The ISQB1 series control valve is an electronic pressure regulator that precisely and proportionally controls the pressure of gaseous media based on an electronic control signal.

The ISQB1 uses two normally closed solenoid valves, a pressure sensor and a control circuit. One valve is actuated to allow supply media into the system. The second valve is actuated to allow working media to vent through a threaded port to atmosphere. The pressure sensor provides feedback to the control circuit. The control circuit compares the pressure sensor feedback to the user supplied electronic command signal and actuates the appropriate valve until the two signals match.

The ISQB1 series can be paired with a variety of air-piloted pressure volume boosters for even greater flow.
CONNECTIONS

Pneumatic Connections
CAUTION: USE ONLY THE THREAD SEALANT PROVIDED. OTHER SEALANTS, SUCH AS PTFE TAPE AND PIPE DOPE, CAN MIGRATE INTO THE FLUID SYSTEM CAUSING FAILURES.

1. The valve can be mounted in any position without affecting performance with the exception of low pressure units, which must be mounted upright to ensure proper functionality. Mounting brackets (ordered separately) can be used to attach the unit to a panel or wall surface.
2. A typical 20 micron (minimum 40 micron) in-line filter is recommended on the inlet of the ISQB1 valve.
3. Connect supply pressure to the INLET PORT (IN) not to exceed the rated supply pressure. (See Figure 1 and Table 1)
4. Connect the OUTPUT PORT (OUT) to the device being controlled.
5. If this is a vacuum or vacuum through positive pressure unit, connect vacuum supply to the EXHAUST PORT (E). Positive pressure is required on the inlet with vacuum units. FOR ANY QUESTIONS, PLEASE CALL THE FACTORY.
6. For positive pressure only units the exhaust port can be plumbed to a point outside the work area, fitted with a muffler or left open to atmosphere as the application dictates. If the media being controlled is hazardous (classified), the threaded exhaust port should be vented into a safe area.
7. Proceed with electrical connection.

Electrical Connections
1. All intrinsically safe installations must conform to applicable Factory Mutual recommendations, the National Electric Code, and the control drawing (Field Wiring Drawing: ISQB-96026-2), as well as any applicable local codes or fire marshal directives. All intrinsically safe installations must be performed by personnel trained in the proper application of the above.
2. Ensure all power is off before making any electrical connections.
3. Figure 1 shows the location of the ISQB1 electrical connector and Figure 2 shows the connector.
4. Must be wired in accordance with the supplied field wiring drawing.

NOTE: ALL COLOR CODES RELATE TO THE FACTORY WIRED QBT POWER CORD.

TABLE 1
Rated Pressure for ISQB1 Valves

<table>
<thead>
<tr>
<th>For valves ordered with MAX calibrated pressure of</th>
<th>MAX inlet pressure is</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;10” H2O</td>
<td>1 PSIG (28” H2O)</td>
</tr>
<tr>
<td>10-28” H2O (1 PSIG)</td>
<td>6.25 PSIG (175” H2O)</td>
</tr>
<tr>
<td>1-8 PSIG</td>
<td>20 PSIG</td>
</tr>
<tr>
<td>8-15 PSIG</td>
<td>30 PSIG</td>
</tr>
<tr>
<td>15-30 PSIG</td>
<td>60 PSIG</td>
</tr>
<tr>
<td>30-70 PSIG</td>
<td>120 PSIG</td>
</tr>
<tr>
<td>70-150 PSIG</td>
<td>165 PSIG</td>
</tr>
</tbody>
</table>
HAZARDOUS (CLASSIFIED) AREA
CLASS I, II, AND III
GROUPS C, D, E, F, AND G

NOTES
A. INTRINSIC SAFETY BARRIERS MUST BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER INSTRUCTIONS

B. THE COMBINATION OF BARRIERS UTILIZED MUST BE FM APPROVED IN THE SPECIFIC CONFIGURATION SUCH THAT:
   \[ V_s \leq V_n \quad C \rightarrow C - G \]
   \[ I_i \leq I_n \quad L \rightarrow L - G \]

C. CONTROL ROOM EQUIPMENT CONNECTED TO BARRIERS MUST NOT USE OR GENERATE IN EXCESS OF 250 VOLTS.

D. FOR GUIDANCE ON INSTALLATION REFER TO:
   ANGELA'S 12.6, "WIRING PRACTICES FOR HAZARDOUS (CLASSIFIED) INSTRUMENTATION PART 1: INTRINSIC SAFETY"
   AND NATIONAL ELECTRIC CODE (ANSI/NFPA 70).

E. SUBSTITUTION OF COMPONENTS MAY IMPAIR INTRINSIC SAFETY

F. FACTORY MUTUAL APPROVAL REQUIRED TO MODIFY OR CHANGE THIS DRAWING.

RECORD OF REVISIONS
A. ADD SHEET 3 TO INCORPORATE REVISED BARRIER PART NUMBERS FROM THE BARRIER MANUFACTURER.
B. ADD SHEET 4 TO INCLUDE NEW ZENER BARRIER.
C. CHANGED 01 ON ALL SHEETS FROM 0.24 UF TO 0.26 UF. DELETE SHEET 2. BARRIERS OBSOLETE. ADDED BARRIER FISO-43-04-05 AS ALTERNATE COMMAND SIGNAL BARRIER TO SHEET 4.
D. ADD SHEETS 5 & 6 TO INCLUDE NEW BARRIER MODELS.
E. ADD SHEET 7 TO INCLUDE TWO ZENER BARRIER COMBINATION.

FIELD WIRING DRAWING ISQB-96026-2 (General Barrier)
HAZARDOUS (CLASSIFIED) AREA
CLASS I, II, AND III
DIVISION 1
GROUPS C, D, E, F, AND G

FIELD WIRING DRAWING ISQB-96026-2
(PEPPERL-FUCHS Z728)

ISQB-XX
V_{cc} = 29 VDC
I_{cc} = 150 mA
C = 3.25 uF
l = 0

POWER

COMMEN

COMMAN (+)

COMMAN (-)

PEPPERL + FUCHS Z728
(+)

(-)

IMC APPROVED

INTRINSICALLY SAFE GROUND

INTRINSICALLY SAFE GROUND

NOTES
A. INTRINSIC SAFETY BARRIERS MUST BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER INSTRUCTIONS WITH THE FOLLOWING EXCEPTIONS.

GROUP C, E
La = 3.69 mm
D, F, G
La = 6.43 mm

B. CONTROL ROOM EQUIPMENT CONNECTED TO BARRIERS MUST NOT USE OR GENERATE IN EXCESS OF 150 VOLTS.

C. FOR GUIDANCE ON INSTALLATION REFERR TO:
AKG-2012-6, "WIRING PRACTICES FOR HAZARDOUS (CLASSIFIED) LOCATIONS INSTRUMENTATION PART 1; INTRINSIC SAFETY" AND NATIONAL ELECTRIC CODE (ANSI/NFPA 70);

D. SUBSTITUTION OF COMPONENTS MAY IMPAIR INTRINSIC SAFETY.

E. FACTORY MUTUAL APPROVAL REQUIRED TO MODIFY OR CHANGE THIS DRAWING.
RECALIBRATION PROCEDURE

All ISQB1 valves come calibrated from the factory by trained personnel using precision calibration equipment. The ISQB1 is a closed loop control valve using a precision electronic pressure sensor. Typical drift is less than 1% over the life of the product. If your ISQB1 appears to be out of calibration by more than 1%, it is not likely to be ISQB1. Check the system for plumbing leakage, wiring and electronic signal levels. Verify the accuracy of your measuring equipment before re-calibrating. If the ISQB1 valve needs re-calibration, use this procedure:

1. Wire the ISQB1 according to the “Electrical Connections” section.
2. Connect a precision pressure gage or pressure transducer to the OUTLET PORT of the ISQB1.

**NOTE:** There must be a closed volume of at least 1 in$^3$ between the OUTLET PORT and the measuring device for the ISQB1 to be stable.

3. Provide supply pressure to the INLET PORT of the ISQB1. (See Figure 1). Make sure supply pressure does not exceed the rating for the valve (see Table 1).
4. Remove the calibration access plug on top of the ISQB1 to access the HYSTERESIS, SPAN and ZERO adjustment potentiometers (Figure 3).

5. **Only use this step if your device is totally out of calibration. If it is slightly out of calibration, skip this step and go to step 6.** Using a small screwdriver, turn the ZERO and SPAN potentiometers (Figure 3) 15 turns clockwise, then 7 turns counter clockwise. This will put the ISQB1 roughly at mid scale.

6. Set the electrical command input to 20mA. Adjust the SPAN potentiometer until MAXIMUM desired pressure is reached (clockwise increases pressure).
7. Set the electrical command input to 10 percent of full value (5.6mA).
8. Adjust the ZERO potentiometer until 10 percent of maximum desired pressure is reached (clockwise increases pressure).
9. If at any time during the calibration procedure the control valve oscillates or becomes unstable for more than one second, turn the HYSTERESIS potentiometer counter-clockwise until the oscillation stops, then turn it one more complete turn (same direction).
10. The ZERO and SPAN potentiometers interact slightly. Repeat steps 6-8 until no error exists.
11. Verify unit shuts off by going to zero command. Check linearity by going to at least six pressure points throughout the full range.

---

ISQB1 AND BRACKET DIMENSIONS

---

---
## ISQB CONFIGURATION

### Example Part Number

<table>
<thead>
<tr>
<th>ISQB1T</th>
<th>B</th>
<th>N</th>
<th>I</th>
<th>X</th>
<th>Z</th>
<th>P</th>
<th>10</th>
<th>BR</th>
<th>G</th>
<th>BR</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
<td>10</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Section Reference**

### Pressure Unit

<table>
<thead>
<tr>
<th>10</th>
<th>Pressure Unit (no additional feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PS</td>
<td>PSI</td>
</tr>
<tr>
<td>MB</td>
<td>Millibars</td>
</tr>
<tr>
<td>BR</td>
<td>Bar</td>
</tr>
<tr>
<td>KP</td>
<td>Kilo-pascal</td>
</tr>
<tr>
<td>MP</td>
<td>Mega-pascal</td>
</tr>
<tr>
<td>MH</td>
<td>Millimeters Hg</td>
</tr>
<tr>
<td>PA</td>
<td>Pascal</td>
</tr>
</tbody>
</table>

### Pressure Unit of Measure

<table>
<thead>
<tr>
<th>11</th>
<th>Pressure Unit of Measure</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Absolute Pressure</td>
</tr>
<tr>
<td>G</td>
<td>Gauge Pressure</td>
</tr>
</tbody>
</table>

### Common Options

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>BR</td>
<td>Install Foot Bracket</td>
</tr>
<tr>
<td>O2</td>
<td>Oxygen Cleaned</td>
</tr>
<tr>
<td>O3</td>
<td>Oxygen Cleaned For Non-Oxygen Use</td>
</tr>
<tr>
<td>R1</td>
<td>Rotate Connector 180 Degrees</td>
</tr>
</tbody>
</table>

### Recommended Accessories

<table>
<thead>
<tr>
<th>QBT-01</th>
<th>Wrap-Around Mounting Bracket</th>
</tr>
</thead>
<tbody>
<tr>
<td>QBT-02</td>
<td>Foot-Mount Bracket (Installed)*</td>
</tr>
</tbody>
</table>

* Use Option BR for Foot-Mount Bracket

---

### PLEASE NOTE:
The user has the additional responsibility of supplying and/or ensuring that the connector/cable that is used with any Proportion-Air ISQB series FM approved product meets all local and national codes for intrinsically safe wiring.

---

### Safety Precautions

#### Warning

Improper operation could result in serious injury to persons or loss of life!

1. **PRODUCT COMPATIBILITY**
   - Proportion-Air, Inc. products and accessories are for use in industrial pneumatic applications with compressed air media. The compatibility of the equipment is the responsibility of the end user. Product performance and safety are the responsibility of the person who determined the compatibility of the system. Also, this person is responsible for continuously reviewing the suitability of the products specified for the system, referencing the latest catalog, installation manual, Safety Precautions and all materials related to the product.

2. **EMERGENCY SHUTOFF**
   - Proportion-Air, Inc. products cannot be used as an emergency shutoff. A redundant safety system should be installed in the system to prevent serious injury or loss of life.

3. **EXPLOSIVE ATMOSPHERES**
   - Products and equipment should not be used where harmful, corrosive or explosive materials or gases are present. Unless certified, Proportion-Air, Inc. products cannot be used with flammable gases or in hazardous environments.

4. **AIR QUALITY**
   - Clean, dry air is not required for Proportion-Air, Inc. products. However, a 40 micron particulate filter is recommended to prevent solid contamination from entering the product.

5. **TEMPERATURE**
   - Products should be used with a media and ambient environment inside of the specified temperature range of 32°F to 158°F. Consult factory for expanded temperature ranges.

6. **OPERATION**
   - Only trained and certified personnel should operate electronic and pneumatic machinery and equipment. Electronics and pneumatics are very dangerous when handled incorrectly. All industry standard safety guidelines should be observed.

7. **SERVICE AND MAINTENANCE**
   - Service and maintenance of machinery and equipment should only be handled by trained and experienced operators. Inspection should only be performed after safety has been confirmed. Ensure all supply pressure has been exhausted and residual energy (compressed gas, springs, gravity, etc.) has been released in the entire system prior to removing equipment for service or maintenance.

### Caution

Improper operation could result in serious injury to persons or damages to equipment!

1. **PNEUMATIC CONNECTION**
   - All pipes, pneumatic hose and tubing should be free of all contamination, debris and chips prior to installation. Flush pipes with compressed air to remove any loose particles.

2. **THREAD SEALANT**
   - To prevent product contamination, thread tape is not recommended. Instead, a non-migrating thread sealant is recommended for installation. Apply sealant a couple threads from the end of the pipe thread to prevent contamination.

3. **ELECTRICAL CONNECTION**
   - To prevent electronic damage, all electrical specifications should be reviewed and all electrical connections should be verified prior to operation.

### Exemption from Liability

1. Proportion-Air, Inc. is exempted from any damages resulting from any operations not contained within the catalogs and/or instruction manuals and operations outside the range of its product specifications.

2. Proportion-Air, Inc. is exempted from any damage or loss whatever caused by malfunctions of its products when combined with other devices or software.

3. Proportion-Air, Inc. and its employees shall be exempted from any damage or loss resulting from earthquakes, fire, third person actions, accidents, intentional or unintentional operator error, product misapplication or irregular operating conditions.

4. Proportion-Air, Inc. and its employees shall be exempted from any damage or loss, either direct or indirect, including consequential damage or loss, claims, proceedings, demands, costs, expenses, judgments, awards, loss of profits or loss of chance and any other liability, whatsoever including legal expenses and costs, which may be suffered or incurred, whether in tort (including negligence), contract, breach of statutory duty, equity or otherwise.

### Warranty

Proportion-Air, Inc. products are warranted to the original purchaser only against defects in material or workmanship for one (1) year from the date of manufacture. The extent of Proportion-Air’s liability under this warranty is limited to repair or replacement of the defective unit at Proportion-Air’s option. Proportion-Air shall have no liability under this warranty where improper installation or filtration occurred.

---

**PROPORTION-AIR, INC.**

**8250 N 600 W, P.O. Box 218**

**McCordsville, IN 46055**

**317.335.2602**

**info@proportionair.com**