

Brooks® IPS122 2 Inch Stainless Steel Indicating Pressure Switches



*IPS122
2 Inch Stainless Steel
Indicating Pressure
Switch*

Essential Instructions

Read this page before proceeding!

Brooks Instrument designs, manufactures and tests its products to meet many national and international standards. Because these instruments are sophisticated technical products, you must properly install, use and maintain them to ensure they continue to operate within their normal specifications. The following instructions must be adhered to and integrated into your safety program when installing, using and maintaining Brooks Products.

- Read all instructions prior to installing, operating and servicing the product. If this instruction manual is not the correct manual, please see back cover for local sales office contact information. Save this instruction manual for future reference.
- If you do not understand any of the instructions, contact your Brooks Instrument representative for clarification.
- Follow all warnings, cautions and instructions marked on and supplied with the product.
- Inform and educate your personnel in the proper installation, operation and maintenance of the product.
- Install your equipment as specified in the installation instructions of the appropriate instruction manual and per applicable local and national codes. Connect all products to the proper electrical and pressure sources.
- To ensure proper performance, use qualified personnel to install, operate, update, program and maintain the product.
- When replacement parts are required, ensure that qualified people use replacement parts specified by Brooks Instrument. Unauthorized parts and procedures can affect the product's performance and place the safe operation of your process at risk. Look-alike substitutions may result in fire, electrical hazards or improper operation.
- Ensure that all equipment doors are closed and protective covers are in place, except when maintenance is being performed by qualified persons, to prevent electrical shock and personal injury.

Pressure Equipment Directive (PED)

All pressure equipment with an internal pressure greater than 0.5 bar (g) and a size larger than 25mm or 1" (inch) falls under the Pressure Equipment Directive (PED). The Directive is applicable within the European Economic Area (EU plus Norway, Iceland and Liechtenstein). Pressure equipment can be traded freely within this area once the PED has been complied with.

- Section 1 of this manual contains important safety and operating instructions related to the PED directive.
- Meters described in this manual are in compliance with EN directive 97/23/EC module H *Conformity Assessment*.
- All Brooks Instrument Flowmeters fall under fluid group 1.
- Meters larger than 25mm or 1" (inch) are in compliance with category I, II, III of PED.
- Meters of 25mm or 1" (inch) or smaller are Sound Engineering Practice (SEP).

ESD (Electrostatic Discharge)

CAUTION

This instrument contains electronic components that are susceptible to damage by static electricity. Proper handling procedures must be observed during the removal, installation or other handling of circuit boards or devices.

Handling Procedure:

1. Power to unit must be removed.
2. Personnel must be grounded, via a wrist strap or other safe, suitable means before any printed circuit card or other internal device is installed, removed or adjusted.
3. Printed circuit cards must be transported in a conductive container. Boards must not be removed from protective enclosure until immediately before installation. Removed boards must immediately be placed in protective container for transport, storage or return to factory.

Comments

This instrument is not unique in its content of ESD (electrostatic discharge) sensitive components. Most modern electronic designs contain components that utilize metal oxide technology (NMOS, SMOS, etc.). Experience has proven that even small amounts of static electricity can damage or destroy these devices. Damaged components, even though they appear to function properly, exhibit early failure.

Installation and Operation Manual

X-PR-IPS122-eng

Part Number: 541B150AAG

January, 2011

IPS122 Series

Dear Customer,

We appreciate this opportunity to service your pressure measurement and control requirements with a Brooks Instrument device. Every day, customers all over the world turn to Brooks Instrument for solutions to their gas and liquid control applications. Brooks provides an array of flow, pressure and level measurement and control products for various industries from biopharmaceuticals, oil and gas, fuel cell research and chemicals, to medical devices, analytical instrumentation, semiconductor manufacturing, and more.

The Brooks product you have just received is of the highest quality available, offering superior performance, reliability and value to the user. It is designed with the ever changing process conditions, accuracy requirements and hostile process environments in mind to provide you with a lifetime of dependable service.

We recommend that you read this manual in its entirety. Should you require any additional information concerning Brooks products and services, please contact your local Brooks Sales and Service Office listed on the back cover of this manual or visit www.BrooksInstrument.com.

Yours sincerely,

Brooks Instrument

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1-1 Product Description

The Brooks IPS122 Series Stainless Steel Indicating Pressure Switch provides a high-purity, precision pressure gauge and electronic switch with an adjustable pressure switch setpoint. This compact 2 inch unit has the ability to operate lights or relays up to a maximum of 12 watts. Available in a variety of pressure ranges and process connections. This device provides solid state switching for cleanroom and hazardous applications.

Designed for intrinsic safety, CL I, II, III, Div 1, 2.

This manual is organized into the following sections:

Section 1 - Introduction

Section 2 - Installation

Back Cover - Limited Warranty and Contacts

It is recommended that this manual be read in its entirety before attempting to operate or repair the Model IPS122 Series.

IPS122 Series

1-2 Specifications

⚠ WARNING

Do not operate this instrument in excess of the specifications listed below. Failure to heed this warning can result in serious personal injury and/or damage to the equipment.

⚠ CAUTION

It is the user's responsibility to select and approve all materials of construction. Careful attention to metallurgy, engineered materials and elastomeric materials is critical to safe operation.

	OFF-ON SWITCH Type 1	LOGIC OUTPUT 8-30 Vdc Type 2	LOGIC OUTPUT 5 Vdc Type 3
Case Material	300 Series stainless steel, electropolished		
Bezel and Lens Material	One-piece polycarbonate, screw-on		
Socket	316L stainless steel		
Movement	300 Series stainless steel		
Bourdon Tube	316L stainless steel		
Proof Pressure	110%		
Burst Pressure	400%		
Connections	Face-seal, male, face-seal swivel male, face-seal swivel female, and 1/4" NPT male		
Dial	White with black marking, "Use No Oil" is red		
Accuracy	1% of full scale		
Helium Leak Check	4 X10 ⁻⁹ Inboard Standard cc/sec		
Cleaning	Cleaned for oxygen service to ANSI B40.1 level IV specifications		
Response Time	Less than 200 milliseconds		
Operating (ambient)	0° to 160°F (-18° to 71°C)		
Compensating	20° to 135°F (-7° to 57°C)		
Storage	-20° to 175°F (-29° to 79°C)		
Switch Power Input	9 to 30 Vdc	9 to 30 Vdc	4.8 to 5.2 Vdc
Switch Power Rating	12 watts or 500 mA 175 mA max, for intrinsically safe applications	60 mA (sink). Open collector NPN	60 mA (sink). Open collector NPN
Output Voltage and Current Draw	0 to 9-30 Vdc; 30 mA (off), 45 mA (on)	0 to 9-30 Vdc; 30 mA (off), 45 mA (on)	0 to 5 Vdc; 3 mA (off), 11 mA (on)
Switch Leads	2 m [6'] cable, tinned ends, 0.23" in diameter		
Switch Differential	3% of scale; 0.25% of scale repeatability		
Trip Position	External adjust. Select to trip on ascending (N.O.) or descending (N.C.) pressure. (Field changeable by internal jumper)		
Pressure Ranges Available	Vacuum to 4,000 psi (276 bar). Metric also available. Offered in single scale only.		
Approximate Shipping Weight	0.65 lbs. (0.29 kg)		

1-3 IPS122 Series Pressure Switch Dimensional Drawings

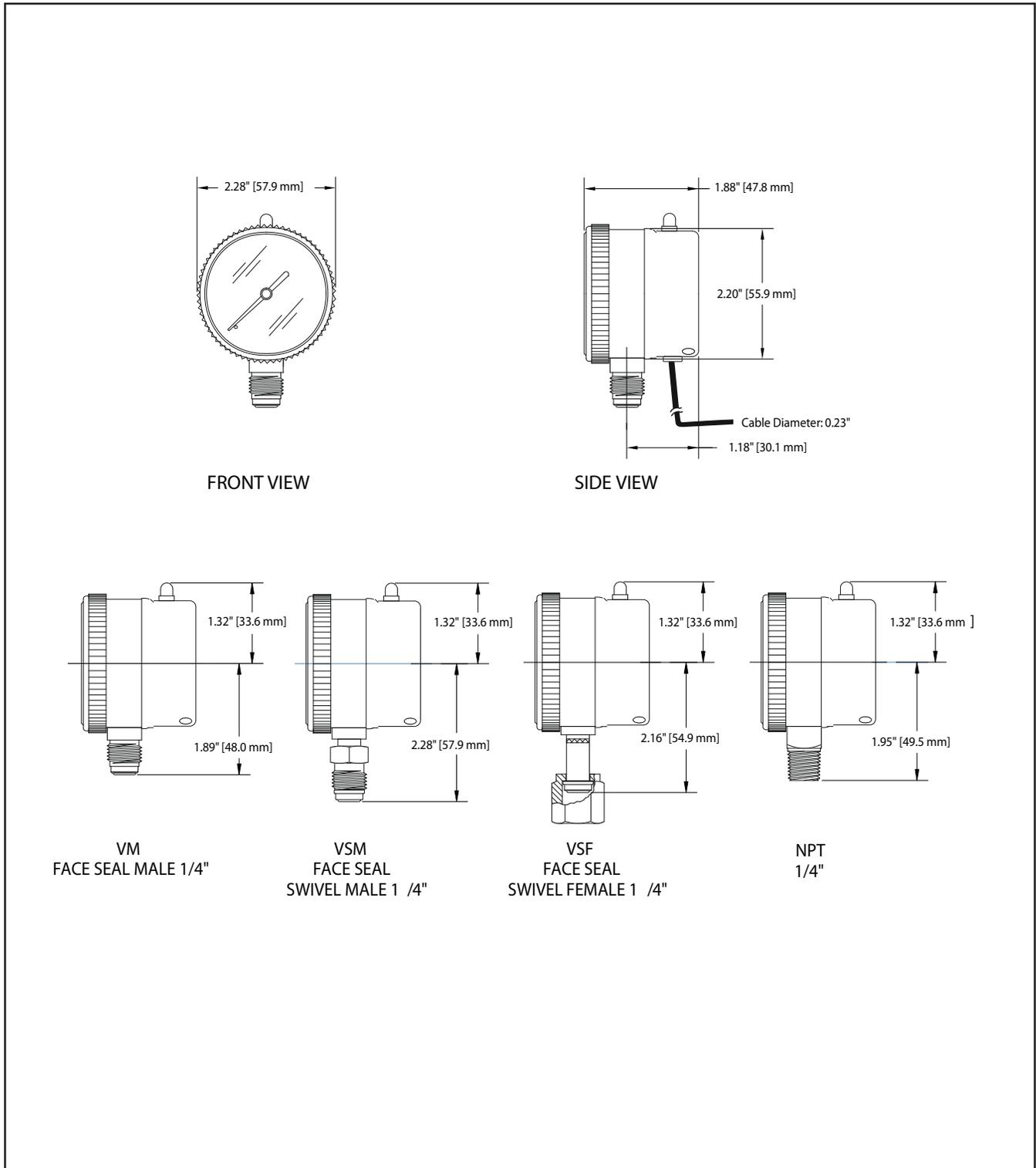


Figure 1-1 IPS122 Dimensions

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2-1 General

This section provides installation instructions for the Brooks® IPS122 Series Indicating Pressure Switch devices. Refer to Section 1 of this manual for dimensions and process connections.

2-2 Receipt of Equipment

When the instrument is received, the outside packing case should be checked for damage incurred during shipment. If the packing case is damaged, the local carrier should be notified at once regarding his liability. A report should be submitted to your nearest Product Service Department.

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Remove the envelope containing the packing list. Carefully remove the instrument from the packing case. Make sure spare parts are not discarded with the packing materials. Inspect for damaged or missing parts.

2-3 Recommended Storage Practice

If intermediate or long-term storage of equipment is required, it is recommended that the equipment be stored in accordance with the following:

- a. Within the original shipping container.
- b. Ambient temperature 21°C (70°F) nominal, 79°C (175°F) maximum
-29°C (-20°F) minimum.
- c. Relative humidity 45% nominal, 60% maximum, 25% minimum.

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2-4 Return Shipment

Prior to returning any device to the factory, visit the Brooks web site (www.BrooksInstrument.com) for a Return Materials Authorization Number (RMA#), or contact one of the locations provided on p. 2-1.

Prior to returning the device, it must be purged in accordance with the following:

⚠ WARNING

Before returning the device purge thoroughly with a dry inert gas such as Nitrogen before disconnecting gas connections. Failure to correctly purge the instrument could result in fire, explosion or death. Corrosion or contamination may occur upon exposure to air.

All devices returned to Brooks require completion of Form RPR003-1, Brooks Instrument Decontamination Statement, along with a Material Safety Data Sheet (MSDS) for the fluid(s) used in the instrument. Failure to provide this information will delay processing by Brooks personnel. Copies of these forms can be downloaded from the Brooks website (www.BrooksInstrument.com) or are available from any of the Brooks Instrument locations provided on p. 2-1.

2-5 Transit Precautions

To safeguard against damage during transit, transport the device to the installation site in the same container used for transportation from the factory, if circumstances permit.

2-6 Removal from Storage

Upon removal of the device from storage, a visual inspection should be conducted to verify its "as-received" condition. If the device has been subject to storage conditions in excess of those recommended (refer to "2-3 Recommended Storage Practice" on p. 2-1), it should be subjected to a pneumatic pressure test in accordance with applicable vessel codes.

2-7 Gas Connections

Prior to installation, ensure that all piping is clean and free from obstructions. Install piping in such a manner that permits easy access to the device if removal becomes necessary.

2-8 Installation

⚠ CAUTION

Perform all operations with standard gas handling procedures in accordance with all local codes for safety and ventilation. You **MUST** wear appropriate clothing and safety apparatus for the gas you are using.

⚠ CAUTION

DO NOT twist the cable so that it turns inside the IPS housing. This may cause permanent damage to the device.

Failure to follow these procedures may adversely affect the product's performance and could void the product warranty. Inspect but **DO NOT** unwrap any parts until installation. Contact your Brooks representative with any problems.

In most cases, physical mounting, wiring to the power supply and control circuit, and setting setpoint is all that is required to complete installation of the IPS pressure switch as received from the factory. Refer to the tag on the back of the IPS pressure switch for factory configuration of close on ascending or close on descending pressure.

For some applications it may be necessary to invert operation of the LED indicator and/or logic signal configuration to ascending or descending operation, disassembly is required to change internal jumper switches.

2-9 Mounting

Mount the IPS pressure switch to the proper fitting in the piping arrangement following standard piping procedures.

2-10 Electrical Configuration

The IPS pressure switch contains two internal "jumper switches" to invert operating functions. Use needle nose pliers to change the switch jumpers. (Refer to Figure 2-1)

- **LED Indicator**
A red LED (light emitting diode) indicates when the pressure setpoint is reached. Its operation is controlled by jumper switch SW1. Changing the position of the internal jumper switch inverts the operation of the LED. For example, the LED may be set to turn ON when pressure either rises above or drops below the setpoint.
- **Output Switch - Ascending/Descending Operation**
The IPS electronic switch may be configured to Close (turn ON) when pressure either rises above the setpoint (ascending), or drops below the set-point. (descending). This operation is controlled by jumper switch SW2.

IPS122 Series

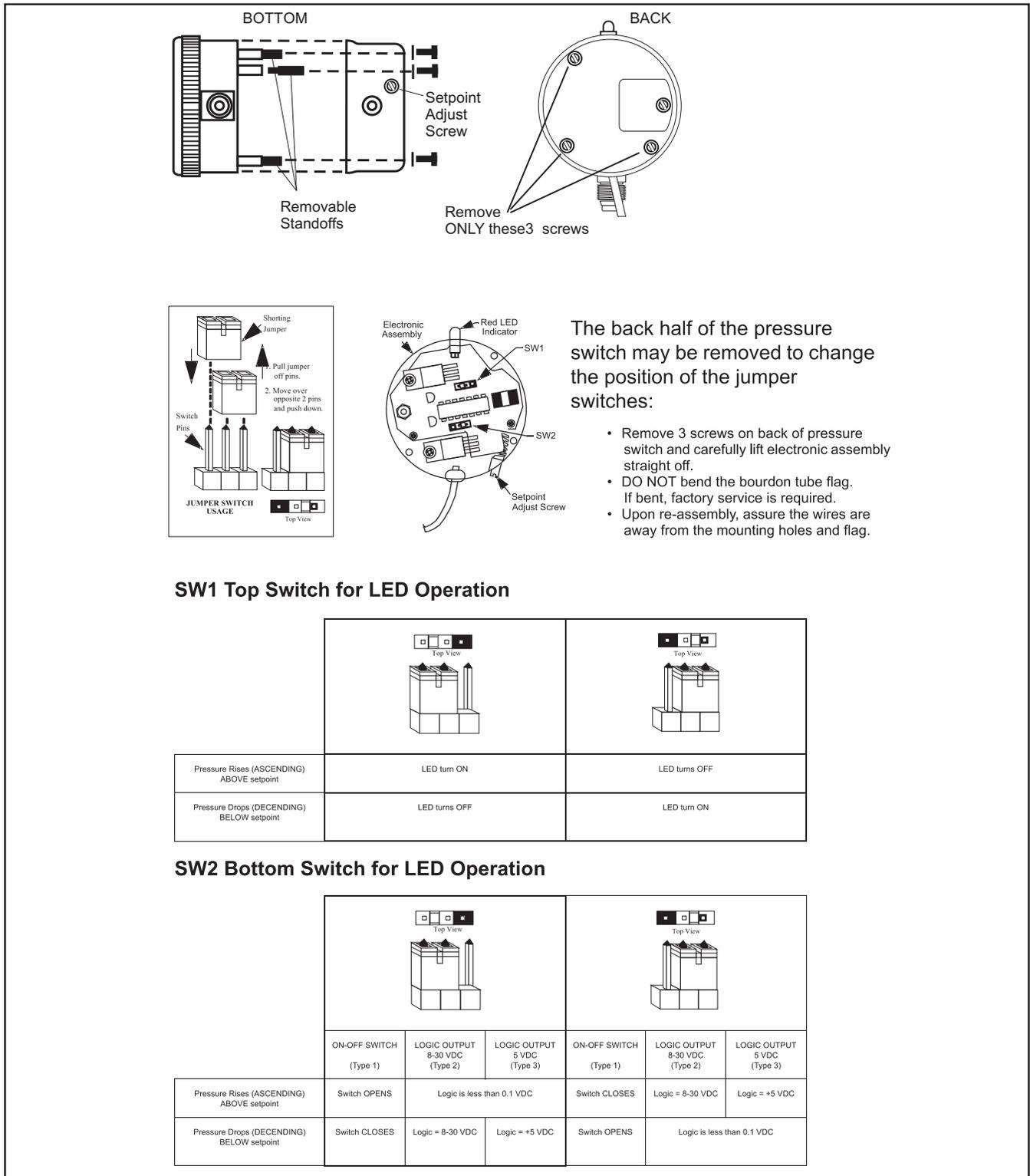


Figure 2-1 IPS122 Internal Jumper Settings

2-11 Electrical Connections

Refer to the appropriate wiring diagram for wiring connections to the IPS pressure switch. (Figure 2-2)

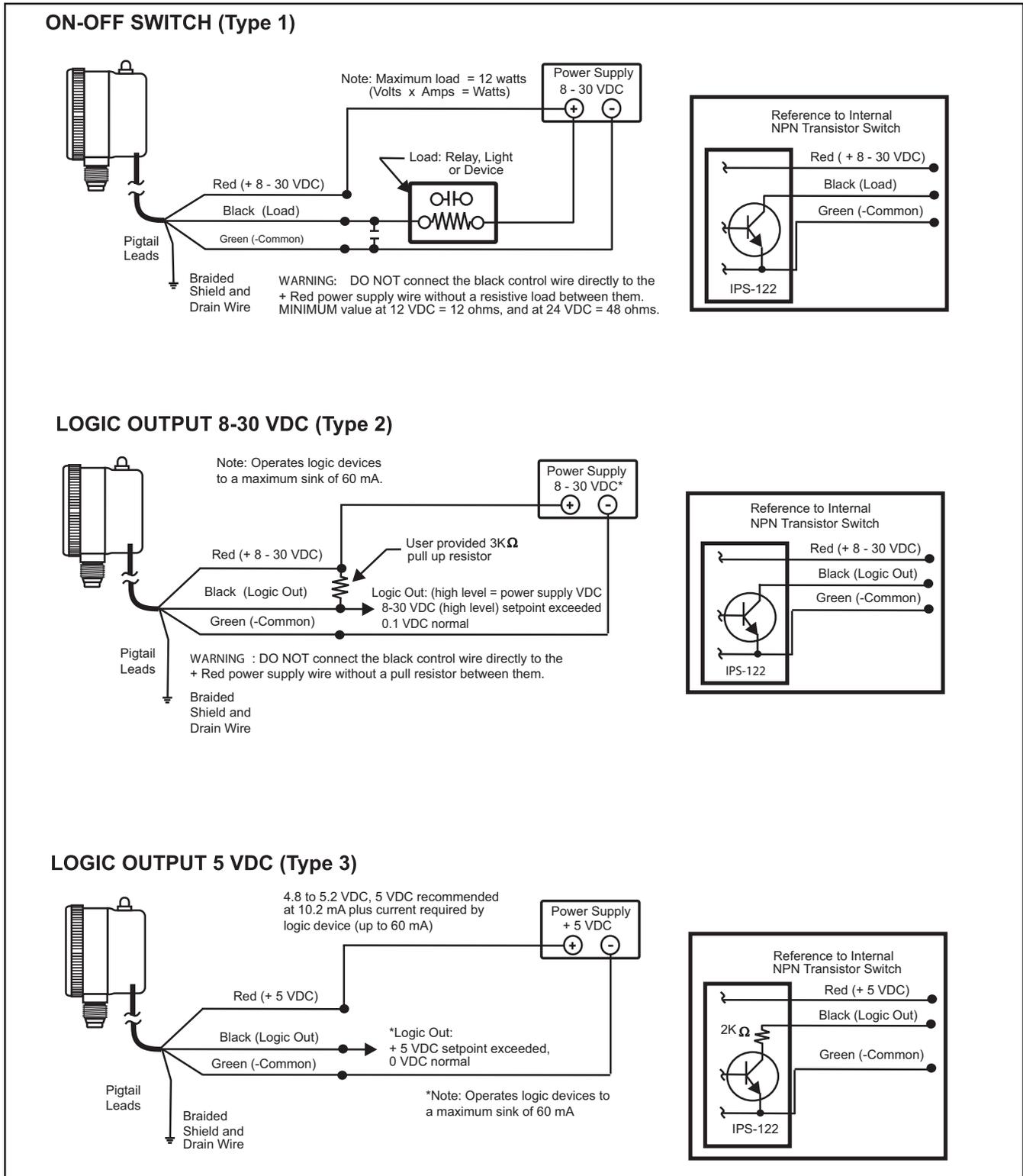


Figure 2-2 IPS122 Wiring Diagrams

IPS122 Series

2-12 Setpoint Adjustment

⚠ NOTICE

Note: Moving the red-pointer does not change the setpoint. It is merely a visual reminder of where setpoint was previously set.

⚠ WARNING

Before operating the device, ensure all fluid connections have been properly tightened and where applicable, all electrical connections have been properly terminated.

⚠ CAUTION

When adjusting the setpoint, DO NOT overtighten the setpoint adjustment screw in either direction. This may cause permanent damage to the device.

(Typical factory setting is at mid-scale.)

1. Connect the IPS pressure switch to a variable pressure source.
2. Apply pressure equal to the desired setpoint.
3. Slowly turn the setpoint adjustment screw (with a 1/8" or smaller flathead screwdriver only) until the LED indicator on top of the IPS pressure switch is activated. **DO NOT OVERTIGHTEN.**
(Refer to Figure 2-1 for adjustment screw location)
 - **CLOCKWISE** to activate the electronic switch to increase pressure setpoint.
 - **COUNTERCLOCKWISE** to activate the electronic switch to decrease pressure setpoint.
4. Change the applied pressure until the gauge is within the normal zone of operating pressure.
5. Slowly continue to change the pressure and verify that the LED indicator is activated at the desired setpoint.
6. Repeat pressure cycle to verify setting and readjust if necessary.
7. Adjust the red pointer mounted on the lens cover with a small screwdriver to indicate the setpoint setting.

⚠ CAUTION

DO NOT attempt to adjust the red pointer by rotating the cover.

8. On a compound gauge, the zero is indicated by a range on the dial rather than a setpoint.

No routine maintenance is required on this device.

	⚠ WARNING
METER/CONTROLLER SEAL COMPATIBILITY	
<p>Products in this manual may contain metal or elastomeric seals, gaskets, O-rings or valve seats. It is the "user's" responsibility to select materials that are compatible with their process and process conditions. Using materials that are not compatible with the process or process conditions could result in the Meter or Controller leaking process fluid outside the pressure boundary of the device, resulting in personnel injury or death.</p> <p>It is recommended that the user check the Meter or Controller on a regular schedule to ensure that it is leak free as both metal and elastomeric seals, gaskets, O-rings and valve seats may change with age, exposure to process fluid, temperature, and /or pressure.</p>	

⚠ WARNING
If it becomes necessary to remove the device from the system, power to the device must be disconnected.

⚠ WARNING
If it becomes necessary to remove the device from the system after exposure to toxic, pyrophoric, flammable or corrosive gas, purge the device thoroughly with a dry inert gas such as Nitrogen before disconnecting gas connections. Failure to correctly purge the device could result in fire, explosion or death. Corrosion or contamination of the device upon exposure to air may occur.

⚠ CAUTION
This instrument contains electronic components that are susceptible to damage by static electricity. Proper handling procedures must be observed during the removal, installation or other handling of internal circuit boards or devices.

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LIMITED WARRANTY

Seller warrants that the Goods manufactured by Seller will be free from defects in materials or workmanship under normal use and service and that the Software will execute the programming instructions provided by Seller until the expiration of the earlier of twelve (12) months from the date of initial installation or eighteen (18) months from the date of shipment by Seller. Products purchased by Seller from a third party for resale to Buyer ("Resale Products") shall carry only the warranty extended by the original manufacturer.

All replacements or repairs necessitated by inadequate preventive maintenance, or by normal wear and usage, or by fault of Buyer, or by unsuitable power sources or by attack or deterioration under unsuitable environmental conditions, or by abuse, accident, alteration, misuse, improper installation, modification, repair, storage or handling, or any other cause not the fault of Seller are not covered by this limited warranty, and shall be at Buyer's expense.

Goods repaired and parts replaced during the warranty period shall be in warranty for the remainder of the original warranty period or ninety (90) days, whichever is longer. This limited warranty is the only warranty made by Seller and can be amended only in a writing signed by an authorized representative of Seller.

BROOKS SERVICE AND SUPPORT

Brooks is committed to assuring all of our customers receive the ideal flow solution for their application, along with outstanding service and support to back it up. We operate first class repair facilities located around the world to provide rapid response and support. Each location utilizes primary standard calibration equipment to ensure accuracy and reliability for repairs and recalibration and is certified by our local Weights and Measures Authorities and traceable to the relevant International Standards.

Visit www.BrooksInstrument.com to locate the service location nearest to you.

START-UP SERVICE AND IN-SITU CALIBRATION

Brooks Instrument can provide start-up service prior to operation when required.

For some process applications, where ISO-9001 Quality Certification is important, it is mandatory to verify and/or (re)calibrate the products periodically. In many cases this service can be provided under in-situ conditions, and the results will be traceable to the relevant international quality standards.

CUSTOMER SEMINARS AND TRAINING

Brooks Instrument can provide customer seminars and dedicated training to engineers, end users and maintenance persons.

Please contact your nearest sales representative for more details.

HELP DESK

In case you need technical assistance:

- Americas ☎ 1 888 554 FLOW
- Europe ☎ +31 (0) 318 549 290
- Asia ☎ +81 (0) 3 5633 7100



Due to Brooks Instrument's commitment to continuous improvement of our products, all specifications are subject to change without notice.

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TRADEMARKS

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