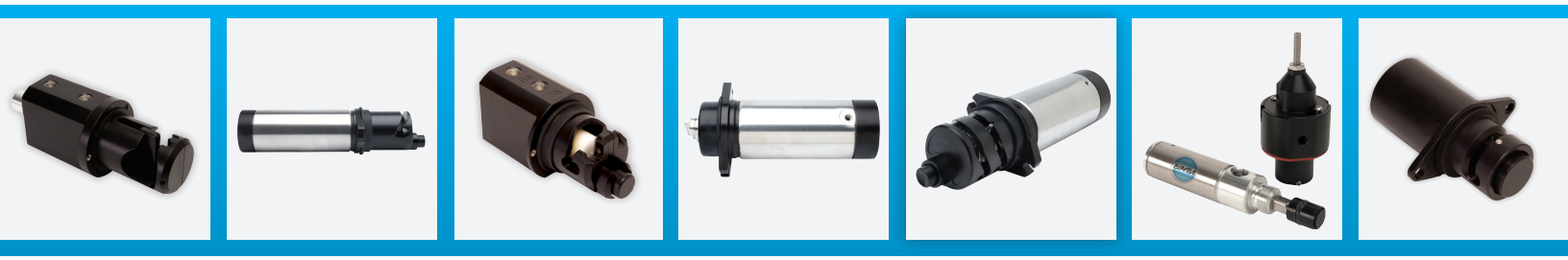
Catalog

BIMBA | ACRO

Pinch Valves



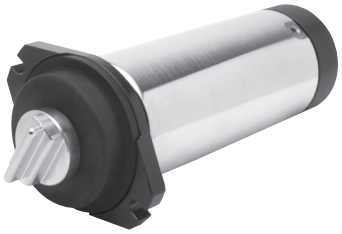
Delivering Innovative Pinch Valves & Fluid Control Components

VERSAGRIP® SOLENOID PINCH VALVES

Flexibility and Affordability for Fluid Control

The Versagrip® Solenoid Pinch Valve product line supports tubing or disposable membrane bags ranging in the 0.063 – 0.375 inch OD or 1.6 – 9.5 mm sizing. 3 Models are orderable in 4 different configurations being single-tube normally open, single-tube normally closed, dual tubes toggling normally open and closed, or a headless cassette mountable options. All units are panel mount ready, and headed versions include a push button override for easy manual tube loading and unloading procedures. .

The housing and plunger are made from stainless steel and valve heads are come as black delrin plastic offering superior corrosive resistance. An optional 900R solenoid control board or optical position state sensors are also available.



Experience the Difference

- Standard formats support customer selectable average tubing hardness up to 60 Shore A and 15 psi/1 bar media pressure
- Compact design with low operational noise
- Average actuation speeds of 80 milliseconds or less without tube loaded
- Seals prevent liquid penetration supporting easy cleaning or sterilization procedures
- Warranted for 3 million MTBF* or 18 months
- ROHS2 compliant
- UL429, CSA139 and CE 60601-1 3rd Edition certifications

*MTBF based on 50% duty cycle testing carried out at 20 degrees ambient C using 60 Shore A tubing. Duty cycle is defined as On Time/(On Time + Off Time).

Each product is also calibrated for pinch force, pinch gap and stroke to ensure optimal performance.

How to Order

Generation 2 Solenoid Valve

Acro Part # Key: For Reference Purposes

MODEL
1100
1300
1400

SENSOR OPTION	
N	No Sensor
S	Position Sensor

MATERIAL/ COLOR	
DB	Delrin Black

FORCE SPEC
5 (Standard)

STROKE
Total plunger movement. Units: thousandths of an inch/millimeter.

1400S - CDBX5 - 040 - 0750

IP RATING	
00	IP60

TUBE SLOT AND NORMAL STATE	
N	Cassette Mount Style (Normally Closed)
C	Single Slot (Normally Closed)
Q	Single Slot (Normally Open)
D	Dual Slot

OPERATING POWER	
X	24 VDC

NOMINAL PINCH GAP OR PLUNGER EXTENSION
Units: thousandth of an inch/ millimeter

Product Selection Guide

Recommended tubing: Silicone Platinum Cured, Clear C-Flex, PharMed BPT up to 60 Durometer and up to 15 PSI media pressure. For higher Durometers or media pressures consult Acro Associates.

Model	Tubing OD [in./mm]	ID [in./mm]	Tubing Slots	Normal State	Includes Position Sensor	Valve Part Number	Shipment Lead Time [days]
1100	.125 / 3.2	.063 / 1.6	1	Normally Closed	N	1100N-CDBX5-040-0060	1 - 3
1100				Normally Open		1100N-QDBX5-040-0060	
1100			2	(1) N/C, (1) N/O		1100N-DDBX5-040-0060	
1100			1	Normally Closed	Y	1100S-CDBX5-040-0060	5 - 10
1100				Normally Open		1100S-QDBX5-040-0060	
1100			2	(1) N/C, (1) N/O		1100S-DDBX5-040-0060	
1100	.157 / 4.0 MAX		1	N/C, Cassette Style	N	1100N-NDBX5-510-0060	1 - 3
1100					Y	1100S-NDBX5-510-0060	5 - 10
1300	.188 / 4.8 or .250 / 6.4	.063 / 1.6 or .125 / 3.2	1	Normally Closed	N	1300N-CDBX5-080-0135	1 - 3
1300				Normally Open		1300N-QDBX5-080-0135	
1300			2	(1) N/C, (1) N/O		1300N-DDBX5-080-0135	
1300			1	Normally Closed	Y	1300S-CDBX5-080-0135	5 - 10
1300				Normally Open		1300S-QDBX5-080-0135	
1300			2	(1) N/C, (1) N/O		1300S-DDBX5-080-0135	
1300	.250 / 6.4 MAX		1	N/C, Cassette Style	N	1300N-NDBX5-810-0135	1 - 3
1300					Y	1300S-NDBX5-810-0135	5 - 10
1400	.250 / 6.4 or .375 / 9.5	.125 / 3.2 or .250 / 6.4	1	Normally Closed	N	1400N-CDBX5-080-0160	1 - 3
1400				Normally Open		1400N-QDBX5-080-0160	
1400			2	(1) N/C, (1) N/O		1400N-DDBX5-080-0160	
1400			1	Normally Closed	Y	1400S-CDBX5-080-0160	5 - 10
1400				Normally Open		1400S-QDBX5-080-0160	
1400			2	(1) N/C, (1) N/O		1400S-DDBX5-080-0160	
1400	.375 / 9.5 MAX		1	N/C, Cassette Style	N	1400N-NDBX5-910-0160	1 - 3
1400					Y	1400S-NDBX5-910-0160	5 - 10

900R PWM Solenoid Controller Options:

Part#	Powering Supply and Trigger Configuration
900RXV-1100	24VDC supply, 2-10VDC trigger
900RXX-1100	24VDC supply, 24VDC trigger
900RXV-1300	24VDC supply, 2-10VDC trigger
900RXX-1300	24VDC supply, 24VDC trigger
900RXV-1400	24VDC supply, 2-10VDC trigger
900RXX-1400	24VDC supply, 24VDC trigger

Specifications

1300N-CDBX5-080-0135

MECHANICAL
RECOMMENDED TUBING SIZE:* .187 - .250 INCH O.D. [4.8 - 6.4 MM O.D.]
MEDIA PRESSURE: 15 PSI MAXIMUM
STATE: NORMALLY CLOSED
SEALS: INTERNAL & PANEL
MOUNTING: PANEL MOUNT
REC. PANEL: 1/8" - 1/4" THK.
TUBE LOADING: SNAP-IN
PINCH GAP: .080" NOMINAL
TOTAL OPENING: .215" NOMINAL
PINCHING FORCE: 5.0LBF NOMINAL
MAXIMUM ON-TIME: DESIGNED FOR EXTENDED ON-TIME
MAX. CYCLE RATE: 1 CYCLE PER 5 SECONDS AT 50% DUTY CYCLE
AMBIENT TEMPERATURE: 40 C MAXIMUM

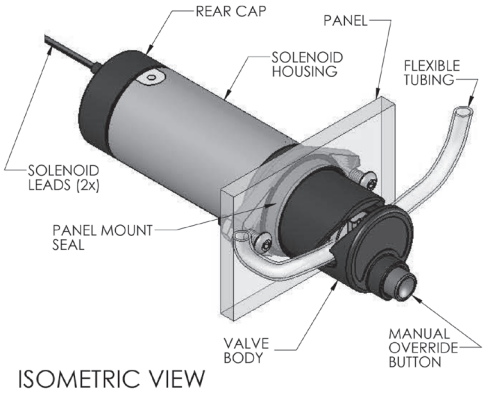
ELECTRICAL
RECOMMENDED SUPPLY: 72 WATTS: 24VDC/3A
POWER CONSUMPTION: (WITHOUT TUBING)
PULL- IN POWER (PULSE): 20 - 42 WATTS
HOLD-IN POWER (HOLD): 0.5 - 2.3 WATTS
ACTUATION: PULSE & HOLD DRIVER RECOMMENDED
POSITION SENSING: NONE
SOLENOID LEAD WIRES: 22 AWG UL1061, 12" LENGTH
CONNECTOR: MOLEX P/N 43640-0201

MATERIAL
WEIGHT/MASS: 16.5oz [470g]
BODY: BLACK ACETAL
HOUSING: 416 STAINLESS STEEL
PLUNGER HEAD: 316L STAINLESS STEEL
OVERRIDE: 303 STAINLESS STEEL
OVERRIDE BUTTON: BLACK ACETAL
OVERRIDE SPRING: STAINLESS STEEL
REAR CAP: BLACK ACETAL
SEALS: BLACK SILICONE
HARDWARE: 303 STAINLESS STEEL

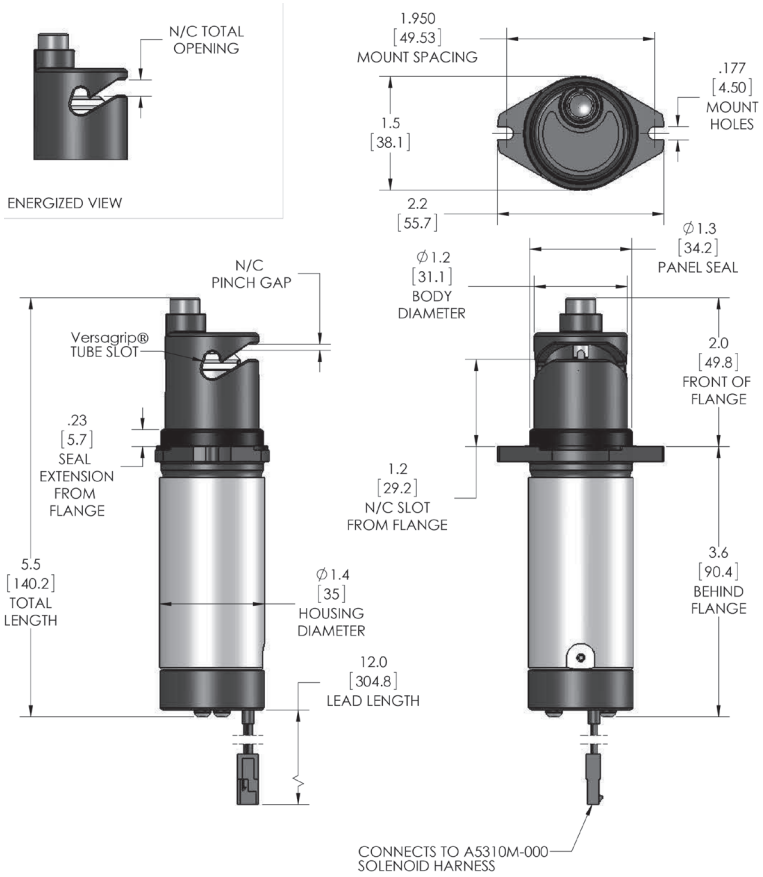
COMPLIANCE
RoHS 2 COMPLIANT
PENDING UL 429, CSA 139 & IEC 60601-1 3rd EDITION

*See Product Selection Guide for specific tubing materials

Dimensional Details: Inch (mm)



ISOMETRIC VIEW



Specifications

1300N-DDBX5-080-0135

MECHANICAL
RECOMMENDED TUBING SIZE:* .187 - .250 INCH O.D. [4.8 - 6.4 MM O.D.]
MEDIA PRESSURE: 15 PSI MAXIMUM
STATE: NORMALLY CLOSED & NORMALLY OPEN
SEALS: INTERNAL & PANEL
MOUNTING: PANEL MOUNT
REC. PANEL: 1/8" - 1/4" THK.
TUBE LOADING: SNAP-IN
PINCH GAP: .080" NOMINAL BOTH SLOTS
TOTAL OPENING: .215" NOMINAL BOTH SLOTS
PINCHING FORCE: 5.0LBF NOMINAL BOTH SLOTS
MAXIMUM ON-TIME: DESIGNED FOR EXTENDED ON-TIME
MAX. CYCLE RATE: 1 CYCLE PER 5 SECONDS AT 50% DUTY CYCLE
AMBIENT TEMPERATURE: 40 C MAXIMUM

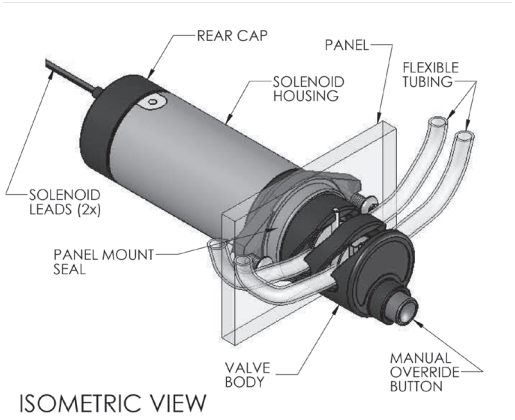
ELECTRICAL
RECOMMENDED SUPPLY: 72 WATTS: 24VDC/3A
POWER CONSUMPTION: (WITHOUT TUBING)
PULL- IN POWER (PULSE): 20 - 42 WATTS
HOLD-IN POWER (HOLD): 1.5 - 3.75 WATTS
ACTUATION: PULSE & HOLD DRIVER RECOMMENDED
POSITION SENSING: NONE
SOLENOID LEADS WIRES: 22 AWG UL1061, 12" LENGTH;
CONNECTOR: MOLEX P/N 43640-0201

MATERIAL
WEIGHT/MASS: 16.5oz [470g]
BODY: BLACK ACETAL
HOUSING: 416 STAINLESS STEEL
PLUNGER HEAD: 316L STAINLESS STEEL
OVERRIDE: 303 STAINLESS STEEL
OVERRIDE BUTTON: BLACK ACETAL
OVERRIDE SPRING: STAINLESS STEEL
PINCH PIN: 303 STAINLESS STEEL
REAR CAP: BLACK ACETAL
SEALS: BLACK SILICONE
HARDWARE: 303 STAINLESS STEEL

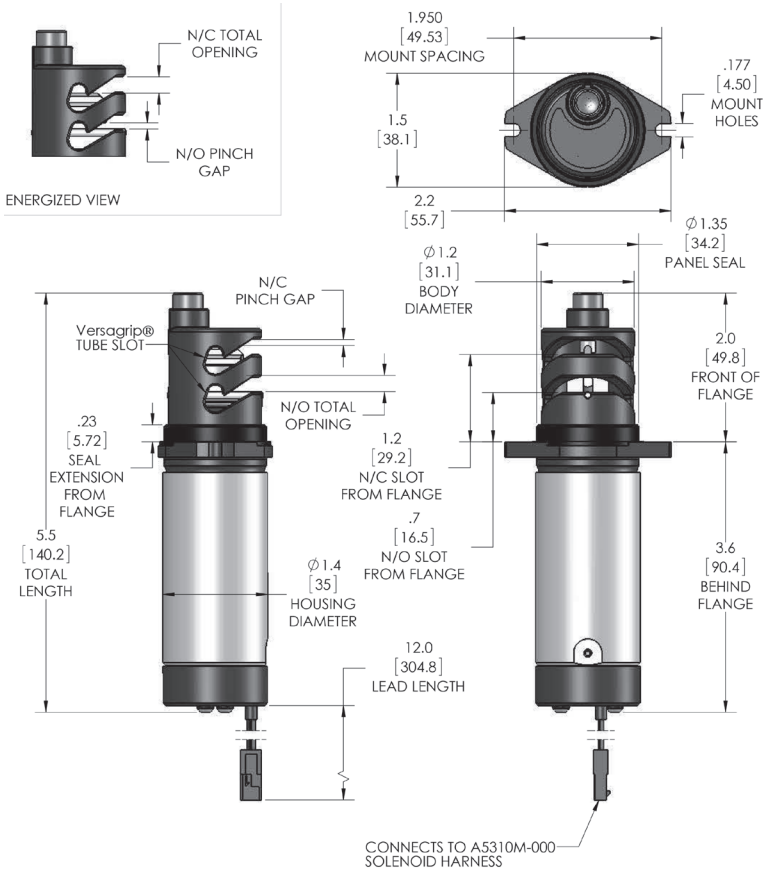
COMPLIANCE
RoHS 2 COMPLIANT
PENDING UL 429, CSA 139 & IEC 60601-1 3rd EDITION

*See Product Selection Guide for specific tubing materials

Dimensional Details: Inch (mm)



ISOMETRIC VIEW



Specifications

1300N-QDBX5-080-0135

MECHANICAL
RECOMMENDED TUBING SIZE:* .187 - .250 INCH O.D. [4.8 - 6.4 MM O.D.]
MEDIA PRESSURE: 15 PSI MAXIMUM
STATE: NORMALLY OPEN
SEALS: INTERNAL & PANEL
MOUNTING: PANEL MOUNT
REC. PANEL: 1/8" - 1/4" THK.
TUBE LOADING: SNAP-IN
PINCH GAP: .080" NOMINALS
TOTAL OPENING: .215" NOMINAL
PINCHING FORCE: 5.0LBF NOMINAL
MAXIMUM ON-TIME: DESIGNED FOR EXTENDED ON-TIME
MAX. CYCLE RATE: 1 CYCLE PER 5 SECONDS AT 50% DUTY CYCLE
AMBIENT TEMPERATURE: 40 C MAXIMUM

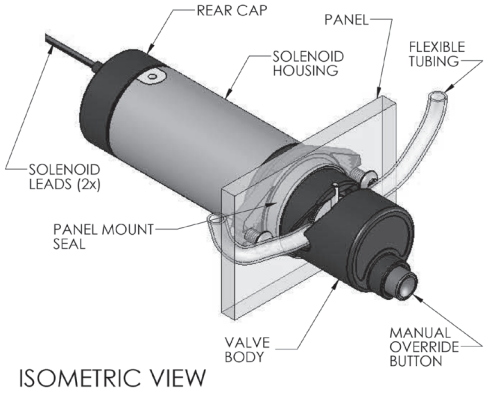
ELECTRICAL
RECOMMENDED SUPPLY: 72 WATTS: 24VDC/3A
POWER CONSUMPTION: (WITHOUT TUBING)
PULL- IN POWER (PULSE): 5 - 13 WATTS
HOLD-IN POWER (HOLD): 0.5 - 1.25 WATTS
ACTUATION: PULSE & HOLD DRIVER RECOMMENDED
POSITION SENSING: NONE
SOLENOID LEAD WIRES: 22 AWG UL1061, 12" LENGTH
CONNECTOR: MOLEX P/N 43640-0201

MATERIAL
WEIGHT/MASS: 16.5oz [470g]
BODY: BLACK ACETAL
HOUSING: 416 STAINLESS STEEL
PLUNGER HEAD: 316L STAINLESS STEEL
OVERRIDE: 303 STAINLESS STEEL
OVERRIDE BUTTON: BLACK ACETAL
OVERRIDE SPRING: STAINLESS STEEL
PINCH PIN: 303 STAINLESS STEEL
REAR CAP: BLACK ACETAL
SEALS: BLACK SILICONE
HARDWARE: 303 STAINLESS STEEL

COMPLIANCE
RoHS 2 COMPLIANT
PENDING UL 429, CSA 139 & IEC 60601-1 3rd EDITION

*See Product Selection Guide for specific tubing materials

Dimensional Details: Inch (mm)



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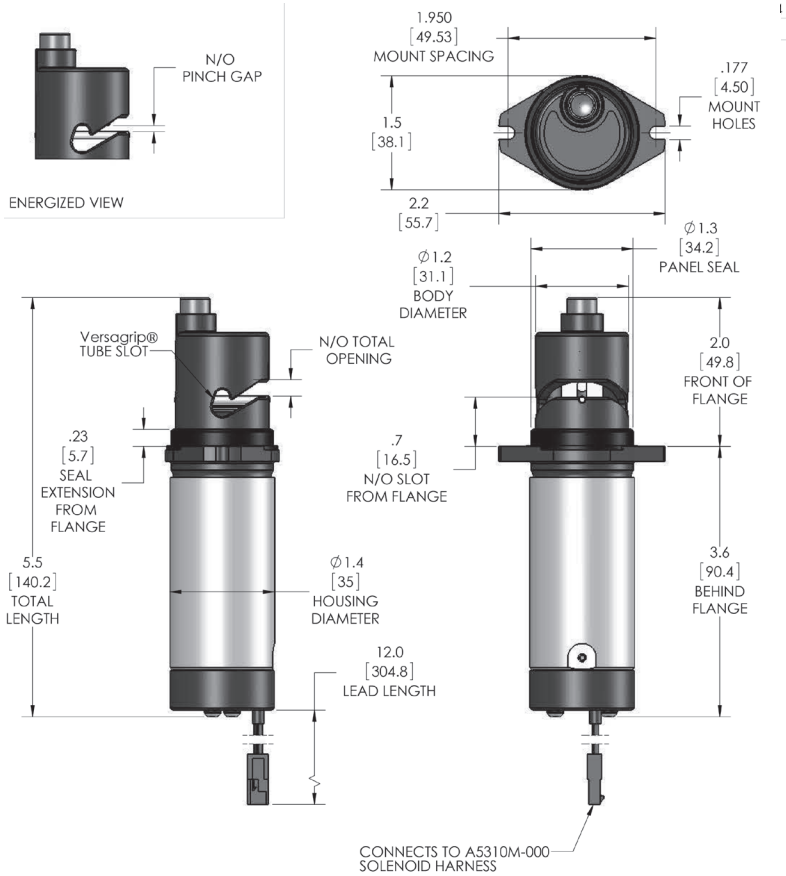

Specifications

1300N-NDBX5-810-0135

MECHANICAL
RECOMMENDED TUBING SIZE:* .187 - .250 INCH O.D. [4.8 - 6.4 MM O.D.]
MEDIA PRESSURE: 15 PSI MAXIMUM
STATE: NORMALLY CLOSED
SEALS: PANEL
MOUNTING: PANEL MOUNT
REC. PANEL: 1/8" - 1/4" THK.
TUBE LOADING: CASSETTE
STROKE LENGTH: .135" NOMINAL
PINCHING FORCE: 5.0LBF NOMINAL
MAXIMUM ON-TIME: DESIGNED FOR EXTENDED ON-TIME
MAX. CYCLE RATE: 1 CYCLE PER 5 SECONDS AT 50% DUTY CYCLE
AMBIENT TEMPERATURE: 40 C MAXIMUM

ELECTRICAL
RECOMMENDED SUPPLY: 72 WATTS: 24VDC/3A
POWER CONSUMPTION: (WITHOUT TUBING)
PULL- IN POWER (PULSE): 20 - 42 WATTS
HOLD-IN POWER (HOLD): 0.5 - 2.3 WATTS
ACTUATION: PULSE & HOLD DRIVER RECOMMENDED
POSITION SENSING: NONE
SOLENOID LEAD WIRES: 22 AWG UL1061, 12" LENGTH
CONNECTOR: MOLEX P/N 43640-0201

MATERIAL
WEIGHT/MASS: 16.5oz [470g]
BODY: BLACK ACETAL
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PLUNGER HEAD: 316L STAINLESS STEEL
REAR CAP: BLACK ACETAL
SEALS: BLACK SILICONE
HARDWARE: 303 STAINLESS STEEL

COMPLIANCE
RoHS 2 COMPLIANT
PENDING UL 429, CSA 139 & IEC 60601-1 3rd EDITION

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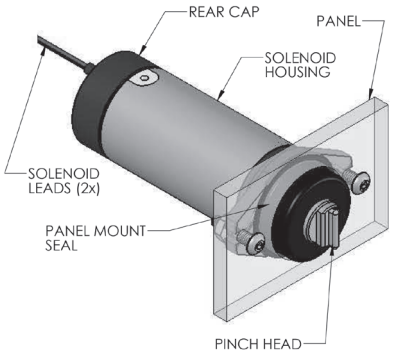
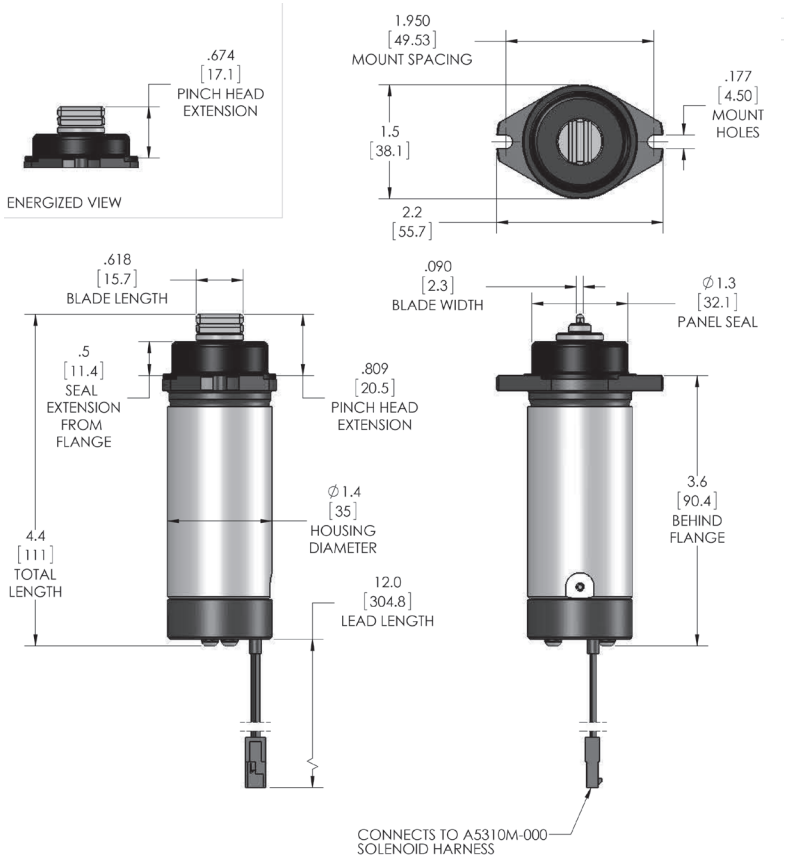
Dimensional Details: Inch (mm)



ISOMETRIC VIEW



Modular Solenoid Controller

Features

- High output drive: 5.0A
- 150 watt drive power
- Supply range: +8V to +32V
- Footprint: 64.8mm x 43.2mm x 24.8mm
- Weight: 25 grams
- PWM output: 25.0kHz
- Integrated current sensor
- Reverse voltage protection
- Internal flyback diode
- Opto-isolated trigger port
- Upgradable solenoidFX firmware
- Multi-color diagnostic LED
- Adaptive pulse and hold technology
- Packaging: Economical panel mount PCB

Description

The 900R is a control module designed for interfacing high-performance solenoid actuators to computer systems and digital logic. It operates from a single 8 to 32 volt DC supply. The user interface consists of an opto-isolated differential input port that can be directly wired to relays, transistor logic, digital I/O boards, and PLCs. The trigger port can be wired for either active-low or active-high operation, depending on the application. The 900R also provides a multicolor diagnostic LED.

The 900R contains a low-side FET power switch employing a pulse-width modulated (PWM) output. PWM operation conserves energy and reduces waste-heat production. This module is optimized for driving inductive electromechanical devices. The load is internally clamped; an external flyback diode is not required. An integrated microprocessor analyzes load current for additional power savings and short-circuit protection. The 900R is also protected against power reversal on its supply pins.

A factory-programmable socketed ROM stores the controller's configuration matrix. The solenoid manufacturer provides this data, which dictates pulse-and-hold levels, inrush current control parameters, and fault behavior. The ROM technique allows fast turn-around on small quantities, and provides for an upgrade path if the users' needs change.

Table 1: 900R Pinout Description

Pin#	Name	Description	Wire Code
J1-1	Trig-	Active Low Trigger Input.	White/Black
J1-2	Trig+	Active High Trigger Input; 2-10 Volts between Trig+ and Trig- activates the device.	White
J1-3	Vss	System ground pin.	Black
J1-4	Vcc	Positive supply pin. Operating range is +8V to +32V.	Red
J2-1	Load-	Connects negative side of load.	Blue/Black
J2-2	Load+	Connects positive side of load.	Blue

Application

High performance DC solenoids are generally operated with either 12 or 24 volt power supplies. Pin J1-4 should be connected to the positive post on the power supply. Pin J1-3 should be connected to the ground post. J2-1 should be connected to the negative lead of the solenoid and J2-2 to the positive. Note that most DC solenoids are not sensitive to polarity, so J2-1 and J2-2 may be reversed without consequence. To activate the solenoid, apply 2 to 10 volts between $Trig_+$ and $Trig_-$ ($10V > Trig_+ - Trig_- > 2V$). To deactivate the solenoid either prevent current from flowing into $Trig_+$ and out $Trig_-$ or let $Trig_+ = Trig_-$. Note that since the trigger port is optically isolated to 5kV, the signals into it need not be referenced to the 900R power supply.

Powering the trigger port initiates a pulse-and-hold cycle. This begins by supplying the load with an initial high-power pulse that is sufficient for activation. The pulse continues until it is either cut short by the adaptive logic, or T_{PULSE} elapses. At this point, the Hold State begins. In the Hold State, the controller operates the power switch in PWM mode and the reduced duty cycle, specified by the 900R's configuration matrix, maintains the solenoid's energize position. When power is removed from the trigger port, the power switch is shut off and the cycle ends.

Modular Solenoid Controller

Diagnostic Indicator

The diagnostic indicator LED is red when the 900R is powered up and inactive. It is orange during the initial high power pulse, and is green during the hold cycle. A flashing red LED indicates device shutdown and an alternating red/green LED indicates a cancelled hold cycle. See Table 2 for the configuration parameters.

Electrical Interface

The module's electrical interface consists of two 2.54mm pitch, gold-plated, 0.64mm square-pin headers with friction locks. The package has a total pin count of six, with four pins on J1 and two pins on J2. J1 (mating connector is AMP 641237-4) connects the unit to the power supply and trigger signal. J2 (mating connector is AMP 641237-2) connects the unit to the load. See Tables 1 and 3 for detailed pin assignments and electrical characteristics.

Packaging

The module is an OEM style printed circuit board, appropriate for panel mounting inside of an equipment enclosure. Four 12.7mm plastic hex standoffs, with #4-40 internal threads, are provided for mounting. Nylon washers and stainless-steel screws for attaching the standoffs to the board are included. The user must supply hardware for attaching the standoffs to their enclosure. See Figure 1 for a device footprint.

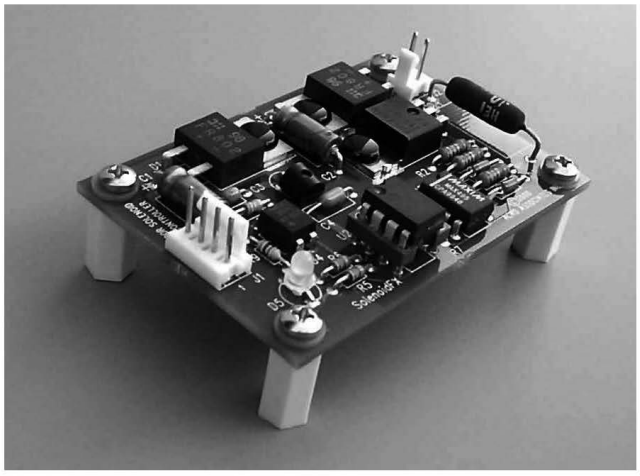
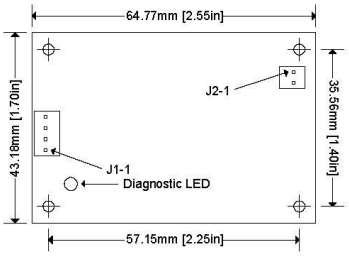


FIGURE 1: 900R FOOTPRINT



Modular Solenoid Controller

Table 2: Configuration Matrix

Name	Min	Typ	Max	Units	Description
T_{PULSE}	--	200	2000	ms	The maximum length of the initial high power pulse. This pulse may be shortened by the adaptive logic if the inrush current peaks and then decreases by at least I_{Δ}. Maximum pulse power in Watts is $P_{PULSE} = \frac{\left[\frac{(V_{CC} - 0.5) \times R_{LOAD}}{R_{LOAD} + 0.122}\right]^2}{R_{LOAD}}$ Where R_{LOAD} is the resistance of the load in Ohms. Typical values for P_{PULSE} are between 16 and 100 Watts.
X_{DUTY}	0.00	0.25	0.50	--	Duty cycle for the Hold State. Hold power is $P_{HOLD} = X_{DUTY}^2 \times P_{PULSE}$ Typical values for P_{HOLD} are between 2 and 7 Watts.
I_{Δ}	0.00	0.75	5.00	A	Current differential for adaptive pulse and hold algorithm.
I_{MAX}	0.00	3.00	5.00	A	Maximum instantaneous current. Load currents above this value will cause the device to shutdown.
I_{PWMLO}	0.00	0.20	5.00	A	Minimum hold current. If the PWM pulse amplitudes fall below this value, the hold cycle will be cancelled. At this point, the user must toggle the trigger port input to start another pulse and hold cycle.
I_{PWMHI}	0.00	1.00	5.00	A	Maximum hold current. If PWM pulse amplitudes exceed this value, the hold cycle will be cancelled.

Table 3: Electrical Characteristics

Sym	Min	Typ	Max	Units	Characteristic
T_{OP}	-35	--	60	oC	Operating temperature
T_{STG}	-50	--	100	oC	Storage temperature
V_{CC}	8	--	32	V	Operating voltage
I_{CC}	--	20	60	mA	Standby current (power switch off)
V_{TRIG}	-5	--	10	V	Trigger input voltage (Trig+ - Trig-)
I_{TRIG}	--	2	9	mA	Trigger input current
V_{ON}	2	--	10	V	Trigger Activation voltage
P_{PULSE}	--	72	150	W	Pulse mode output power
P_{HOLD}	--	5	37.5	W	Hold mode output power
I_{LOAD}	--	3	5	A	Load current
F_{OSC}	24.0	25.0	26.5	kHz	PWM output frequency
V_{RESET}	--	VSS	--	V	VCC start voltage to ensure error bit cleared and device reset
I_{FAULT}	--	--	100	A	Current during load fault (100ms max)

Modular Solenoid Controller

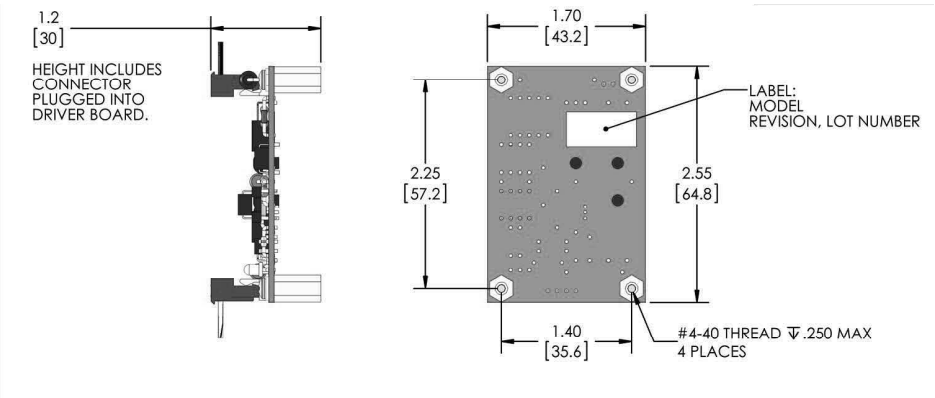
Specifications

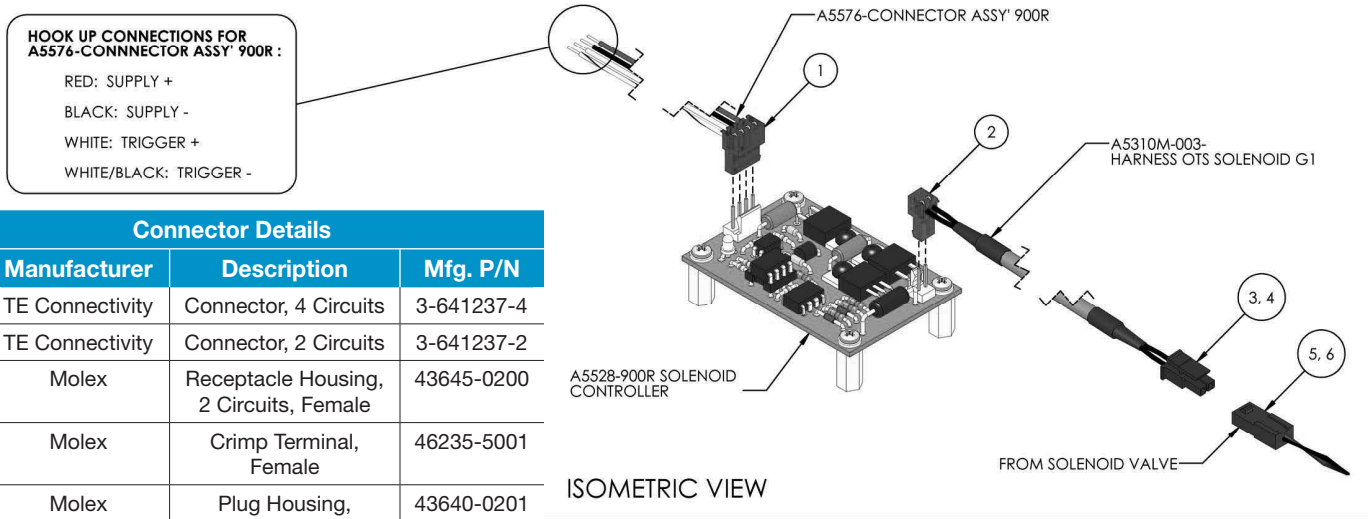
SUGGESTED SUPPLY POWER
- **Voltage:** 24VDC
- **Current:** 3amps

LED STATES
- **Red:** Valved Closed
- **Green:** Valve Open
- **Orange:** Valve in Transition
- **Alternating Red/Green:** Error
- **Red Flashing:** Under/Over Power

900R PWM Solenoid Controller Board is compatible with Legacy and Versagrip® Solenoid Pinch Valves

Dimensional Details: Inch (mm)





Connector Details			
No.	**Manufacturer**	**Description**	**Mfg. P/N**
1	TE Connectivity	Connector, 4 Circuits	3-641237-4
2	TE Connectivity	Connector, 2 Circuits	3-641237-2
3	Molex	Receptacle Housing, 2 Circuits, Female	43645-0200
4	Molex	Crimp Terminal, Female	46235-5001
5	Molex	Plug Housing, 2 Circuits, Male	43640-0201
6	Molex	Crimp Terminal, Male	43031-0008