

## PI991 Intelligent Positioner with HART, PROFIBUS PA, FOUNDATION Fieldbus H1 or FoxCom for EEx ia Intrinsically Safe Applications

### DESCRIPTION

The microprocessor controlled positioner PI991 is designed to control pneumatic valve actuators and can be operated locally or by means of control systems. The advanced diagnostic can be partially shown on the local LCD of the positioner or fully on a PC or a DCS workstation with a DTM based software (VALcare or Valve Monitor). The positioner is available with different communication protocols. This includes versions with analog setpoint (4 to 20 mA) and superimposed HART- or FoxCom signal; digital with FoxCom protocol, or fieldbus communication according to PROFIBUS-PA and FOUNDATION fieldbus H1 according to IEC 1158-2 based on FISCO. The PI991 also has the capability to control a Partial Stroke Test (PST) that offers to operators a tool to identify the trouble-proof function of ESD (Emergency Shut Down) valves.



### Version “Intelligent”

- Autostart with self calibration
- Self diagnostic, status and diagnostic messages

### Version “Intelligent with Communication”

- Communication HART, FOUNDATION Fieldbus H1, PROFIBUS-PA or FoxCom
- Configuration by means of local keys, Hand Held Terminal, PC or I/A Series system or with an infrared interface by means of IRCOM

### Version “Intelligent without Communication”

- Input signal 4-20 mA

### For all Versions

- Stroke range 8 to 260 mm (0.3 to 10.2 in)
- Angle range up to 95°
- Supply air pressure up to 6 bar (90 psig), with “Spool Valve” up to 7 bar (105 psig)
- Single or double acting
- Mounting on linear actuators according to NAMUR:
  - IEC 534 Part 6
  - VDI/VDE 3847
- Direct mounting on actuators FlowPak and FlowTop
- Mounting on rotary actuators acc. to VDI/VDE 3845
- Protection class IP 65, NEMA 4X
- Explosion protection:
  - II 2 G EEx i / II 2 G EEx n (intrinsic safety) according to ATEX
  - Intrinsic safety according to FM and CSA
- Ambient temperature –40 to 80 °C (–40 to 176 °F)
- Display and Local User Interface:
  - Multilingual Full-Text Graphic LCD or LEDs
  - Status- and Diagnostic-Messages displayed on LCD
  - Easy configuration by means of 3 pushbuttons

- Mechanical travel indicator
- Suitable for safety applications up to SIL 3
- Partial Stroke Test (PST) for Emergency Shut Down applications
- Infrared Interface for wireless communication
- Stainless Steel housing for Offshore or Food and Beverage applications
- Additional Inputs/outputs (optional):
  - 2 binary outputs (limits)
  - Position feedback 4 to 20 mA, 1 Alarm output
  - 2 binary inputs
  - Built-in independent inductive limit switches (2- 3-wire) or micro switches
  - Sensors for supply air pressure and output pressure
  - Binary Inputs/Outputs dedicated to SIS logic solvers
- Accessories
  - Booster relay to minimize stroke time
  - Gauge Manifold

### Input

All “intelligent” versions are with micro controller

#### With HART communication

Two-wire system

Reverse polarity protection . . . built-in standard feature

Signal range . . . . . 4 to 20 mA

Operating range . . . . . 3.6 to 21 mA

Voltage . . . . . DC 12 to 36 V (unloaded circuit)

Max. load. . . . . 420 Ohms (8.4 V at 20 mA)

Communication signal . . . . . HART, 1200 Baud, FSK modulated on 4 to 20 mA

#### With Fieldbus communication (acc. to FISCO)

Input signal . . . . . digital fieldbus

Supply voltage . . . . . DC 9 to 32 V

Operating current . . . . . 10.5 mA  $\pm$ 0.5 mA (base current)

Current amplitude. . . . .  $\pm$ 8 mA

Fault current . . . . . base current +0 mA

(+4 mA by means of independent FDE-safety circuit)

#### PROFIBUS-PA

Data transfer . . . . . acc. to PROFIBUS- PA

profileclass B based on EN

50170 and DIN 19245 part 4

#### FOUNDATION Fieldbus H1

Data transfer . . . . . FF Specification Rev. 1.4, Link-Master (LAS)

Function blocks . . . . . AO, PID, Transducer, Resource, 2xDI, DO

#### With FoxCom communication

Operating mode digital

Input signal . . . . . digital

Supply voltage . . . . . DC 13 to 36 V

Supply current . . . . . ~ 9 mA at 24 V

Communication signal . . . . . FoxCom digital, 4800 Baud, FSK modulated on supply Voltage

## Without communication 4 to 20 mA

Two-wire system

Reverse polarity protection . . . built-in standard feature

Signal range . . . . . 4 to 20 mA

Operating range . . . . . 3.8 to 21.5 mA

Voltage . . . . . DC 8 to 36 V (unloaded circuit)

Max. load . . . . . 300 Ohms (6 V at 20 mA)

## Common data for all versions

### Supply

Supply air pressure . . . . . 1.4 to 6 bar (29 to 90 psig)

with spool valve . . . . . 1.4 to 7 bar (20 to 105 psig)

Supply air quality . . . . . according to ISO 8573-1

Max. particle size and density . . Class 2

Max. oil contents. . . . . Class 3

### Response characteristics

Min. Sensitivity. . . . . <0.1% of travel span

Non-linearity

terminal based adjustment. <0.4% of travel span

Hysteresis . . . . . <0.3% of travel span

Supply air dependence. . . . . <0.1%/1 bar (15 psi)

Temperature effect . . . . . <0.3%/10 K

Mechanical effect

10 to 60 Hz up to 0.14 mm,

60 to 500 Hz up to 2 g . . . <0.25 of travel span

### Pneumatic connection

NAMUR mounting . . . . . 3x female threads 1/4-18 NPT or G1/4 for pipe diameter 6 to 12 mm (0.24 to 0.47 in)

Direct mounting . . . . . Instead of output y1 an air connection on the backside with O-ring is used (closed at NAMUR mounting).

### Electrical connection

Line entry . . . . . 1 or 2 cable glands M20 x1.5  
or 1/2-14 NPT (with Adapter) (for additional Adapter see AD-...)

Cable diameter . . . . . 6 to 12 mm (0.24 to 0.47 in)

Screw terminals . . . . . 2 terminals for input,

4 terminals for additional inputs/outputs

Wire cross section 0.3 to 2.5 mm<sup>2</sup> (AWG 22-14)

Test Sockets . . . . . for connection of communicator

### Technical Data for 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 (others with Adapter AD...)