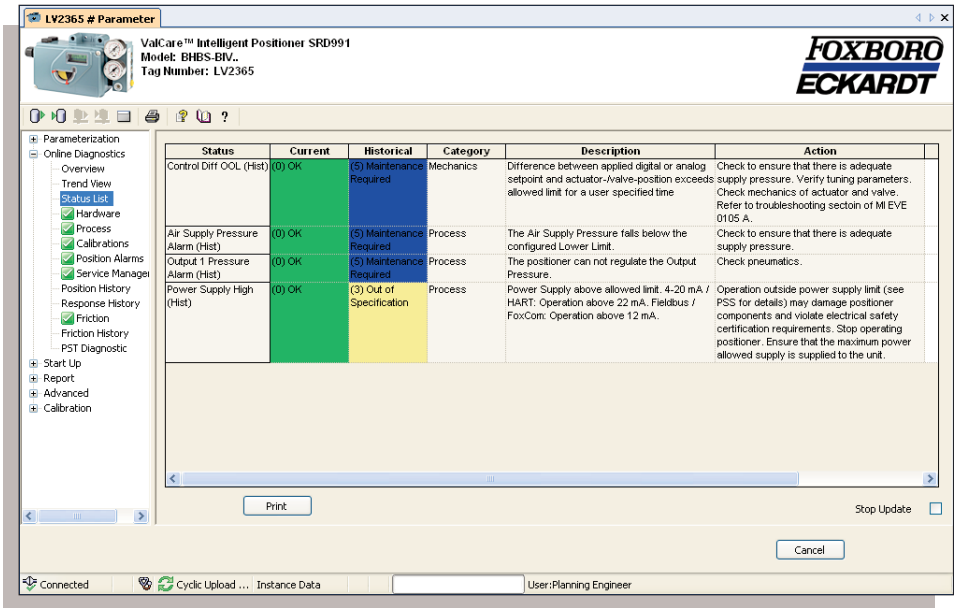
Valve Footprint is an off-line function that defines a reference behavior of the valve/actuator/positioner entity. Several types of signatures are available to define precisely the overall characteristic of the final control element such as:

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

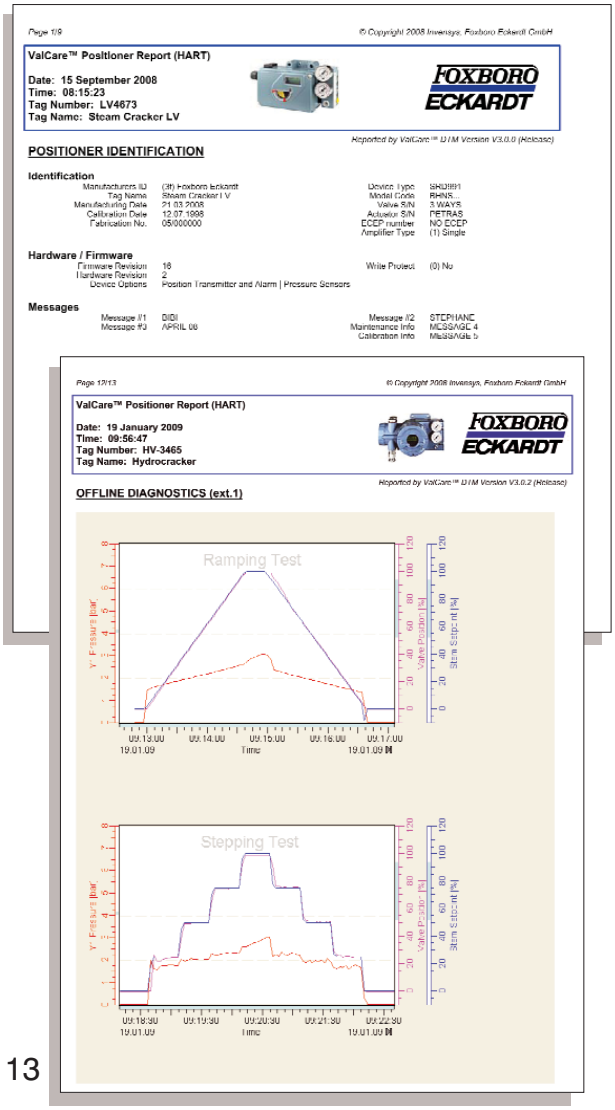


Unified self-surveillance (NE107)

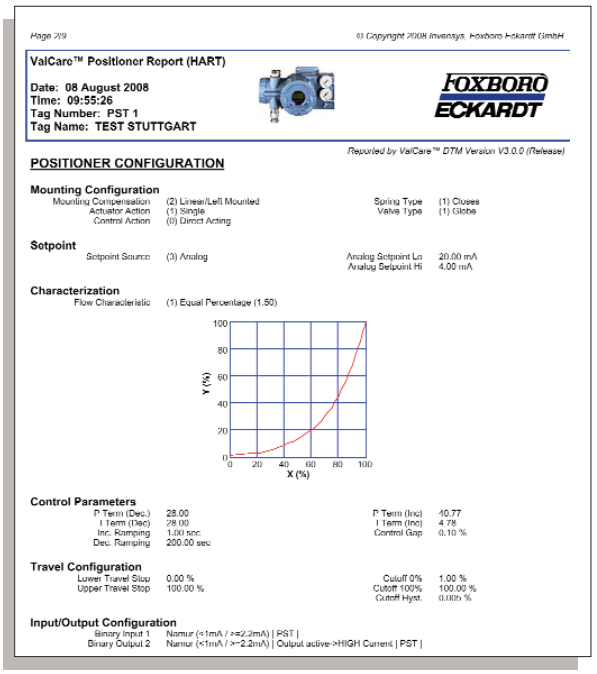
The Status List screen is a conglomeration of all status messages of the field device. All messages comply with the NAMUR – NE107 standard which helps users adhere to consistent visual format and allows the integration to external alarm systems. The available information provides clear indication of 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.



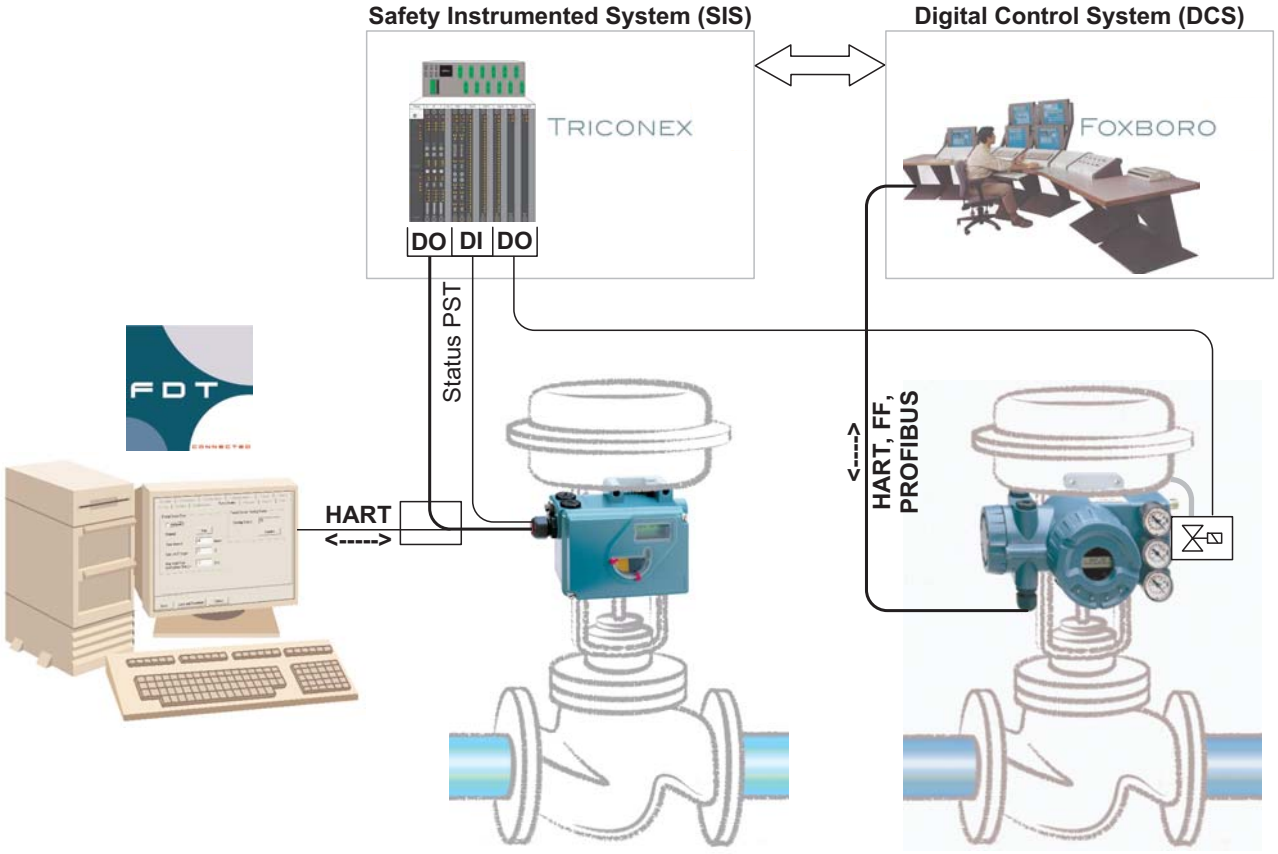
Positioner Report



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 for intrinsically safe and SRD960 for Explosion proof areas
- Positioners certified SIL 3 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
  - Backlighted LCD with clear messages
  - Timer for last PST done

PST running

PST good

PST failed or stuck valve

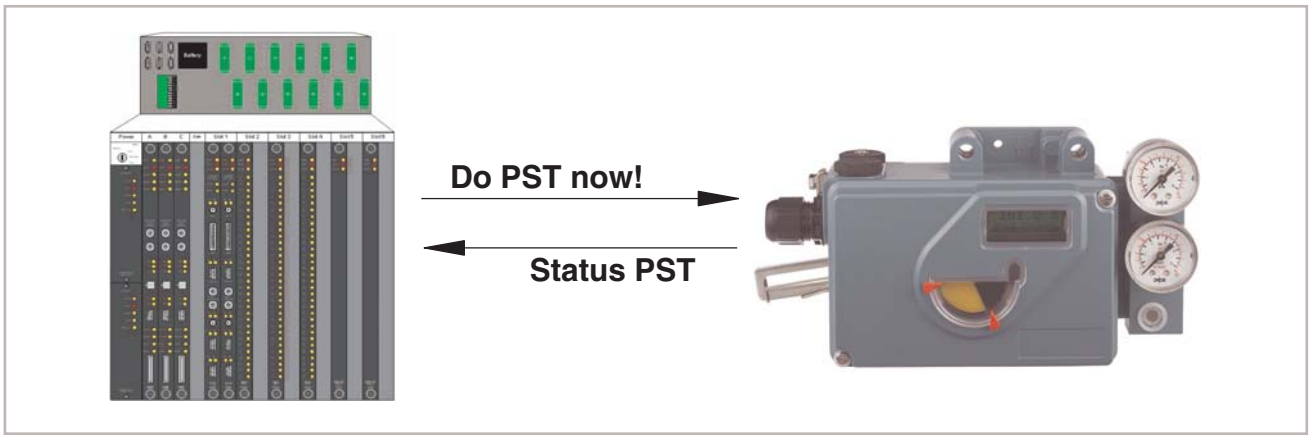
Invensys Partial Stroke Testing Solution

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 can show the tendency to get stuck and as a result may not operate upon 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 the high level of safety as described by IEC 61508 and IEC 61511.



Sequence of events inside the Triconex memory, for a safe tracability of all done tests.

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

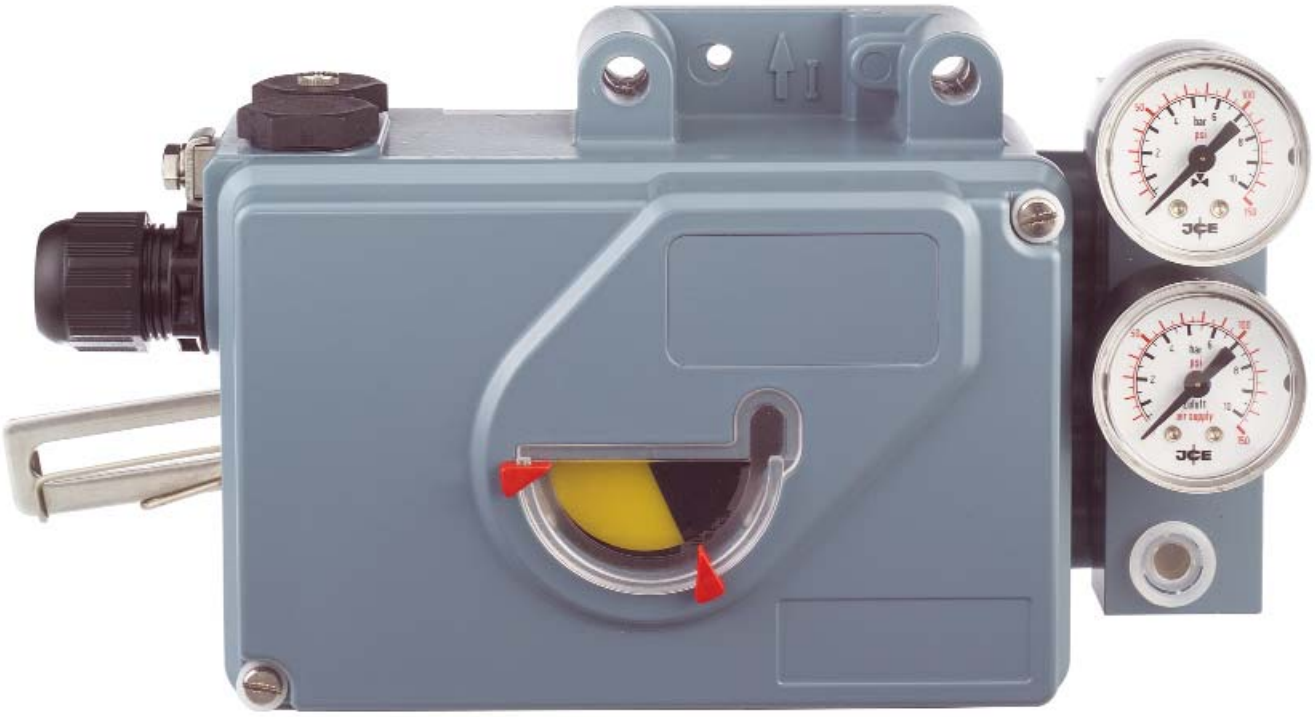
Date	Time	Alias	TagName	Variable State	Node
12/07/2006	11:58:13.805	10003	PST_LAUNCH	TRUE	01 - trinode01
12/07/2006	11:58:26.456	10003	PST_LAUNCH	FALSE	01 - trinode01
12/07/2006	11:58:26.856	10001	PST_STATUS	TRUE	01 - trinode01
12/07/2006	11:58:26.856	15001	PST_COMPLETED	TRUE	01 - trinode01
12/07/2006	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 behavior
- 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 4-20 mA
  - Manifolds for gauges and boosters

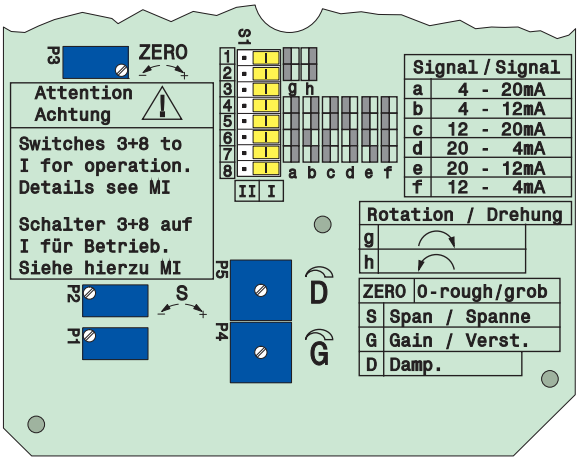
Optional Stainless Steel housing.

Example for mounting on rotary actuators.

Technical Data

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

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 EEx 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		



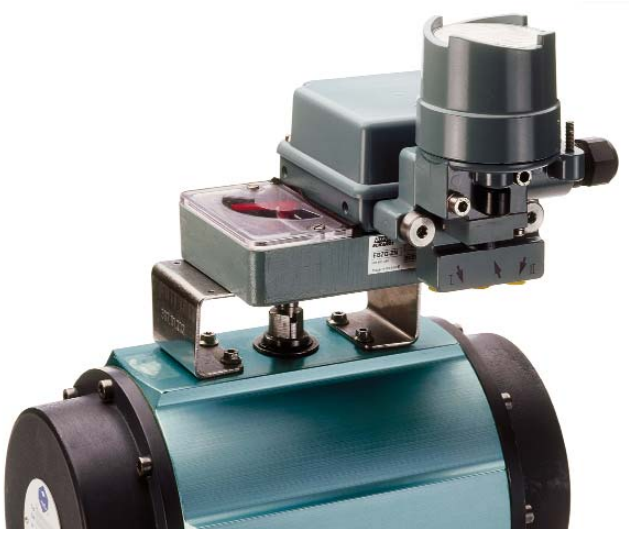
Local operation and configuration.

Electro-Pneumatic Positioner SRI983

SRI983 - The classic explosionproof application

- Analog valve control with fast control behavior
- 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 (independant from positioner)
  - Fail Freeze block relay

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



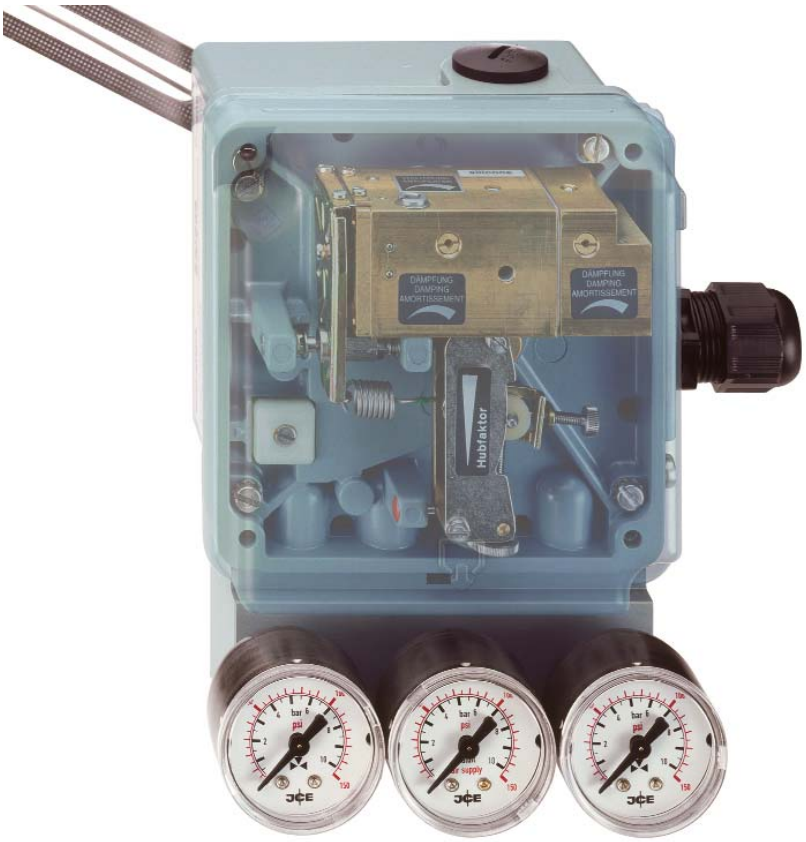
Example for mounting on rotary valves.

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 EEx d IIC T6
	FM and CSA	“explosion proof” 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 Mio. applications worldwide!

- Analog valve control with fast control behavior
- 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.

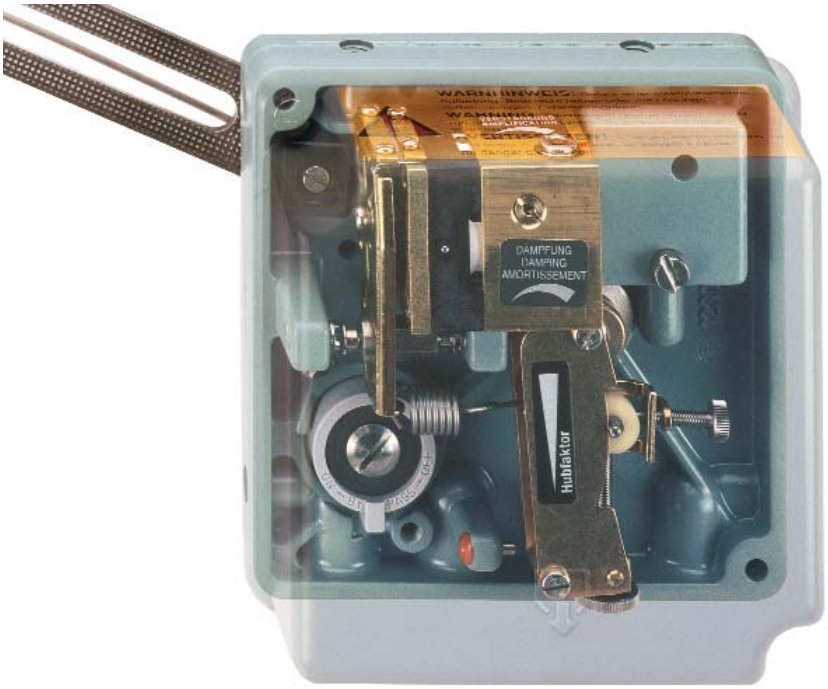
Example for mounting on rotary valves.

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 EEx 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 from 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 behavior
- 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 actuators.

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 EEx ia/intrinsic safety.
It is used to reduce the adverse effects of valve friction, for higher thrust and shorter positioning time.
By the employment of durable pneumatic components an extraordinary reliability and economy is reached, also under difficult climatic conditions.

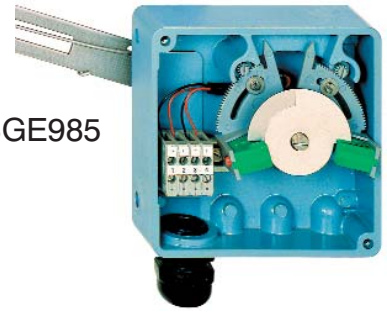
Technical Data

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 EEx c IIC T6
Accessories	ATEX	“intrinsic safety” II 2 G EEx 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
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
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

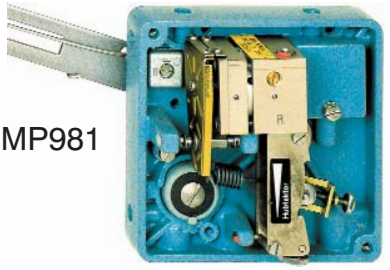
Limit switch unit
With Intrinsically safe certification SGE985
With Explosion Proof certification SRD960-TxT/U/R/V
Inductive NAMUR
Inductive NAMUR increased safety (SIL3)
3 wires type PNP
Micro Switches
For rotary actuator up to 180° rotation
For linear actuator up to 260 mm stroke with standard lever

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

SMP981



4-20 mA position feedback
With Intrinsically safe certification SMI983 and SRI990-TxQ
With Explosion proof certification SRD960-TxQ
Output 4-20mA
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 4-20 mA
Output 3-15 psi / 0.2-1 bar
In field housing up to IP65

Filter regulator
FRS series
Input up to 15 bar
Output 0-6 bar
Special application for pure Oxygen possible
Stainless steel version available

Volume Booster
LEXG-F / G / X / Y
High Flow Volume booster
Available with SIL 3 certification

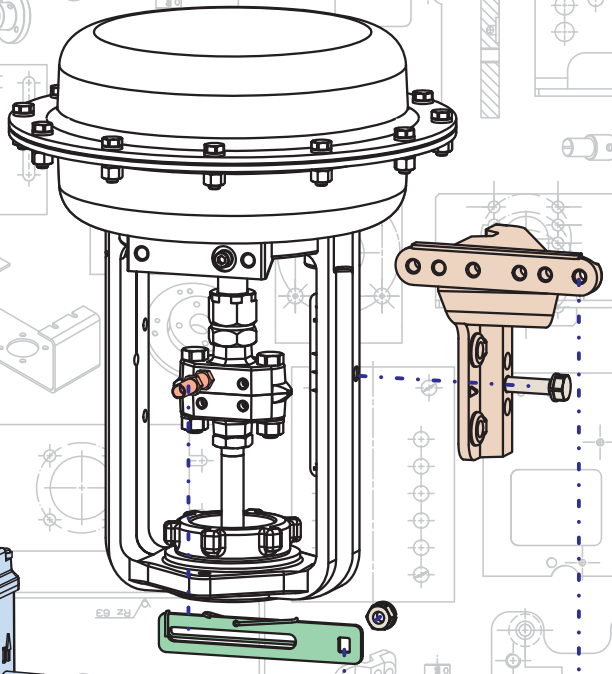
Lock-in / Fail Freeze unit
LEXG-VRx
Fail in place unit in case of lost of air supply (Lock-in)
Fail in place unit in case of lost of air supply and electrical signal (Fail Freeze)
Certified Intrinsically safe / to be use in combination of Analog positioner

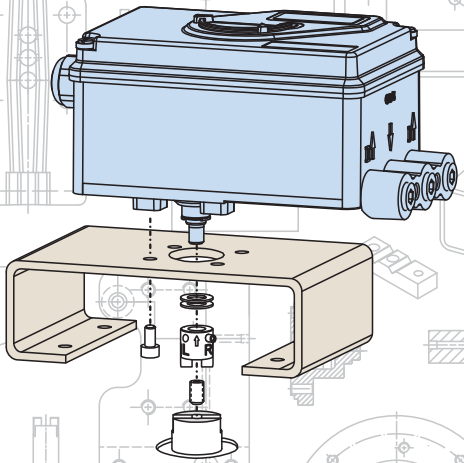
Attachment kits

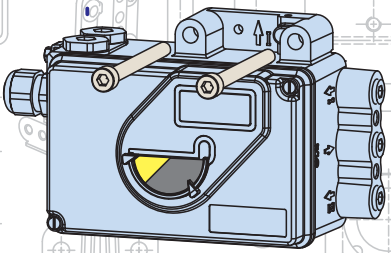
Foxboro Eckardt Positioners can be mounted onto any actuator / valve thanks to a wide range of Attachment kits.

For all linear actuators (diaphragm, piston, cylinder) we have the right solution.

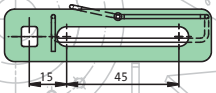
For any Rotary actuator we can provide coupling part and mounting bracket.



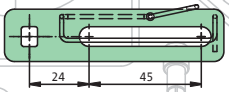




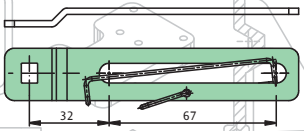
EBZG-A2
Extra short feedback lever for stroke 5 to 15 mm



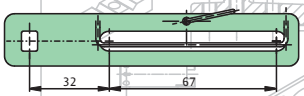
EBZG-A4
Short feedback lever for stroke 8 to 35 mm



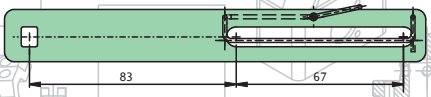
EBZG-A3
Feedback lever for stroke 8 to 70 mm



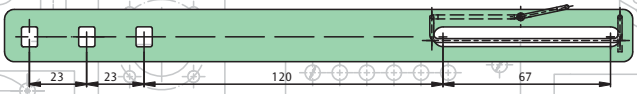
EBZG-A
Feedback lever for stroke 8 to 70 mm



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

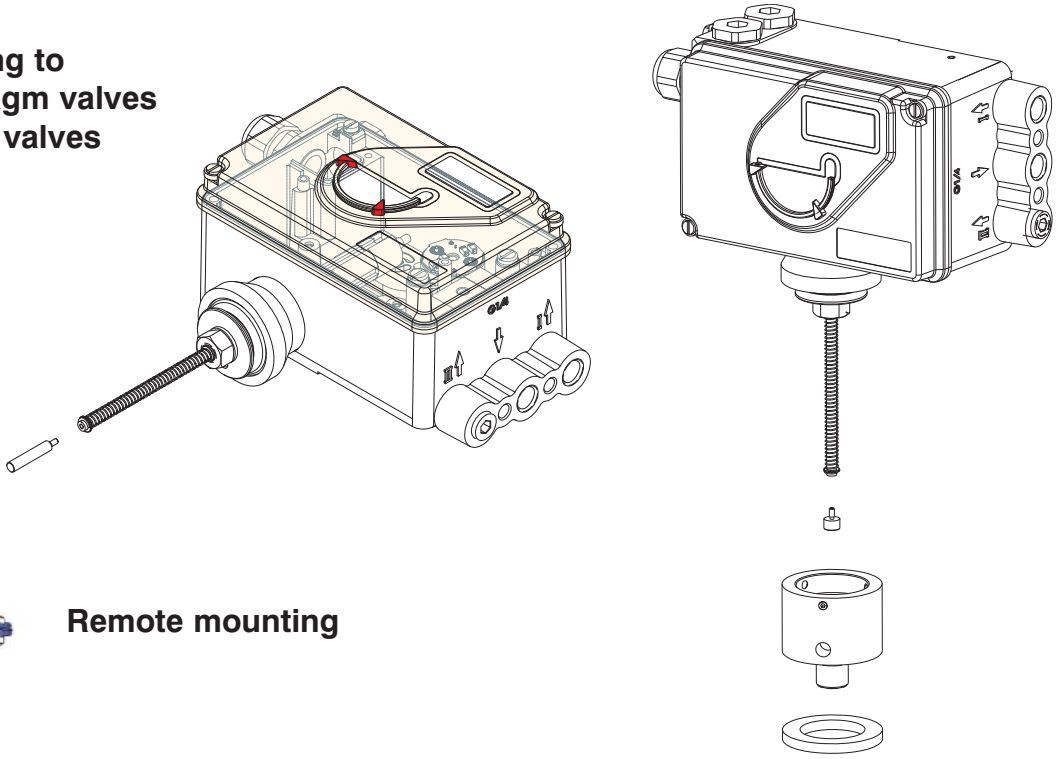


EBZG-A1
Extended feedback lever for stroke 110 to 260 mm

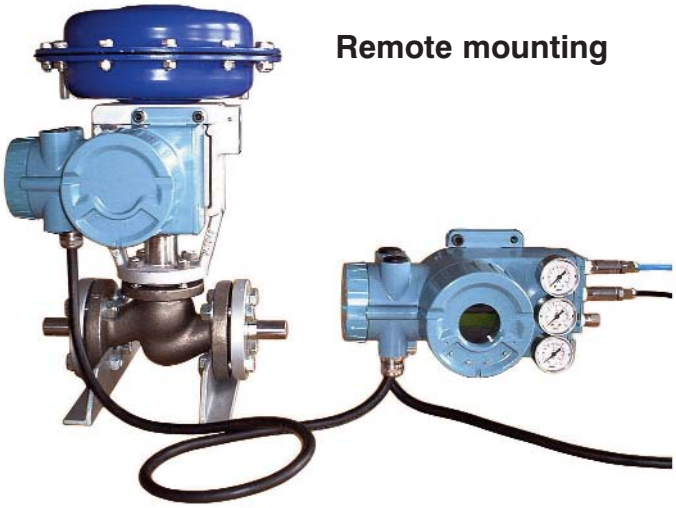


Special versions

Easy mounting to small diaphragm valves or angle seat valves



Remote mounting



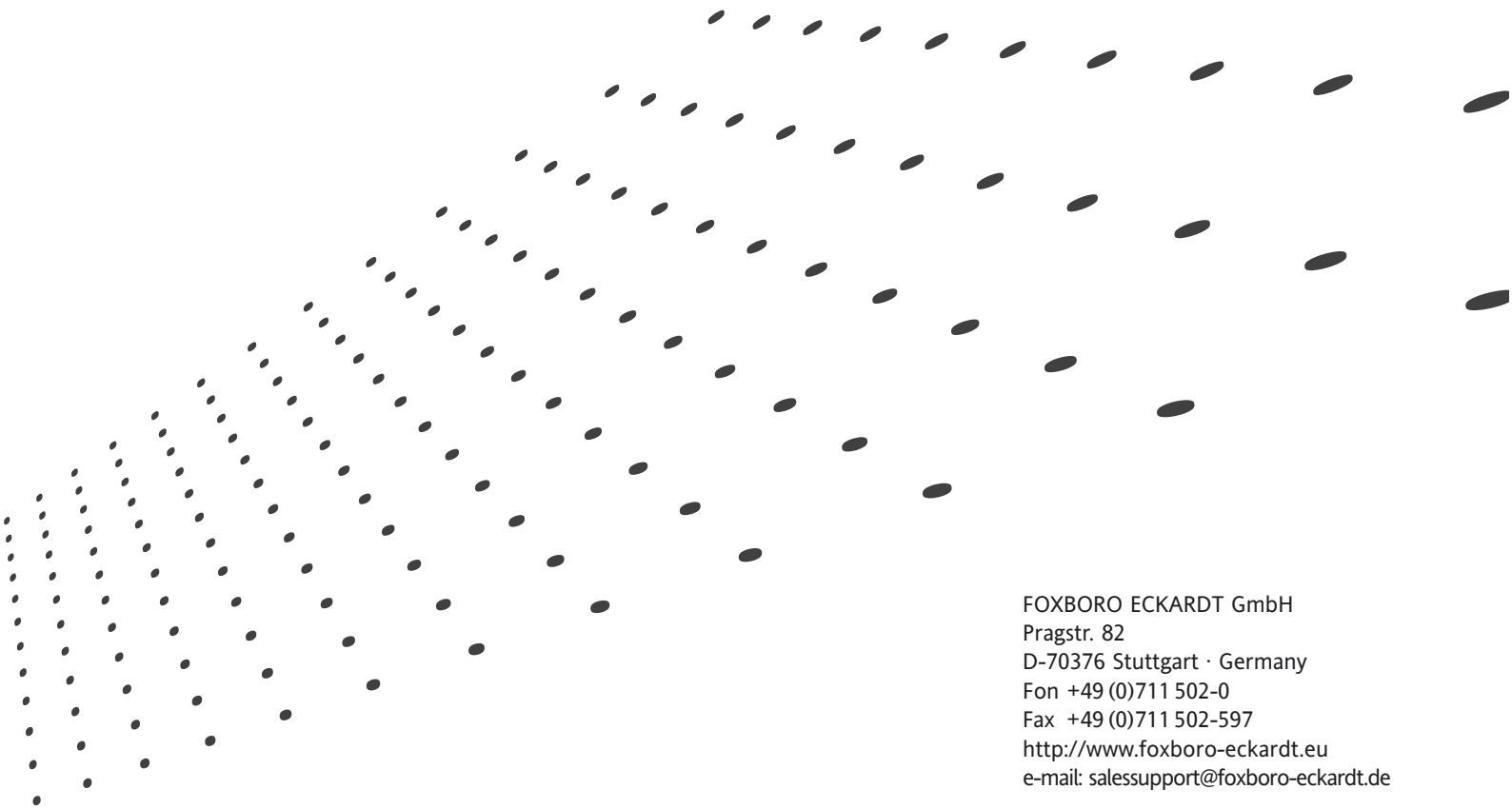
This remote application is used in applications where high temperatures or vibration are present and can result in negative influences to the control. It can also be used in places that are not easy to reach, to ensure an easier handling of the unit, or for a cylinder with large stroke.

The Positioner SRI990 / SRD991 / SRD960 (Remote unit) is mounted far away from the valve or cylinder in a safe environment.

The Potentiometer unit is mounted on the valve or cylinder. This potentiometer unit can be made of a derivate version of our SRI990 /SRD960 positioner (only potentiometer in the housing) or of an external potentiometer like a linear potentiometer for application onto cylinder, for example.

FEATURES

- Remote unit (unit mounted far away from the valve)
- Intrinsic Safety (SRD991 or SRI990) or Explosion Proof (SRD960)
- All communication protocols
- Option board (4-20mA position feedback, binary inputs or outputs)
- Potentiometer unit made of a SRD housing and potentiometer inside and optional features such as Limit Switches
- Potentiometer unit made of a SRD housing in Intrinsically safe version and potentiometer unit can resist temperatures of up to 100°C (212°F) as a standard
- Potentiometer unit can be made of linear potentiometer for application on cylinder or very small valve



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