

Type 200 Series Welded or Bonded Diaphragm Seal



Welded or Bonded Capsule Design

TYPE 200 SHOWN

When isolation of the process from an instrument is required, Ashcroft offers a comprehensive line of diaphragm seals. Seal types include threaded, flanged, in-line threaded, in-line flanged, in-line socket weld, in-line butt weld, saddle and sanitary seals. Also available is a complete offering of isolation or iso-rings and isolation or iso-spools.

Applications for diaphragm seals include:

- Elevated process temperatures
- Corrosive service
- Isolation of the process for safety
- Suspended solids in the process
- Sanitary connections
- Replacement of process dead leg
- Ease of cleaning between batches

FEATURES

- A metal diaphragm is welded to the top housing. Elastomeric diaphragms are bonded to the top housing. Either provides a double positive seal.
- A fill/bleed connection is standard, which permits filling the seal and instrument simultaneously after evacuation and allows the fill to flow into the completed unit.
- A Viton O-ring, compatible with all standard fill fluids, and a Teflon back-up ring provide a seal between the diaphragm capsule and the top housing.
- A thin Teflon PTFE gasket between the diaphragm and bottom housing ensures a leak-tight corrosion resistant seal even at high pressure.
- Top housing and pressure instrument are removable.
- Continuous-duty design will prevent loss of process fluid if pressure instrument is removed or fails.

SPECIFICATIONS

Model Number: Type 200, 201, 202, 203, 204, 205, 206, 207, 208

Process Connection Size: See Table A

Instrument Connection Size: 1/4", 1/2" NPT

Diaphragm Material: See Table B

Bottom Housing Materials: See Table C

Filling Fluid: See Table E

OPTIONS

| | |
|---------------------------------------------------------------------------------------------------------------------|--------------------------|
| 316 stainless steel top housing | Code YT |
| Stainless steel clamp rings and flanged ring – includes 300 stainless steel clamping bolts (1500 psi max) | SE |
| 300 series stainless steel clamping bolts (max pres is 1500 psi) | SB |
| Pipe plugs for flushing connections – pipe plugs are available in the same materials as bottom housings per Table C | PU |
| 5000 psi pressure rating – (Type 200 only) threaded inlet only, no flushing connection (metal diaphragm only) | HP |
| Welded instrument to diaphragm seal | DU |
| Dual flushing connections (1/2" NPT) (Limited to 2" thru 3" flanged seals) | DB |
| Ring joint (Flanged seal only) | RJ |
| Flat face (Flanged seal only) | FF |
| Clean for gaseous oxygen or strong oxidizing agent applications. | 6B |

HOW TO ORDER:

1. From Table A...select TYPE NUMBER based on process connection, process connection size and diaphragm type/construction. (e.g., Threaded/1"/capsule-code-10-200)
2. From Table B...select DIAPHRAGM MATERIAL. (e.g., 316L stainless steel-code S)
3. From Table C...select BOTTOM HOUSING MATERIAL. (e.g., 316 stainless steel-code S)
4. From Table D...select INSTRUMENT CONNECTION size. (e.g., 1/4" NPT-code 02T)
5. From Table E...select FILLING FLUID, if diaphragm seal will be attached to instrument. (e.g., Glycerin-code CG)

Typical Code: 10-200SS-02T-CG

Type 200 Series Welded or Bonded Diaphragm Seal

TYPE 200 SERIES WELDED OR BONDED SEAL TYPES

Type 200 – Threaded
 $\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$, 1 NPT



Type 201 – Threaded with flushing connection
 $\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$, 1 NPT



Type 202 – Raised Face Flanged
 $\frac{1}{2}$, $\frac{3}{4}$ NPT



Type 203 – Raised Face Flanged with flushing connection
 1 $\frac{1}{2}$, 2, 3 (raised face only)
 1 piece with and without flushing connection



Type 204 – In-line Threaded
 $\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$, 1 NPT



Type 205 – Saddle
 3, 4" pipe only



Type 206 – In-line Flanged
 $\frac{1}{2}$, $\frac{3}{4}$, 1, 1 $\frac{1}{2}$, 2, 3, 4, 6, 8"



Type 207 – In-line Socket Weld
 $\frac{1}{2}$, $\frac{3}{4}$, 1, 1 $\frac{1}{2}$, 2"



Type 208 – In-line Butt Weld
 $\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$, 1, 1 $\frac{1}{2}$, 2"



Table A – Process Connection/Type Number

| Process Connection | Process Connection Size/Code—Inches | | | | | | | | | | | Type Number |
|-------------------------------------------|-------------------------------------|-----|-----|-----|---|-------|---|---|------------|---|---|-------------|
| | Size Code | 1/4 | 1/2 | 3/4 | 1 | 1 1/2 | 2 | 3 | 4 | 6 | 8 | Capsule |
| Threaded—female NPT | | * | * | * | * | * | | | | | | 200 |
| Threaded—female NPT (with flushing conn.) | | * | * | * | * | * | | | | | | 201 |
| Flanged ⁽¹⁾ | | | * | * | * | * | * | | | | | 202 |
| Flanged (with flushing conn.) | | | * | * | * | * | * | | | | | 203 |
| In-line—threaded NPT | | * | * | * | * | * | | | | | | 204 |
| Saddle | | | | | | | | * | AND LARGER | | | 205 |
| In-line—butt weld | | * | * | * | * | * | | | | | | 208 |
| In-line—flanged ⁽²⁾ | | * | * | * | * | * | * | * | * | * | * | 206 |
| In-line—socket weld | | * | * | * | * | * | | | | | | 207 |

Pressure Ratings—All 2500 psi except flanged seals are per ASME B 16.5, temperature limit determined by diaphragm, bottom housing and/or filling fluid.

Table B – Diaphragm Material

| Material | Code |
|--------------------------------|------|
| 316L stainless steel | S |
| 304 stainless steel | C |
| Monel 400 | P |
| Nickel | N |
| Carpenter 20 | D |
| Tantalum | U |
| Hastelloy B | G |
| Hastelloy C 22 ⁽⁶⁾ | J |
| Hastelloy C 276 ⁽⁶⁾ | H |
| Teflon ⁽⁴⁾ | T |
| Viton ⁽⁵⁾ | Y |
| Kalrez ⁽¹²⁾ | K |
| Titanium ⁽¹⁴⁾ | TI |

Table C – Bottom Housing Materials

| Material | Code |
|--------------------------------------|------|
| Steel | B |
| 304L stainless steel | C |
| 316L stainless steel | S |
| Hastelloy B | G |
| Hastelloy C 22 ⁽⁶⁾ | J |
| Hastelloy C 276 ⁽⁶⁾ | H |
| Carpenter 20 | D |
| Monel "400" | M |
| Inconel "600" | W |
| Nickel | N |
| PVC ⁽⁷⁾⁽¹⁵⁾ | V |
| Tantalum clad SS ⁽⁸⁾ | SU |
| Halar coated SS ⁽⁹⁾ | BH |
| Teflon flanged steel ⁽¹⁰⁾ | T |
| Kynar ⁽¹³⁾⁽¹⁵⁾ | KY |
| Titanium | TI |

Table D – Instrument Connection

| Size – NPT | Code |
|---------------|------|
| $\frac{1}{4}$ | O2T |
| $\frac{1}{2}$ | O4T |

Table E – Filling Fluid

| Filling | Service | Connection to Instrument | Temperature Range °F | Code |
|------------|-------------------------------------------------------|--------------------------|----------------------|------|
| Glycerin | Pressure | Direct Only | 0/400 | CG |
| Silicone | Pressure/Vacuum | Direct or Flexible Line | -40/600 | CK |
| Halocarbon | Pressure/Vacuum in presence of strong oxidizing agent | Direct or Flexible Line | -70/300 | CF |
| Syltherm | Pressure/Vacuum | Direct or Flexible Line | -40/750 | HA |

Notes:

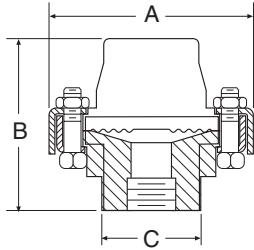
- (1) 150, 300, 600, 900, 1500 & 2500 class flanges.
- (2) 1" 150 thru 8" 300 class flanges only.
- (3) Metal diaphragms welded; Teflon, Kalrez & Viton diaphragms bonded.
- (4) Temp limits: -40/400°F.
- (5) Max. pressure: 500 psi, Temp. limits: -40/350°F.
- (6) Use on applications where NACE standard MR-01-75 2003 is standard.
- (7) Maximum press./temp.
 Threaded: 200 psi/74°F, 125 psi/125°F, 80 psi/150°F.
 Flanged: 75 psi/100°F.
- (8) Type 202 only.
- (9) Temp. Limits: -40/300°F.
- (10) Only available in 1", 1 $\frac{1}{2}$ ", & 2" 150 class, Types 202 max. press./temp. – 270 psi and 150°F. Consult factory for conditions beyond these limits.
- (11) Max. pressure: 500 psi, Temp. limits: 30/212°F.
- (12) Maximum pressure/temp.: 200 psi and 180°F.
- (13) Type 200: $\frac{1}{4}$ or $\frac{1}{2}$ NPT only. Larger sizes offered with solvent weld joint. N/A in 201 or 203 design.
- (14) Includes Titanium top housing.
- (15) Type 200 only available in 1/4 NPT or 1/2 NPT. 3/4" & 1" size available as solvent welded joint only.

Type 200 Series Welded or Bonded Diaphragm Seal

DIMENSIONS

Type 200 – Threaded

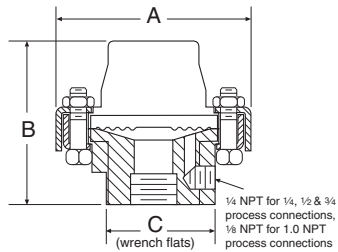
¼, ½, ¾, 1 NPT



| A | | B | | C | |
|----|------|----|------|----|------|
| in | mm | in | mm | in | mm |
| ¾ | (95) | 2⅞ | (73) | 1⅜ | (46) |

Type 201 – Threaded

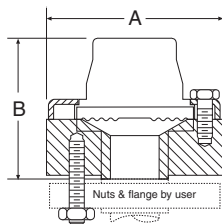
¼, ½, ¾, 1 NPT (with flushing connection)



| A | | B | | C | |
|----|------|----|------|----|------|
| in | mm | in | mm | in | mm |
| ¾ | (95) | 2⅞ | (73) | 1⅜ | (46) |

Type 202 – Flanged

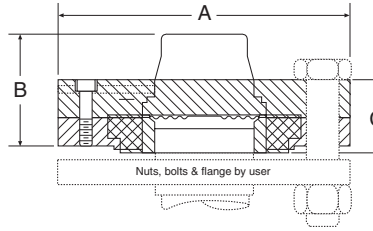
½, ¾, 1"



| Flange Size | | A | | B | |
|--------------|----|-------|----|------|----|
| Rating # | in | mm | in | mm | mm |
| 150 | 3½ | (89) | 2⅞ | (75) | |
| ¾ 300 or 600 | 3¾ | (95) | 3 | (76) | |
| 900 or 1500 | 4¾ | (121) | 3¾ | (81) | |
| 150 | 3⅞ | (98) | 2⅞ | (71) | |
| ¾ 300 or 600 | 4⅝ | (117) | 3 | (76) | |
| 900 or 1500 | 5⅞ | (130) | 3¾ | (81) | |

Type 202 – Flanged 1" (raised face only)

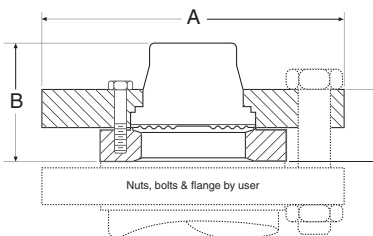
two piece bottom housing, 1½, 2" - PVC, Teflon and Kynar



| Flange Size | | A | | B | | C | |
|-------------|----|-------|----|------|----|------|--|
| Rating # | in | mm | in | mm | in | mm | |
| 150 | 1½ | (127) | 2⅝ | (59) | 1⅜ | (39) | |
| 150 | 2" | (152) | 2⅞ | (54) | 1⅞ | (40) | |

Type 202 – Flanged (raised face only)

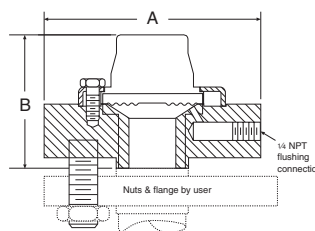
1½, 2, 3" one piece bottom housing - all materials except PVC, Teflon and Kynar



| Flange Size | | A | | B | | C | |
|---------------|-----|-------|----|------|----|------|--|
| Rating # | in | mm | in | mm | in | mm | |
| 150 | 5 | (127) | 1½ | (38) | | | |
| 1½ 300 or 600 | 6¼ | (159) | 2⅝ | (61) | 1½ | (38) | |
| 900 or 1500 | 7 | (178) | 1½ | (38) | | | |
| 150 | 6 | (152) | 1¾ | (35) | | | |
| 2" 300 or 600 | 6½ | (165) | 1⅞ | (49) | 1½ | (38) | |
| 900 or 1500 | 8½ | (216) | 2⅞ | (54) | | | |
| 150 | 7½ | (191) | 2 | (51) | 1⅝ | (41) | |
| 3" 300 or 600 | 8¼ | (206) | 2⅞ | (52) | 1⅞ | (47) | |
| 900 or 1500 | 10½ | (267) | 2⅞ | (68) | 3¼ | (82) | |

Type 203 – Flanged

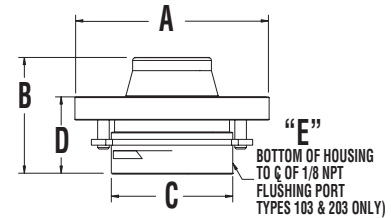
½, ¾, 1" (with flushing connection)



| Flange Size | | A | | B | |
|--------------|----|-------|----|------|----|
| Rating # | in | mm | in | mm | mm |
| 150 | 3½ | (89) | 2⅞ | (75) | |
| ½ 300 or 600 | 3¾ | (95) | 3 | (76) | |
| 900 or 1500 | 4¾ | (121) | 3¾ | (81) | |
| 150 | 3⅞ | (98) | 2⅞ | (71) | |
| ¾ 300 or 600 | 4⅝ | (117) | 3 | (76) | |

Type 202/203 – Flanged 1" (raised face only)

one piece bottom housing, with and without flushing connection. Class 150, 300, 600

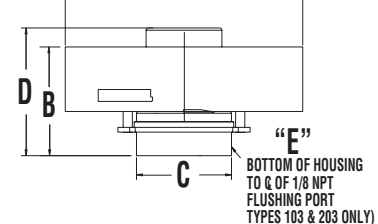


| Flange Size | | A | | B | | C | |
|-------------|-------|-------|--------|------|---------|------|--|
| Rating # | in | mm | in | mm | in | mm | |
| 150 | 4-1/4 | (100) | 2-9/16 | (65) | 1-23/32 | (69) | |
| 300 or 600 | 5 | (127) | | | | | |

| Flange Size | | D | | E | |
|-------------|-------|------|-----|-----|----|
| Rating # | in | mm | in | mm | mm |
| 150 | 1-5/8 | (41) | 3/8 | (9) | |
| 300 or 600 | | | | | |

Type 202/203 – Flanged 1" (raised face only)

one piece bottom housing, with and without flushing connection. Class 900, 1500, 2000



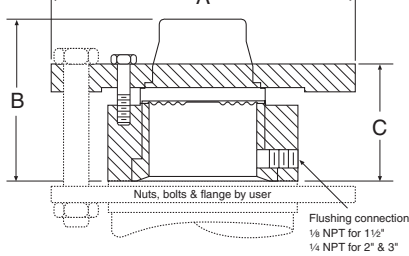
| Flange Size | | A | | B | | C | |
|-------------|-------|-------|-------|------|-------|------|--|
| Rating # | in | mm | in | mm | in | mm | |
| 900 or 1500 | 5-7/8 | (149) | 2-7/8 | (73) | 2-1/4 | (57) | |
| 2500 | 6-1/4 | (159) | | | | | |

| Flange Size | | D | | E | |
|-------------|-------|------|-----|-----|----|
| Rating # | in | mm | in | mm | mm |
| 900 or 1500 | 3-3/8 | (86) | 3/8 | (9) | |
| 2500 | | | | | |

Type 200 Series Welded or Bonded Diaphragm Seal

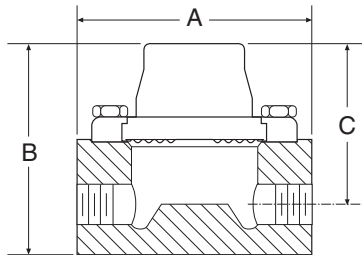
DIMENSIONS

Type 203 – Flanged 1½", 2", 3" (raised face only)
one piece bottom housing with flushing connection



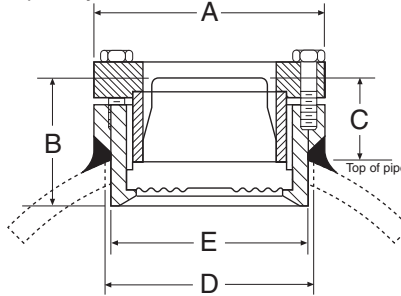
| Flange Size | Rating # | A in | A mm | B in | B mm | C in | C mm |
|-------------|-------------|------|-------|------|------|------|------|
| 150 | | 5 | (127) | | | | |
| 1½" | 300 or 600 | 6¼ | (159) | 3 | (76) | 2½ | (64) |
| | 900 or 1500 | 7 | (178) | | | | |
| 2" | 300 or 600 | 6 | (152) | 3½ | (89) | 2¾ | (71) |
| | 900 or 1500 | 8½ | (215) | | | | |
| 3" | 150 | 7½ | (191) | 3¾ | (94) | 2¾ | (71) |
| | 300 or 600 | 8¼ | (210) | 3¾ | (94) | 2¾ | (71) |
| | 900 | 9½ | (241) | | | | |
| | 1500 | 10½ | (267) | | | | |

Type 204 – In-Line Threaded
¼", ½", ¾", 1 NPT



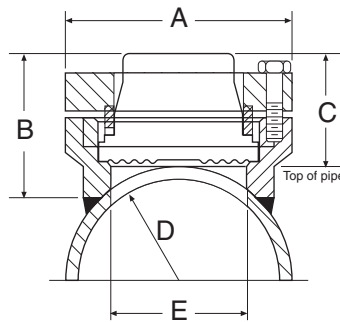
| Process Connection | A in | A mm | B in | B mm | C in | C mm |
|--------------------|------|-------|------|------|------|------|
| ¼ NPT | 4 | (102) | 2½ | (64) | 2½ | (64) |
| ½ NPT | | | 3¾ | (94) | 2¾ | (71) |
| ¾ NPT | | | 3 | (76) | | |
| 1 NPT | | | 3 | (76) | | |

Type 205 – Saddle
4" Pipe only



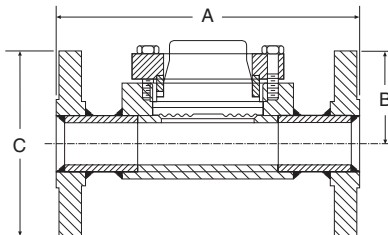
| A in | A mm | B in | B mm | C in | C mm | D in | D mm | E in | E mm |
|------|------|------|------|------|------|------|------|------|------|
| 3½ | (89) | 1½ | (50) | 1¾ | (31) | 3 | (76) | 2¾ | (71) |

Type 205 – Saddle
3" Pipe only



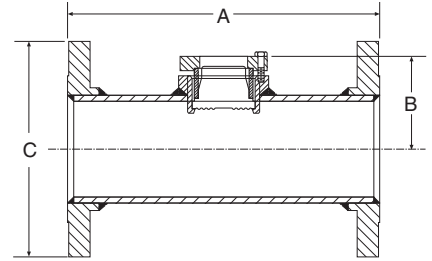
| A in | A mm | B in | B mm | C in | C mm | D in | D mm | E in | E mm |
|------|------|------|------|------|------|------|------|------|------|
| 3½ | (89) | 2¼ | (57) | 1¾ | (48) | 1¾ | (44) | 2½ | (64) |

Type 206 – In-Line Flanged
½", 1", 1½", 2", 3"



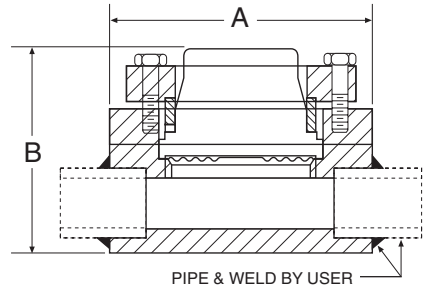
| Flange Size | Rating # | A in | A mm | B in | B mm | C in | C mm |
|-------------|----------|------|-------|------|------|------|-------|
| ½" | 150 | 7 | (178) | | | 3½ | (89) |
| | 300 | 7 | (178) | 2½ | (62) | 3¾ | (94) |
| 1" | 150 | 7 | (178) | | | 4¼ | (108) |
| | 300 | 8 | (203) | 2½ | (62) | 4¾ | (123) |
| 1½" | 150 | 8 | (203) | | | 5 | (127) |
| | 300 | 9 | (229) | 2½ | (62) | 6½ | (165) |
| 2" | 150 | 9 | (229) | | | 6 | (152) |
| | 300 | 10 | (254) | 2½ | (62) | 6½ | (165) |
| 3" | 150 | 11 | (279) | | | 7½ | (229) |
| | 300 | 12 | (305) | 3 | (76) | 8¼ | (254) |

Type 206 – In-Line Flanged
4", 6", 8"



| Flange Size | Rating # | A in | A mm | B in | B mm | C in | C mm |
|-------------|----------|------|-------|------|-------|------|-------|
| 4" | 150 | 13 | (330) | | | 9 | (229) |
| | 300 | 14 | (356) | 3¾ | (86) | 10 | (254) |
| 6" | 150 | 16 | (406) | | | 11 | (279) |
| | 300 | 17 | (432) | 4¾ | (113) | 12½ | (318) |
| 8" | 150 | 16 | (406) | 5¾ | (138) | 13½ | (343) |

Type 207 – In-Line Welded
¼", ½", ¾", 1", 1½", 2"



| Pipe Size | A in | A mm | B in | B mm |
|-----------|------|-------|------|------|
| ¼" | 4 | (102) | 2½ | (64) |
| ½", ¾" | | | 2½ | (64) |
| 1" | | | 2½ | (64) |
| 1½" | | | 2¾ | (71) |
| 2" | | | 2¾ | (71) |