



Easy Rate Single Sensor

INFICON Easy Rate single crystal sensors minimize quartz crystal microbalance (QCM) total cost of ownership through low price and extended sensor life. This sensor minimizes production cost with the lowest initial investment and total cost of ownership. It is also designed to maximize availability through a long-lasting sensor that has less maintenance.

INFICON Easy Rate single crystal sensors are designed and manufactured to provide a cost effective solution to high-accuracy thickness monitoring for short optical and batch coating processes.

Sensor Configurations

The INFICON Easy Rate Single Sensor is available with standard or right angle orientations. 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.

The front load design allows for easy insertion of the crystal holder in applications lacking sufficient room for side insertion. All Easy Rate Sensors are compatible with industry-standard 6 MHz crystals and are designed for easy crystal changes while remaining rugged enough for even the most demanding depositions.

Feedthroughs

INFICON Easy Rate Sensors are offered with either a 2.54 cm (1 in.) bolt feedthrough or a CF40 (2.75 in.) ConFlat® flange feedthrough.

Feedthrough Connection

The sensor/feedthrough connection can be either welded onsite by the user or made with bored-through union fittings. These union fittings allow for easy adjustability without the need for brazing or welding. The length of the tubes can be cut to meet the needs of the chamber, allowing the length inside the vacuum system to be customized and the feedthrough to be attached easily and quickly. Alternately, if using a custom feedthrough or bending the sensor on site, an option of no connection may be chosen allowing for onsite welding.

ADVANTAGES

- Minimum investment with lowest upfront cost
- Lowest total cost of ownership
- Maximum throughput with less maintenance
- Optimize system performance through worldwide expert applications support
- Available in two configurations
 - Standard (water tubes parallel)
 - Right-Angle (water tubes perpendicular)
- Available with
 - 2.54 cm (1 in.) bolt feethrough
 - CF40 feedthrough
- Adjustable position when ordered with bored-through union fittings
- Shutter option available



ORDERING INFORMATION

Easy Rate Single Sensor

Type of sensor

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

In-vacuum cable

None.....
 25.4 cm (10 in.) in-vacuum cable
 76.2 cm (30 in.) in-vacuum cable

Shutter assembly (See note 1)

None
 Shutter

Length of sensor (See note 3)

Standard: 771 mm (30.35 in.).....
 Right angle: 776 mm (30.55 in.).....

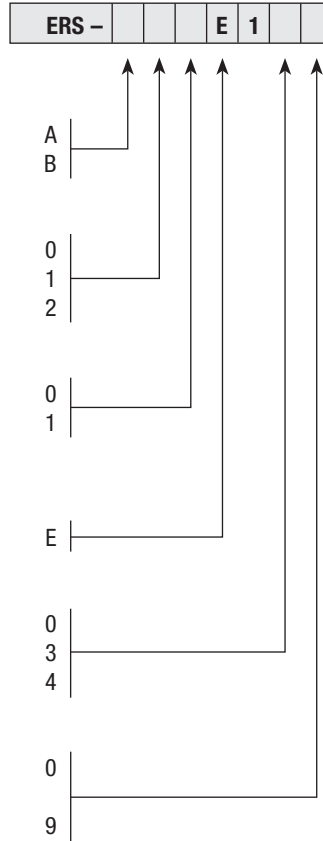
Feedthrough

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

Feedthrough connection

Sensor not connected to feedthrough.....
 Bored-through union fittings
 (Allow the sensor water tubes to slide into the feedthrough.).....

The following combinations are not available: ERS-BX1E1XX



NOTE 1:

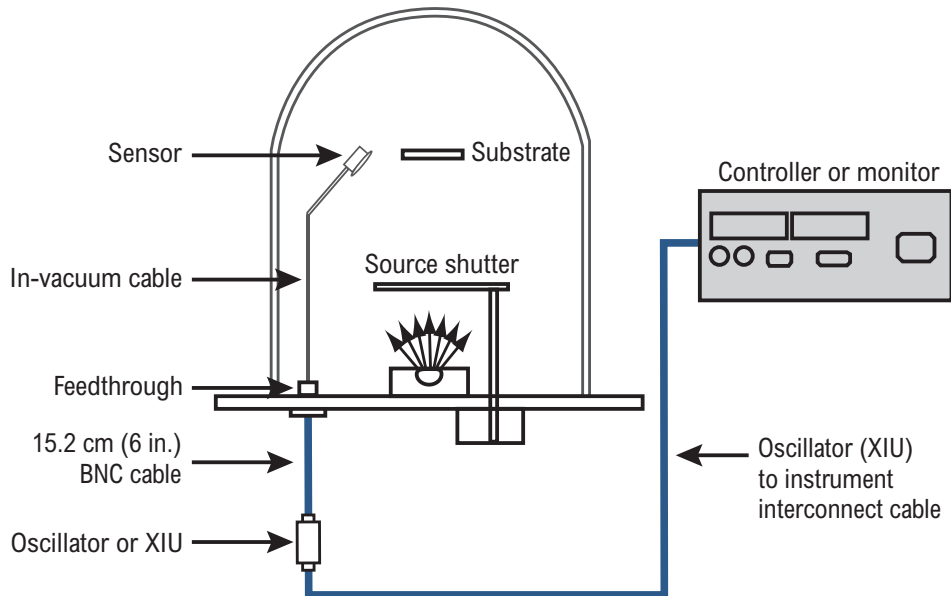
Shutter not available for Right Angle Single Sensor.

NOTE 2:

Crystals sold separately.

NOTE 3:

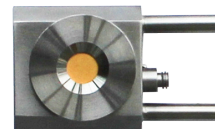
Sensor length is measured from center of crystal to the end of the water tubes (see drawings).



SPECIFICATIONS

Easy Rate Standard Single Sensor

Maximum bakeout temp with no water	175°C
Maximum operating isothermal environment temperature with minimum water flow	400°C
Size (maximum envelope without shutter)	3.25 x 4.04 x 1.53 cm (1.28 x 1.59 x 0.60 in.)
Size (maximum envelope with shutter)	3.25 x 7.06 x 3.15 cm (1.28 x 2.78 x 3.15 in.)
Water tube	4.76 mm (0.188 in.) OD seamless stainless steel
Crystal exchange	Front loading
Mounting	Four #4-40 tapped holes on the back of the sensor body



Installation Requirements

Feedthrough	Two pass water 6.35 mm (0.250 in.) OD with one microdot coaxial connection One pass air 4.76 (0.188 in) OD (with shutter)
Other	XIU or oscillator to match controller, solenoid valve assembly for shuttered sensors
Utilities	Minimum water flow 150 – 200 cm ³ /min, 30°C max For shuttered sensors, air 70 – 80 psi (gauge) {85 – 95 psi (absolute)} (5.8 – 6.5 bar (absolute)) [584–653 kPa (absolute)] Do not exceed 100 psi (gauge) {115 psi (absolute)} (7.9 bar (absolute)) [791 kPa (absolute)]
Water quality	Coolant should not contain chlorides as stress corrosion cracking may occur. Extremely dirty water may result in loss of cooling capacity.
Crystal	13.97 mm (0.550 in.) diameter

Materials

Body and holder	304 type stainless steel
Springs, electrical contacts	Gold plated beryllium copper
Water tubes	S-304, 4.76 mm (0.188 in.) OD x 0.51 mm (0.020 in.) wall thickness Seamless stainless steel tubing
Connector (Microdot)	Stainless steel, Teflon® and glass insulation
Insulators	>99% aluminum oxide, Teflon
Wire	Tin plated copper

SPECIFICATIONS

Easy Rate Right Angle Single Sensor

Maximum bakeout temp with no water	175°C
Maximum operating isothermal environment temperature with minimum water flow	400°C
Size (maximum envelope)	3.25 x 4.04 x 1.53 cm (1.28 x 1.59 x 0.60 in.)
Water tube	4.76 mm (0.188 in.) OD seamless stainless steel
Crystal exchange	Front loading
Mounting	Four #4-40 tapped holes on the back of the sensor body



Installation Requirements

Feedthrough	Two pass water 6.35 mm (0.250 in.) OD with one microdot coaxial connection
Other	XIU or Oscillator to match controller, solenoid valve assembly for shuttered sensors
Utilities	Minimum water flow 150-200 cm ³ /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.
Crystal	13.97 mm (0.550 in.) diameter

Materials

Body and holder	304 type stainless steel
Springs, electrical contacts	Gold plated beryllium copper
Water tubes	S-304, 4.76 mm (0.188 in.) OD x 0.51 mm (0.020 in.) wall thickness Seamless stainless steel tubing
Connector (Microdot)	Stainless steel, Teflon and glass insulation
Insulators	>99% aluminum oxide, Teflon
Wire	Tin plated copper

SPECIFICATIONS

Feedthroughs

NOTE: Sensor/feedthrough combination specifications are determined by lowest component specification. Appearance as shown here will differ to match sensor requirements accordingly.

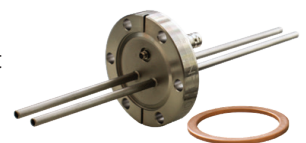
1 in. bolt feedthrough

Materials	304 stainless steel, Teflon, ceramic, beryllium nickel, VITON®
Temperature	Operational environment to 300°C with water cooling or 120°C without
Mounting	25.8 mm (1.015 in., ±0.010 in.) diameter aperture
Electrical connection	BNC connector (atmosphere side) Microdot connector (vacuum side)
Sealing surface	O-ring



CF40 feedthrough

Materials	304 stainless steel, Teflon, ceramic, beryllium nickel, copper
Temperature	Operational environment to 450°C with water cooling or 165°C without
Mounting	2 ¾ in. ConFlat type flanges with 1.375 in. I.D. min.
Electrical connection	BNC connector (atmosphere side) Microdot connector (vacuum side)
Sealing surface	Gasket



SPARE PARTS LIST

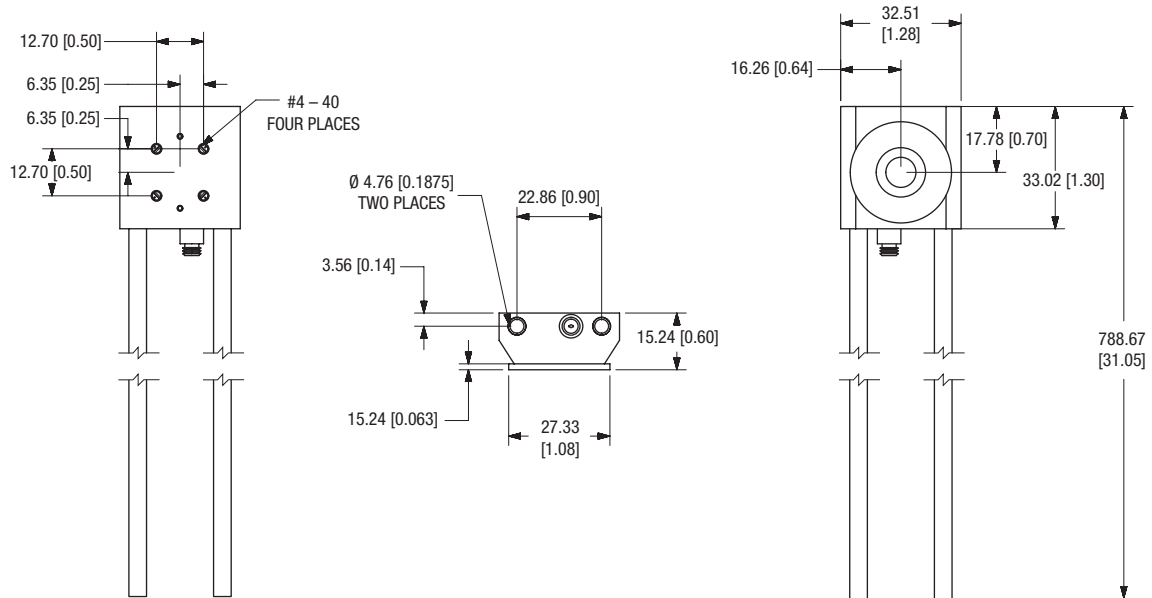
P/N	Description
784-205-G1	Crystal retainer assembly, Easy Rate Sensor
784-204-G1	Crystal holder assembly, Easy Rate Sensor
784-404-P1	Retaining ring, Easy Rate Sensor
784-403-P1	Crystal finger spring, Easy Rate Sensor
784-300-P1	Crystal holder, Easy Rate Sensor
784-405-P1	Holder finger spring, Easy Rate Sensor
080-011-P3	Screw 0-80 x 0.125 LG PH PAN HD SS GP

784-322-P1	0-80 retainer plate
784-323-P1	Coax connector, female, flat sides
783-500-023	25.4 cm (10 in.) in-vacuum cable
783-500-024	76.2 cm (30 in.) in-vacuum cable
059-0773	0.125 – 0.188 in. thru union with Ferrule set
059-0774	0.188 – 0.250 in. thru union with Ferrule set
784-209-G1	Actuator single kit
750-420-G1	Solenoid valve, 24 V (dc) or 24 V (ac)

DIMENSIONS

Easy Rate Standard Single Sensor

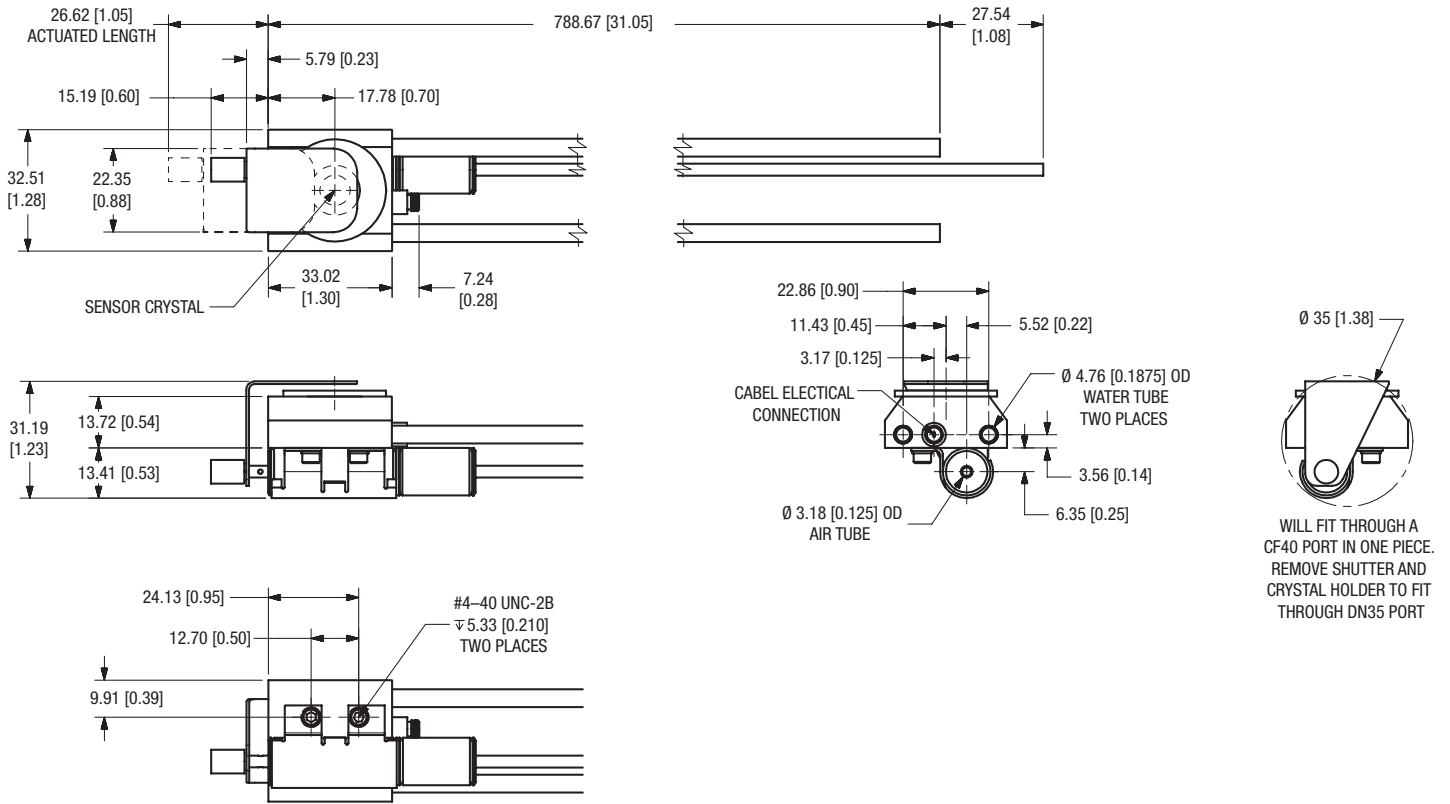
NOTE: measurements in mm [in.]



DIMENSIONS

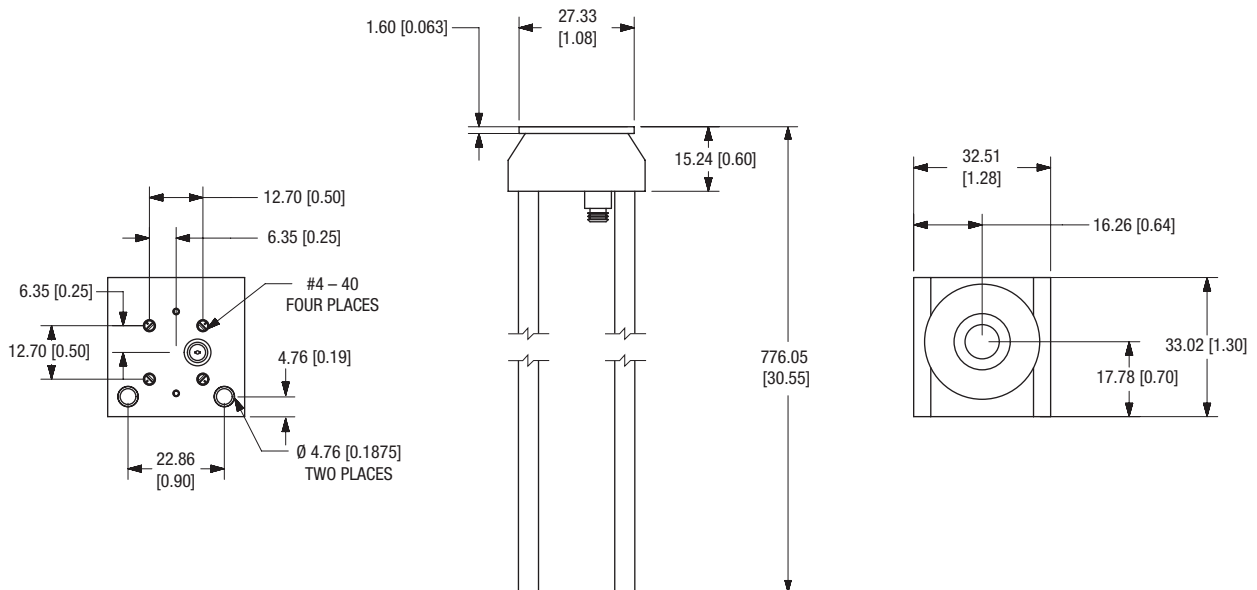
Easy Rate Shuttered Standard Single Sensor

NOTE: measurements in mm [in.]



Easy Rate Right Angle Single Sensor

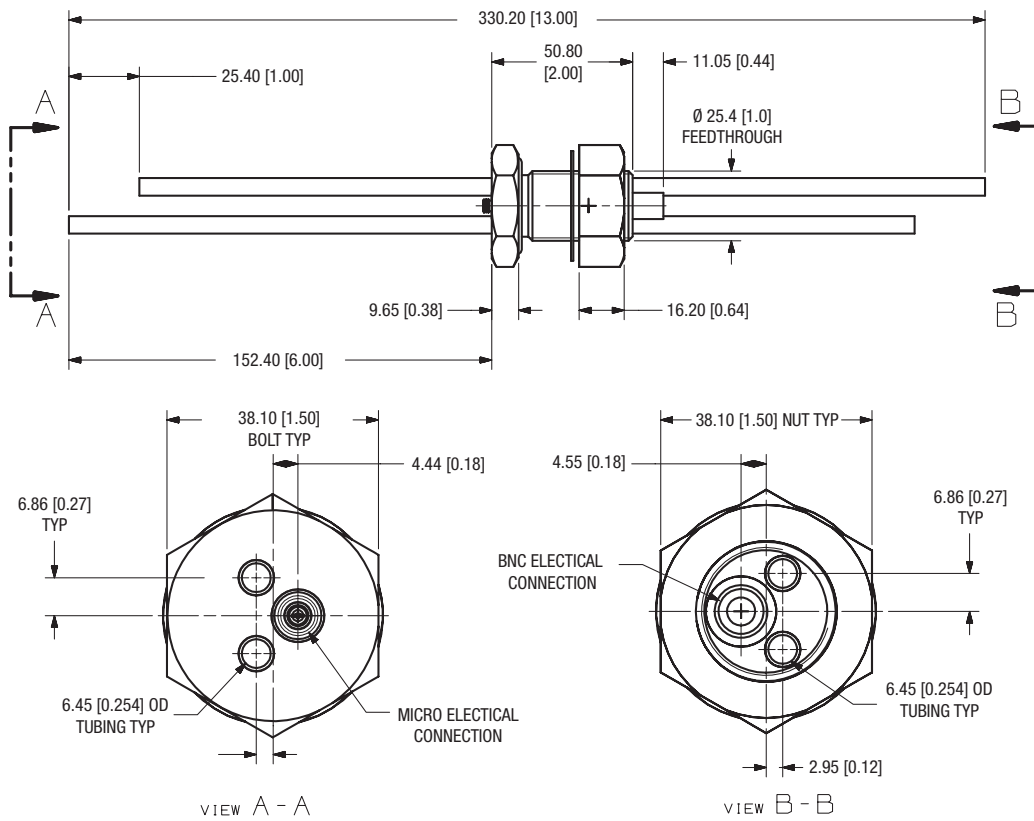
NOTE: measurements in mm [in.]



DIMENSIONS

Bolt feedthrough offered for ERS-A_0E13_ and ERS-B_0E13_ sensor/feedthrough combinations (feedthrough PN 784-283-G1)

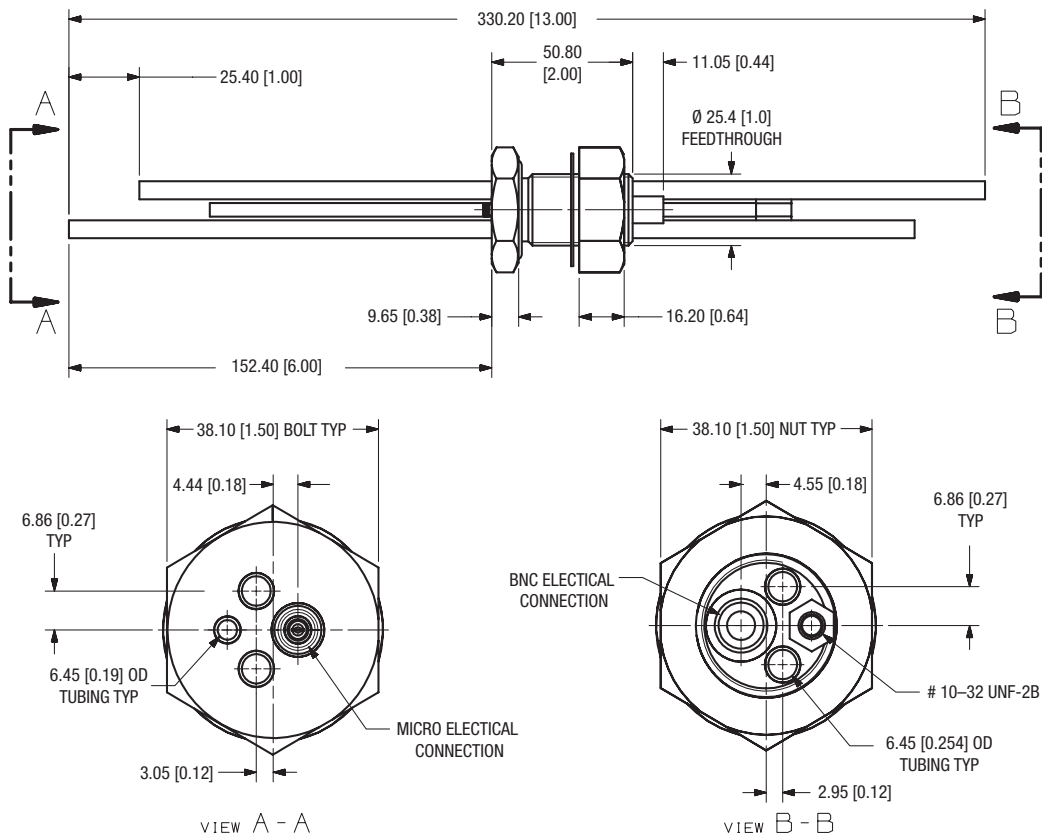
NOTE: measurements in mm [in.]



DIMENSIONS

CF40 feedthrough offered for ERS-A_1E13_ and ERS-B_1E13_ sensor/feedthrough combinations (feedthrough PN 784-284-G1)

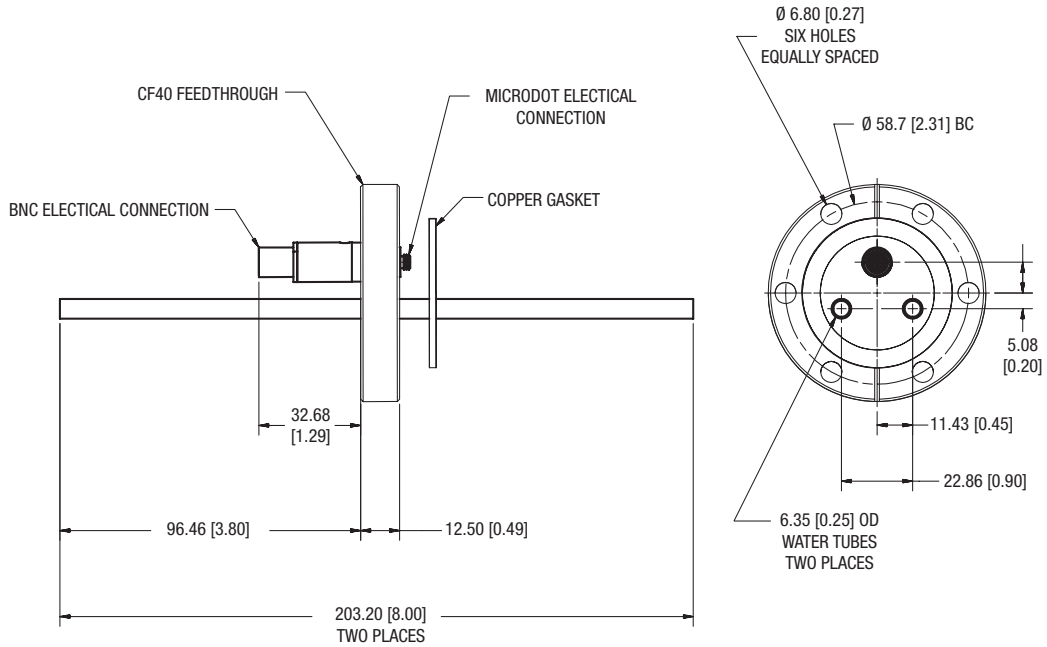
NOTE: measurements in mm [in.]



DIMENSIONS

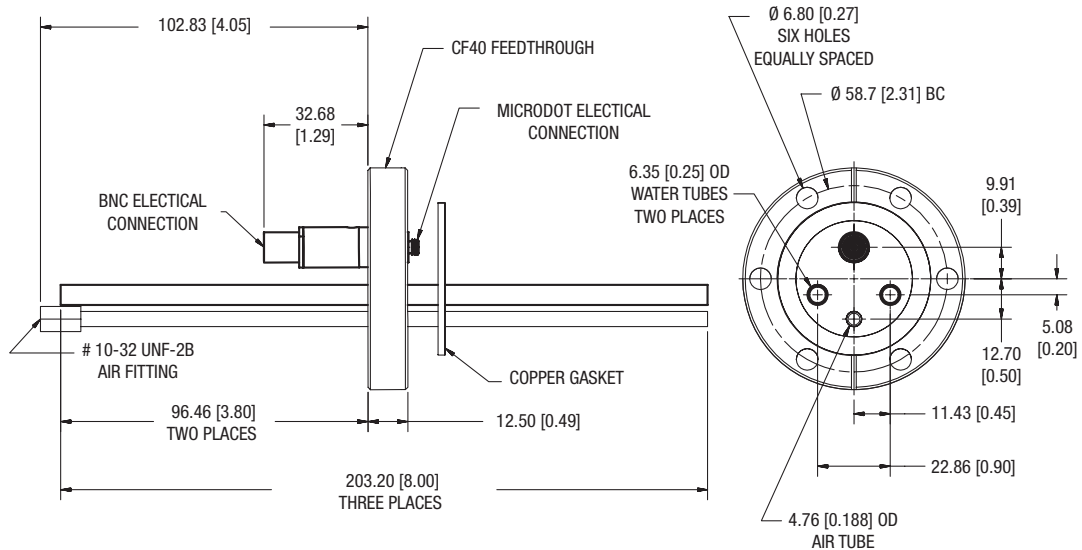
CF40 feedthrough offered for ERS-A_OE14_ and ERS-B_OE14_ sensor/feedthrough combinations (feedthrough PN 784-273-G1)

NOTE: measurements in mm [in.]



CF40 feedthrough offered for ERS-A_1E14_ sensor/feedthrough combinations (feedthrough PN 784-274-G1)

NOTE: measurements in mm [in.]



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