Onyx

StoneL's Onyx with Cyclone integral pneumatic valve saves you valuable set up and installation time. The Cyclone is a high flow, low power pneumatic valve with the pilot solenoid or piezo protected within the Onyx Lexan® enclosure. The Onyx with Cyclone eliminates your need for junction boxes, connectors and extra wiring. Optional pre-wired quick connect cabling offers extra protection from moisture and corrosives and further reduces wiring cost.

Components Sealed Inside Enclosure

- Vapor tight seal is achieved by hand tightening the screw-on cover.
- NEMA 4, 4x, 6 & IP 67 rated to withstand severe washdown and temporary submersion environments.
- Shaft is lubricated and o-ring sealed top and bottom.
- Onyx design is streamlined to shed water and corrosive liquids.

Durable and Corrosion Resistant

- Onyx Lexan® polycarbonate is the same material used in bullet proof windows and F-16 jet canopies.
- Onyx enclosure and pneumatic valving have been tested to severe shock and vibration with no adverse consequences.
- Lexan® enclosure material is tolerant of temperature extremes of -40° C to 100° C without significantly affecting its physical properties.
- Lexan® is resistant to most acids, bases and salt solutions. A fusion coating is available to withstand organic solvents.
- External pneumatic body/manifold is available in stainless steel and 360 brass for a variety of corrosive applications.

Nonincendive and Intrinsically Safe

FM and CSA have approved the proximity sensor models for Class I & II, Division 2 areas.

The Onyx is available with or without integral pneumatic valving. Select from a variety of switch/sensor options or the dual module with sensors and/or communication capabilities.

Onyx Specifications

Materials

Enclosure	Lexan® Polycarbonate Fusion Coating Available
Seals	Viton
Shaft	Stainless Steel

Other

Temperature Range	-40° to 80°C (-40° to 176°F)
with solenoid	Max. Ambient 50ºC (120ºF)
Warranty	Two years on all mechanical parts
Enclosure Protection	NEMA 4, 4X, & 6 IP67

Approvals

Nonincendive (Proximity models only)	Class I, Div. 2 Groups A,B,C,D Class II, Div. 2 Groups F,G
Intrinsically Safe (ON44 model only)	Class I & II, All Groups, Div. 1 & 2

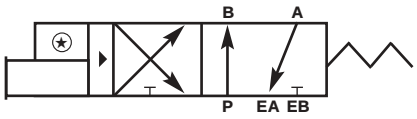
StoneL Corporation Phone: (218) 739-5774 • Toll-free: (800) 843-7866 • Website: www.stonel.com

Pneumatic Options and Specifications

Cyclone Valve

- High tolerance to dirty air.
- Available with low power and intrinsically safe solenoids.
- External manual override standard on all models.
- Features long life with special o-ring and seat design.
- Valve body available in stainless steel or brass.

Valve Schematic (Other Options Available)



Pilot Operator

Solenoid ⊛ = ▨

The Cyclone high flow valve may be pilot operated with a low power contamination tolerant solenoid poppet valve. Choose from either AC or DC 1.8 watt versions or an intrinsically safe 0.6 watt DC model.

Piezo ⊛ = ▤

For ultra low power FOUNDATION Fieldbus (FF) networking applications a Piezo pilot may be selected. The Piezo crystal operates at less than 2.0 mA at 6.5 VDC enabling it to be operated from the FF dual module without auxiliary power. Total FF dual module current consumption with the Piezo pilot is less than 16 mA allowing at least 5 units on one intrinsically safe string dramatically reducing barrier and wiring costs.

Cyclone Valve Specifications

Valve Body

Configurations (All Pilot Operated)	Single coil, 5-way, 2 position, spring return Dual coil, 5-way, 2 position, shuttle piston Dual coil, 5-way, 3 position, spring centered (blocked)
Flow Rating	Cv - 0.75 (Kv - 10.7)
Porting	1/4" NPT
Operating Pressure	25 to 120 psi (1.7 to 7.5 bar)
Filtration Requirements	40 micron
Manual Override	External
Operating Life	1 million cycles
Operating Temperature	-18° to 50° C (0° to 120° F)
Valve Body Material	360 Brass or 303 Stainless Steel

Solenoid Pilot Specifications

DC Coil Power	1.8 watts @ 24 VDC
AC Coil Inrush Current	0.09 Amps @ 120 VAC
AC Holding Current	0.06 Amps @ 120 VAC
AC Coil	Burn-out proof
Intrinsically Safe Coil	0.6 watts @ 12 VDC FM approved & CENELEC Certified

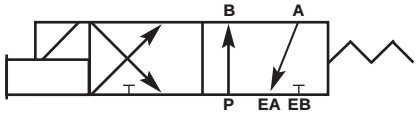
Piezo Pilot Specifications

Operating Pressure	36 to 120 psi (2.5 to 7.5 bar)
Media	Dried / filtered air (30 micron)
Operating Life	1 million cycles
Operating Temperature	-10° to 60° C (14° to 140° F)
DC Coil Power	2mA@7.5VDC
Electrical Protection	EEx ia IIC T6

Direct Acting Valve

- High tolerance to dirty air.
- Internal momentary manual override.
- External manifold available in stainless steel or brass.

Valve Schematic



Direct Acting Valve Specifications

Valve Body

Configuration	Direct Acting 5-way, 2 position, spring return
Flow Rating	Cv - 0.2 (Kv - 2.86)
Manifold Porting	1/4" NPT
Exhaust Porting	1/8" NPT
Operating Pressure	0 to 120 psi (0 to 7.5 bar)
Filtration Requirements	40 micron
Manual Override	Internal momentary
Operating Life	1 million cycles
Operating Temperature	-18° to 50° C (0° to 120° F)

Solenoid Coil Specifications

DC Coil Power	7.3 watts @ 24 VDC
AC Coil Inrush Current	0.09 Amps @ 120 VAC
AC Holding Current	0.06 Amps @ 120 VAC
AC Coil	Burn-out proof
Manifold Material	Stainless Steel or 360 Brass

Sensors and Comunications

Dual Module System

The Onyx dual module and integral pneumatic valve is an environmentally protected valve control platform. With the Cyclone solenoid low power pilot, power may be directly delivered over the AS-Interface or DeviceNet buses. Auxiliary power may be provided for the Modbus network to power the solenoid. Choose the FOUNDATION Fieldbus bus powered module to operate the piezo piloted Cyclone or choose the FOUNDATION Fieldbus externally powered module for the solenoid powered Cyclone. ***(For more detailed information please see pages 2 through 8.)***

SST Switching Sensors (33)

Configuration	(2) SST Switching Sensors Terminations for Solenoid
Electrical Ratings	0.3 Amps @ 125 VAC/DC

Namur Sensors (44)

Configuration	(2) Namur Sensors Terminations for Solenoid Intrinsically safe (DIN 19234)
Voltage Range	6 to 29 VDC
Current Ratings	Target On I<1 mA Target Off I>3 mA

AS-Interface VCT (96)

Configuration	(2) Sensor Inputs (2) Auxiliary Inputs (2) Power Outputs (Solenoids)
Max. Current	160mA, Both Outputs Combined (Current Limited to 200mA)
Outputs, Max. Power	4 Watts, Both Outputs Combined
Outputs, Voltage	25 to 30 VDC

DeviceNet VCT (92)

Configuration	(2) Discrete Inputs (Open & Closed) (2) Power Outputs (Solenoids) (1) 4-20 mA Auxiliary Input
Outputs, Max. Power	4 Watts, Both Outputs Combined
Outputs, Voltage	24 VDC

Bus Powered FOUNDATION Fieldbus VCT (93)

Configuration	(2) Discrete Inputs, DI (Open & Closed) (2) Discrete Outputs, DO (Piezo Valves)
Outputs	2mA @ 6.5 VDC each; Current Limited to 2mA (Bus Powered)

Externally Powered FOUNDATION Fieldbus VCT (94)

Configuration	(2) Discrete Inputs, DI (Open & Closed) (2) Power Outputs, DO (Solenoids)
Outputs	4 watts @ 24VDC Both Outputs Combined; Current Limited to 200mA (Externally Powered)

Modbus VCT (95)

Configuration	(2) Discrete Inputs (Open & Closed) (2) Power Outputs (Solenoids)
Outputs	160 mA @ 24 VDC Both Outputs Combined; Current Limited to 200 mA

Fieldbus DeviceNet ASi MODBUS

Switch/Sensor Options

SST Solid State Sensors

SST sensors have an unlimited application life and are ideal for AC and DC control circuits. Onyx is available in 2 switch or 2 switch and position transmitter models.
(See page 8 for details.)

Operation	Cam Selectable NO or NC
Operating Life	More than 10 million cycles
Electrical Ratings	0.3 Amps @ 125V AC/DC
Leakage Current	Less than 0.25 mA
Maximum Voltage Drop	6.5 Volts @ 10 mA
Warranty	Five Years

Mechanical Switches (SPDT)

Mechanical silver contact switches are ideal for high power applications. Gold contacts are suitable for low power applications, typically computer input circuits. ***(See page 9 for details.)***

Electrical Ratings (Silver)	10 Amp @ 125/250 VAC 0.5 Amp @ 125 VDC
Operating Life (Silver)	400,000 cycles
Electrical Ratings	1.0 Amp @ 125 VAC 0.5 Amp @ 30 VDC
Operating Life	100,000 cycles

Maxx-Guard Switches

Maxx-Guard hermetically sealed reed switches with SPDT tungsten contacts are recommended for 120VAC computer inputs. SPST contacts are ideal for either 120VAC or 24VDC computer inputs. Two switches are available in Onyx models. ***(See page 8 for details.)***

Electrical Ratings	SPST	0.15 A @ 125/250 VAC, 30 VDC
	SPDT	Varies, see page 8
Seal		Hermetically Sealed
Operating Life		5 million cycles
Warranty		2 Years

Model Selector

Model Example: ON332B5S2LR

ON

Functions

Proximity Models
- **33** (2) SST Sensor Dual Module
- **2X** (2) SST Sensors
- **2P** (2) SPST Maxx-Guard
- **2L** (2) SPST Maxx-Guard LED
- **2H** (2) SPDT Maxx-Guard
- **2S** (2) SPDT Maxx-Guard LED

Intrinsically Safe Models
- **44** (2) Namur Sensor Dual Module (DIN 19234)
- **2J** (2) SPST Maxx-Guard (Passive)

Mechanical Models
- **2V** (2) SPDT Mechanical
- **2W** (2) SPDT Gold Contact Mechanical

Valve Communication Terminals (VCT)
- **92** DeviceNet Dual Module[1]
- **93** FOUNDATION Fieldbus Dual Module[2] (Bus Powered)
- **94** FOUNDATION Fieldbus Dual Module[1] (Externally Powered)
- **95** Modbus Dual Module[1]
- **96** AS-Interface Dual Module[1]

1. Use only Cyclone 24VDC Pneumatic Valve
2. Use only Cyclone Piezo Pneumatic Valve

Position Transmitter Models
- **7X** Position Transmitter with (2) SST Sensors
- **7O** High Performance Position Transmitter

Pneumatic Valve

Description	Voltage	Brass	Stainless
Single Direct Acting 0.2 Cv	24 VDC	1H	12
	120 VAC	1J	14
Cyclone Single Pilot Spring Return 0.75 Cv	24 VDC*	2H	2B
	120 VAC	2J	2C
	I.S.	2G	2A
	Piezo*	3G	3A
Cyclone Dual Pilot Shuttle Piston 0.75 Cv	24 VDC	2L	2E
	120 VAC	2M	2F
	I.S.	2K	2D
	Piezo**	3K	3D
Cyclone Dual Pilot Blocked Center 0.75 Cv	24 VDC*	2Q	2N
	120 VAC	2R	2P
	I.S.	2T	2U
	Piezo**	3T	3U

No Pneumatic Valve **11**

**Use with 92, 94, 95, or 96 Function options.*

***Use with 93 Function option.*

Enclosure/ Conduit
- **S2** (2) 1/2" NPT
- **S5** (2) M20
- **S8** (2) PG13.5

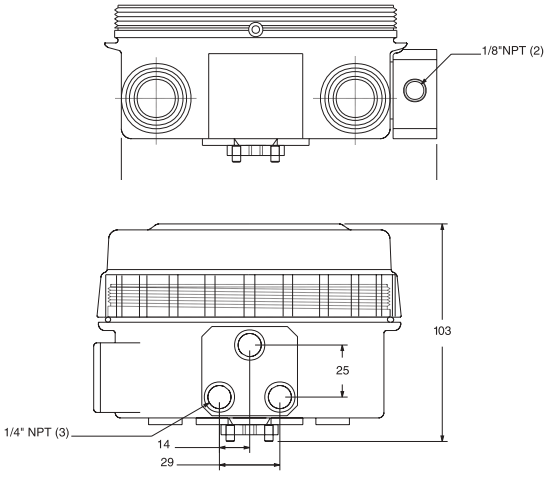
Shaft
- **L** 15mm1 NAMUR
- **S** 2 Pin Coupler

Indicator
- **R** Red Closed Green Open
- **1 or 2** Three Way Flow Path
- **X** Special

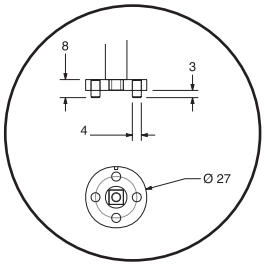
See Visual Indications Designations chart on page 15

Dimensions (mm)

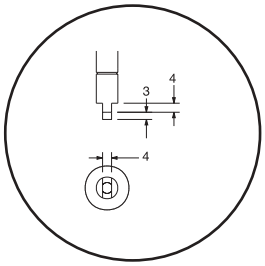
Direct Acting Valve with "S" Shaft



"S" Shaft



"L" Shaft



Cyclone Valve with "L" Shaft