Masoneilan

a Baker Hughes business

SVI™ II APN Nuclear Qualified Positioner

Advanced Performance Digital Valve Positioner

The **Masoneilan**™ SVI II APN is an Advanced Performance positioner with **HART**™ protocol, local display and push buttons for single- and double-acting pneumatic control valves. Its universal and modular design with proven non-contact position sensor fits many applications, offering high performance valve control with real-time diagnostics.

Key Features

- Field-proven non-contact position sensor
- Universal design for linear and rotary valve applications
- External LCD and push buttons
- Setup Wizard for quick and easy commissioning
- Offline and online diagnostics
- Two (2) configurable and built-in isolated solid-state switches
- Position transmitter 4-20 mA output
- HART communicating
- Universal label with ATEX, FM, FMc, IEC … approvals
- **ValVue**™ communication software
- Robust housing made of anodized aluminum

Benefits

- Faster commissioning and start up of control valves
- Accurate and reliable valve positioning
- Bi-directional communication for local or remote setup
- Integration with many control systems and asset management software
- Optimized performance regardless of actuator size

Nuclear Specific Qualifications

Environmental Parameter	Specification
Service Temperature	-20° to 55°C (-4° to 131°F)
Shelf Life	5 years at 30°C (86°F)
Abnormal Temperature and Humidity (EPRI TR-107330)	90% RH @ 55°C (140°F) for 48 Hours
Ambient Humidity Limits	10 to 95 percent RH non-condensing
Electromagnetic Interference / Radio Frequency	Criteria A – NRC Regulatory Guide 1.180 Rev.1
Thermal Life IEEE-323, version 1983/2003	6 years @ 55°C (131°F)
Radiation	30,000 rads (+ 10%)
Vibration Aging	0.75 g sine sweep at 2 octaves/minute from 5 to 100 to 5 hz for 90 minutes in each axis
Seismic (per IEEE-382-1996 and IEEE 344-2004)	Valve or structure mounted RIM: 6g (up to 100 Hz) Valve or structure mounted RRS: 14g @ 5% damping 4.5 - 16 Hz

The Safety Function of the SVI II APN Nuclear positioner is:

1. Receive a set-point from a controller, measure valve position, and provide an output pressure to an actuator to position a valve according to that set-point.
2. In an accident condition,
   a. Single-Acting configuration; on loss of air supply or on loss of electrical power, the output pressure goes to zero psig
   b. Double-Acting configuration; on loss of air supply, actuator 1 output pressure is equal to or below actuator 2 output pressure;
   c. Double-Acting configuration; on loss of electrical power, the output pressure differential between actuator 1 and actuator 2 is equal to the smaller of the supply pressure or 80 psig;

Specifications

Safety Compliance
- SIL2 Self compliance per IEC61508 section 2-3

Diagnostics
- 5 Pressure sensors (supply, I/P, P1, P2, atmospheric)
- Total travel and number of cycles
- Valve operations (time open/time close/time near closed)
- Offline control valves signatures with ValVue Suite or Advanced DTM
- Online valve diagnostics and friction analysis using with ValVue OVD software

Materials
- Case/cover:
  - Aluminum ASTM 360
  - Paint (2): Grey polyurethane (category C4 per ISO 12944-2)
- I/P Transducer and relay are constructed of composite polymers and stainless steel (300 and 400 Series)

Input Power and Signal
- Power supply (taken from 4-20 mA)
- Required terminal voltage: 9 Vdc at 20 mA
- Minimum current signal: 3.2 mA

Output Signals
- Valve position: 4-20 mA – Two wire loop powered with 10-24Vdc compliance voltage
- Two configurable digital contacts – 1 A, 30 Vdc

Input Signals
- Valve setpoint: 4-20 mA, 450 Ohms input resistance
- Remote position sensor: 1 kOhms

Communication
- HART revision 5 or 6 protocol
- Open technologies: eDDL, DTM, plug-in and snap-on applications, wireless
- Field or remote communication with true control system integration

Actuator Travel Range
- Linear motion: 0.25" to 4" (6.4 to 100 mm) – standard mounting
- >4" (100 mm) – extended mounting
- Rotary motion: 18 to 140 degrees
- Travel sensor resolution: 0.0015 percent

How to Specify (model)

Positioner IEEE qualified – single-acting:	SVI II-31123126
Positioner IEEE qualified – double-acting:	SVI II-32123126
Remote positioner sensor (non qualified):	RPS3M (3 m cable)
	RPS10M (10 m cable)
	RPS25M (25 m cable)

Control Valve Mounting System:
- Material: 300 Series St. St. standard
- Valve type:
  - Linear or rotary motion control valve
  - Single- or double (3)-acting actuator
- Optional remote-mount position sensor kit:
  - Remote Position Sensor (RPS) assembly
  - Two–inch pipe mount bracket

Pneumatics
- Air Regulated and filtered per ISA 7.4
- Connections (supply and actuator): 1/4" NPT

Air Supply Pressure
- Single-acting: 20 to 100 psi (1.4 to 6.9 bar)
- Double-acting: 20 to 150 psi (1.4 to 10.3 bar)

Air Delivery and Air Consumption

Output Delivery		
Air supply	**Single acting**	**Double acting**
30 psi (2.1 bar) supply	10.0 scfm (280 l/m)	7.2 scfm (204 l/m)
60 psi (4.2 bar) supply	16.6 scfm (470 l/m)	12.8 scfm (362 l/m)
90 psi (6.3 bar) supply	23.3 scfm (660 l/m)	18.3 scfm (518 l/m)
120 psi (8.4bar) supply	NA	23.8 scfm (674 l/m)
Air Consumption		
Air supply	**Single acting**	**Double acting**
30 psi (2.1 bar) supply	0.212 scfm (6 l/m)	0.424 scfm (12 l/m)
60 psi (4.2 bar) supply	0.282 scfm (8 l/m)	0.565 scfm (16 l/m)
90 psi (6.3 bar) supply	0.424 scfm (12 l/m)	0.847 scfm (24 l/m)
120 psi (8.4bar) supply	NA	1.06 scfm (30 l/m)

Certifications
- FM, CSA, ATEX, IEC
- Explosion proof, intrinsically safe, flame proof, nL
- Enclosure protection: NEMA 4X/IP66
- CE MARK

Performance[1] per ISA S75.13 / IEC61514

Accuracy	± 0.5 percent full
Span Linearity	± 1.0 percent full
Span Hysteresis + deadband	± 0.3 percent full
Span Repeatability	± 0.3 percent full
Span Power-up with position control	<150 ms
Power interruption without causing reset	<100 ms

1. Post cumulative aging and seismic event +/- 10% full span for each of the above performance criteria.

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