Stonel™ Prism™ linear on/off sanitary diaphragm valve controller

PI Series

Intelligent features offer advanced performance

The Stonel Prism series integrates an advanced position sensing system and integral pneumatic control for sanitary diaphragm and other linear applications.

Compact and durable, with networking/wireless capabilities, the units are suited for corrosive, heavy washdown and hazardous areas.

Advanced position sensing

With the continuous solid state mag res sensor system, the Prism series offers the ultimate in ease of set-up, reliability and consistent performance. Push button or remote setting is simple and quick with bold mechanical, as well as LED visual position status.

Integral pneumatic control in compact, vapor tight enclosure

Position sensing system and control valve are enclosed in a vaportight submersible enclosure with convenient screw on cover access. Pneumatic solenoid valve is available in standard high flow. Settings and wiring may be conveniently accessed for quick set-up and maintenance.

Compact design for convenient adaptability to linear valves

The Prism device offers precision feedback for valve stroke lengths varying from 4 mm (0.13”) up to 66 mm (2.6”). Options include three cover heights, the low profile version with no visual indicator and a medium or tall cover version both with a visual indicator. With the low profile version, the unit is less than 76 mm (3”) above actuator mounting pads and may accommodate stroke lengths up to 28 mm (1.1”).

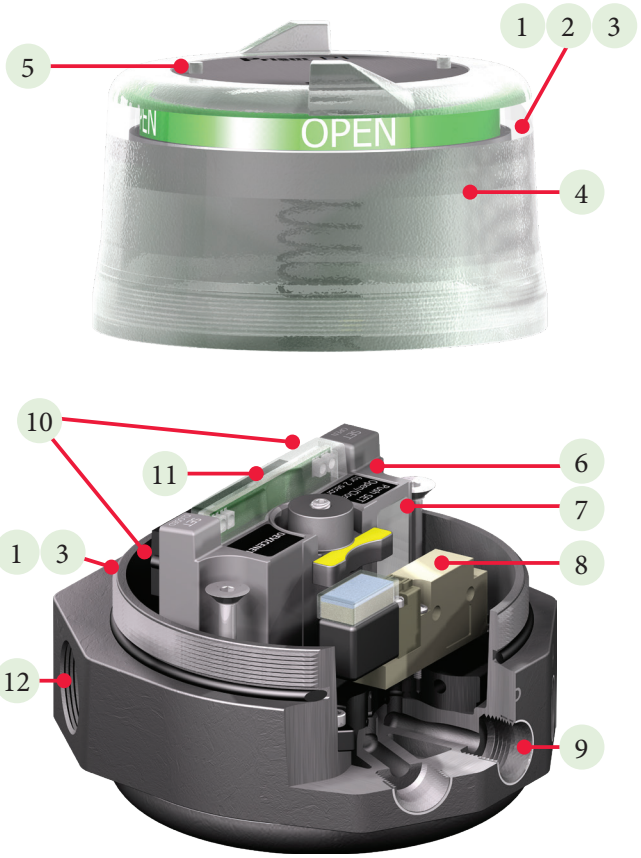
Advanced diagnostics

The Prism PI series C with IO-Link features advanced diagnostics that minimizes failure risks, optimizes maintenance and scheduling, and reduces effort needed for troubleshooting.

- Easily change diagnostic settings using the advanced configuration feature in the Stonel Wireless Link app
- Enable alarm conditions to generate an event on the IO-Link network

Features

1. **Suitable for high pressure washdown** and temporary submersion. Rated for Type 4, 4X and 6 (IP66, 67, & 69K).
2. **Screw-on cover** enables convenient access without tools.
3. **Enclosure is made of high impact strength,** corrosion-resistant polycarbonate.
4. **Prominent visual indicator** boldly displays mechanical position status.
5. **Low profile design** minimizes height clearance required above actuator.
6. **All electronics are sealed** inside the linear C-module to protect against contamination, shock and vibration.
7. **Intelligent high accuracy position sensor** is solid state with no moving parts for long life. Sensor automatically adjusts dead band based on stroke length.
8. **Integral solenoid valve** available with Cv of 0.20.
9. **NPT pneumatic connections** are stainless steel reinforced for long life sealing under high torque stress conditions.
10. **Push button open and closed** settings are made conveniently and quickly. Devices with optional Wireless Link can be set remotely with the app.
11. **LED light ba**r brightly displays open, closed and solenoid status.
12. **Conduit entries** available in NPT, metric threads or quick connectors.

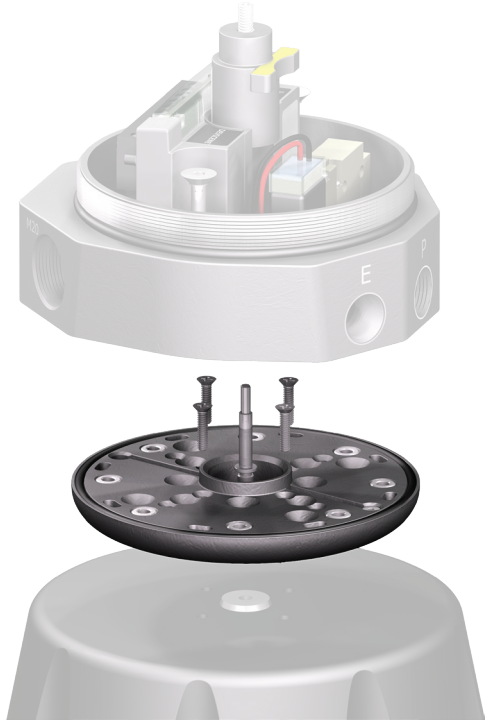


Prism mounting system

Prism adapting systems are designed for each actuator using a standardized system that minimizes the required space envelope. Mounting components include:

- Standardized rugged mounting plate allowing for rotational flexibility and compact secure attachment.
- Actuator fasteners made of stainless steel and tailored for each specific mounting application.
- Shaft coupler made of stainless steel and designed to conveniently attach the magnetic trigger to actuator shaft.

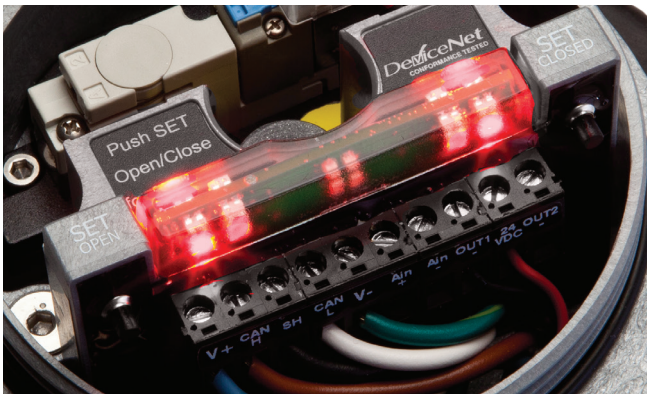
Complete mounting adaption is performed in minutes! With no moving wear-parts long-life is assured. And, the trigger system is impervious to thermal shock and vibration.



Position sensor module

The Prism features an intelligent linear magnetic resistive sensor system to precisely measure stroke position at all times.

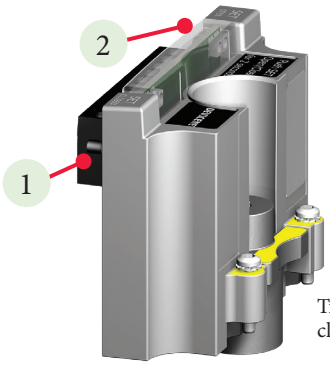
- High accuracy over wide operating temperature range.
- Automatic tuning of open and closed deadband depending on stroke length (See below).
- High intensity LEDs in module light bar which reflect on enclosure cover for visibility of switch status even in brightly lit areas.
- Fully potted and sealed making it resistant to high G vibration forces and moisture.
- Convenient, simple push button settings accurately locking in open and closed positions, which remain in place when power is removed and reapplied.



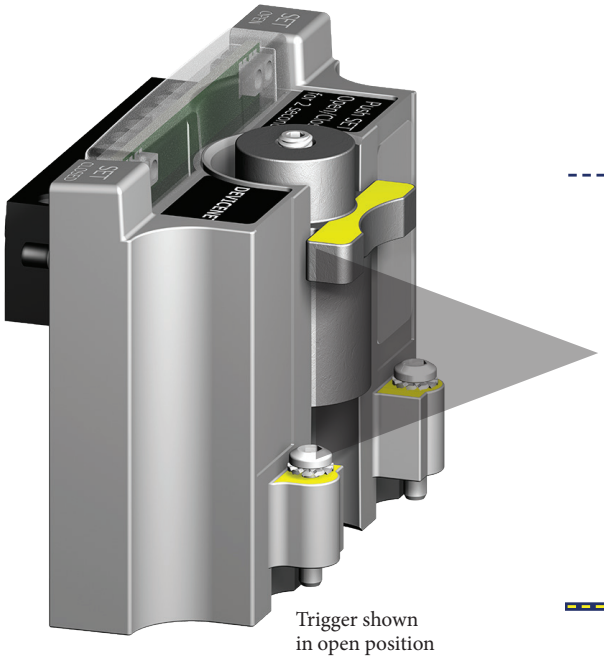
Convenient push button settings and high intensity LEDs

Automatic tuning

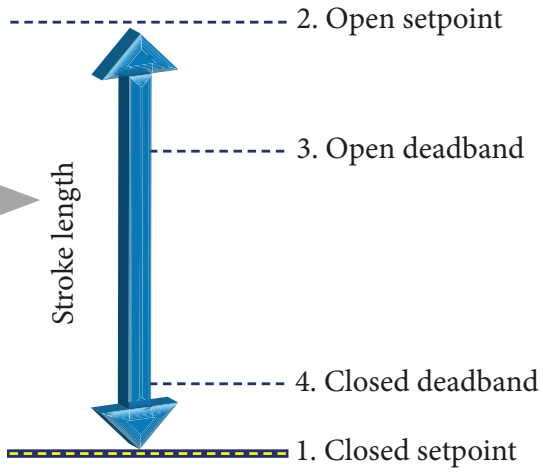
The intelligent sensing system offers precise feedback. Set-up is performed in seconds with high precision in the closed position and no false switching in varying open positions.



Trigger shown in closed position



Trigger shown in open position



Easy set-up

1. Push button to set closed (2 seconds).
2. Push button to set open (2 seconds).
3. Open deadband is automatically set to 30% of full stroke length, eliminating false switch feedback from “floating” due to pressure variations.
4. Closed deadband is automatically set to 3.8 mm (0.150”), or 30% of stroke, whichever is less, providing precise closed indication.

Sensing and communication modules

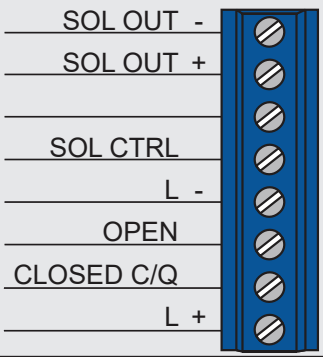
The Prism features our linear module system with field proven reliability in all on/off applications. Outputs are available as 3-wire PNP/NPN, IO-Link, SST (switching) and VCTs (valve communication terminals).

Modules have a **five year warranty.**

Specifications, 30S, 30W (3-wire with IO-Link)	
Configuration	(2) 24 VDC N.O. solid state sensors. Self-learning outputs for NPN/PNP/ Sinking/Sourcing PLC input cards.
	(1) 24 VDC output for external solenoid. Self-learning control input for NPN/PNP/ Sinking/Sourcing PLC output cards.
Voltage range	18 - 30 VDC
Minimum on current	2.0 mA
Maximum continuous current	0.1 amps
Maximum leakage current	0.0
Maximum voltage drop	0.1 volts @ 10 mA 0.5 volts @ 100 mA
Operating power (1 LED "ON" Solenoid "OFF")	0.7 watts
Operating power (coil energized)	1N solenoid: 1.5 watts (Notice: for 80 ms after energizing solenoid, operating power increases to 4.8 watts max.) 1K solenoid: 1.7 watts External 2 watt solenoid: 2.9 watts
Circuit protection	Protected against short circuits and direct application of voltage with no load.
Output Specifications	
Solenoid input voltage	18 - 30 VDC
Solenoid output voltage	24 VDC
Solenoid output current	85 mA
Solenoid output power	2.0 watts
Circuit protection	External solenoid output is short circuit protected
Wireless link features (30W)*	Allows Set Open / Set Closed Advanced configuration Stroke times *(Only functions when attached to external solenoid)* Valve Position graph Lifetime Cycle Count *(non-resettable)*

3-Wire

IO-Link

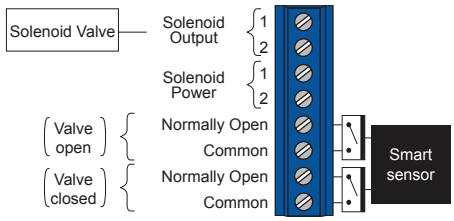


Switching and sensor specifications

SST switching sensors (33S & 33W)	
Configuration	Linear solid state sensors (2) Wire terminations for one solenoid
Operation	Select NO (33) model
Maximum current inrush	1.0 amp @ 125 VAC/VDC
Maximum current continuous	0.10 amp @ 125 VAC/VDC
Minimum on current	2.0 mA
Maximum leakage current	0.5 mA
Voltage range	20 - 125 VAC/VDC
Maximum voltage drop	6.5 volts @ 10 mA 7.5 volts @ 100 mA

Wiring diagram (33)

SST

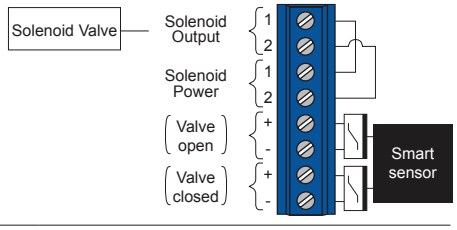


Sensor specifications

NAMUR sensor (45)	
Configuration	(2) NAMUR sensors (EN 60947-5-6; I.S.) Wire terminations for one solenoid
Operation	Normally closed NAMUR sensors (solid state)
Voltage range	5 - 25 VDC
Current ratings	Target on I<1 mA Target off I>3 mA

Wiring diagram (45)

NAMUR



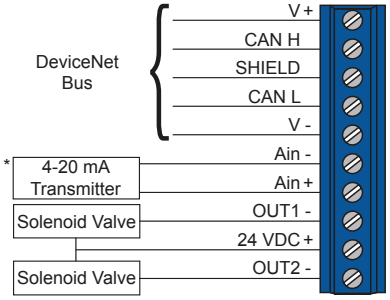
Valve Communication Terminal (VCT) specifications

DeviceNet™ (92S & 92W)

Configuration	92W 92W	(2) Discrete inputs (open and closed) (2) Remote sensor settings (1) Wink feature (2) Power outputs (solenoids) (1) 4-20 mA auxiliary analog input, 10-bit resolution; no additional power source required
Transmission rate		Software selectable 125K, 250K or 500K baud
Messaging		Polling, cyclic and change of state
Outputs		4 watts @ 24 VDC both outputs combined
Output voltage		24 VDC (with input voltage ranging from 10 - 24 VDC)
Other features		Predetermined output fail state

Wiring diagram (92S & 92W)

DeviceNet



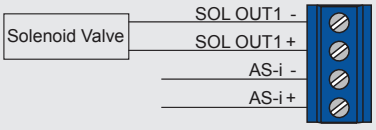
* 4-20 mA transmitter not included

Valve Communication Terminal (VCT) specifications

AS-Interface (96S) and AS-Interface with extended addressing (97S & 97W)

Configuration		(2) Discrete sensor inputs (1) Power output (solenoid)
Maximum current		167 mA
Output voltage		21 - 26 VDC
Profile	96 97	ID=F, IO=7; (4DI/4DO) ID=A, IO=7; (4DI/3DO)
AS-i version		3.0
Devices per network	96 97	31 62
Features	96 97	Wink and remote setting Wink

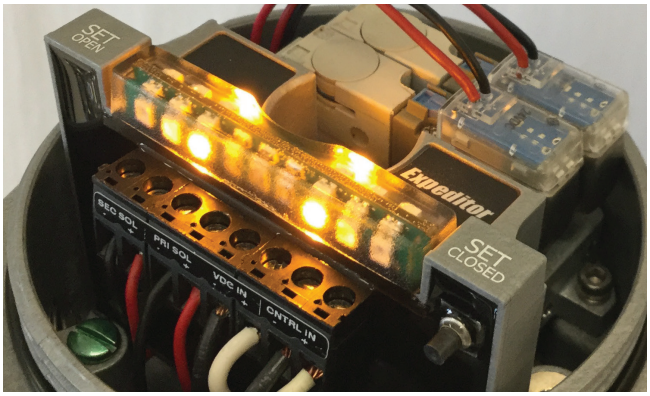
Wiring diagram (96S) and (97S & 97W)



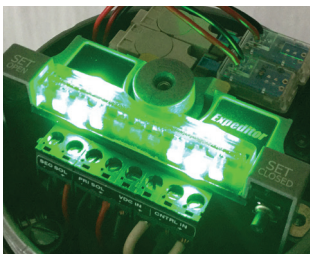
Expeditor

The Prism Expeditor features an intelligent linear magnetic resistive sensor system to precisely measure stroke position at all times and provides control signals to the solenoid control.

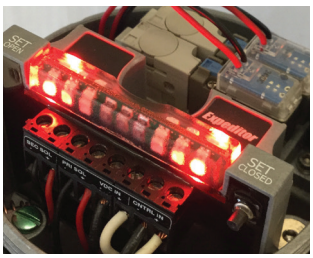
- High accuracy over wide operating temperature range.
- Automated teach function to tune control algorithm to the specific actuator.
- High intensity LEDs in module light bar which reflect on enclosure cover for visibility of switch status even in brightly lit areas.
- Fully potted and sealed making it resistant to high G vibration forces and moisture.
- Convenient, simple push button teach settings may be done by simply removing the cover. Or with the Wireless Link maybe be set-up remotely.



Intermediate position



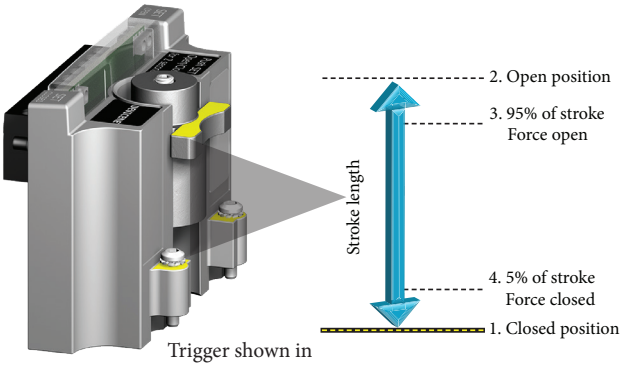
Open position



Closed position

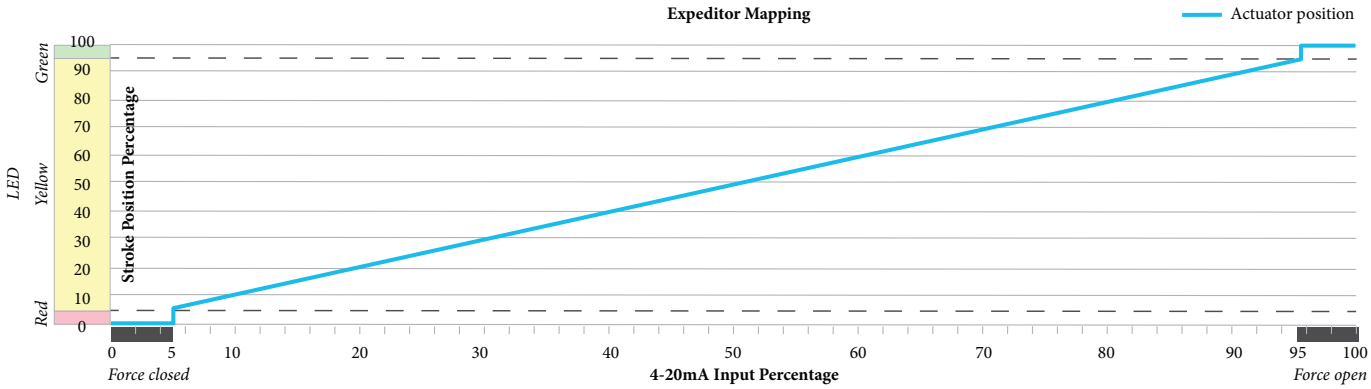
Positioner operation

The expeditor's position control is directly proportional to the input signal from 5% to 95% (4.8 mA to 19.2 mA). When the input signal is less than 5% (4.8 mA),the actuator is driven closed. When the input signal is greater than 95% (19.2 mA), the actuator is driven open.



Trigger shown in open position

Fig. 1.



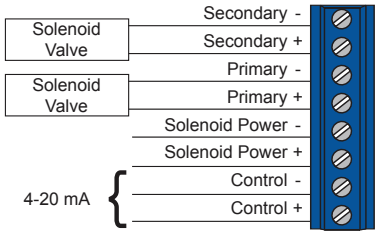
Expeditor module

Expeditor for standard stroke	
Expeditor (80S & 80W) with valve size (SA)	
Solenoid voltage	24 VDC
Position control (AO)	(1) 4-20 mA loop, 9 - 30 VDC
LED states *(see "Fig. 1" on page <OT>)*	
Red	Closed state (current position ≤ 5% of full scale)
Yellow	Intermediate state (5% < current position < 95%)
Green	Open state (current position ≥ 95% of full scale)
Control signal *(see "Fig. 1" on page <OT>)*	
Force closed	4-20 mA signal ≤ 5% of full scale
Linear intermediate control	5% < 4-20 mA signal < 95%
Force open	4-20 mA signal ≥ 95% of full scale

Wiring diagram (80S & 80W) for valve with standard stroke

Expeditor

Specify pneumatic valve option 2KS

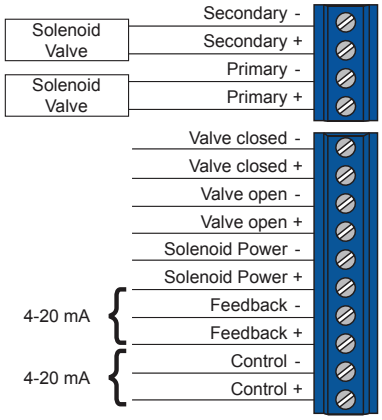


Expeditor for long stroke	
Expeditor (81S & 81W) with valve size (LA)	
Solenoid voltage	24 VDC
Position control (AO)	(1) 4-20 mA loop, 9 - 30 VDC
Position feedback (AI)	(1) 4-20 mA loop, 9 - 30 VDC
Position feedback (DI)	(2) Discrete inputs
LED states *(see "Fig. 1" on page <OT>)*	
Red	Closed state (current position ≤ 5% of full scale)
Yellow	Intermediate state (5% < current position < 95%)
Green	Open state (current position ≥ 80% of full scale)
Control signal *(see "Fig. 1" on page <OT>)*	
Force closed	4-20 mA signal ≤ 5% of full scale
Linear intermediate control	5% < 4-20 mA signal < 95%
Force open	4-20 mA signal ≥ 95% of full scale

Wiring diagram (81S & 81W) for valve with long stroke

Expeditor

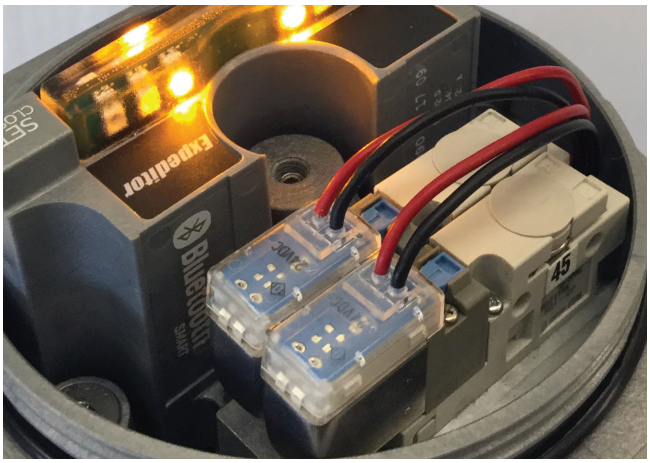
Specify pneumatic valve option 2KS



Expeditor specifications

Two three-way, two-position spring return pneumatic valves quickly and precisely operate valves to specific position in less than two seconds.

Expeditor pneumatic specifications	
2K (80_, 81_) solenoid valve	
Configuration	(2) 3-way, 2-position, spring return
Porting	1/8" NPT (stainless steel reinforced)
Operating pressure	25 psi to 140 psi
Operating voltage	24 VDC
Solenoid power	1.0 watt
Flow rating	0.2 Cv (Kv = 0.17 based on flow m3/hr)
Operating temperature	-10° C to 50° C (0° F to 122° F)
Filtration requirements	40 microns
Inrush	Negligible



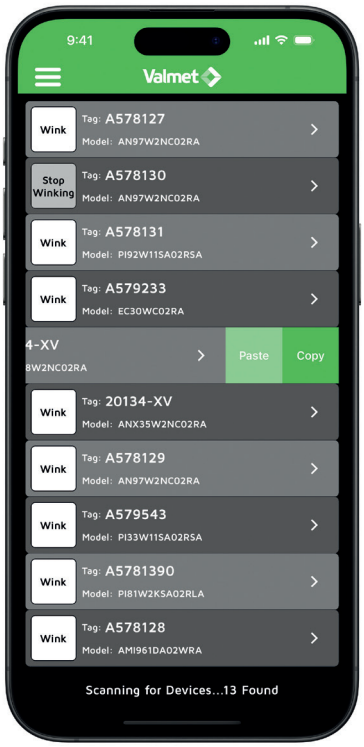
Stonel Wireless Link capabilities

Easily access hard-to-reach automated valves

Discover convenient remote access of your automated valves when you install the Prism series featuring *Bluetooth®* technology. Devices may be remotely accessed from up to 50 meters depending on obstructions. Setting changes and solenoid control are enabled through the DeviceNet or AS-Interface network or by the AS-Interface power supply jumper.

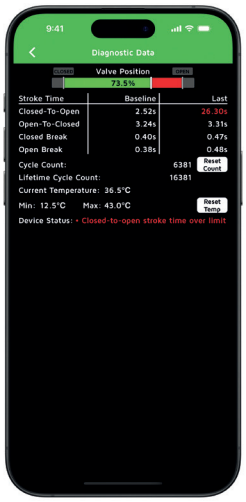
Special features

- Improve safety by easily controlling hard-to-reach automated valves without putting plant personnel at risk.
- Look up factory preset module code and serial number remotely.
- Electronically enter and store key automated valve system information including user tag and maintenance log.
- Reduce network commissioning time by accessing the VCT address to make changes.
- Reduce maintenance time by monitoring valve cycle count, cycle times, storing maintenance logs, and accessing multiple valves from one location.
- Conveniently retrieve installation manuals for additional technical information when connected to internet.



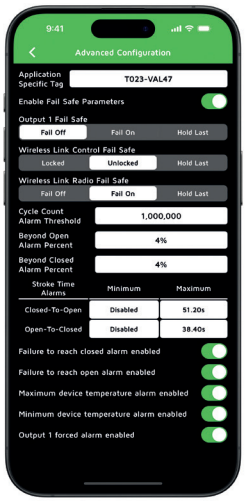
Customize the tag for a device, change the address, force the solenoids on or off, wink the device, and set the valve limits.

Operating information



Store and view additional information about a specific valve, real time valve position, cycle count, cycle timing, current valve temperature, error status, and more.

Diagnostic data



Apply fail safe settings, cycle count alarms, stroke time thresholds, and more.

Advanced configuration

Interfacing devices

Compatible with Android and iOS devices.

Download on the App Store

GET IT ON Google Play

Stonel Wireless Link User guide is available

1. By selecting the Menu option in the app
2. At https://www.valmet.com/flowcontrol/stonel-wireless-link-user-guide and
3. By scanning this QR code

Set up and operation

Devices with the wireless function are commissioned and set up identically to a standard unit. In addition, when powered up with a conventional power source or by the network, it may be accessed by standard iOS devices. The device is accessed with the Bluetooth® protocol using the Stonel Wireless Link application.

Sequence of operation is:

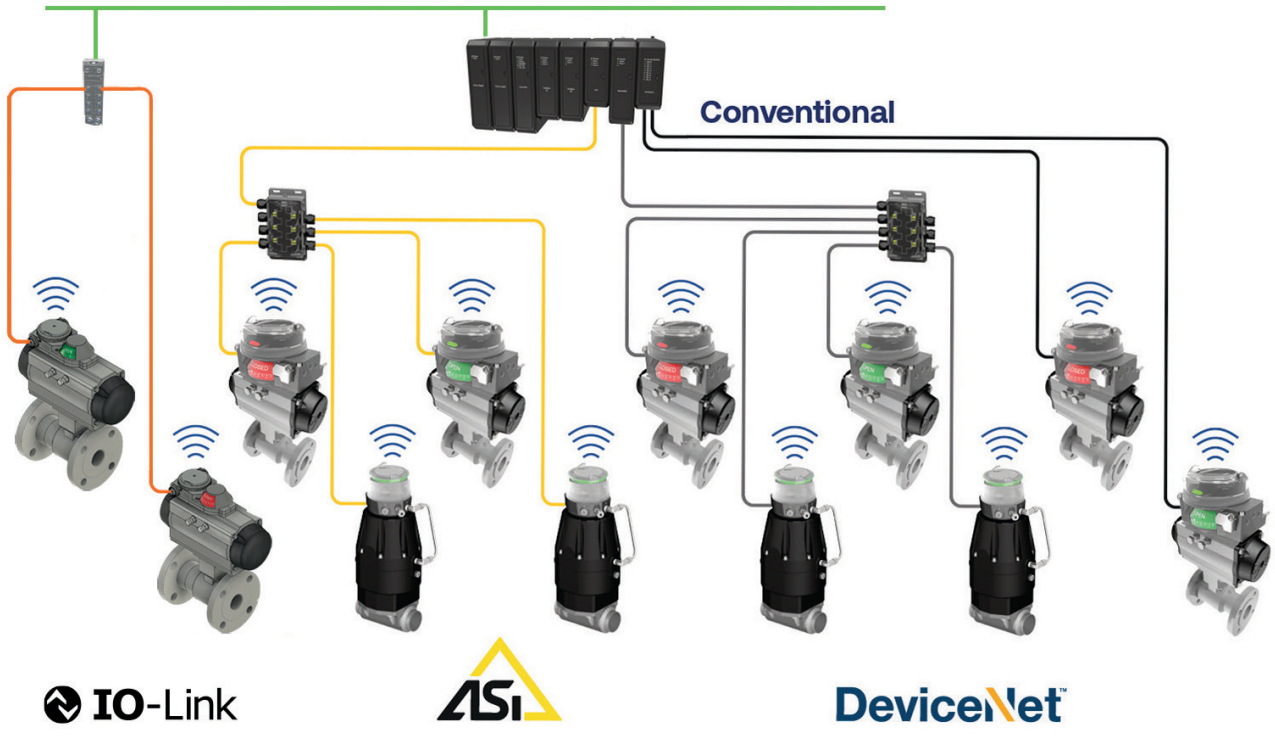
1. Download the Stonel application onto your device (free of charge)
2. Start the application in your device
3. All energized wireless modules in range will come up
4. Push wink to positively confirm the device you have linked (device LEDs will flash)
5. Touch the specific ID tag to link with your handheld.

You can then monitor all status and diagnostic information and make necessary information changes to the free form fields at any time. Switch settings, address changes, and solenoid operation may be performed only if network- or power supply-enabled. Other information may also be added to the free form fields.

Specifications for Wireless Link	
Applies to functions PI30W, PI33W, PI80W, PI81W, PI92W, and PI97W	
Communication	*Bluetooth*® technology; single mode (not compatible with *Bluetooth* Classic)
Transmit power	4dBm or ~2.5 milliwatts
Data rate	1 Mbit/second; effective information transmit rate ~10 Kbits/second
Range	Up to 100 meters (330 feet) in free space. Range is reduced by obstructions between hand-held device and Wireless Link VCT. Line of site is not necessary.
Registrations	FCC, IC, CE
CE compliance	Exceeds industrial compliance standards
VCT identification	VCTs in range will be displayed
VCT link	One device accessed at a time between client (hand-held device) and server (VCT). Each server accessed by one client at a time
Application	Stonel Wireless Link available from the App store
Hand-helds	Compatible with Android and iOS devices.

Wireless Link enabled network

All settings and inputs are locked when standard network communication is functioning. For fast commissioning and asset management you can import and export electronic tags, model number, serial number, device address, descriptive fields, diagnostic data and more to and from standard CSV/Excel® files.

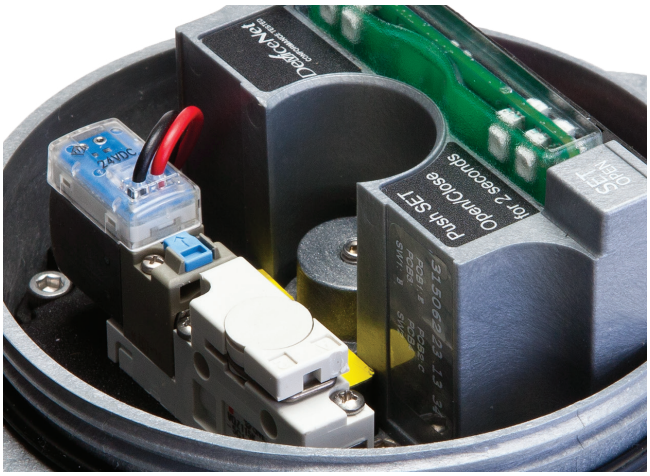


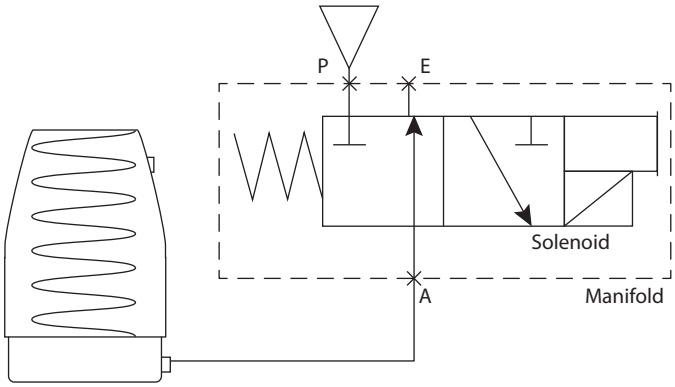
Pneumatic control and other specifications

Three-way, two-position spring return pneumatic valve features a standard Cv of 0.1 or 0.2, operating most actuators in less than two seconds. The valve is completely isolated from the environment enabling pneumatic control to be located in the field with no threat of contamination.

Solenoid valve

This high flow solenoid valve operates at low power and is well-suited for most applications. It features a convenient manual override for stroking during set-up and commissioning.





Valve schematic

General pneumatic valve specifications	
Configuration	3-way, 2-position, spring return
Type	Direct acting
Porting	1/8" NPT (stainless steel reinforced)
Operating pressure	25 psi to 120 psi (1.72 to 9.65 bar)
Operating life	1 million cycles
Manual override	Internal momentary
Solenoid coil specifications	
1K (33_, 92_, 96_, 97_)	
Operating voltage	24 VDC
Power consumption	1.0 watt
Flow rating	0.2 Cv (Kv = 0.17 based on flow m3/hr)
Operating temperature	-10° C to 50° C (14° F to 122° F)
Filtration requirements	40 microns
1M (33_)	
Operating voltage	120 VAC
Power consumption	1.0 watt
Flow rating	0.2 Cv (Kv = 0.17 based on flow m3/hr)
Operating temperature	-10° C to 50° C (14° F to 122° F)
Filtration requirements	40 microns
1N (33_)	
Operating voltage	20 - 125 VAC; 20 - 55 VDC
Power consumption	12 mA @ 20 - 125 VAC (1.0 watt typical) 20 mA @ 20 - 55 VDC (0.5 watts typical)
Flow rating	0.1 Cv (Kv = 0.08 based on flow m3/hr)
Operating temperature	-20° C to 60° C (-4° F to 140 ° F)
Filtration requirements	50 microns
1N (92_, 96_, 97_)	
Operating voltage	24 VDC
Power consumption	0.5 watts
Flow rating	0.1 Cv (Kv = 0.08 based on flow m3/hr)
Operating temperature	-20° C to 60° C (-4° F to 140 ° F)
Filtration requirements	50 microns
1N (45_)	
Operating voltage	18 - 28 VDC
Power consumption	0.3 watts
Flow rating	0.1 Cv (Kv = 0.08 based on flow m3/hr)
Operating temperature	-20° C to 60° C (-4° F to 140 ° F)
Filtration requirements	50 microns
Entity parameters	Ui=28 VDC, Ii=120 mA, Ci=3 nF, Li=0 mH, Pi=0.84 W

Specifications

Materials of construction		
Cover	Clear polycarbonate	
Housing and mounting manifold	Fiber reinforced polycarbonate	
Fasteners	Stainless steel	
Valve manifold	Integral with stainless steel reinforced NPT	
Trigger system (magnetic)	Polysulfone with black chromated zinc reinforcement	
Position sensor system		
Accuracy	1.0 mm (.040")	
Repeatability	0.5 mm (.020")	
Setting buffer	Open: 25% of stroke length Closed: 25% of stroke length up to 3.2 mm (.125")	
Deadband	Open: Closed:	30% of stroke length (variable; based on stroke length) 30% of stroke length or 3.8 mm (.150”) (whichever is less)

Temperature ratings (pneumatic valve dependent)		
Operating temperature	11S, _NS _KS, _MS	-20° C to 60° C (-4° F to 140° F) -10° C to 50° C (14° F to 122° F)
Operating life	Over 1 million cycles	
Warranty		
Electronic module	Five years	
Mechanical components	Two years	
Ratings		
Nonincendive *(Zone 2 or Class I and II, Div. 2)*	All models*	
Intrinsically safe *(Ex ia, Zone 0 or Class I and II, Div. 1)*	Function 45*	
Enclosure protection		
Type 4, 4X and 6	All models	
Ingress Protection 66, 67 and 69K	All models	
Approvals*	See manufacturer's website	

* Only models listed on Valmet official website are approved per specific rating.

Model selector

SERIES

PI Intelligent nonincendive

FUNCTIONS

Sensor modules

- 33S (2) SST NO switching sensors *[select pneumatic valve option 1KS, 1MS, 1NS or 11S]*
- 45S (2) NAMUR sensors (EN 60947-5-6; I.S.) *[select pneumatic valve option 1NS or 11S]*

Sensor modules with Wireless Link

- 33W (2) SST NO switching sensors *[select pneumatic valve option 1KS, 1MS, 1NS or 11S]*

Sensor/switching modules with IO-Link

- 30S (2) 24 VDC NO solid state sensors *[self-learning outputs for NPN/PNP/Sinking/Sourcing PLC input cards]* and (1) 24 VDC output for external solenoid *[self-learning control input for NPN/PNP/Sinking/Sourcing PLC output cards; available with solenoid options 1KS and 1NS]*

Sensor/switching modules with IO-Link and Wireless Link

- 30W (2) 24 VDC NO solid state sensors *[self-learning outputs for NPN/PNP/Sinking/Sourcing PLC input cards]* and (1) 24 VDC output for external solenoid *[self-learning control input for NPN/PNP/Sinking/Sourcing PLC output cards; available with solenoid options 1KS and 1NS]*

Expeditor, standard stroke

- 80S (1) 4-20mA AO for position control *[select pneumatic option 2KS and valve size SA]*

Expeditor, standard stroke with Wireless Link

- 80W (1) 4-20mA AO for position control *[select pneumatic option 2KS and valve size SA]*

Expeditor, long stroke

- 81S (1) 4-20mA AO for position control with (1) 4-20mA AI and (2) 24V DI for position feedback *[select pneumatic option 2KS and valve size LA]*

Expeditor, long stroke with Wireless Link

- 81W (1) 4-20mA AO for position control with (1) 4-20mA AI and (2) 24V DI for position feedback *[select pneumatic option 2KS and valve size LA]*

Valve Communication Terminals (VCTs)

- 92S DeviceNet™ *[select pneumatic valve option 1KS, 1NS or 11S]*
- 97S AS-Interface with extended addressing *[select pneumatic valve option 1KS, 1NS or 11S]*
- 96S AS-Interface *[select pneumatic valve option 1KS, 1NS or 11S]*

Valve Communication Terminals (VCTs) with Wireless Link

- 92W DeviceNet™ *[select pneumatic valve option 1KS, 1NS or 11S]*
- 97W AS-Interface with extended addressing *[select pneumatic valve option 1KS, 1NS or 11S]*

PNEUMATIC VALVE / TEMPERATURE

-20° C to 60° C / 0.1 Cv

- 11S No pneumatic valve
- 1NS Three-way voltage / power depends on function

-10° C to 50° C / 0.2 Cv

- 1KS Three-way 24 VDC 1.0 watt
- 1MS Three-way 120 VAC 1.0 watt
- 2KS Dual three-way 24 VDC 1.0 watt

ENCLOSURE

- A North American (NEC/CEC)
- V International (IEC)
- L Other

CONDUIT/CONNECTORS

Standard

- 01 (1) ½" NPT
- 02 (2) ½" NPT
- 04 (1) M20
- 05 (2) M20

CONNECTORS

Mini-connectors

- 10 (1) 4-pin
- 11 (1) 5-pin
- 19 (1) 6-pin

Micro-connectors (M12)

- 13 (1) 4-pin
- 15 (1) 5-pin
- 17 (1) 6-pin

VISUAL INDICATOR

- R Green open
- 0 No mechanical indication

VALVE SIZE

- SA ¼" to 2" (3.2 mm to 28.5 mm; ⅛" to 1 ⅛ " stroke)
- LA ¼" to 6" (3.2 mm to 66.8 mm; ⅛" to 2 ⅝ " stroke)

Model number example

PI	33S	1KS	A	01	R	SA	OPTIONAL

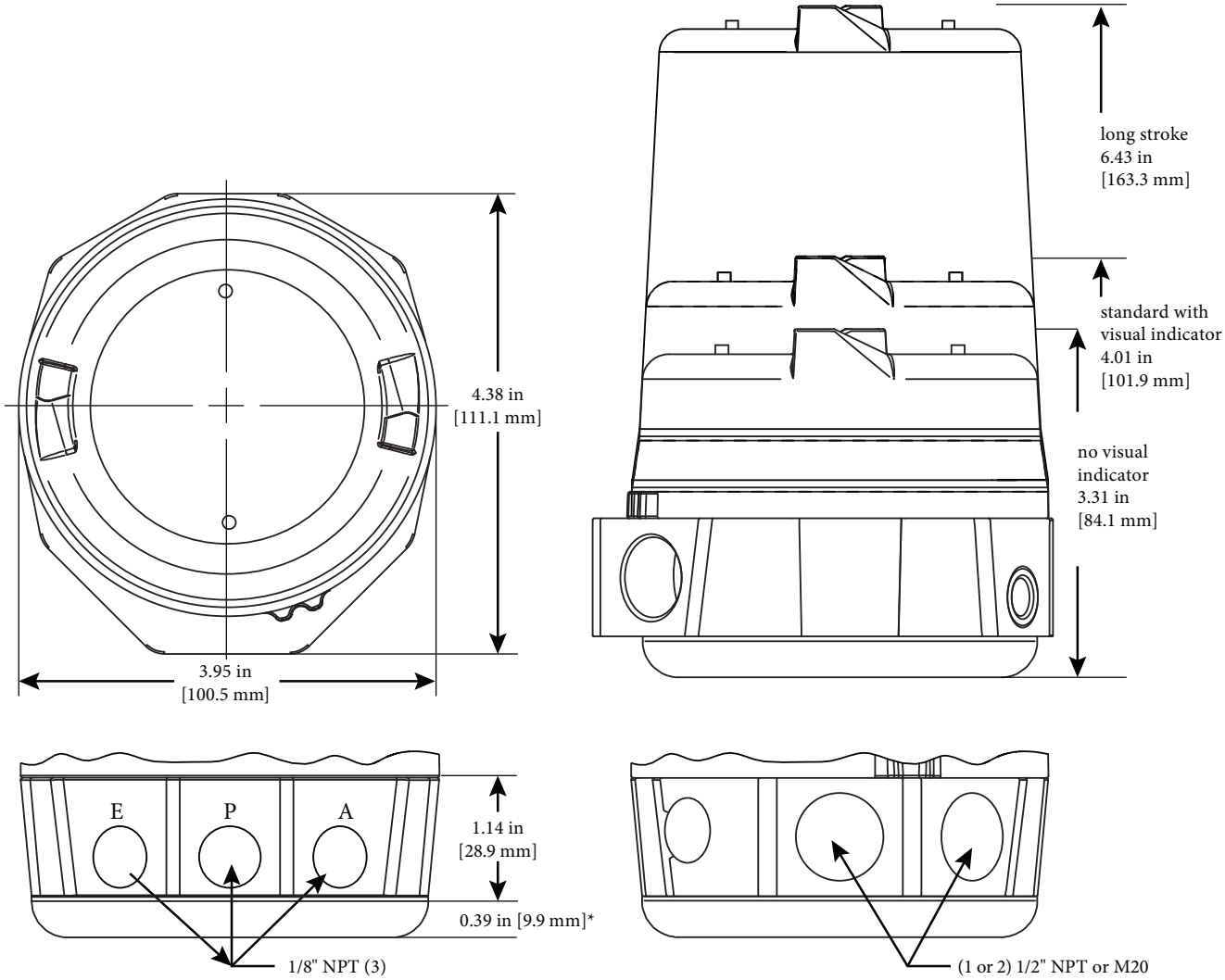
MODEL NUMBER

Mounting hardware required and sold separately.

PARTNERSHIP ID

Some models may include 5-digit identification suffix.

Dimensions



*Part of mounting system

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