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# Quick Guide to Pressure Instrument Assembly

# Ashcroft® Assemblies

## Engineered for Maximum Performance and Durability

Since 1852, Ashcroft has been designing and manufacturing the highest quality pressure and temperature instruments. Our wide selection of multi-device assemblies are purpose-built to fulfill your mission, and are in wide usage in nearly every industry and municipality. The reason for this is simple – we understand your application. You can rely on Ashcroft to deliver the expertise needed to partner with you, by enabling informed choices to protect your people, processes and profits.

At Ashcroft, our engineers ensure that all fittings and adapters are made from rugged 316 stainless steel fittings. For assemblies involving diaphragm seals, we design the assembly to minimize fill volume and temperature error by using compact instrument tees or cross fittings. This eliminates the need for bulky “goalpost” configurations, and lengthy fittings that are prone to damage and leaks. Additionally, our compact design minimizes the effects of temperature fluctuations on the accuracy of instrumentation.

### INDUSTRY KNOWLEDGE FUELS INSTRUMENT COMPATIBILITY

For multiple-instrument assemblies, instrument ranges should be as close as possible for best performance. For assemblies containing a pressure switch, the switch nominal range should match or approximate the gauge range. When this is not possible, the following limitations apply:

- Switch setpoints must not exceed the full-scale value of an attached gauge.
- The full-scale value of a gauge must not exceed the proof pressure of an attached switch.

For more information on the Ashcroft approach to instrument/seal compatibility, please see Ashcroft Product Information Page DS-PI-82.


**Contact us to help you take on your next project:**

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## ORDERING GUIDELINES

- Each product is ordered as a separate line item.
- Assembly option codes are included in each product used in an assembly.
- For assemblies that include a diaphragm seal, include the seal fill option code (e.g. DJ, CK) on all products containing the fill.
- Many variations are specific to the connection codes involved; note any connection code requirements found within this guide when creating a part number.
- See Complete Guide to Instrument Assembly or Contact Ashcroft for assistance with assemblies not shown.

**Assembly coding may affect agency approvals for switches and transducers. Contact Ashcroft for assistance.**

### CODING EXAMPLE FOR OPTION L5 ASSEMBLY FILLED WITH 50 CST SILICONE (OPTION CK):

| CODE | Component | Coding Example |
|---|---|---|
| L5 | Gauge | 451279SSL04LXCKL5100# |
| | Switch | B424BXCKL5100# |
| | Snubber | 501112SDXCKL5 |
| | Diaphragm Seal | 50200SS04TXCKL5 |

# ASSEMBLY VARIATIONS

## Q7: Tamper Evident Sealant

Option Q7 instructs the assembler to apply a brightly-colored, temper-evident, hardening sealant at each threaded joint on an assembly.

## Q8: Elbow for Vertical Piping

Option Q8 codes for an elbow installed (typically on an isolation ring, though available with diaphragm seals) between the instrument and the isolator. Option Q8 is only available on assemblies with ¼ NPT connections.

## 1H: Hydrostatic Assembly Testing

Option 1H is used on assemblies requiring hydrostatic testing certification. Once the assembly is built, we pressurize the assembly to above its indicating range for 5 minutes and check for any evidence of pressure loss or leaks.

## 6G: Miscellaneous Configurations

For assemblies not included in this guide, contact Ashcroft for assistance setting up a custom variation to suit your needs. In most cases, Option 6G can be used in conjunction with a custom-configured engineering drawing approved by the customer prior to ordering.

## DU: Instrument Welded to Seal

Option DU codes for an instrument to be welded to a seal. Welded surfaces must be of like materials. Instruments attached directly to seals can be welded, and assemblies with capillaries or siphons can be welded at each connection. Fittings (e.g. tee, nipples) cannot be welded, nor can snubbers, dampeners, or PLVs.




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## Ashcroft® SMART Transmitter Assemblies

Ashcroft offers the assembly of SMART transmitters to our diaphragm seals and isolation rings, ensuring that your pressure assemblies are tested for accuracy and leak integrity prior to shipment. Our transmitter assembly service helps to take the guesswork out of specifying the correct pressure instrumentation and assembly orientation, while our Ashcroft instrumentation experts ensure that the instruments are compatible and properly calibrated to suit your application.

Selection is easy: choose the transmitter you want us to attach and configure the appropriate assembly code according to the instructions found here. We'll build the assembly with our custom-made low volume fittings for minimal temperature error, fill the assembly with our state-of-the-art vacuum filling system, and ensure that every instrument in the assembly is checked for calibration prior to shipment.

### STEP 1: TRANSMITTER SELECTION

To ensure compatibility with the seal or isolation ring being attached, we recommend the following:

- Note the instrument connection: make sure all instruments being attached are the same size NPT.
- Note the required output span – make sure it does not exceed the pressure rating of the isolator or the ranges of any attached instrument.
- Remove any option codes for block and bleed valves from the transmitter manufacturer part number– these cannot be installed above a diaphragm seal.

### STEP 2: CONFIGURE THE ASSEMBLY PART NUMBER

Select the appropriate coding for the assembly orientation you need. When ordering, be sure to include the full transmitter part number somewhere on the purchase order. Refer to the respective data sheets to configure part numbers for isolation rings, seals, and any other instrument included on the assembly.

### STEP 3: SEND US YOUR SMART TRANSMITTER

Working through your Ashcroft sales representative or authorized distributor, submit your order. Once it has been entered into our system, we will issue a return authorization number for your transmitters.

If you have any questions or need assistance, please contact Ashcroft.

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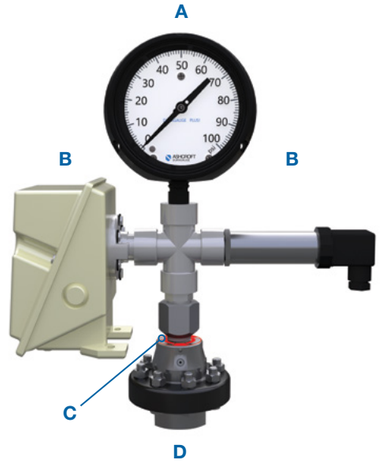
To use the below table, select the number of instruments and accessories required in your assembly and whether a seal is required. Confirm that the accessories are available in the desired configuration, and note any connection size requirements. See the assembly illustrations on pages 8–10 for more detailed information for each assembly.

| CODE | Instruments (Gauge, Switch, or Transducer) | Connections | Diaphragm Seal | Number of Accessories | Snubber or Dampener | PLV | Siphon | Valve | Capillary | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| J9 | 1 | ¼ NPT | ✓ | 2 | ✓ | | | ✓ | | |
| K2 | 1 | ½ NPT | ✓ | 3 | ✓ | ✓ | | | ✓ | |
| K9 | 1 | ¼ or ½ NPT | ✓ | 1 | | | ✓ | | | MicroTube™ siphon only |
| L2 | 2 | ¼ NPT | ✓ | 1 | | ✓ | | | | |
| L3 | 2 | ¼ NPT | ✓ | 1 | ✓ | | | | | |
| L4 | 2 | Mix | ✓ | | | | | | | |
| L5 | 2 | Mix | ✓ | 1 | ✓ | | | | | |
| L6 | 1 | ½ NPT | ✓ | 2 | ✓ | | | ✓ | | |
| E8 | 1 | ¼ or ½ NPT | ✓ | 2 | ✓ | | | ✓ | | Snubber above diaphragm seal, valve below |
| F4 | 1 | ¼ or ½ NPT | ✓ | 1 | | | | ✓ | | Valve below diaphragm seal |
| FL | 1 | ¼ or ½ NPT | ✓ | 1 | | | | ✓ | | Valve between diaphragm seal and instrument |
| H3 | 2 | ¼ NPT | ✓ | | | | | | | Both instruments with ¼ NPT Male connections |
| H5 | 2 | ½ NPT | ✓ | | | | | | | Both instruments with ½ NPT Male connections |
| H6 | 3 | ½ NPT | ✓ | | | | | | | All instruments with ½ NPT Male connections |
| H7 | 2 | ¼ NPT | ✓ | | | | | | | 1 Male / 1 Female ¼ NPT instrument connections |
| H8 | 3 | ¼ NPT | ✓ | | | | | | | |
| H9 | 2 | Mix | ✓ | | | | | | | ¼ NPT Male gauge, ½ NPT Female switch/diaphragm seal |
| Q1 | 1 | ½ NPT | ✓ | 2 | | | | ✓ | | |
| Q4 | 3 | ½ NPT | ✓ | 1 | ✓ | | | | | |
| 5G | 1 | ¼ or ½ NPT | | 1 | ✓ | ✓ | ✓ | | ✓ | Direct connection only |
| E7 | 2 | ½ NPT | | 1 | ✓ | | | | | |
| E9 | 1 | ¼ or ½ NPT | | 2 | | ✓ | ✓ | | | |
| FC | 1 | ¼ or ½ NPT | | 2 | | | ✓ | ✓ | | |
| F2 | 1 | ¼ or ½ NPT | | 1 | | | ✓ | | | |
| FA | 1 | ¼ or ½ NPT | ✓ | 2 | ✓ | | | | ✓ | |
| F3 | 1 | ¼ or ½ NPT | ✓ | 1 | | | ✓ | | | Siphon below diaphragm seal |
| F6 | 1 | ¼ or ½ NPT | ✓ | 1 | ✓ | | | | | |
| F7 | 1 | ¼ or ½ NPT | ✓ | 1 | | ✓ | | | | |
| F8 | 1 | ¼ or ½ NPT | ✓ | 1 | | | | | ✓ | Capillary between instrument and diaphragm seal |
| F9 | 1 | ¼ or ½ NPT | ✓ | 2 | | ✓ | | | ✓ | |

## 3 Instruments Attached to a Diaphragm Seal

| CODE | Instrument A | Instrument B | Accessory C | Seal D |
|---|---|---|---|---|
| H6 | ½ NPT Male | 2x ½ NPT Male | N/A | ½ NPT Female diaphragm seal or ring |
| H8 | ¼ NPT Male | 2x ¼ NPT Female | N/A | ¼ NPT Female diaphragm seal or ring |
| Q4 | ½ NPT Male | 2x ½ NPT Male | Snubber or Dampener | ½ NPT Female diaphragm seal or ring |




Q4 SHOWN

## Assemblies for 1 Instrument Without a Diaphragm Seal

| CODE | Instrument A | Accessory B | Accessory C |
|---|---|---|---|
| 5G | ½ or ¼ NPT | ½ or ¼ NPT | N/A |
| E9 | ½ or ¼ NPT Male | Snubber, Dampener, or PLV with Male process connection | Siphon with Female instrument connection |
| FC | ½ or ¼ NPT Male | Needle valve with Female inlet and outlet | Siphon with Male instrument connection |
| F2 | ½ or ¼ NPT Male | N/A | Siphon with Female instrument connection |

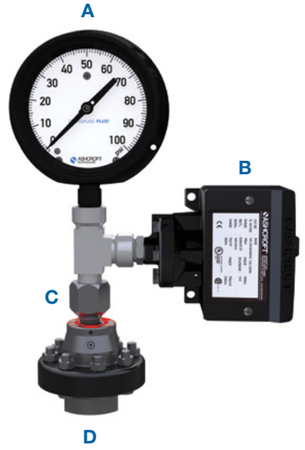
Note: All components must mate without the use of adapter fittings; all connections must be ½ or ¼ NPT for a given assembly.


E9 SHOWN

## Assemblies Consisting of 2 Instruments

| CODE | Instrument A | Instrument B | Accessory C | Isolator D |
|---|---|---|---|---|
| E7 | ½ NPT Male | ½ NPT Male[1] | ½ NPT Snubber or Dampener | N/A |
| L2 | ½ NPT Male | ¼ NPT Female | ¼ NPT PLV | ¼ NPT diaphragm seal or isolation ring |
| L3 | ¼ NPT Male | ¼ NPT Female | ¼ NPT Snubber or Dampener | ¼ NPT diaphragm seal or isolation ring |
| L4 | ½ NPT Male | ¼ NPT Female | N/A | ½ NPT diaphragm seal or isolation ring |
| L5 | ½ NPT Male | ¼ NPT Female | ½ NPT Snubber or Dampener | ½ NPT diaphragm seal or isolation ring |
| H3 | ¼ NPT Male | ¼ NPT Male | N/A | ½ NPT diaphragm seal or isolation ring |
| H5 | ½ NPT Male | ½ NPT Male | N/A | ½ or ¼ NPT diaphragm seal or isolation ring |
| H7 | ¼ NPT Male | ¼ NPT Female | N/A | ¼ NPT diaphragm seal or isolation ring |
| H9 | ½ NPT Male | ½ NPT Female[1] | N/A | ½ NPT diaphragm seal or isolation ring |

1. Instrument B installed in the 9 o'clock position




L5 SHOWN

## Assemblies with 1 Instrument, Accessory(ies), and Isolators

| CODE | Instrument A | Accessory B | Accessory C | Diaphragm Seal D |
|---|---|---|---|---|
| FA | ½ or ¼ NPT Male | Snubber or Dampener | Capillary | Diaphragm seal or isolation ring |
| FL | ½ or ¼ NPT Male | Needle valve | N/A | Diaphragm seal |
| F6 | ½ or ¼ NPT Male | Snubber or Dampener | N/A | Diaphragm seal or isolation ring |
| F7 | ½ or ¼ NPT Male | PLV | N/A | Diaphragm seal or isolation ring |
| F8 | ½ or ¼ NPT | N/A | Capillary | Diaphragm seal or isolation ring |
| F9 | ½ or ¼ NPT Male | PLV | Capillary | Diaphragm seal or isolation ring |
| K9 | ½ or ¼ NPT Male | N/A | MicroTube™ siphon | Diaphragm seal |
| L6 | ½ NPT Male | ½ NPT Snubber or Dampener | ½ NPT Needle valve | Diaphragm seal |


FA SHOWN

## Diaphragm Seals with Accessories Attached at Process Connection

| CODE | Instrument A | Accessory B | Diaphragm Seal C | Accessory D |
|---|---|---|---|---|
| F3 | ½ or ¼ NPT Male | N/A | Diaphragm seal | Siphon or Capillary |
| J9 | ¼ NPT Male | N/A | Diaphragm seal with ¼ NPT Female PC | Snubber or Dampener and valve |
| E8 | ½ or ¼ NPT Male | Snubber or Dampener | Diaphragm seal | Valve |
| F4 | ½ or ¼ NPT Male | N/A | Diaphragm Seal | Valve |
| Q1 | ½ or ¼ NPT Male | N/A | Diaphragm Seal with Option DB or ½ NPT model 82 ring | 2x ½ NPT Valves |


E8 SHOWN



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# Choose Ashcroft for Your Instrument Assembly Solution

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