



Installation, Operation, and Maintenance Manual

Integrated Sensing Platform (ISP)



ITT

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1 Introduction and Safety

1.1 Safety message levels

Definitions

Safety message level	Indication
 DANGER:	A hazardous situation which, if not avoided, will result in death or serious injury
 WARNING:	A hazardous situation which, if not avoided, could result in death or serious injury
 CAUTION:	A hazardous situation which, if not avoided, could result in minor or moderate injury
 ELECTRICAL HAZARD:	The possibility of electrical risks if instructions are not followed in a proper manner
NOTICE:	<ul style="list-style-type: none"> • A potential situation which, if not avoided, could result in an undesirable result or state • A practice not related to personal injury

1.2 User health and safety

General precautions

This product is designed and manufactured using good workmanship and materials, and meets all applicable industry standards. This product should be used only as recommended by ITT.



WARNING:

- Misapplication of the valve can result in injury or property damage. Select valves and valve components of the proper materials and make sure that they are consistent with your specific performance requirements. Incorrect application of this product includes but is not limited to:
 - Exceeding the pressure or temperature rating
 - Failing to maintain this product according to the recommendations
 - Using this product to contain or control media that is incompatible with the materials of construction
 - Proper containment or protection from hazardous media must be provided by the end user to protect employees and the environment from valve discharge.

Qualifications and training

The personnel responsible for the assembly, operation, inspection, and maintenance of the valve must be appropriately qualified. The operating company must do the following tasks:

- Define the responsibilities and competency of all personnel handling this equipment.
- Provide instruction and training.
- Ensure that the contents of the operating instructions have been fully understood by the personnel.

Instruction and training can be carried out by either ITT or the reseller of the valve by order of the operating company



WARNING:

California Proposition 65 Cancer and Reproductive Harm <http://www.P65Warnings.ca.gov>
Plastics in product contain Bisphenol A (BPA) and Glass Wool Fibers, chemicals known to the State of California to cause cancer and reproductive harm. Wash hands after handling.

Non-compliance risks

Failure to comply with all safety precautions can result in the following conditions:

- Death or serious injury due to electrical, mechanical, and chemical influences
- Environmental damage due to the leakage of dangerous materials
- Product damage
- Property damage
- Loss of all claims for damages

Operational safety precautions

Be aware of these safety precautions when operating this product:

- Do not leave hot or cold components of the product unsecured against contact if they are a source of danger.
- Do not remove the contact guard for moving parts when the product is in operation. Never operate the product without the contact guard installed.
- Do not hang items from the product. Any accessories must be firmly or permanently attached.
- Do not use the product as a step or hand hold.
- Do not paint over the identification tag, warnings, notices, or other identification marks associated with the product.



ELECTRICAL HAZARD:

ISP is designed for nominal 24VDC power only. See specifications for maximum voltage allowable. Do not apply AC power or excess DC voltage.



CAUTION:

Pinch hazard – Use care with hand tools to avoid injury.



CAUTION:

Pinch hazard – When installing and removing the ISP, ensure that actuator control is locked out so it cannot reposition.



CAUTION:

Pressurized air – Do not exceed pressure ratings. See specifications for maximum air pressure. ISP vents air pressure to atmosphere. Avoid approaching the vent port when ISP is operating.

Maintenance safety precautions

Be aware of these safety precautions when performing maintenance on this product:

- You must decontaminate the product if it has been exposed to harmful substances such as caustic chemicals.

Use of unauthorized parts

Reconstruction or modification of the product is only permissible after consultation with ITT. Genuine spare parts and accessories authorized by ITT serve to maintain safety. Use of non-genuine ITT parts can annul liability of the manufacturer for the consequences. ITT parts are not to be used in conjunction with products not supplied by ITT as this improper use can annul all liability for the consequences.

Unacceptable modes of operation

The operational reliability of this product is only guaranteed when it is used as designated. The operating limits given on the identification tag and in the data sheet may not be exceeded under any circumstances. If the identification tag is missing or worn, contact for specific instructions.

NOTICE:

ISP employs a magnet to indicate valve position. Other than the calibration/solenoid dongle, avoid placing magnets on or around the ISP. Such magnets may erroneously modify the position indication.

2 Transportation and Storage

2.1 Handling and unpacking guidelines

**CAUTION:**

Always observe the applicable standards and regulations regarding the prevention of accidents when handling the product.

Handling guidelines

Follow these guidelines when handling the product to prevent damage:

- Use care when handling the product.
- Leave protective caps and covers on the product until installation.

Unpacking guidelines

Follow these guidelines when unpacking the product:

1. Inspect the package for damaged or missing items upon delivery.
2. Note any damaged or missing items on the receipt and freight bill.
3. Do not lift or pull on the electrical conduit lines. Doing so may cause the POC switches to come out of calibration.

2.2 Storage, disposal, and return requirements

Storage

If you are not immediately installing the product after delivery, store it as follows:

- Store the product in a dry room that maintains a constant temperature.
- Make sure that the products are not stacked on top of one another.

Disposal

Dispose of this product and associated components in compliance with federal, state, and local regulations.

Return

Ensure these requirements are met before you return a product to :

- Contact for specific instructions on how to return the product.
- Clean the valve of all hazardous material.
- Complete a Material Safety Data Sheet or Process Data Sheet for any process fluid that could remain on the valve.
- Obtain a Return Material Authorization from the factory.

3 Product Description

3.1 General Description

The ISP is a compact and robust monitoring and control device for ITT PureFlo and EnviZion valve actuators. The device senses the position of a magnet mounted to the actuator’s indicating spindle. The sensor output is calibrated to the valve open and closed positions. Local position indication is provided by several LEDs. As an option, an internal 3-way solenoid valve is provided as a pilot valve to control the valve actuator.

Calibration is automatic or semi-automatic, depending on the model. There is no need to adjust mechanical targets or linkages.

The default local indication colors are red for valve-closed and green for valve-open. The colors can be reversed by the user - see detailed instructions within.

The ISP operates on 24 VDC nominal voltage. The only available electrical connection is to the M12 quick-connect.

There is no user access to the interior of the housing. The ISP is filled with a sealing compound to protect against the intrusion of water and other contaminants.

As a convenience, a companion iOS app is available from the Apple Store. Depending on the ISP model selected, the app may be used to calibrate and operate the ISP, including an internal solenoid valve. The app also permits access to Diagnostic data recorded on the ISP.

ISP Options

Model codes are shown below. Here are some examples of how model numbers are constructed:

- 3 Wire, no solenoid, 0.25"-2" cover size, no diagnostics: ISP-3W
- 3 wire, with solenoid, 0.25"-2" cover size, with diagnostics: ISP-3W-SV-BL
- ASi, no solenoid, 2.5"-4" cover size, no diagnostics: ISP-AI-LS
- ASi, with solenoid, 0.25"-2" cover size, with diagnostics and control: ISP-AI-SV-BT

Product	Output		Solenoid		Cover Size		Diagnostics	
	Option	Code	Option	Code	Option	Code	Option	Code
ISP	ASi	AI	None	-	0.25"-2"	-	None	-
	2 Wire	2W	Included	SV	2.5"-4"	LS	With Diagnostics	BL
	3 Wire	3W					With Diagnostics and Control	BT
	DeviceNet	DN						

3.2 ISP with AS-i Communication Specifications


ITT ISP, AS-Interface with extended addressing

Communication Protocol	AS-Interface v3.0*1
Configuration	(2) Discrete Inputs (0 or 1) Integral Solenoid(s)
Input Mapping	Bit 0: Closed Position

Communication Protocol	AS-Interface v3.0*1
	Bit 1: Open Position Bit 2: Solenoid Local Override is Active Bit 3: Unused
Output Mapping	Bit 0: Solenoid 1 Bit 1: Unused Bit 2: BLE Overrides Enabled Bit 3: Unavailable
Parameter Mapping	Bit 0: Wink Bits 1-3: Unused
Profile Code	4 In/3 Out, ID = A; IO = 7; ID1 = F; ID2 = E (S.7.A.E)
Default Address	0A

*1 The ISP is backward compatible with previous versions of ASi. Consult factory for more details

Sensor Specifications

Sensor Specifications	Notes	Minimum	Typical	Maximum	Units	
Operation	Normally open					
Supply Voltage Range	Use ASi Power Supply	26.5	30.55	31.6	V	
Operating Current	1 LED Color ON, Solenoid OFF, Over Voltage Range		23		mA	
	1 LED Color ON, Solenoid ON, Over Voltage Range		65			
Full Range Accuracy		-0.5		+0.5	mm	
"Make" deadband	From Closed Set Point		25		% Full	
	From Open Set Point		40		Stroke	
Hysteresis	From "Make" Point		5		%Full Stroke	
Connector	<u>4 Pin M12 Male A-coded</u> Pin 1: ASi + Pin 2: not used Pin 3: ASi - Pin 4: not used			4 Pin Micro (M12) 4-PIN MICRO CONNECTOR (M12)  Male (Pins)		
ASi Slave Impedance	Better than Extended Address Slave Requirements					
Short circuit	Solenoid Coil is Short Circuit Protected			Continuous	Minutes	
Pneumatic ratings	See Solenoid Valve specification sheet.					
Manual Solenoid Override	<u>On all -SV models:</u> Local Latching Solenoid Override. See Local Solenoid Override feature below. <u>On models with -SV and -BT:</u> Temporary Solenoid Overrides via the ISP app. Overrides are automatically de-activated when disconnecting from the unit.					

Environmental Specifications

Environmental Specifications	Minimum	Typical	Maximum	Units
Operating temperature	-10		50	°C
Ingress Protection Degree			IP65	
Pollution Degree			4	
Location			Indoor	
Altitude			5000	m
Humidity			90	%

AS-i/FAULT LED State

AS-i/FAULT LED State:	Possible Cause:	Recommended Action:
LED Off	1) Slave does not have power.	1) Supply power
LED solid green	1) Data communication is established	
LED flashing green/red	<u>Peripheral Fault:</u> 1) The solenoid coil is shorted. 2) A magnet was not detected. 3) Magnetic sensor's internal bond wire is broken.	1) Toggle Solenoid bit, if fault still present, replace module. 2) Ensure magnet is properly installed. 3) Power cycle module, if fault is still present, replace module.
	<u>No Data Exchange:</u> 1) The slave is waiting for a <i>Write_Parameter</i> request. 2) Slave has detected a No Data Exchange status	1) Add module to scan list of master. 2) Verify master is operating correctly.
LED solid red	1) No data exchange, and slave's address is set to 0.	1) Assign new address and add to scan list of master.

Bluetooth Specifications

Bluetooth Specifications (Units with model -BT or -BL)	
Communication	Bluetooth 5 Low Energy technology (not compatible with Bluetooth Classic)
Frequency band*	2.402 - 2.480 GHz
Transmit power*	+4 dBm
Data rate	1 Mbps; effective information transmit rate ~10 Kbps
Range	Theoretically up to 100 meters (330 feet) in free space. Range is reduced by obstructions. Line of sight is not necessary.
Application	ISP app available from the App store
Hand-held	Compatible with iPhone® and iPad® with iOS 9 or later

Optional Diagnostic Features

Optional Diagnostic Feature Description	-BT Supported?	-BL Supported?
Allows Overriding the Solenoid via BLE (Only functions with Integral Solenoid)	Yes	No
Allows Calibrating/Teaching the valve via BLE	Yes	No
Stroke Times (Only functions with Integral Solenoid)	Yes	Yes

Optional Diagnostic Feature Description	-BT Supported?	-BL Supported?
Valve Position graph	Yes	Yes
Lifetime Cycle Count (non-resettable)	Yes	Yes
Valve Position graph	Yes	Yes
Auxiliary 4-20mA Input	No	No
Auxiliary Discrete Inputs	No	No
Unlocking the Device: Power the unit with a standard 24VDC power supply, Place the ASi's power supply jumper into "IR addressing" mode, or enable the BLE Overrides bit via the ASi bus.		

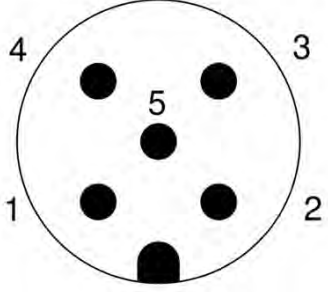
3.3 ISP with 3-Wire Discrete Specifications

ITT ISP, 3-Wire Discrete Specifications

Configuration	(2) Discrete N.O. Push-Pull Input. Self-learning outputs for NPN/PNP/Sinking/Sourcing PLC input cards. (0 or 1) Integral Solenoid(s). Self-learning control input for NPN/PNP/Sinking/Sourcing PLC output cards.
Input Mapping	Pin 2: Open Signal (DI) ^{Note 1} Pin 4: Closed Signal (DI) ^{Note 1}
Output Mapping	Pin 5: Solenoid Signal (DO) ^{Notes 1, 2} NOTICE: 1. "DI" and "DO" are defined as being from the perspective of the PLC/DCS. 2. Due to the Self-learning DO signal, each DO signal must be wired to a dedicated PLC Output Card point (they cannot be wired together (aka parallel) with other ISP DO signals).

Sensor Specifications

Sensor Specifications:	Notes	Minimum	Typical	Maximum	Units
Operation	Normally open (solid state)				
Supply Voltage range		18	24	30	V
Operating Current	Supply = 24V, 1 LED Color ON, Solenoid OFF		20		mA
	Supply = 24V, 1 LED Color ON, Solenoid ON		65		
Operating Supply power	Supply = 18-30V, 1 LED Color ON, Solenoid OFF			0.6	W
	Supply = 18-30V, 1 LED Color ON, Solenoid ON			1.8	
Full Range Accuracy		-0.5		+0.5	mm
"Make" deadband	From Closed Set Point		25		% Full
	From Open Set Point		40		Stroke
Hysteresis	From "Make" Point		5		% Full
					Stroke
Connector		5 Pin M12 Male A-coded		5-Pin micro connector M12	

Sensor Specifications:	Notes	Minimum	Typical	Maximum	Units
	Pin 1: 24V+ (L+) Pin 2: Open Signal (DI) Pin 3: 24V- (L-) Pin 4: Closed Signal (DI) Pin 5: Solenoid Signal (DO)				
					
				Male pins	

Discrete Inputs

Discrete Inputs:	Notes	Minimum	Typical	Maximum	Units
On state current		2.0		100	mA
Leakage current			0.00		mA
Voltage drop	10mA DC operation		0.05	0.1	V
	100mA DC operation		0.30	0.5	
"No Load" Protection	Yes, Protected from direct application of 30 VDC all pins			Continuous	Minutes
PLC card compatibility	Self-learning outputs (inputs to PLC) configure themselves to the card used, whether it be PNP/NPN/Sinking/Sourcing, as long as the Minimum On state current rating is met.				

Discrete Output / Solenoid:

Discrete Output / Solenoid:	Notes	Minimum	Typical	Maximum	Units
Output Card Max Off state leakage	Sinking (NPN) output cards			1.0	mA
	Sourcing (PNP) output cards			2.0	
Solenoid Signal Input Impedance			3.4		kΩ
Short circuit	Solenoid Coil is Short Circuit Protected			Continuous	Minutes
Pneumatic ratings	See Solenoid Valve specification sheet.				
Manual Solenoid Override	<u>On all -SV models:</u> Local Latching Solenoid Override. See Local Solenoid Override feature below.				
	<u>On models with -SV and -BT:</u> Temporary Solenoid Overrides via ISP app. Overrides are automatically de-activated when disconnecting from the unit.				
PLC card compatibility	Self-learning input (output from PLC) configures itself to the card used, whether it be PNP/NPN/Sinking/Sourcing/Push-pull ³ , as long as the Maximum Off State current rating is met.				
NOTICE:					
³ When connected to Push-pull output card, it uses "Active High" logic.					

Environmental Specifications

Environmental Specifications	Minimum	Typical	Maximum	Units
Operating temperature	-10		50	°C
Ingress Protection			IP65	

Environmental Specifications	Minimum	Typical	Maximum	Units
Pollution Degree			4	
Location			Indoor	
Altitude			5000	m
Humidity			90	%

Bluetooth Specifications (Units with model -BT or -BL)

Communication	Bluetooth 5 Low Energy technology (not compatible with Bluetooth Classic)
Frequency band	2.402 - 2.480 GHz
Transmit power	+4 dBm
Data rate	1 Mbps; effective information transmit rate ~10 Kbps
Range	Theoretically up to 100 meters (330 feet) in free space. Range is reduced by obstructions. Line of sight is not necessary.
Application	ITT Valve Sensing available from the App store
Application	Compatible with iPhone® and iPad® with iOS 9 or later

Optional Diagnostics Features

Optional Diagnostics Feature Description	-BT Supported?	-BL Supported?
Allows Overriding the Solenoid via BLE (Only functions with Integral Solenoid)	Yes	No
Allows Calibrating/Teaching the valve via BLE	Yes	No
Stroke Times (Only functions with Integral Solenoid)	Yes	Yes
Valve Position graph	Yes	Yes
Lifetime Cycle Count (non-resettable)	Yes	Yes
Valve Position graph	Yes	Yes
Auxiliary 4-20mA Input	No	No
Auxiliary Discrete Inputs	No	No
Unlocking the Device: The Device is unlocked until any of the signals (Open/Closed/Solenoid) are wired to a PLC/DCS card, at which time it locks, and it cannot be unlocked until unwired and power cycled.		

3.4 ISP With Pneumatics Specifications

Manual override	See Output Protocol Specification Sheet
Configuration	Single pilot 3-way, 2-position, spring return
Flow Rating	0.2 Cv (Kv = 0.17 based on flow m3/hr)
Porting	1/8" NPT (Torque 5ft-lb recommended; 10ft-lb Max.)
Medium	Air or inert gas
Medium Temp. Range (TS)	-10°C to 50°C 14°F to 122°F
Operating Pressure	1.72 to 8.2 bar 25 psi to 120 psi
Operating Temperature	-10°C to 50°C 14°F to 122°F
Operating Life	1,000,000 cycles
Type	Direct acting
Solenoid	

Operating Voltage	See Sensor Specifications in • Sensor Specifications on page 9 and • Sensor Specifications on page 7
Power Consumption	See Sensor Specifications in • Sensor Specifications on page 9 and • Sensor Specifications on page 7
Operating Temperature	-10°C to 50°C 14°F to 122°F
Filtration Requirements	40 microns

Valve Schematic

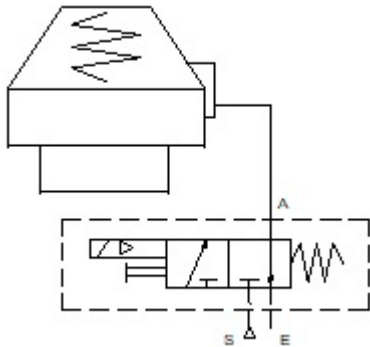


Figure 1: Single Pilot Spring Return Actuator

NOTICE:

- It is recommended to use thread tape etc. on fittings for the (S) and (A) 1/8" NPT ports.
- It is recommended that the exhaust port E be fitted with low restriction mufflers or breather vent caps or elbows etc. to prevent ingestion of water and debris into the pneumatic valve.

4 Installation

4.1 Install the ISP

Installation details depend on the valve type, size and actuator model. Details are provided in the charts below. See [7.1 Parts Listings and Cross-Sectional Drawings on page 25](#) for details.

Table 1: ISP Mounting Kits for Pure-Flo with Advantage Actuator

Valve Size	Valve Type	Actuator Type		Kit Type
		A Series	B Series	
Bio-Tek	Pure-Flo	A103, A203, A204, A303	B103, B203, B204, B303	T1
0.50	Pure-Flo	A105, A205, A206, A208, A209, A305	B105, B205, B206, B208, B209, B305	T1
0.75	Pure-Flo	A108, A208, A209, A208	B108, B208, B209, B305	T1
1.00	Pure-Flo	A108, A208, A209, A308	B108, B208, B209, B308	T1
1.50	Pure-Flo	A116, A216, A217, A316	B116, B216, B217, B316	T2
2.00	Pure-Flo	A116, A216, A217, A316	B116, B216, B217, B316	T2
2.50 - 4.00	Pure-Flo	A133, A233, A234, A333		T6

Table 2: ISP Mounting Kits for Pure-Flo with ACS Actuator

Valve Size	Valve Type	Actuator Type	Kit Type
Bio Pure	Pure-Flo	ACS1, ACS2, ACS3	N/A
0.50	Pure-Flo	ACS1, ACS2, ACS3	T3
0.75	Pure-Flo	ACS1, ACS2, ACS3	T4
1.00	Pure-Flo	ACS1, ACS2, ACS3	T4
1.50	Pure-Flo	ACS1, ACS2, ACS3	T2
2.00	Pure-Flo	ACS1, ACS2, ACS3	T5

Table 3: ISP Mounting Kits for EnviZion with Advantage Actuator (ZB)

Valve Size	Valve Type	Actuator Type	Kit Type
0.75	EnviZion	ZB1, ZB2, ZB3	T1
1.00	EnviZion	ZB1, ZB2, ZB3	T1
1.50	EnviZion	ZB1, ZB2, ZB3	T2
2.00	EnviZion	ZB1, ZB2, ZB3	T2

Table 4: ISP Mounting Kits for EnviZion with Stainless Steel Actuator (ZA)

Valve Size	Valve Type	Actuator Type	Kit Type
BioviZion	EnviZion	ZA1, ZA2, ZA3	T1
0.50	EnviZion	ZA1, ZA2, ZA3	T1
0.75R	EnviZion	ZA1, ZA2, ZA3	T1
0.75	EnviZion	ZA1, ZA2, ZA3	T3
1.0	EnviZion	ZA1, ZA2, ZA3	T3

4.2 Install ISP on the Valve Actuator

Valve Size	Valve Type	Actuator Type	Kit Type
1.50	EnviZion	ZA1, ZA2, ZA3	T2
2.00	EnviZion	ZA1, ZA2, ZA3	T2

Table 5: ISP Mounting Kits for Dia-Flo valves with Advantage Actuators

Valve Size	Valve Type	Actuator Type	Kit Type
0.50	Dia-Flo	A105, A205, A206, A208, A305	T1
0.75	Dia-Flo	A108, A208, A209, A308	T1
1.00	Dia-Flo	A108, A208, A209, A308	T1
1.50	Dia-Flo	A116, A216, A217, A316	T2
2.00	Dia-Flo	A116, A216, A217, A316	T2
2.00	Dia-Flo	A133, A233	T6
3.00	Dia-Flo	A133, A233, A234, A333	T6

4.2 Install ISP on the Valve Actuator

1. The mounting kit supplied by ITT has the correct parts for your specific actuator. Compare the parts supplied with the applicable drawings. Ensure all parts are available.
2. With fingers only, thread the magnet completely into the actuator indicator spindle. Thread locking compound is recommended.
3. If a mounting plate is required, install it along with the appropriate O-rings. Tighten screws securely.

NOTICE:

In order to maintain enclosure type and IP ratings, the 4-40 mounting screws shall be tightened to 3.5 in-lb min. to 5.5 in-lb max.

4. Open the valve. (For fail-closed and double acting actuators, use 90 psi air pressure. Vent any air pressure from fail-open actuators.) Check the height of the magnet above the ISP mounting surface. If the height of the magnet above the mounting surface exceeds 1.04", contact ITT.

NOTICE:

If the above measurement exceeds 1.04", the ISP may be damaged by movement of the magnet.

5. The ISP can be installed in 90 degree increments about the centerline of the actuator. The standard position of installation is with the flat side of the ISP aligned with the actuator ports.
6. Install the ISP along with the appropriate gasket. Tighten screws securely.

4.3 Piping

1. If the ISP has NPT ports on the side, it contains a solenoid valve, which may be used to operate the valve actuator. However, an ISP with solenoid is not normally used with double acting actuators. If an ISP with solenoid is to be mounted on a double acting actuator, contact ITT.
2. Plant instrument air should be connected to port 'S'.
3. The exhaust port is marked 'E'.
 - a) Do not block the exhaust port; the valve will not operate.
 - b) It is recommended that a breather or muffler accessory be installed at port 'E', to prevent ingestion of debris or water.
4. Port 'A' should be connected to the actuator port.

NOTICE:

Loose pieces of Teflon tape may interfere with the function of the solenoid valve. Use care to avoid excess tape. Do not allow tape to extend beyond the end of the fitting.

5 Operation

5.1 Operation of ISP with AS-i Communication

5.1.1 Bench test procedure and sensor setting instructions

**CAUTION:**

Performing this procedure will cause the sensor inputs to change state and will cause the valve/actuator to automatically stroke on units with integral solenoid. Performing this procedure is not recommended during a live process. Use appropriate lockout/tagout procedure.

To test sensors, use a 24 VDC power supply. No series load resistor is required.

1. Apply power across the ASi+ (Pin 1) and ASi- (Pin 3) M12 receptacle.
2. Calibrate:
 - a) Using Dongle:
 - i. Hold Dongle over Dongle Target with word "Calibrate" upwards. Hold for about 2 seconds, until blue LEDs start to flash. Note: flashing will continue for 10 seconds if no further action is taken.
 - ii. Remove Dongle briefly and re-apply Dongle to Dongle Target with either side upwards. Hold for about 1 second until blue LEDs turn solid blue. The 30 second Calibrate sequence has been started. Remove Dongle from Dongle Target.
 1. On units with integral solenoid, the solenoid will change states, stroking the valve.
 2. On units without integral solenoid, the valve must be manually stroked by the operator.
 - iii. If the ISP has detected a full stroke of the valve, the setpoints are saved in non-volatile memory, and the blue LED and valve position (red or green) starts to alternate flash for 10 seconds
 1. During this flashing period, the user may apply either side of the Dongle to the Dongle Target for about 1 second to swap LED colors associated with open and closed positions (default from factory is red for closed, green for open).
 - iv. If the ISP does not detect a full stroke of the valve, the previous setpoints are deleted and the valve position LEDs will remain off until the valve is properly calibrated.
 - b) Using ISP app (Only on -BT units):
 - i. Select unit from the list of Devices.
 - ii. Ensure the device is unlocked (see "Unlocking Device" portion of Optional Diagnostics Feature table). Note: The Calibrate button should have a white background.
 - iii. Select the Calibrate button. After accepting the warning pop-up, the 30 second Calibrate sequence will be started. The unit's blue LEDs will turn solid blue.
 1. On units with integral solenoid, the solenoid will change states, stroking the valve.
 2. On units without integral solenoid, the valve must be manually stroked by the operator.
 - iv. A pop-up showing the current settings for LED colors will appear. The LED colors may be swapped at this time if desired.

- v. If the ISP has detected a full stroke of the valve, the setpoints are saved in non-volatile memory, and the blue LED and valve position (red or green) starts to alternate flash for 10 seconds
 - 1. During this flashing period, the user may apply either side of the Dongle to the Dongle Target for about 1 second to swap LED colors associated with open and closed positions (default from factory is red for closed, green for open).
 - vi. If the ISP does not detect a full stroke of the valve, the previous setpoints are deleted and the valve position LEDs will remain off until the valve is properly calibrated.
3. Setpoints are retained even after power is removed.

A functioning AS-Interface network is required to test communications.

5.1.2 Local Solenoid Override feature

NOTICE:

Available only on units with integral solenoid (-SV).



CAUTION:

Performing this procedure will cause the valve/actuator to stroke. Performing this procedure is not recommended during a live process. Use appropriate lockout/tagout procedure.

1. Locally Overriding the solenoid will invert the current state of the solenoid. If the solenoid is off, it will turn on; if it is on, it will turn off.
2. The Local Override is a latching override and takes precedence over the ASi master and ISP app overrides.
3. To enable solenoid override, hold Dongle over Dongle Target with word "Solenoid" upwards. Hold for about 2 seconds, until blue LEDs start to flash. The Solenoid LED indicates the current state of the solenoid. ASi input bit 2 is set to "1", indicating the local force to the control system.
 - a) The blue LED will continue to flash until the Local Override is removed.
 - b) ASi input bit 2 is set to "1" until the Local Override is removed.
4. To disable solenoid override, hold Dongle over Dongle Target with word "Solenoid" upwards. Hold for about 2 seconds, until blue LEDs stop flashing. The solenoid is then returned to the ASi Master's control. The Solenoid LED indicates the current state of the solenoid.

5.1.3 AS-Interface Wink feature

This feature provides the capability of setting the CLOSED or OPEN LEDs to flash or "wink". This feature aids in physically locating the unit on the network.

1. AS-Interface communications are required in order to set the "Wink" feature. The unit must be addressed and correctly configured to be recognized by the Control System or the AS-Interface Gateway/Master.
2. Set parameter Bit 0 to "1" in the desired unit. Once the correct unit has been physically located on the network, indicated by the "winking" of the LEDs, set parameter Bit 0 back to "0". Performing this function will not change the Closed and Open sensor setpoints.

5.2 Operation of ISP with 3-Wire Discrete Operation

5.2.1 Bench test procedure and sensor setting instructions



CAUTION:

Performing this procedure will cause the sensor inputs to change state and will cause the valve/actuator to automatically stroke on units with integral solenoid. Performing this procedure is not recommended during a live process. Use appropriate lockout/tagout procedure.

To test sensors, use a 24 VDC power supply. No series load resistor is required.

1. Apply power across the L+ (Pin 1) and L- (Pin 3) M12 receptacle.
2. Calibrate:
 - a) Using Dongle:
 - i. Hold Dongle over Dongle Target with word "Calibrate" upwards. Hold for about 2 seconds, until blue LEDs start to flash. Note: flashing will continue for 10 seconds if no further action is taken.
 - ii. Remove Dongle briefly and re-apply Dongle to Dongle Target with either side upwards. Hold for about 1 second until blue LEDs turn solid blue. The 30 second Calibrate sequence has been started. Remove Dongle from Dongle Target.
 1. On units with integral solenoid, the solenoid will change states, stroking the valve.
 2. On units without integral solenoid, the valve must be manually stroked by the operator.
 - iii. If the ISP has detected a full stroke of the valve, the setpoints are saved in to non-volatile memory, and the blue LED and valve position (red or green) starts to alternate flash for 10 seconds
 1. During this flashing period, the user may apply either side of the Dongle to the Dongle Target for about 1 second to swap LED colors associated with open and closed positions (default from factory is red for closed, green for open).
 - iv. If the ISP does not detect a full stroke of the valve, the previous setpoints are deleted and the valve position LEDs will remain off until the valve is properly calibrated.
 - b) Using ISP app (Only on -BT units):
 - i. Select unit from the list of Devices.
 - ii. Ensure the device is unlocked (see "Unlocking Device" portion of Optional Diagnostics Feature table). Note: The Calibrate button should have a white background.
 - iii. Select the Calibrate button. After accepting the warning pop-up, the 30 second Calibrate sequence will be started. The unit's blue LEDs will turn solid blue.
 1. On units with integral solenoid, the solenoid will change states, stroking the valve.
 2. On units without integral solenoid, the valve must be manually stroked by the operator.
 - iv. A pop-up showing the current settings for LED colors will appear. The LED colors may be swapped at this time if desired.
 - v. If the ISP has detected a full stroke of the valve, the setpoints are saved in non-volatile memory, and the blue LED and valve position (red or green) starts to alternate flash for 10 seconds
 1. During this flashing period, the user may apply either side of the Dongle to the Dongle Target for about 1 second to swap LED colors associated with open and closed positions (default from factory is red for closed, green for open).
 - vi. If the ISP does not detect a full stroke of the valve, the previous setpoints are deleted and the valve position LEDs will remain off until the valve is properly calibrated.
3. Setpoints are retained even after power is removed.

5.2.2 Local Solenoid Override Feature

NOTICE:

Available only on units with integral solenoid (-SV).



CAUTION:

Performing this procedure will cause the valve/actuator to stroke. Performing this procedure is not recommended during a live process. Use appropriate lockout/tagout procedure.

1. Locally Overriding the solenoid will invert the current state of the solenoid. If the solenoid is off, it will turn on; if it is on, it will turn off.
2. The Local Override is a latching override and takes precedence over the PLC output card and ISP app overrides.
3. To enable solenoid override, hold Dongle over Dongle Target with word "Solenoid" upwards. Hold for about 2 seconds, until blue LEDs start to flash. The Solenoid LED indicates the current state of the solenoid.
 - a) The blue LED will continue to flash until the Local Override is removed.
4. To disable solenoid override, hold Dongle over Dongle Target with word "Solenoid" upwards. Hold for about 2 seconds, until blue LEDs stop flashing. The solenoid is then returned to the PLC output card's control. The Solenoid LED indicates the current state of the solenoid.

5.3 Compliance Statements for ISP with AS-i Communication

Statements required by FCC

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference.
2. This device must accept any interference received, including interference that may cause undesired operation.

NOTICE:

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.



CAUTION:

Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

Contains FCC ID: SQGBL651 IC: 3147A-BL651

FCC Radiation Exposure Statement: The product complies with the US portable RF exposure limit set forth for an uncontrolled environment and are safe for intended operation as described in this manual. The further RF exposure reduction can be achieved if the product can be kept as far as possible from the user body or set the device to lower output power if such function is available.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Statements required by Industry Canada (IC)

This device complies with Industry Canada's license-exempt RSSs. Operation is subject to the following two conditions:

1. This device may not cause interference; and
2. This device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes:

1. l'appareil ne doit pas produire de brouillage;
2. l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Radiation Exposure Statement: The product complies with the Canada portable RF exposure limit set forth for an uncontrolled environment and are safe for intended operation as described in this manual. The further RF exposure reduction can be achieved if the product can be kept as far as possible from the user body or set the device to lower output power if such function is available.

Déclaration d'exposition aux radiations: Le produit est conforme aux limites d'exposition pour les appareils portables RF pour les Etats-Unis et le Canada établies pour un environnement non contrôlé. Le produit est sûr pour un fonctionnement tel que décrit dans ce manuel. La réduction aux expositions RF peut être augmentée si l'appareil peut être conserve aussi loin que possible du corps de l'utilisateur ou que le dispositif est réglé sur la puissance de sortie la plus faible si une telle fonction est disponible.

Statements required by EU Declaration of Conformity (CE)

Products with Bluetooth:

Directive:

2014/53/EU – Radio Equipment Directive (RED)

Harmonized Standards:

EN 60950-1:2006 +A11:2009 +A1:2010 +A12:2011 +A2:2013

EN 62311:2008

EN 301 489-1 v2.2.0 (2017-03)

EN 301 489-17 v3.2.0 (2017-03)

EN 300 328 v2.1.1 (2016-11)

EN 62026-2:2013

Products without Bluetooth:

Directive:

2014/30/EU – Electromagnetic Compatibility (EMC)

Harmonized Standards:

EN 62026-2:2013

Statement required by EN 62026-2:2013**CAUTION:**

To maintain safety, only power supplies that provide Double/Reinforced insulation, such as those with PELV/SELV outputs, shall be used.

Statement required by EN 61010-1**NOTICE:**

If the unit is used in a manner not specified by the manufacturer, the protection provided by it may be impaired.

Statement required by EN 62026-2:2013**NOTICE:**

In order to maintain enclosure type and IP ratings, the 4-40 mounting screws shall be tightened to 3.5 in-lb min. to 5.5 in-lb max.

5.4 Compliance Statements for ISP with 3-Wire Discrete

Statements required by FCC

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference.
2. This device must accept any interference received, including interference that may cause undesired operation.

NOTICE:

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

**CAUTION:**

Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

Contains FCC ID: SQGBL651 IC: 3147A-BL651

FCC Radiation Exposure Statement: The product complies with the US portable RF exposure limit set forth for an uncontrolled environment and are safe for intended operation as described in this manual. The further RF exposure reduction can be achieved if the product can be kept as far as possible from the user body or set the device to lower output power if such function is available.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Statements required by Industry Canada (IC)

This device complies with Industry Canada's license-exempt RSSs. Operation is subject to the following two conditions:

1. This device may not cause interference; and
2. This device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes:

1. l'appareil ne doit pas produire de brouillage;
2. l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Radiation Exposure Statement: The product complies with the Canada portable RF exposure limit set forth for an uncontrolled environment and are safe for intended operation as described in this manual. The further RF exposure reduction can be achieved if the product can be kept as far as possible from the user body or set the device to lower output power if such function is available.

Déclaration d'exposition aux radiations: Le produit est conforme aux limites d'exposition pour les appareils portables RF pour les Etats-Unis et le Canada établies pour un environnement non contrôlé. Le produit est sûr pour un fonctionnement tel que décrit dans ce manuel. La réduction aux expositions RF peut être augmentée si l'appareil peut être conserve aussi loin que possible du corps de l'utilisateur ou que le dispositif est réglé sur la puissance de sortie la plus faible si une telle fonction est disponible.

Statements required by EU Declaration of Conformity (CE)

Products with Bluetooth:

Directive:

2014/53/EU – Radio Equipment Directive (RED)

Harmonized Standards:

EN 60950-1:2006 +A11:2009 +A1:2010 +A12:2011 +A2:2013

EN 62311:2008

EN 301 489-1 v2.2.0 (2017-03)

EN 301 489-17 v3.2.0 (2017-03)

EN 300 328 v2.1.1 (2016-11)

EN 60947-5-2:2007+A1:2012

Products without Bluetooth:

Directive:

2014/30/EU – Electromagnetic Compatibility (EMC)

Harmonized Standards:

EN 60947-5-2:2007+A1:2012

Statements required by EN IEC 61010-2-201:2018



WARNING:

To maintain safety, only power supplies that provide Double/Reinforced insulation, such as those with PELV/SELV outputs, shall be used.

Statements required by EN 61010-1

NOTICE:

If the unit is used in a manner not specified by the manufacturer, the protection provided by it may be impaired.

Statements required by EN 60947-5-2:2007+A1:2012

NOTICE:

In order to maintain enclosure type and IP ratings, the 4-40 mounting screws shall be tightened to 3.5 in-lb min. to 5.5 in-lb max.

6 Maintenance

6.1 ISP Maintenance

The ISP is permanently sealed and no maintenance is required.

Periodically inspect the ISP to check:

- Mounting. The ISP should be attached securely to the actuator. Tighten the mounting screws as necessary.
- Cracks. The ISP must be replaced if cracked.
- Internal moisture. The ISP must be replaced if internal moisture is noted.
- Piping connections are secure and not leaking. Seal and tighten as appropriate.

AS-i and DeviceNet units have LED fault indicators. See the applicable section for explanation of these indications.

Additional status information and error codes is available via the ISP app (if ISP is equipped with diagnostics.) See the User Guide for the ISP App: Diagnostics and Control.

7 Parts Listing and Cross-Sectional Drawings

7.1 Parts Listings and Cross-Sectional Drawings

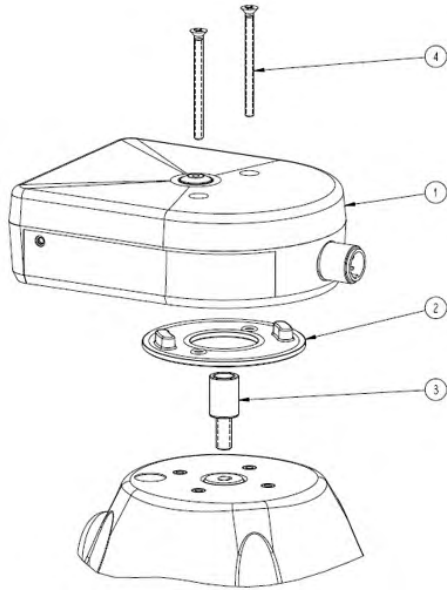


Figure 2: Type 1

Table 6: List of Parts

Item	Dwg. No.	Qty.	Description	Note
1	-	1	ISP switchpack	
2	-	1	Gasket	1
3	-	1	Magnet	1
4	-	2	MCHSCR-FL PHH 4-40 x 1.38	1

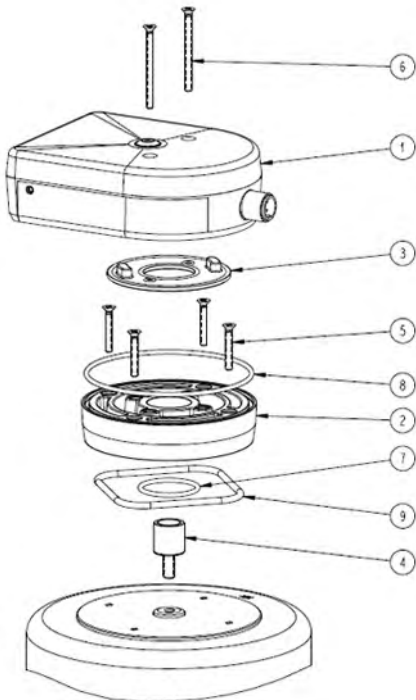


Figure 3: Type 2

Table 7: List of Parts

Item	Dwg. No.	Qty.	Description	Note
1	-	1	ISP Switchpack	
2	-	1	Mounting plate	1
3	-	1	Gasket	1
4	-	1	Magnet	1
5	-	4	MCHSCR-FL PHH 4-40 x 0.75	1
6	-	2	MCHSCR-FL PHH 4-40 x 1.38	1
7	106308	1	O-ring 020	1
8	106308	1	O-ring 038	1
9	106308	1	O-ring 140 (shown in shape of gland)	1

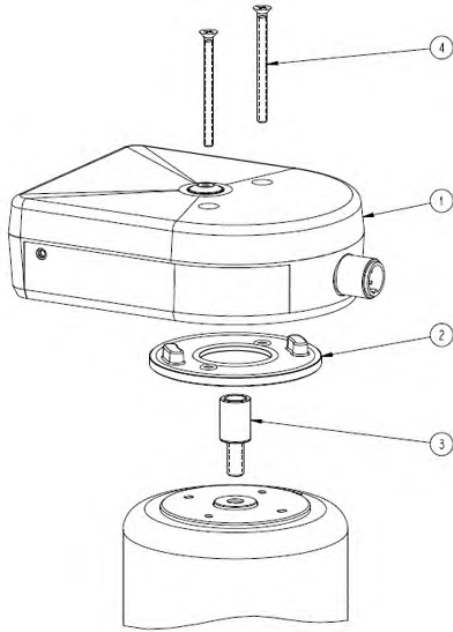


Figure 4: Type 3

Table 8: List of Parts

Item	Dwg. No.	Qty.	Description	Note
1	-	1	ISP switchpack	
2	-	1	Gasket	1
3	-	1	Magnet	1
4	-	2	MCHSCR-FL PHH 4-40 x 1.38	1

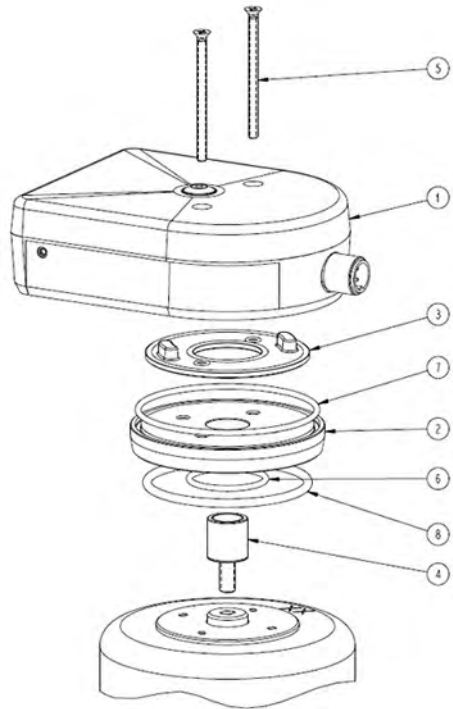


Figure 5: Type 4

Table 9: List of Parts

Item	Dwg. No.	Qty.	Description	Note
1	-	1	ISP Switchpack	
2	124452	1	Mounting plate - ISP	
3	-	1	Gasket	1
4	-	1	Magnet	1
5	-	2	MCHSCR-FL PHH 4-40 x 1.63	
6	106308	1	O-ring 020	
7	106308	1	O-ring 038	
8	106308	1	O-ring 134	

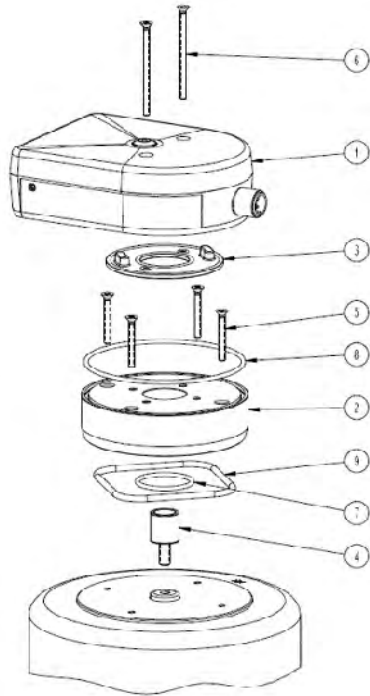


Figure 6: Type 5

Table 10: List of Parts

Item	Dwg. No.	Qty.	Description	Note
1	-	1	ISP Switchpack	
2	124453	1	Mounting plate - ISP	
3	-	1	Gasket	1
4	-	1	Magnet	1
5	-	4	MCHSCR-FL PHH 4-40 x 0.88	
6	-	2	MCHSCR-FL PHH 4-40 x 1.63	
7	106308	1	O-ring 020	
8	106308	1	O-ring 038	
9	106308	1	O-ring 140 (shown in shape of gland)	

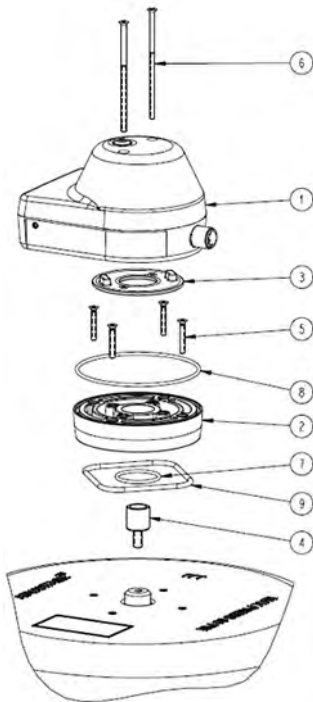
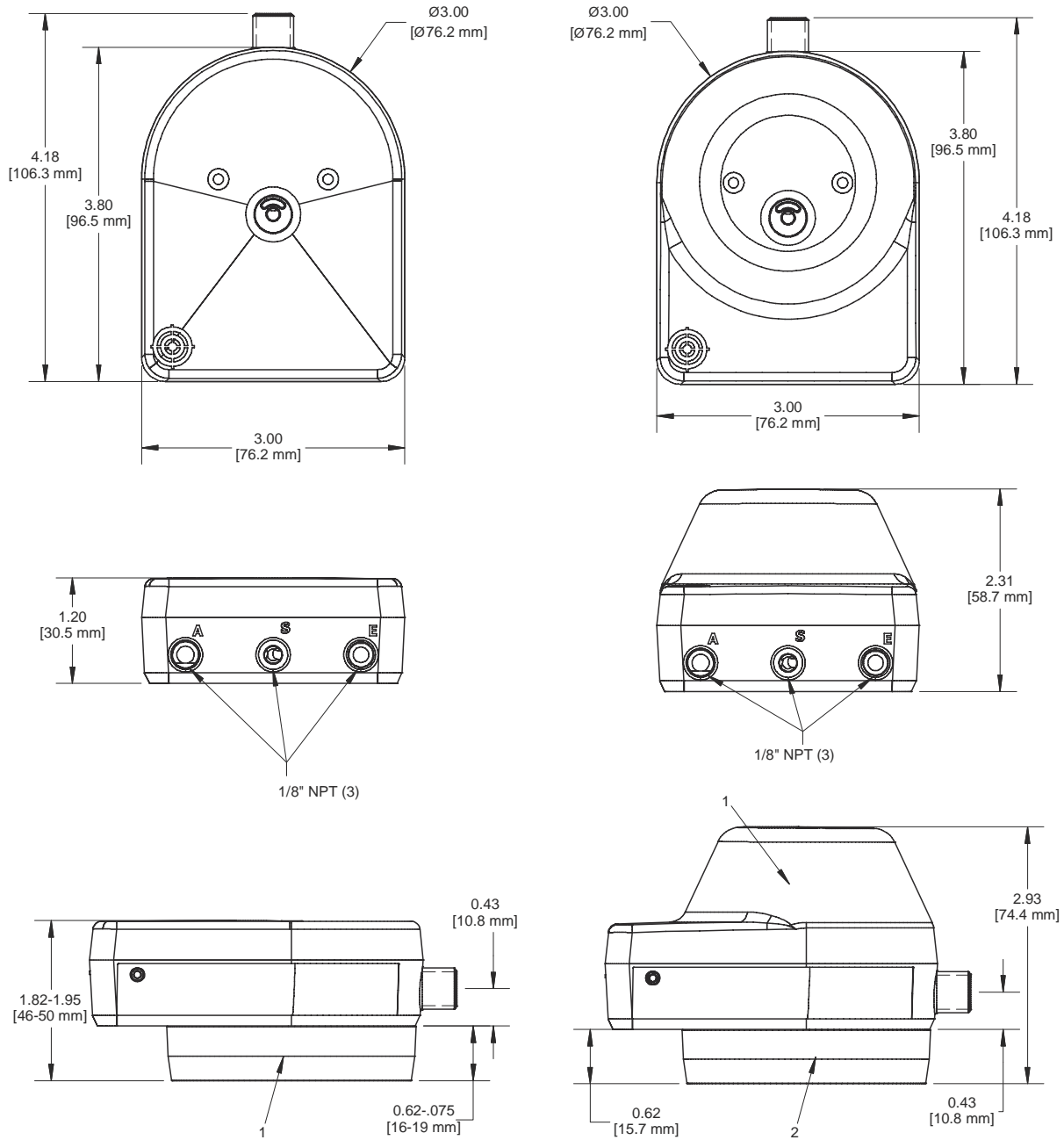


Figure 7: Type 6

Table 11: List of Parts

Item	Dwg. No.	Qty.	Description	Note
1	-	1	ISP Switchpack	
2	-	1	Mounting plate	1
3	-	1	Gasket	1
4	-	1	Magnet	1
5	-	4	MCHSCR-FL PHH 4-40 x 0.75	1
6	-	2	MCHSCR-FL PHH 4-40 x 2.50	1
7	106308	1	O-ring 020	1
8	106308	1	O-ring 038	1
9	106308	1	O-ring 140 (shown in shape of gland)	1

ISP Dimensions



1. Spacer for valves $\geq 1.5"$

Figure 8: Short Cover

1. Tall cover, 3 - 4" valves

2. Spacer for valves $\geq 1.5"$

Figure 9: Tall Cover

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