

# Front Load Single Sensor

INFICON Front Load Single crystal sensors offer proven reliability and durability and have the best thermal stability of any sensor head on the market. The front load design allows for easy insertion of the crystal holder in applications lacking sufficient room for side insertion. Assembled mechanically rather than soldered, parts can be replaced conveniently in the field, if necessary. Sensors can be ordered individually or in a sensor / feedthrough combination that can be either welded or assembled with compression fittings.

## Sensor Configurations

Two sensor configurations are offered: The standard version and the right angle (compact) version. The standard version is designed for installation from the side or bottom of the chamber having the cooling tubes parallel to the crystal face. The right angle version is designed for installation through the top of the vacuum system having the water cooling tubes perpendicular to the crystal face. Optionally, sensors can be ordered with a pneumatically driven crystal shutter to protect the crystal during source warm up, when not used during deposition of an alternate material, or to extend crystal life when used with RateWatcher™. The shutter is designed to flip down allowing easy crystal replacement. The exposed crystal electrode is fully grounded to effectively eliminate problems due to RF interference.

## Feedthroughs

INFICON offers two types of feedthroughs, either a 1 inch bolt feedthrough or a 2¾ inch (CF40) ConFlat® flange feedthrough. KF40 feedthroughs are available on request.

## Feedthrough Connection

Front Load Single Sensors can be ordered in combination with a feedthrough. The sensor / feedthrough connection can be either welded or made with compression fittings. Compression fittings allow for easy adjustability without the need for brazing or welding. The feedthrough can be moved along the length of the tubes allowing the length inside the vacuum systems to be adjusted over a range of 20.3–71.1 cm (8–28 in.) for “E” length sensors. Once the desired length is determined, the compression fittings allow for a finger tight tube seal. Alternately, a welded connection may be chosen.

## ADVANTAGES

- Front load crystal holder
- Easy installation
- Available with:
  - CF40 feedthrough
  - 2.54 cm (1 in.) bolt feedthrough
- Adjustable length if ordered with compression fittings
- Sensor / feedthrough combinations available welded to customer specified lengths.
- No brazing required if ordered with compression fittings or welded to feedthrough



## ORDERING INFORMATION

### Front Load Single Sensor (with in-vacuum cables)

**Type of sensor** (Includes in-vacuum cable, crystal snatcher and user manual. Crystals sold separately)

Standard sensor .....  
(water lines parallel)  
Right angle sensor .....  
(water lines perpendicular)

**Shutter assembly** (see note 3)

None .....  
Standard shutter .....

**Length of sensor** (see note 2)

Standard length .....  
includes 78.1 cm (30.75 in.) in-vacuum cable

**Feedthrough** (see note 1)

None .....  
1 in. bolt .....  
CF40 .....

**Feedthrough connection** (see notes 3 and 4)

Sensor not connected to feedthrough .....  
Sensor welded to feedthrough .....  
Feedthrough equipped with Ultra-Torr compression fittings .....  
(allows for adjustable sensor length).

**Welded sensor length**

(use only when feedthrough connection is 7)  
(see notes 2 and 5)

Not required when feedthrough connection option is 0 or 8.  
Weld length in centimeters, 20–70 cm (8–27.5 in.) ..... 20–70  
Weld length in centimeters, 71–99 cm (28–39 in.) ..... 71–99

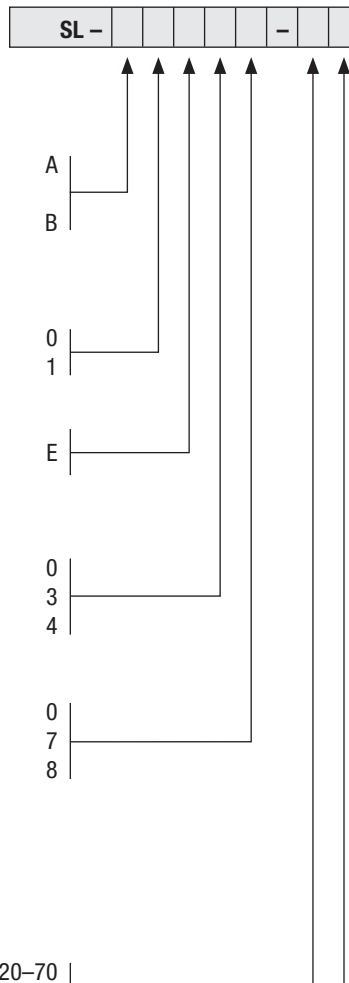
\*\*\* Other lengths may be available: contact factory.

Other lengths will be considered a special order  
and will be subject to additional cost and lead time

**The following combinations are not available:** (see notes 3 and 4):

SL-A1E38, SL-B1E38, SL-A1E47, and SL-B1E47

Examples of non-valid part numbers include all options with no feedthrough connection or compression fittings and a welded sensor length; for example, SL-A0E48-20, SL-B1E40-20, etc.



**NOTE 1:**

Feedthrough configuration varies depending on options selected (Front Load or Cool Drawer, with or without shutter, type of feedthrough, etc.). Example: SL-A0E37 uses feedthrough PN 002-042 while SL-A1E37 uses feedthrough PN 750-030-G1.

**NOTE 2:**

Sensor lengths are measured from center of the crystal to the vacuum side (sealing surface) of the feedthrough. Once a welded sensor order is confirmed, it cannot be cancelled.

**NOTE 3:**

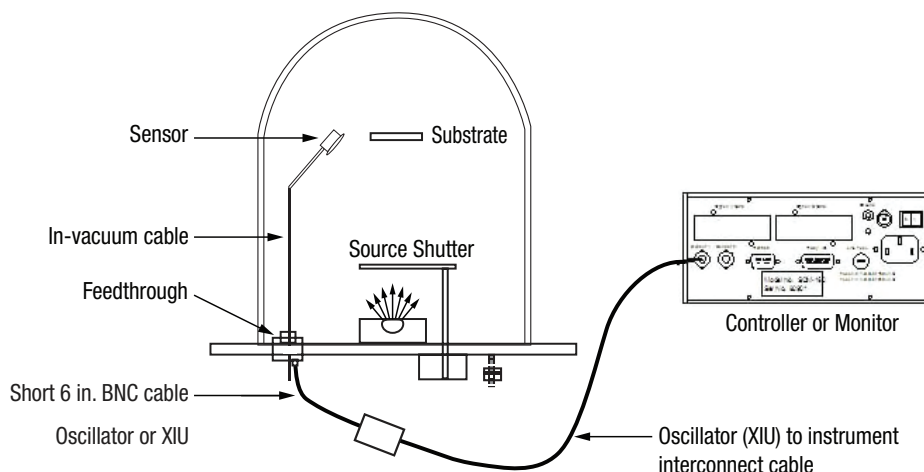
Front Load Sensors ordered with shutters and 1 in. bolt style feedthrough can only be welded (compression fittings not available).

**NOTE 4:**

Front Load Sensors ordered with a CF40 feedthrough and a shutter cannot be welded due to dimensional limits of the CF40.

**NOTE 5:**

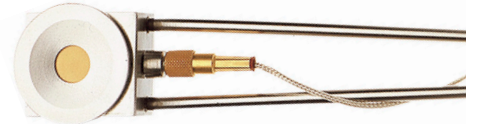
Front Load sensors welded to lengths between 28–34 in. will include a 36 in. in-vacuum cable. Sensors welded to lengths between 34–39 in. will include a 48 in. in-vacuum cable.



## SPECIFICATIONS

### SL-A \_ E \_ \_ series standard single sensor

Maximum bakeout temp with no water	130°C
Maximum operating isothermal environment temperature with minimum water flow	400°C



SL-A size (maximum envelope without shutter)	27 mm x 61.47 mm x 17.53 mm (1.063 x 2.42 x 0.69 in.)
Water tube	3.175 mm (1/8 in.) O.D. seamless stainless steel
Crystal exchange	Front loading; self-contained package for ease of exchange
Mounting	Two #4-40 tapped holes on the back of the sensor body

#### Installation Requirements

Feedthrough	Two pass water 4.8 mm (3/16 in.) O.D. tubing with Microdot® coax connector
Water flow rate	Minimum water flow 150–200 cc/min, 30°C max (do not allow to freeze)
Water quality	Coolant should not contain chlorides as stress corrosion cracking may occur. Extremely dirty water may result in loss of cooling capacity.

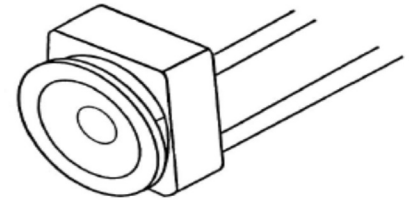
#### Materials

Body and holder	304 type stainless steel
Springs, electrical contacts	Au plated Be-Cu
Water tubes	S-304, 3.175 mm (0.125 in.) O.D. x 0.381 mm (0.015 in.) wall thickness seamless stainless steel tubing
Connector (Microdot)	Stainless steel, Teflon® and glass insulated
Insulators	>99% Al <sub>2</sub> O <sub>3</sub>
Wire	Teflon insulated copper
Braze	Vacuum process high temperature Ni-Cr alloy
Crystal	13.97 mm (0.550 in.) diameter

## SPECIFICATIONS

### SL-B \_ E \_ \_ series right angle single sensor specifications

Maximum bakeout temp with no water	130°C
Maximum operating isothermal environment temperature with minimum water flow	400°C
SL-B _ E _ _ size (maximum envelope without shutter)	28.19 x 26.92 x 26.92 mm (1.11 x 1.06 x 1.06 in.)
Water tube	3.175 mm ( $\frac{1}{8}$ in.) O.D. seamless stainless steel
Crystal exchange	Front loading; self-contained package for ease of exchange
Mounting	Two #4-40 tapped holes on the back of the sensor body



#### Installation requirements

Feedthrough	Two pass water 4.8 mm ( $\frac{3}{16}$ in.) O.D. tubing with Microdot® coax connector
Other	XIU or oscillator to match specific controller, solenoid valve assembly 750-420-G1 for shuttered sensors
Water flow rate	Minimum water flow 150–200 cc/min, 30°C max
Water quality	Coolant should not contain chlorides as stress corrosion cracking may occur. Extremely dirty water may result in loss of cooling capacity.

#### Materials

Body and holder	304 type stainless steel
Springs, electrical contacts	Au plated Be-Cu
Water tubes	S-304, 3.175 mm (0.125 in.) O.D. x 0.381 mm (0.015 in.) wall thickness seamless stainless steel tubing
Connector (Microdot)	Stainless steel, Teflon® and glass insulated
Insulators	>99% Al <sub>2</sub> O <sub>3</sub>
Wire	Teflon insulated copper
Braze	Vacuum process high temperature Ni-Cr alloy
Crystal	0.550 in. (13.97 mm) diameter

## SPECIFICATIONS

### Feedthrough specifications

**NOTE: Sensor / feedthrough combination specifications are determined by lowest component specification**

#### 1 in. bolt and Ultra-Torr (compression fitting) terminations:

Materials	304 stainless steel, Teflon®, ceramic, beryllium nickel, VITON®
Temperature	Operational environment to 300°C with water cooling or 165°C without
Mounting	1.015 in. ±0.010 in. diameter aperture

#### CF 40 welded terminations:

Materials	304 stainless steel, Teflon, ceramic, beryllium nickel
Temperature	Operational environment to 450°C with water cooling or 165°C without
Mounting	Mates with 2¾ in. ConFlat type flanges with 1.375 in. I.D. min.

## SPARE PARTS LIST

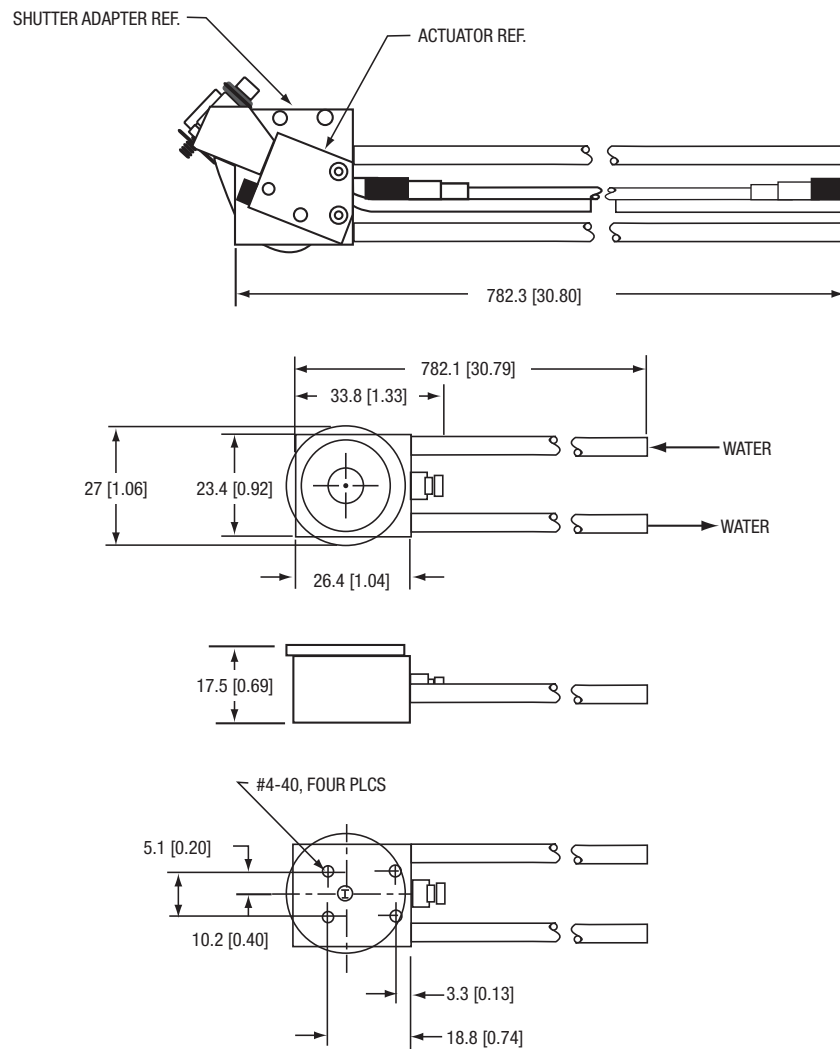
P/N	Description
007-007	Retainer spring (for crystal holder)
007-023	Ceramic retainer
007-044	In-vacuum cable, 78.1cm (30.75 in.)
080-018	Set screw (for female coax)
082-044	Teflon screw (for leaf spring)
750-115-P4	Coupling (for bellows assembly)
750-169-P2	Bellows assembly (coupling not included)
750-171-P1	Finger spring contact
321-039-G13	In-vacuum cable, 154.2 cm (60 in.)

P/N	Description
750-172-G1	Crystal holder (includes retainer spring)
750-174-P2	Female coax
750-175-P1	Insulator (underneath leaf spring)
750-188-P3	Leaf spring
750-210-G1	Shutter module (bellows assembly, Shaft assembly, and shutter assembly)
750-215-G1	Shaft assembly (part of shutter module)
750-216-G1	Shutter assembly (part of shutter module)

## DIMENSIONS

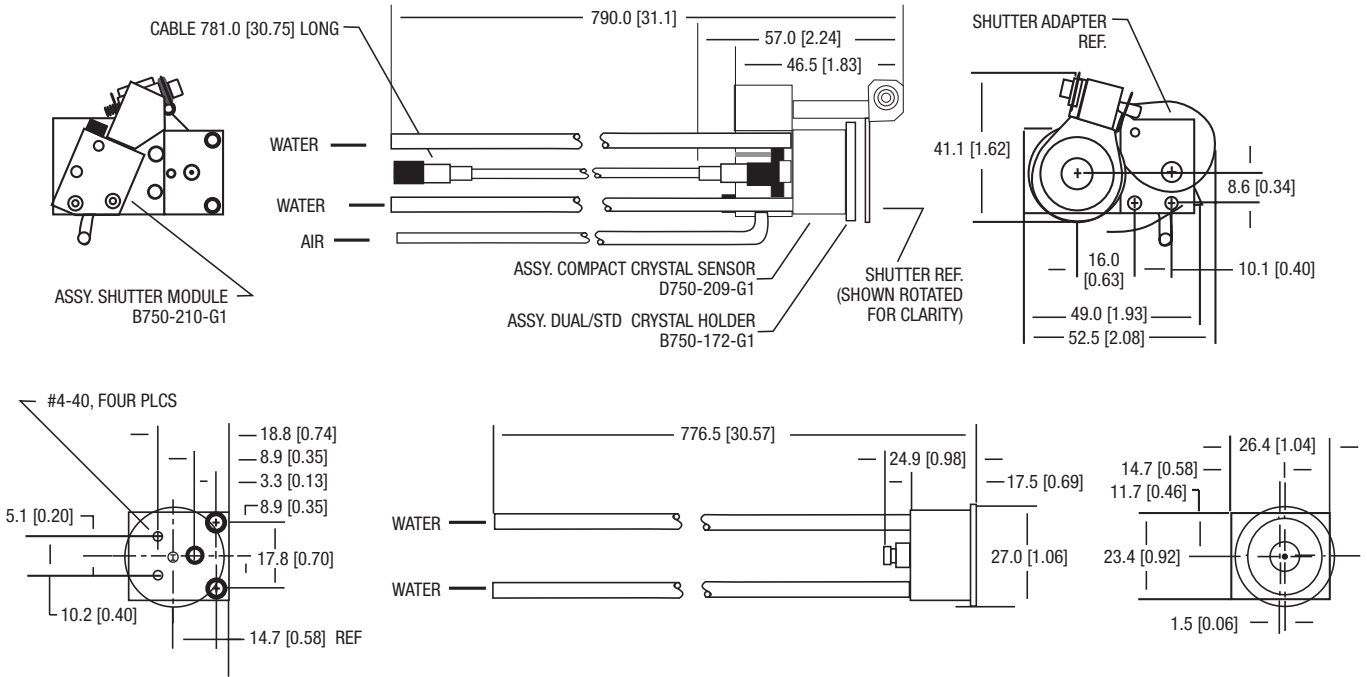
### SL-A \_ E \_ \_ series standard single sensor (sensor only)

NOTE: Measurements in cm [in.]



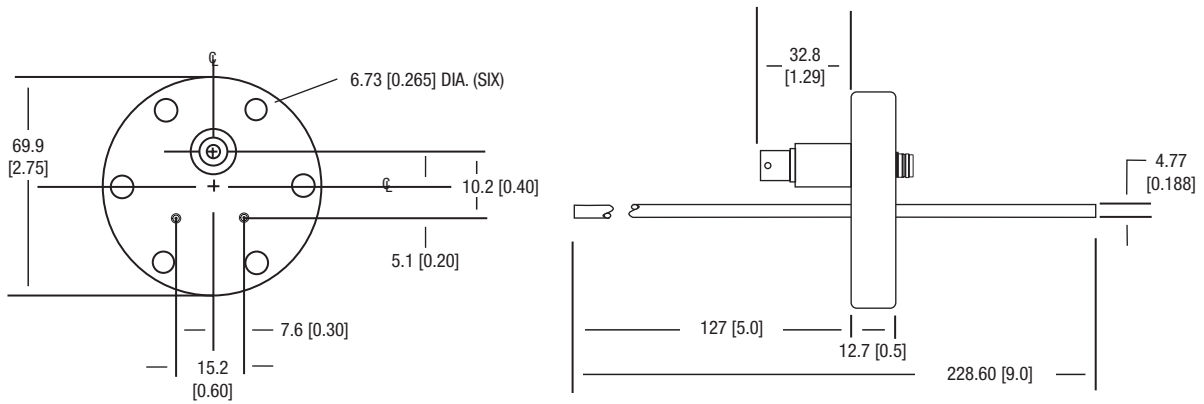
# DIMENSIONS

## SL-B \_ E \_ \_ Series Right Angle Single Sensor (sensor only)



## Feedthrough used for SL-A0E47, SL-A0E40, SL-B0E47, and SL-B0E40 sensor / feedthrough combinations (feedthrough PN 002-043)

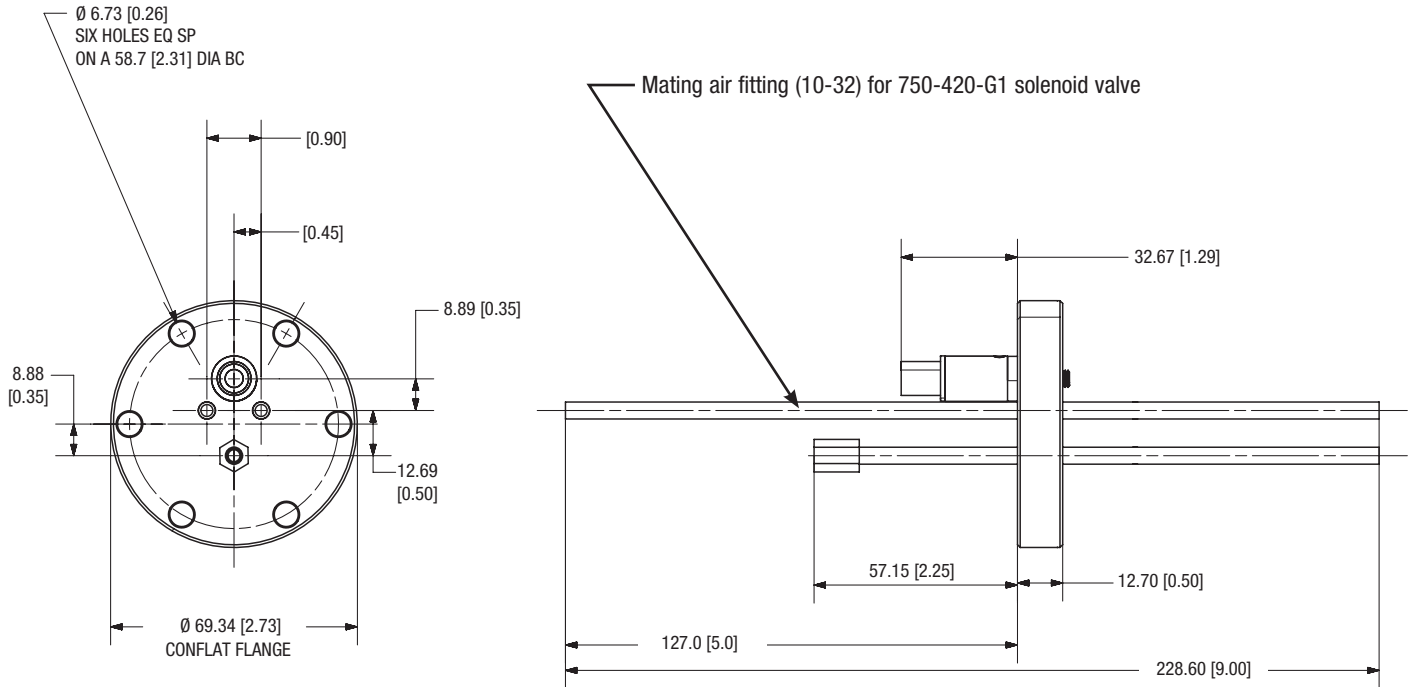
NOTE: Measurements in cm [in.]



## DIMENSIONS

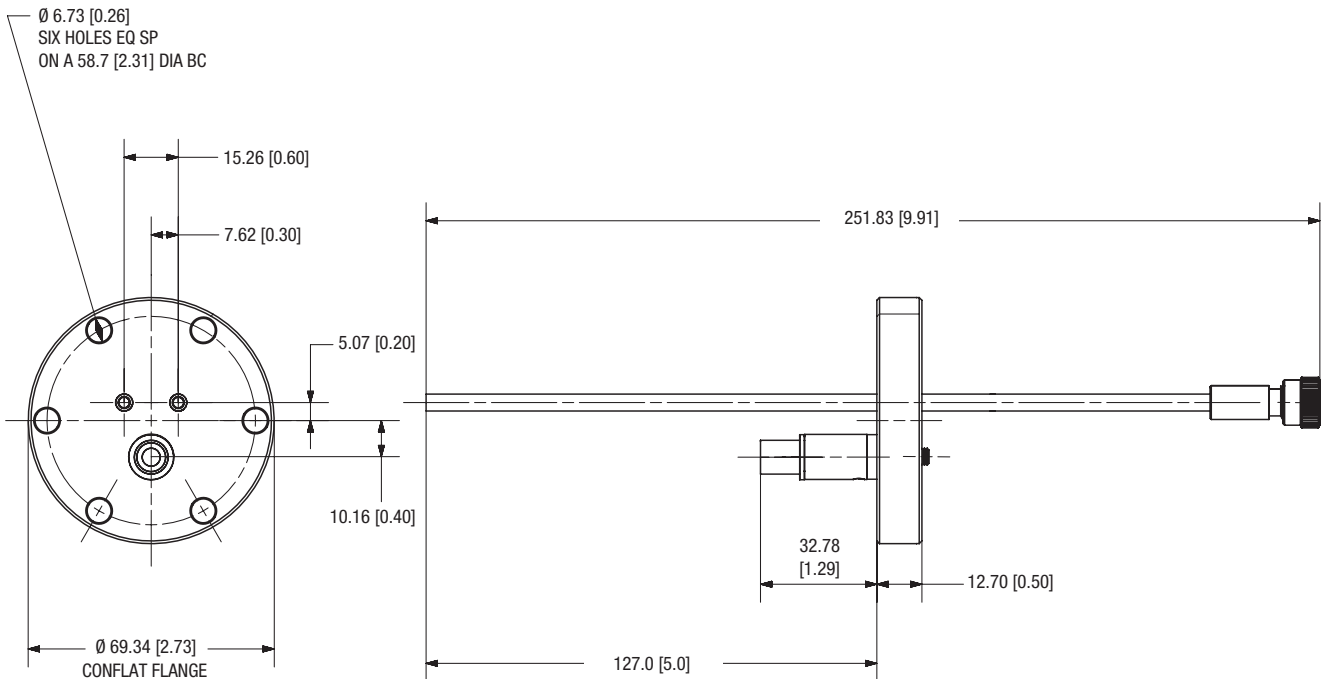
### Feedthrough used for SL-A1E40 and SL-B1E40 sensor / feedthrough combinations (feedthrough PN 750-685-G1)

NOTE: Measurements in cm [in.]



### Feedthrough used for SL-A0E48 and SL-B0E48 sensor / feedthrough combinations (feedthrough PN 206-878-G2)

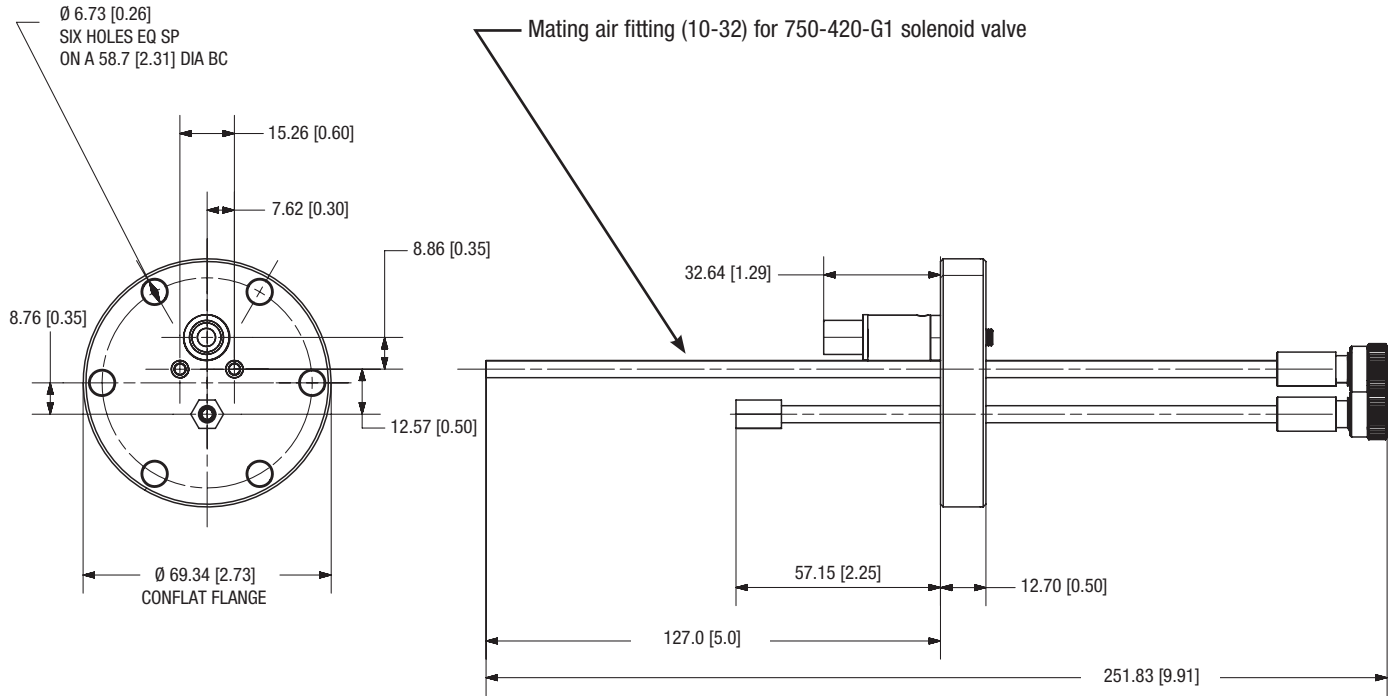
NOTE: Measurements in cm [in.]



## DIMENSIONS

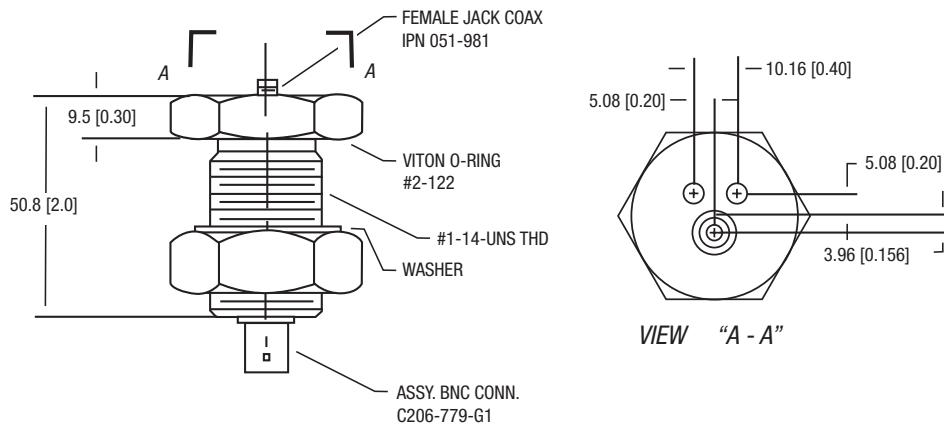
### Feedthrough used for SL-A1E48 and SL-B1E48 sensor / feedthrough combinations (feedthrough PN 750-685-G2)

NOTE: Measurements in cm [in.]



### Feedthrough used for SL-A0E37, SL-B0E37, SL-A0E30 and SL-B0E30 sensor / feedthrough combinations (feedthrough PN 002-042)

NOTE: Measurements in cm [in.]

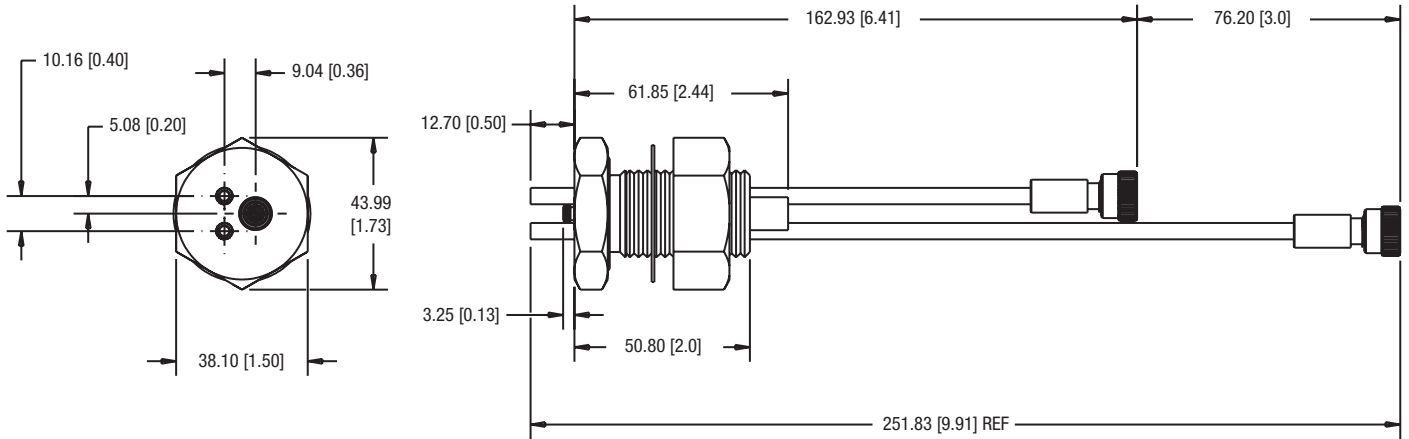




## DIMENSIONS

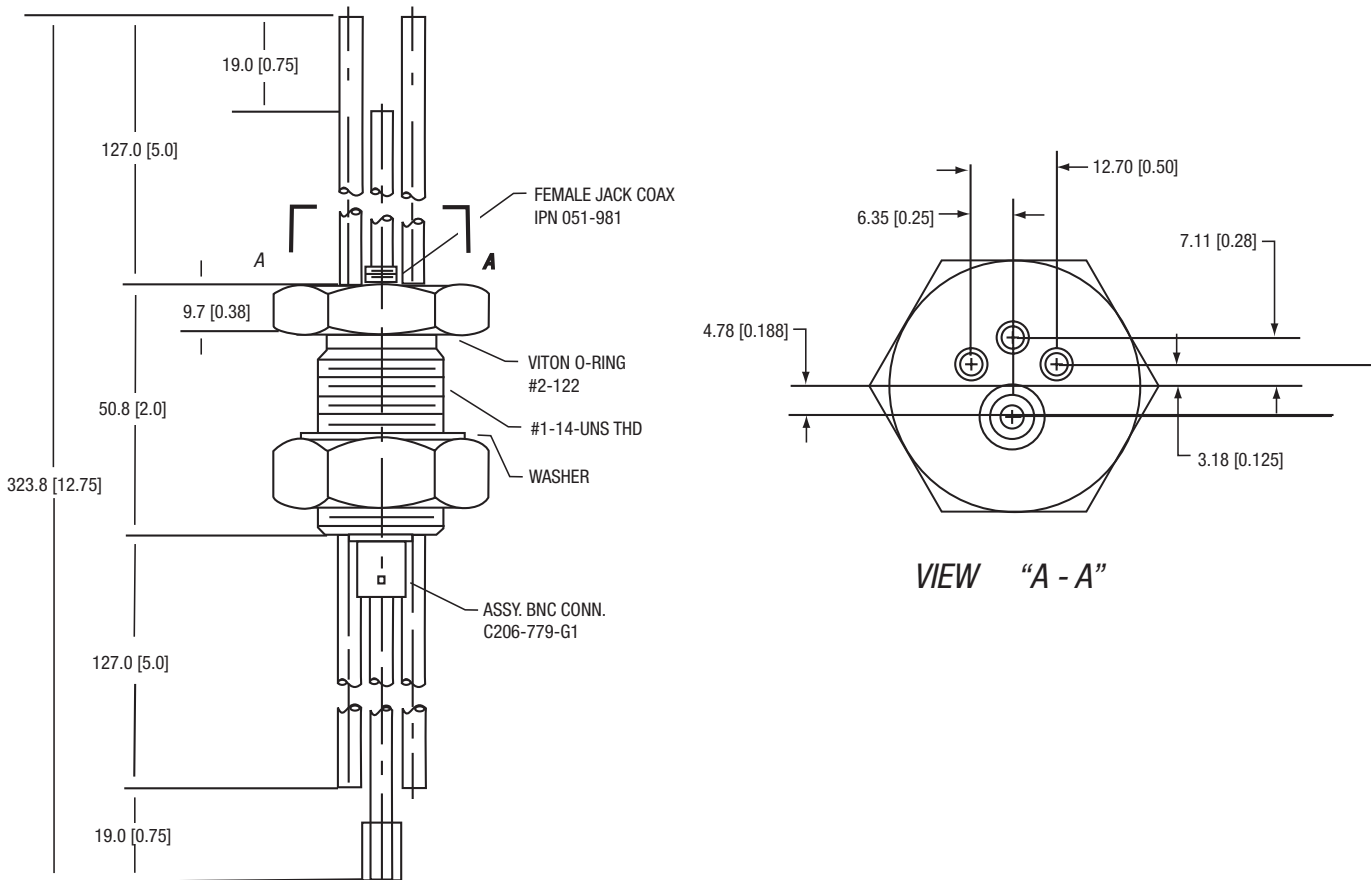
### Feedthrough used for SL-A0E38 and SL-B0E38 sensor / feedthrough combinations (feedthrough PN 750-624-G1)

NOTE: Measurements in cm [in.]



### Feedthrough used for SL-A1E37, SL-B1E37, SL-A1E30 and SL-B1E30 sensor / feedthrough combinations (feedthrough PN 750-030-G1)

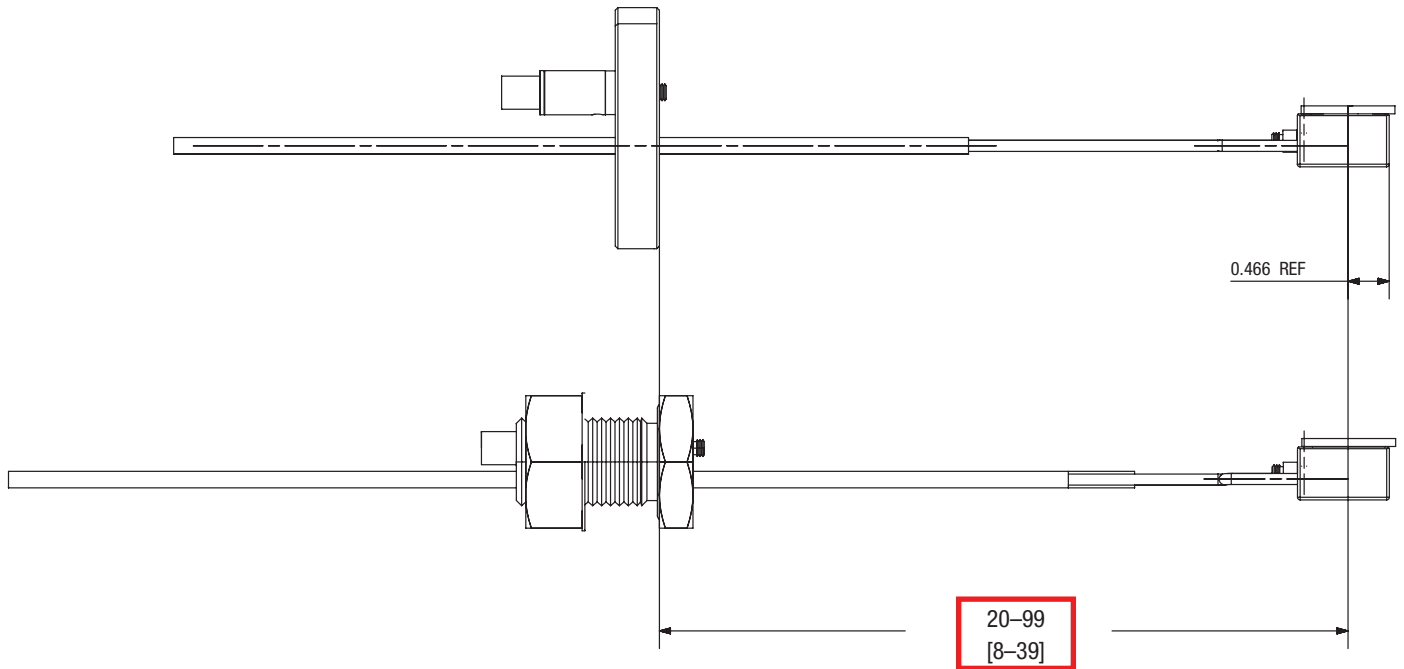
NOTE: Measurements in cm [in.]



## DIMENSIONS

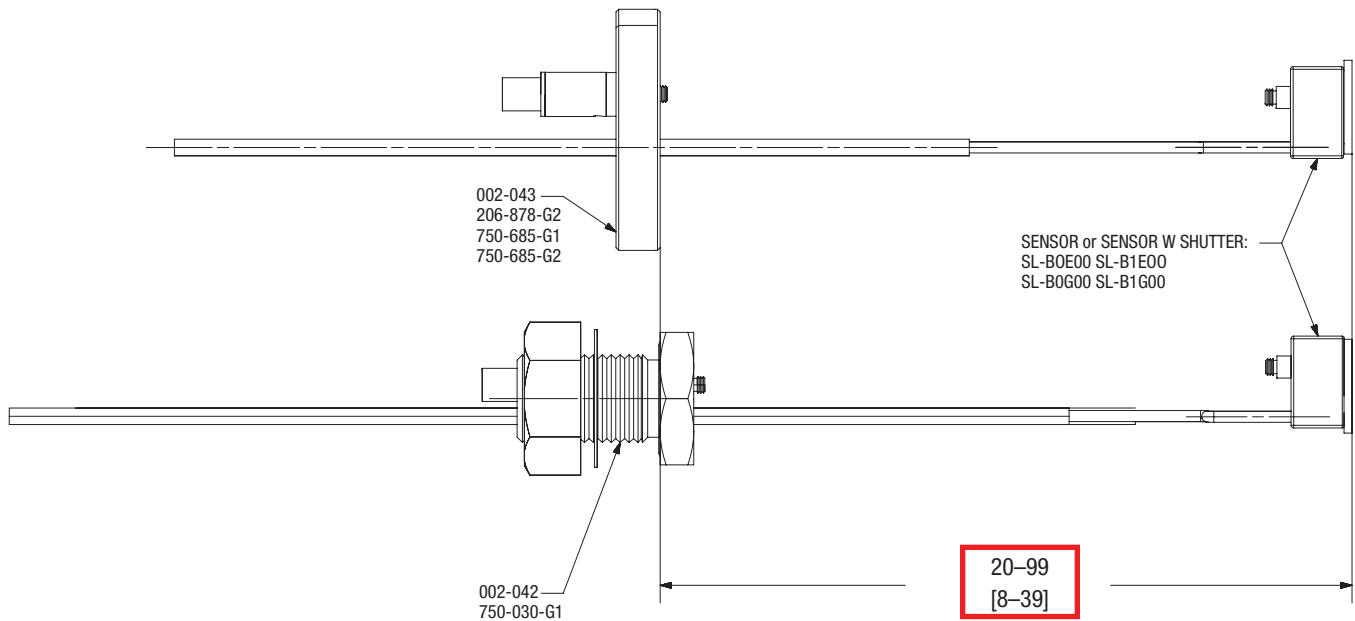
### Sensor Length Specification for SL-A\_E\_-XX sensor / feedthrough combinations

NOTE: Measurements in cm [in.]



### Sensor Length Specification for SL-B\_E\_-XX sensor / feedthrough combinations

NOTE: Measurements in cm [in.]



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