

NuFlo™

Orifice Fittings and Equipment

User Manual

*Dual Chamber Orifice Fittings • Single Chamber Orifice Fittings
Orifice Flange Unions • Orifice Plates • Orifice Meter Runs*



Sold as North Star Flow Products in Canada

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Model 4055 Dual Chamber Orifice Fittings

NuFlo Model 4055 Dual Chamber Orifice Fittings are compact, streamlined and rugged featuring a simple and rapid method for changing or inspecting orifice plates under pressure. The orifice fittings feature a ball-type construction for opening and closing “without” a complicated gear mechanism.

The unique construction incorporating a ball closure with spring-loaded, self-lubricating, Moly-filled Teflon® floating seals eliminates any need for periodic lubrication. All NuFlo dual chamber orifice fittings are manufactured in accordance with ANSI and ATSM standards and available in 2”, 3”, 4” and 6” sizes.

Features

- Compact construction
- Rapid method for changing orifice plates under pressure
- Self-lubricating Moly-filled Teflon® seals (periodic lubrication not required)
- Orifice plate O-ring seal provides positive seal around orifice plate
- Positive orifice plate alignment assured with closure of chamber lid and internal ball stop

Standard Specifications

Meter Connections: All NuFlo orifice fittings are provided with two sets of flange taps located 1” on each side of the orifice plate. Flange tap meter connections are 1/2” NPT, internal tap hole sizes follow latest AGA/API recommendations. Internal edges of tap holes are free from burrs and slightly rounded.

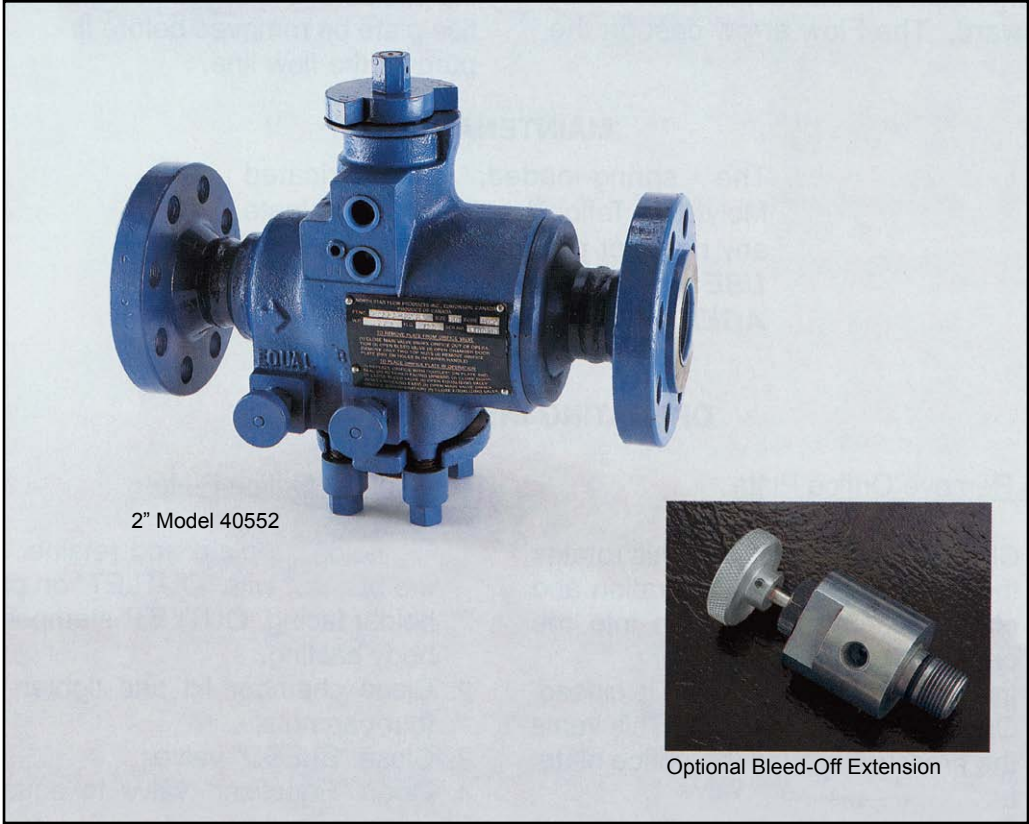
Two types of NuFlo orifice fittings are available:

- Flanged Type, either raised face or ring joint
- Flangeweld Type, having a weldneck inlet and a flanged outlet

When Ordering, Specify:

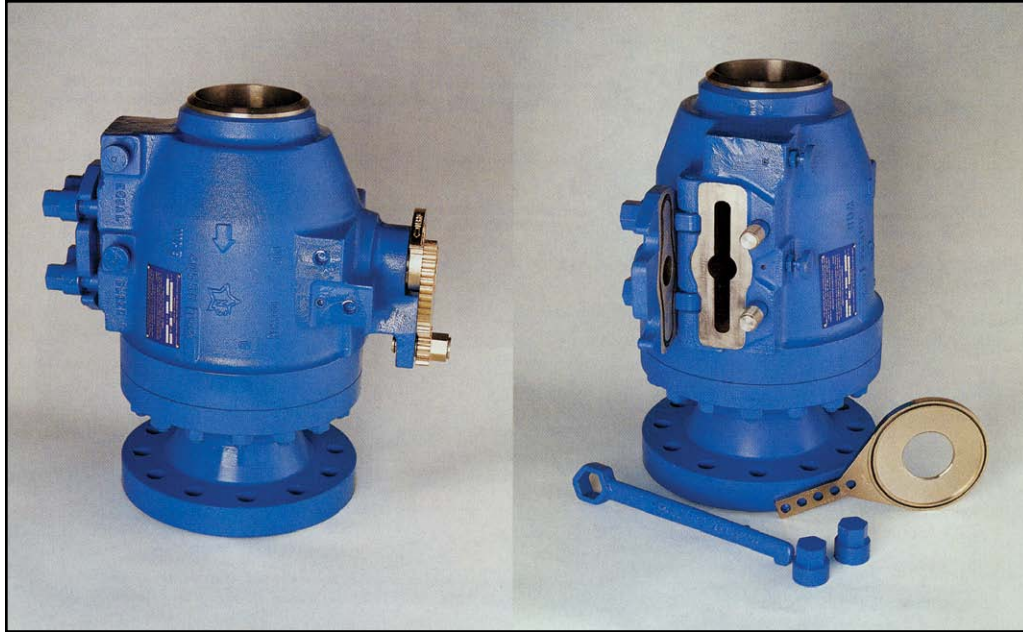
- Quantity
- Assembly part number
- Type of dual chamber orifice fitting (flanged, flangeweld)
- Service (sweet, (H₂S) sour)
- Flange rating
- Flange type (raised face, ring type joint)
- Pipe schedule
- Orifice plate bore size(s)

| ORIFICE FITTING SIZES | 2” | 3” | 4” | 6” |
|------------------------------|------------------------|------------------------|------------------------|-----------------------|
| ASSEMBLY PART NUMBER | 40552 | 40553 | 40554 | 40556 |
| ANSI FLANGE PRESSURE RATINGS | 150 THROUGH 1500 | 150 THROUGH 1500 | 150 THROUGH 1500 | 150 THROUGH 600 |
| INTERNAL DIAMETERS | SCH 40 THROUGH SCH 160 | SCH 40 THROUGH SCH 160 | SCH 40 THROUGH SCH 160 | SCH 40 THROUGH SCH 80 |



Dual chamber orifice fitting, flanged type





Dual chamber orifice fitting, flangeweld type (6 in.)

Installation and Maintenance

It is recommended that the NuFlo Dual Chamber Orifice fitting be placed in the line with the two 1/2" NPT flange taps and instruction plate facing upward. The flow arrow cast on the body must correspond with flow direction of line. The orifice fitting is shipped with an orifice plate installed in operating position. It is suggested that the orifice plate be removed before flushing or purging the flow line.

The spring-loaded, self-lubricated Moly-filled Teflon® ball seals eliminate any need for periodic lubrication. ***Grease is not required for sealing.***

Operating Instructions

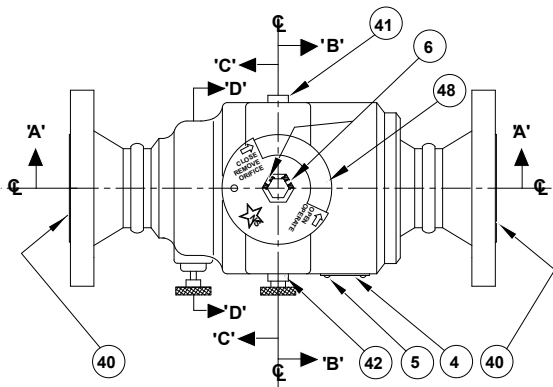
Removing an Orifice Plate

1. Close main orifice fitting. This rotates the orifice plate out of operation and places the bypass section into the orifice fitting bore.
2. Insure "EQUALIZER" valve is closed.
3. Open the "BLEED" valve. This vents the pressure around the orifice plate and chamber lid.
4. Open the chamber lid by loosening the hinge bolt cap nuts and removing the two top cap nuts. This will allow the chamber lid to open freely.
5. Remove orifice plate and retainer with the wrench supplied with unit.

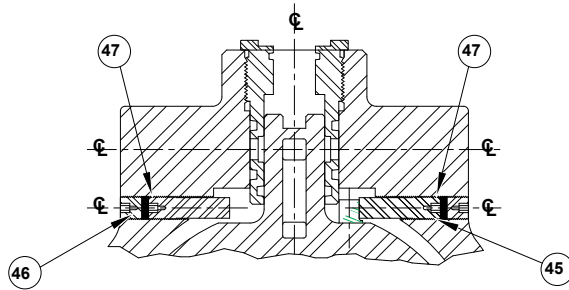
Replacing an Orifice Plate

1. Place orifice plate and retainer into the ball slot with "OUTLET" on plate holder facing "OUTLET" stamped on body casting.
2. Close chamber lid and tighten the four cap nuts.
3. Close "BLEED" valve.
4. Open "EQUALIZER" valve to equalize ball seal pressure.
5. Open main orifice fitting. This places orifice plate into operation and removes bypass section from the bore.
6. Close "EQUALIZER" valve.

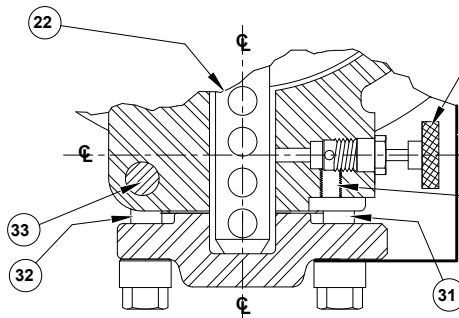
2" and 3" MODEL 4055 DUAL CHAMBER ORIFICE FITTINGS WITH INTERNAL BALL-STOP



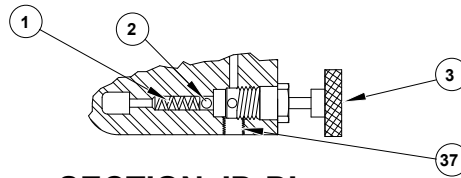
TOP VIEW



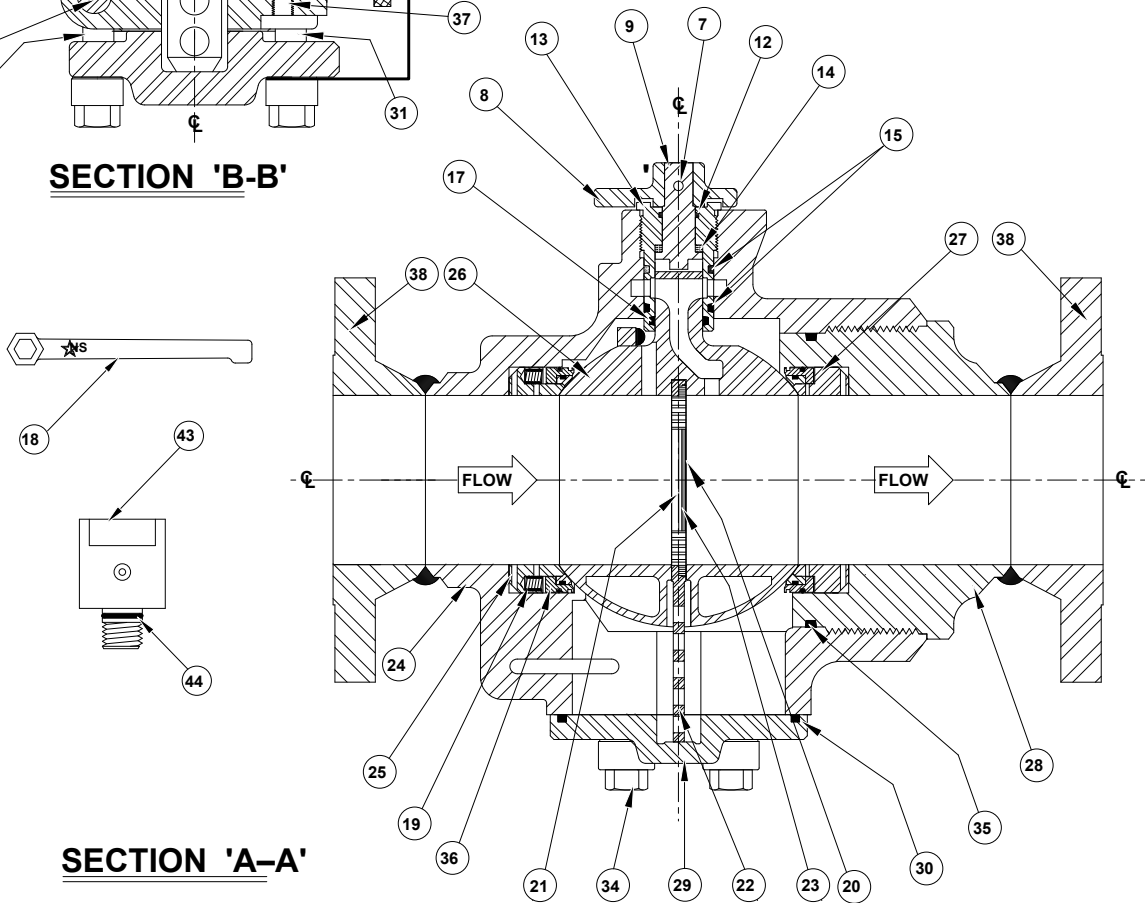
SECTION 'C-C'



SECTION 'B-B'



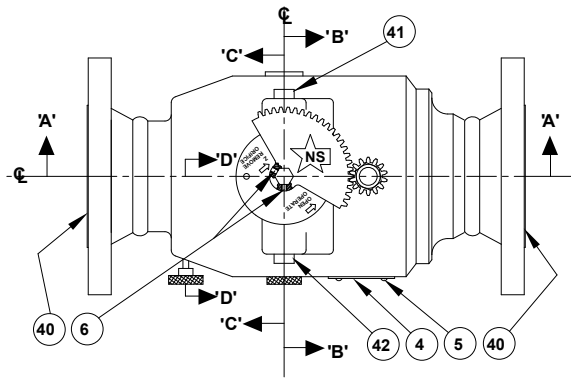
SECTION 'D-D'



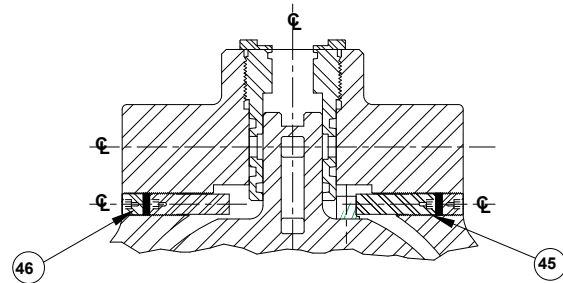
SECTION 'A-A'

4" MODEL 4055 DUAL CHAMBER ORIFICE FITTING WITH INTERNAL BALL-STOP

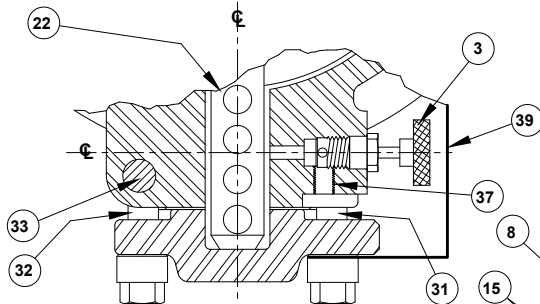
(SEE PAGE 8 FOR 6" DUAL CHAMBER FITTING DRAWING)



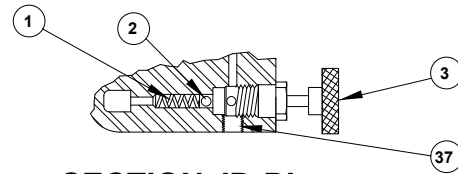
TOP VIEW



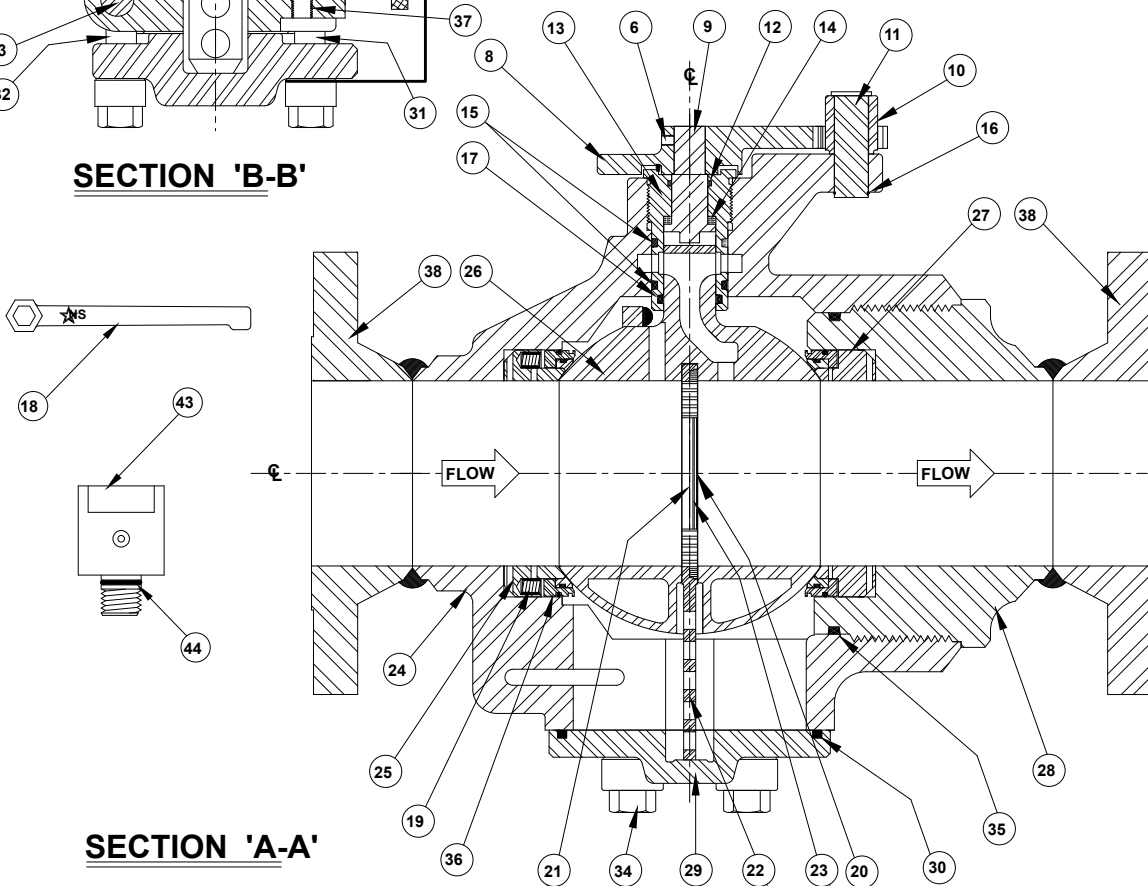
SECTION 'C-C'



SECTION 'B-B'



SECTION 'D-D'



SECTION 'A-A'

PARTS LIST
2", 3" and 4" MODEL 4055 DUAL CHAMBER ORIFICE FITTINGS
WITH INTERNAL BALL-STOP

| ITEM | DESCRIPTION | QTY. | ASSY. NO. 40552 (2") PART NO. | ASSY. NO. 40553 (3") PART NO. | ASSY. NO. 40554 (4") PART NO. |
|------|--|------|---|---|---|
| 1 | SPRING | 1 | 40701-053-04000 | 40701-053-04000 | 40701-053-04000 |
| 2 | 0.250 316 S.S. BALL | 1 | 01001-030-04300 | 01001-030-04300 | 01001-030-04300 |
| 3 | BLEED VALVE ASSEMBLY | 2 | 40701-J00-06000 | 40701-J00-06000 | 40701-J00-06000 |
| 4 | INSTRUCTION PLATE | 1 | 40701-009-04000 | 40701-009-04000 | 40701-009-04000 |
| 5 | DRIVE SCREW #4 - 1/4" TYPE U | 4 | NCN | NCN | NCN |
| 6 | SET SCREW (ALLEN HEAD) | 2 | NA | 5/16" - 18 TPI X 1/4" | 3/8" - 16 TPI X 1/2" |
| 7 | ROLL PIN | 1 | 1/8" X 7/8" | | |
| 8 | BALL STOP | 1 | 40552-119-04000 | 40553-130-04000 | 40554-138-04000 |
| 9 | BALL STEM | 1 | 40552-046-04000 | 40553-048-04000 | 40554-042-04000 |
| 10 | SPUR GEAR | | | | 40704-004-04000 |
| 11 | SPUR GEAR STEM | 1 | | | 40704-046-04000 |
| 12 | O-RING STEM RETAINER | 1 | 40700-060-06000 | 40713-035-06000 | 40714-046-06000 |
| 13 | STEM RETAINER | 1 | 40552-027-04000 | 40703-016-04000 | 40704-033-04000 |
| 14 | STEM RING | 1 | 40701-014-04000 | 40703-018-04000 | 40704-034-04000 |
| 15 | O-RING STEM RETAINER | 2 | 40700-061-06000 | 40714-047-06000 | 40714-048-06000 |
| 16 | STEM LOCK | 1 | | | 40704-050-04000 |
| 17 | O-RING STEM RETAINER | 1 | 40700-059-06000 | 40713-036-06000 | 40714-047-06000 |
| 18 | ORIFICE FITTING WRENCH | 1 | 40701-075-00000 | 40703-045-00000 | 40704-031-00000 |
| 19 | WAVE SPRING (STANDARD) WAVE SPRING (H ₂ S) SOUR | 5 | 40700-009-03000 40700-020-06000 | 40703-088-03000 40703-093-06000 | 40704-082-04000 40704-087-06000 |
| 20 | DOVETAIL RING | 1 | 40712-001-04000 | 40713-006-04000 | 40714-010-04000 |
| 21 | STANDARD ORIFICE PLATE 316 S.S | 1 | 40552-052-00000 | 40553-055-00000 | 40554-049-00000 |
| 22 | STANDARD ORIFICE PLATE RE- TAINER ORIFICE PLATE RETAINER ORIFICE PLATE RETAINER (TEFLON) | 1 | 40552-062-04000 40552-069-04000 | 40553-062-04000 40553-065-04000 | 40554-063-04000 40554-065-04000 |
| 23 | O-RING PLATE RETAINER O-RING (TEFLON) PLATE RETAINER | 1 | 40700-005-06000 40552-059-06000 | 40702-025-06000 40553-060-06000 | 40714-052-06000 40554-059-06000 |
| 24 | ORIFICE FITTING BODY 150# - 600# RATING SCH - 40 150# - 600# RATING SCH - 80 150# - 600# RATING SCH - 160 900 - 1500# RATING SCH - 80 900 - 1500# RATING SCH -160 | 1 | 40552-023-04000 40552-024-04000 40552-025-04000 40552-024-04000 40552-025-04000 | 40553-023-04000 40553-034-04000 40553-035-04000 40553-036-04000 40553-037-04000 | 40554-017-04000 40554-025-04000 40554-026-04000 40554-035-04000 40554-030-04000 |
| 25 | UPSTREAM SEAL RETAINER SCH - 40 BORE SCH - 80 BORE SCH - 160 BORE | 1 | 40552-031-04000 40552-032-04000 40552-033-04000 | 40553-025-04000 40553-028-04000 40553-031-04000 | 40554-019-04000 40554-021-04000 40554-023-04000 |
| 26 | BYPASS BALL SCH - 40 SCH - 80 SCH - 160 | 1 | 40552-115-04000 40552-116-04000 40552-117-04000 | 40553-124-04000 40553-125-04000 40553-126-04000 | 40554-135-04000 40554-136-04000 40554-137-04000 |
| 27 | DOWNSTREAM SEAL RETAINER SCH - 40 SCH - 80 SCH - 160 | 1 | 40552-035-04000 40552-036-04000 40552-037-04000 | 40553-026-04000 40553-029-04000 40553-032-04000 | 40554-020-04000 40554-022-04000 40554-024-04000 |
| 28 | DOWNSTREAM WELDNECK SCH - 40 SCH - 80 SCH - 160 | 1 | 40552-038-03000 40552-039-03000 40552-040-03000 | 40553-024-03000 40553-027-03000 40553-030-03000 | 40554-027-03000 40554-028-03000 40554-029-03000 |
| 29 | CHAMBER LID | 1 | 40552-043-04000 | 40553-033-04000 | 40554-018-04000 |

PARTS LIST
2", 3" and 4" MODEL 4055 DUAL CHAMBER ORIFICE FITTINGS
WITH INTERNAL BALL-STOP (cont'd)

| ITEM | DESCRIPTION | QTY. | ASSY. NO. 40552 (2") PART NO. | ASSY. NO. 40553 (3") PART NO. | ASSY. NO. 40554 (4") PART NO. |
|------|---|--------|---------------------------------------|------------------------------------|------------------------------------|
| 30 | O-RING CHAMBER LID | 1 | 40552-051-06000 | 40553-051-06000 | 40714-059-06000 |
| 31 | STUD BOLT | 2 | 40726-006-04000 | 40703-026-04000 | 40704-019-04000 |
| 32 | HINGE BOLT | 2 | 40726-005-04000 | 40703-027-04000 | 40704-018-04000 |
| 33 | HINGE PIN | 1 | 40726-008-04000 | 40703-024-04000 | 40704-020-04000 |
| 34 | HEX NUT | 4 | 40701-021-04000 | 40703-025-04000 | 40704-021-04000 |
| 35 | O-RING DOWNSTREAM WELDNECK | 1 | 40552-054-06000 | 40553-052-06000 | 40714-060-06000 |
| 36 | BALL SEAL ASSY. FOR 150# AND 300# RATING FOR 600# TO 1500# RATING | 2 | 40552-C00-04000 40552-A00-04000 | 40703-D00-04000 40703-P00-04000 | 40704-D00-04000 40704-P00-04000 |
| ITEM | DESCRIPTION | QTY | ASSY. NO. 40552 (2") PART NO. | ASSY. NO. 40553 (3") PART NO. | ASSY. NO. 40554 (4") PART NO. |
| 37 | PIPE PLUG 1/16" - 27 NPT | 1 | NCN | NCN | NCN |
| 38 | FLANGES FLANGED FLANGEWELD | 2 1 | SPECIFIED BY TYPE AND PRESSURE RATING | | |
| 39 | ORIFICE FITTING GUARD W/O BLEED-OFF-EXTENSION (STAN- DARD) W/BLEED-OFF-EXTENSION | 1 | 40700-039-04000 40701-101-04000 | 40702-013-04000 40701-102-04000 | 40702-013-04000 40701-102-04000 |
| 40 | PLASTIC BORE PLUG | 2 | NCN | NCN | NCN |
| 41 | PIPE PLUG 1/2" | 2 | 35364-004-04000 | 35364-004-04000 | 35364-004-04000 |
| 42 | PLASTIC PIPE PLUG 1/2" | 2 | NCN | NCN | NCN |
| 43 | BLEED-OFF EXTENSION (H ₂ S) SOUR | 1 | 40701-S00-06000 | 40701-S00-06000 | 40701-S00-06000 |
| 44 | O-RING | 1 | 40714-061-06000 | 40714-061-06000 | 40714-061-06000 |
| 45 | SET SCREW 1/2" - 20 UNF | 2 | 40700-068-04000 | 40700-068-04000 | 40700-070-04000 |
| 46 | PLUG 1/2" - 20 UNF | 2 | 40700-069-04000 | 40700-069-04000 | 40700-069-04000 |
| 47 | NYLON LOCKING PELLET | 4 | 10008-006-04000 | 10008-006-04000 | N/A |
| 48 | BALL STOP PLATE | 1 | 40552-118-04000 | 40553-127-04000 | |

NOTE: ANSI FLANGE PRESSURE RATINGS 150# THROUGH 1500#

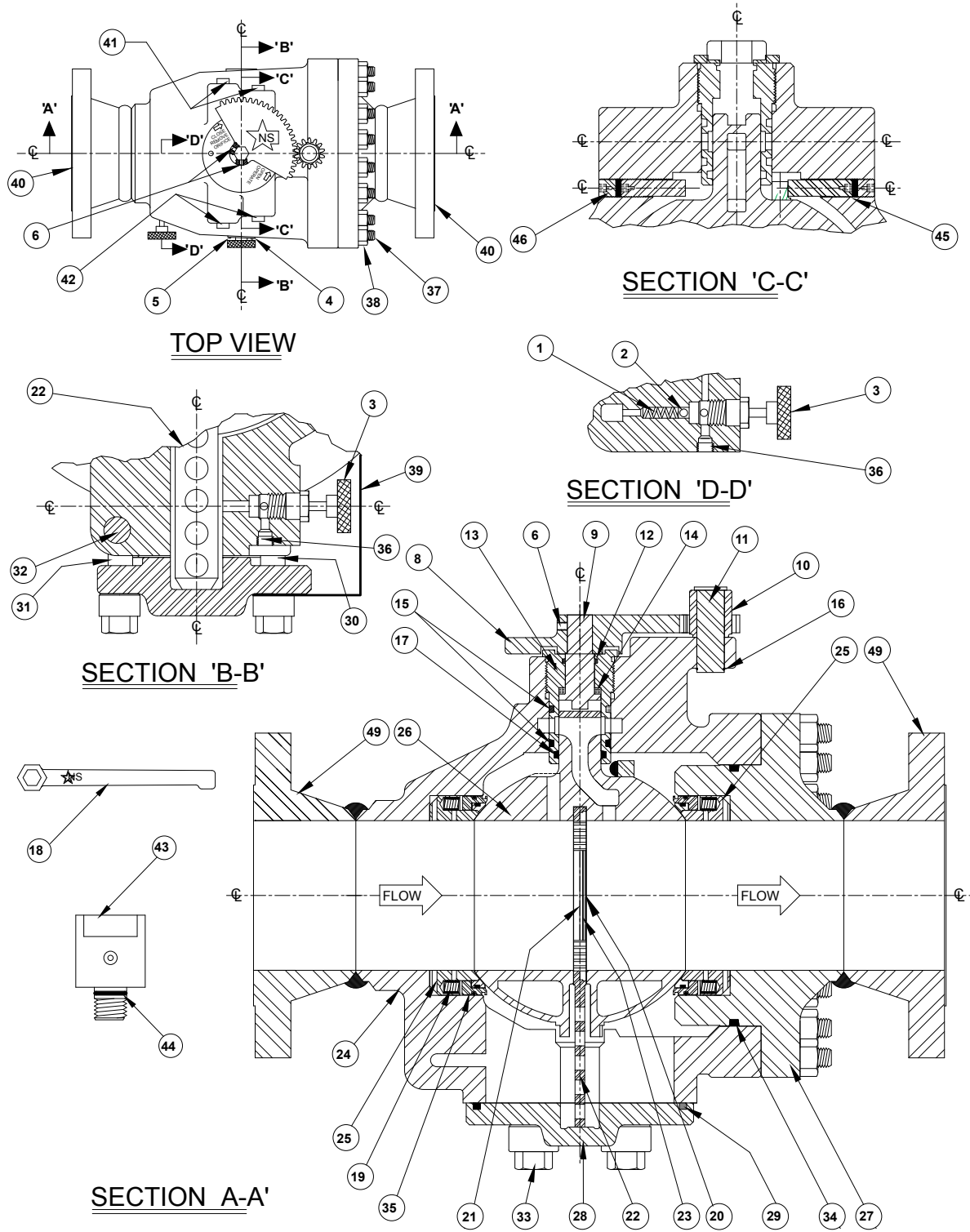
WHEN ORDERING SPARE PARTS, SPECIFY:

- NOMINAL SIZE - SCHEDULE
- TYPE OF SERVICE (SWEET, (H₂S) SOUR)
- SERIAL NUMBER

RECOMMENDED SPARE PARTS, DUAL CHAMBER ORIFICE FITTINGS

| SIZE | DESCRIPTION | PART NO. | QTY. |
|------|--------------------------|-----------------|------|
| 2" | Dovetail Ring | 40712-001-04000 | 1 |
| | O-Ring for Orifice Plate | 40700-005-06000 | 2 |
| | O-Ring for Chamber Lid | 40552-051-06000 | 2 |
| 3" | Dovetail Ring | 40713-006-04000 | 1 |
| | O-Ring for Orifice Plate | 40702-025-06000 | 2 |
| | O-Ring for Chamber Lid | 40553-051-06000 | 2 |
| 4" | Dovetail Ring | 40714-010-04000 | 1 |
| | O-Ring for Orifice Plate | 40714-052-06000 | 2 |
| | O-Ring for Chamber Lid | 40714-059-06000 | 2 |

6" MODEL 4055 DUAL CHAMBER ORIFICE FITTING WITH INTERNAL BALL-STOP



PARTS LIST

6" MODEL 4055 DUAL CHAMBER ORIFICE FITTING WITH INTERNAL BALL-STOP

| ITEM | DESCRIPTION | QTY | ASSY. NO. 40556 (6") PART NO. |
|------|--|-----|----------------------------------|
| 1 | SPRING INCONNEL | 1 | 40701-053-04000 |
| 2 | T.C. BALL 0.250 | 1 | 01001-030-04300 |
| 3 | BLEED VALVE ASSEMBLY | 2 | 0701-J00-06000 |
| 4 | INSTRUCTION PLATE | 1 | 40701-009-04000 |
| 5 | DRIVE SCREW #4 - 1/4" TYPE U | 4 | NCN |
| 6 | SET SCREW (ALLEN HEAD) | 2 | 3/8 - 16 TPI X 1/2" |
| 7 | N/A | | |
| 8 | BALL STOP | 1 | 40706-055-04000 |
| 9 | BALL STEM | 1 | 40556-034-04000 |
| 10 | SPUR GEAR | 1 | 40704-004-04000 |
| 11 | SPUR GEAR STEM | 1 | 40704-046-04000 |
| 12 | O-RING STEM RETAINER | 1 | 40713-036-06000 |
| 13 | STEM RETAINER | 1 | 40706-032-04000 |
| 14 | STEM RING | 1 | 40706-033-04000 |
| 15 | O-RING STEM RETAINER | 2 | 40706-095-06000 |
| 16 | STEM LOCK | 1 | 40704-050-04000 |
| 17 | O-RING STEM RETAINER | 1 | 40706-094-06000 |
| 18 | ORIFICE FITTING WRENCH | 1 | 40704-031-00000 |
| 19 | COIL SPRING (STANDARD) | 16 | 40706-047-04000 |
| | COIL SPRING (H ₂ S) SOUR | | 40706-046-06000 |
| 20 | DOVETAIL RING | 1 | 40706-080-04000 |
| 21 | STANDARD ORIFICE PLATE 316 S.S. | 1 | 40556-046-00000 |
| 22 | ORIFICE PLATE RETAINER (STANDARD) | 1 | 40556-076-04000 |
| | ORIFICE PLATE RETAINER (TEFLON) | 1 | 40556-083-04000 |
| 23 | O-RING PLATE RETAINER | 1 | 40706-098-06000 |
| | O-RING (TEFLON) PLATE RETAINER | 2 | 40556-074-06000 |
| 24 | ORIFICE FITTING BODY SCH 40 SCH 80 | 1 | 40556-066-04000 |
| | | | 40556-065-04000 |
| 25 | SEAL RETAINER SCH 40 SCH 80 | 2 | 40556-018-04000 |
| | | | 40556-020-04000 |
| 26 | BY-PASS BALL SCH 40 SCH 80 | 1 | 40556-137-04000 |
| | | | 40556-138-04000 |
| 27 | DOWNSTREAM WELDNECK SCH 40 SCH 80 | 1 | 40556-086-03000 |
| | | | 40556-087-03000 |
| 28 | CHAMBER LID | 1 | 40706-093-04000 |
| 29 | O-RING CHAMBER LID | 1 | 40556-038-06000 |
| 30 | STUD BOLT | 2 | 40704-019-04000 |
| 31 | HINGE BOLT | 2 | 40704-018-04000 |
| 32 | HINGE PIN | 1 | 40706-018-04000 |
| 33 | HEX NUT | 4 | 40704-021-04000 |
| 34 | O-RING DOWNSTREAM WELDNECK | 1 | 40706-096-06000 |
| 35 | BALL SEAL ASSEMBLY FOR 150 AND 300# RATING FOR 600# RATING | 2 | 40706-A00-04000 |
| | | | 40706-P00-04000 |

PARTS LIST (cont'd)
6" MODEL 4055 DUAL CHAMBER ORIFICE FITTING WITH INTERNAL BALL-STOP

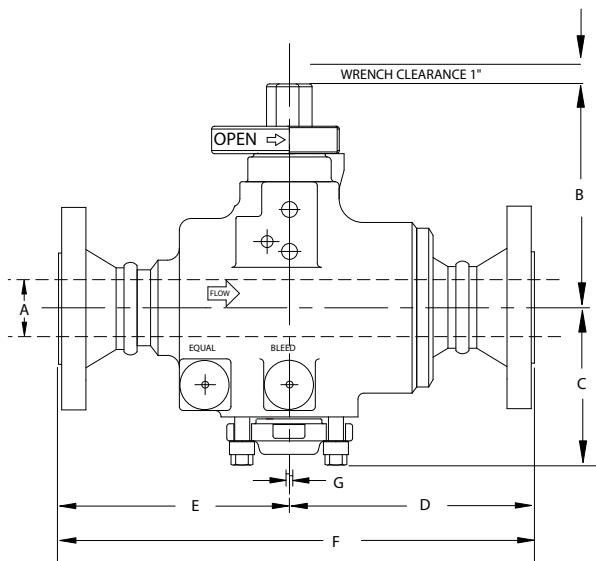
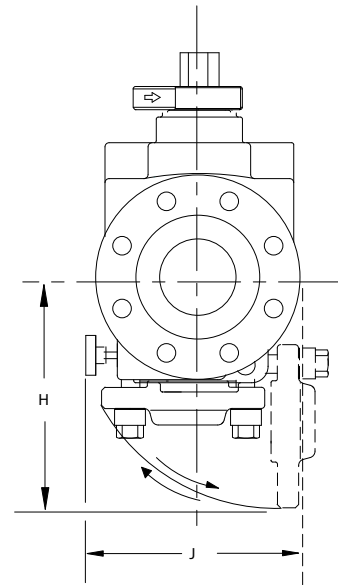
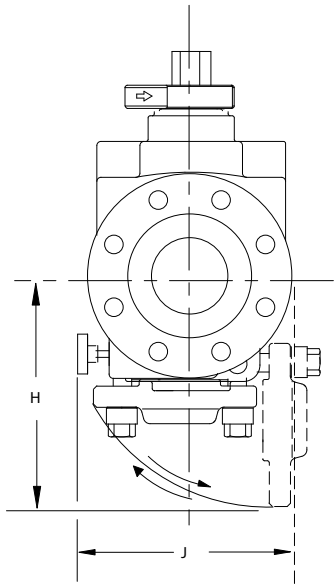
| ITEM | DESCRIPTION | QTY | ASSY. NO. 40556 (6") PART NO. |
|------|---|--------|--|
| 36 | PIPE PLUG 1/16" - 27 NPT | 1 | NCN |
| 37 | MILL STUD | 16 | 40706-052-06000 |
| 38 | HEX NUT | 16 | C1408-006-06000 |
| 39 | ORIFICE FITTING GUARD W/O BLEED-OFF-EXTENSION (STANDARD) W/ BLEED-OFF-EXTENSION | 1 | 40556-035-04000 40701-103-04000 |
| 40 | PLASTIC BORE PLUG | 2 | NCN |
| 41 | PIPE PLUG 1/2" | 2 | 35364-004-04000 |
| 42 | PLASTIC PIPE PLUG 1/2" | 2 | NCN |
| 43 | BLEED-OFF-EXTENSION (H ₂ S) SOUR | 1 | 40701 -S00-06000 |
| 44 | O-RING | 1 | 40714-061-06000 |
| 45 | SET SCREW 5/8" - 18 UNF | 2 | 40700-071-04000 |
| 46 | PLUG 5/8" - 18 UNF | 2 | 40700-072-04000 |
| 47 | NYLON LOCKING PELLET | | N/A |
| 48 | BALL STOP PLATE | | N/A |
| 49 | FLANGES FLANGED FLANGEWELD | 2 1 | SPECIFIED BY TYPE AND PRESSURE RATING |

WHEN ORDERING SPARE PARTS, SPECIFY:

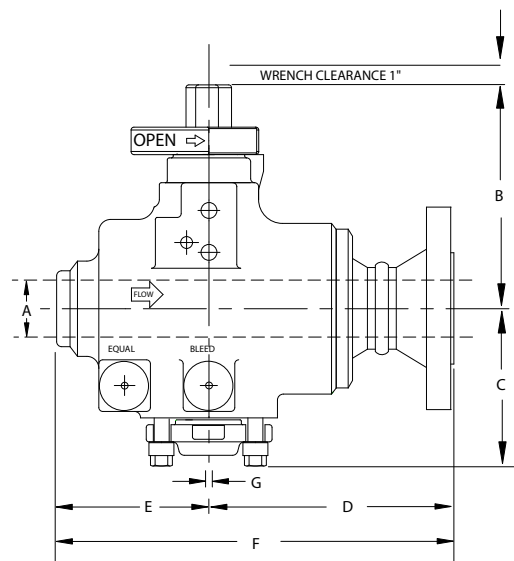
- NOMINAL SIZE - SCHEDULE
- TYPE OF SERVICE (SWEET, (H₂S) SOUR)
- SERIAL NUMBER

DIMENSIONAL DATA

2" and 3" MODEL 4055 DUAL CHAMBER ORIFICE FITTINGS

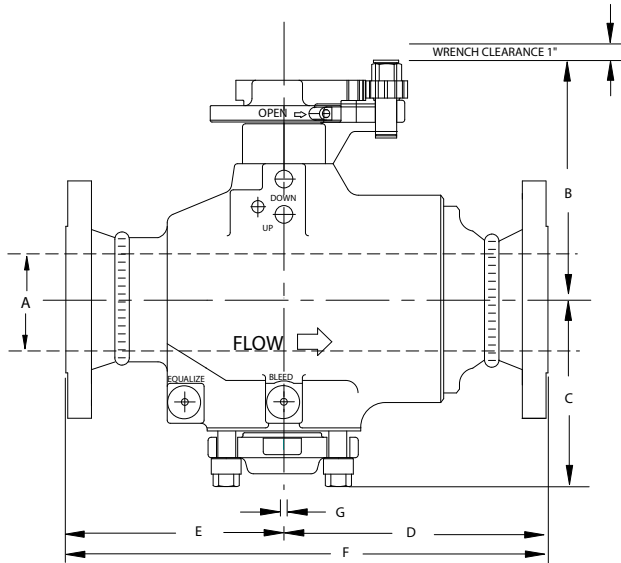
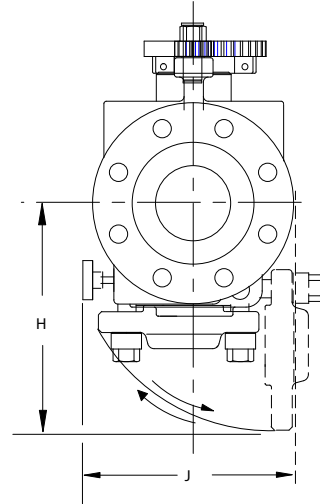
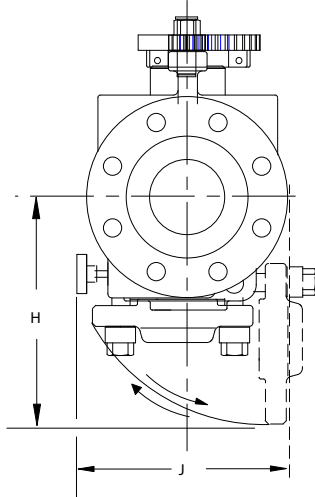


FLANGED TYPE

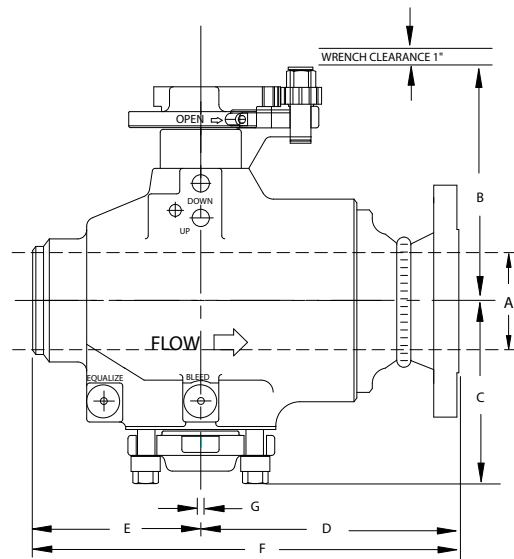


FLANGEWELD TYPE

DIMENSIONAL DATA
4" MODEL 4055 DUAL CHAMBER ORIFICE FITTINGS

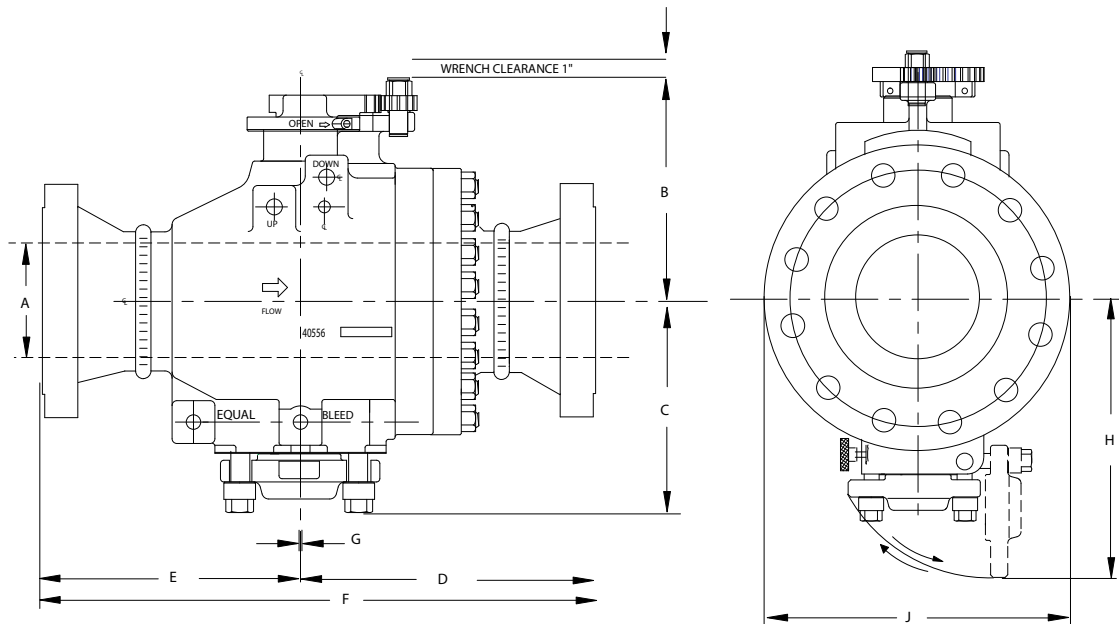


FLANGED TYPE

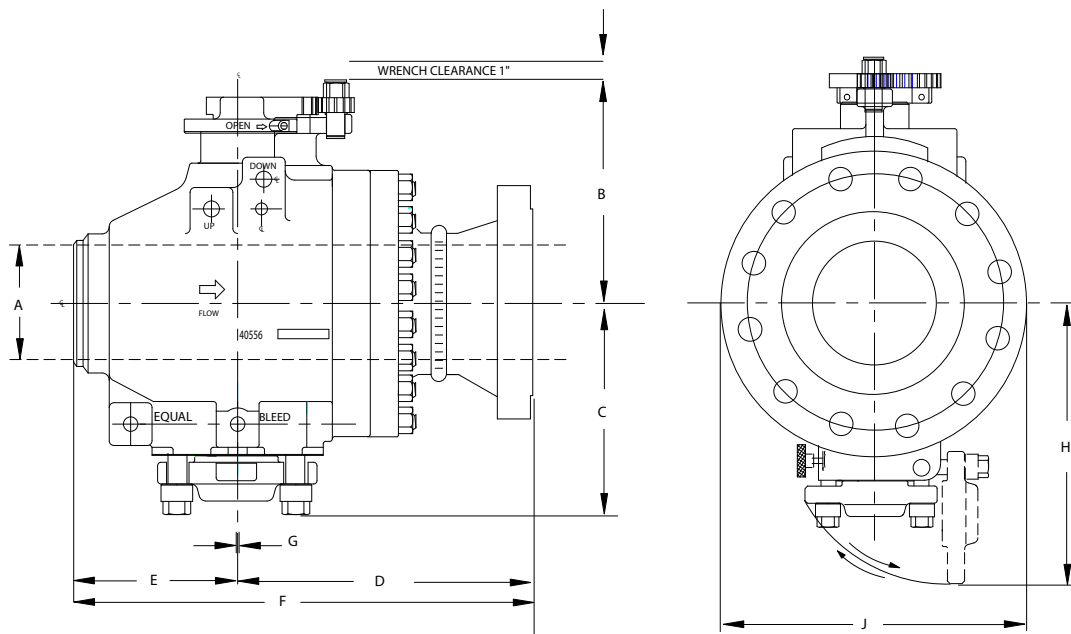


FLANGEWELD TYPE

DIMENSIONAL DATA
6" MODEL 4055 DUAL CHAMBER ORIFICE FITTING



FLANGED TYPE



FLANGEWELD TYPE

**MODEL 4055 DUAL CHAMBER ORIFICE FITTINGS
DIMENSIONS—FLANGED TYPE WITH RAISED FACE FLANGES**

| SIZE | DIAMETER OF INTERNAL BORE | CENTERLINE TO TOP | CENTERLINE TO BOTTOM | DOWNSTREAM LENGTH FROM CENTERLINE TO FACE AT END | UPSTREAM LENGTH FROM CENTERLINE TO FACE AT END | OVERALL LENGTH END TO END | ORIFICE PLATE THICKNESS | OPERATING CLEARANCE FROM CENTER WITH CHAMBER LID OPEN | BODY CLEARANCE | APPROXIMATE WEIGHT, LBS. | HYDROSTATIC TEST PRESSURE, TEMP. LESS THAN 125°F |
|---|---------------------------|-------------------|----------------------|--|--|---------------------------|-------------------------|---|----------------|--------------------------|--|
| | A | B | C | D | E | F | G | H | J | | |
| FLANGED TYPE, 150LB. A.N.S.I. - RAISED FACE FLANGE - 285 PSI. C.W.P. | | | | | | | | | | | |
| 2 | 2.067* | 6-7/16 | 5-3/8 | 8 5/64 | 7-7/16 | 15-33/64 | 1/8 | 6-7/8 | 6-1/4 | 67 | 450 PSI |
| 3 | 3.068* | 7-3/8 | 6-3/4 | 9-1/4 | 8-5/16 | 17-9/16 | 1/8 | 8-5/16 | 7-3/4 | 95 | |
| 4 | 4.026* | 9-3/4 | 8 | 11-7/8 | 10-1/16 | 21-15/16 | 1/8 | 10-7/8 | 8-9/16 | 182 | |
| 6 | 6.065* | 11-7/8 | 10-3/4 | 13-3/4 | 12-3/16 | 25-61/64 | 1/8 | 13-1/2 | 14 | 170 | |
| FLANGED TYPE, 300LB. A.N.S.I. - RAISED FACE FLANGE - 740 PSI. C.W.P. | | | | | | | | | | | |
| 2 | 2.067* | 6-7/16 | 5-3/8 | 8-21/64 | 7-11/16 | 16-1/64 | 1/8 | 6-7/8 | 6-1/4 | 71 | 1125 PSI |
| 3 | 3.068* | 7-3/8 | 6-3/4 | 9-21/32 | 8-11/16 | 18-11/32 | 1/8 | 8-5/16 | 8-1/2 | 105 | |
| 4 | 4.026* | 9-3/4 | 8 | 12-1/4 | 10-7/16 | 22-11/16 | 1/8 | 10-7/8 | 9-1/8 | 202 | |
| 6 | 6.065* | 11-7/8 | 10-3/4 | 14-1/8 | 12-9/16 | 26-45/64 | 1/8 | 13-1/2 | 14 | 420 | |
| FLANGED TYPE, 600LB. A.N.S.I. - RAISED FACE FLANGE - 1480 PSI. C.W.P. | | | | | | | | | | | |
| 2 | 2.067* | 6-7/16 | 5-3/8 | 8-11/16 | 8-1/16 | 16-3/4 | 1/8 | 6-7/8 | 6-1/4 | 75 | 2225 PSI |
| 3 | 3.068* | 7-3/8 | 6-3/4 | 10-1/64 | 9-1/16 | 19-5/64 | 1/8 | 8-5/16 | 8-1/2 | 105 | |
| 4 | 4.026' | 9-3/4 | 8 | 13-1/4 | 11-5/16 | 24-9/16 | 1/8 | 10-7/8 | 9-1/2 | 225 | |
| 6 | 6.065* | 11-7/8 | 10-3/4 | 15-1/8 | 13-9/16 | 28-45/64 | 1/8 | 13-1/2 | 14 | 490 | |
| FLANGED TYPE, 900LB. A.N.S.I. - RAISED FACE FLANGE - 2220 PSI. C.W.P. | | | | | | | | | | | |
| 2 | 1.939' | 6-7/16 | 5-3/8 | 9-13/16 | 9-1/4 | 19-1/16 | 1/8 | 6-7/8 | 8-5/16 | 108 | 3350 PSI |
| 3 | 2.900* | 7-3/8 | 6-3/4 | 10-3/4 | 9-7/8 | 20-5/8 | 1/8 | 8-5/16 | 9 | 127 | |
| 4 | 3.826* | 9-3/4 | 8 | 13-5/8 | 11-7/8 | 25-1/2 | 1/8 | 10-7/8 | 9-1/2 | 251 | |
| FLANGED TYPE, 1500LB. A.N.S.I. - RAISED FACE FLANGE - 3705 PSI. C.W.P. | | | | | | | | | | | |
| 2 | ** | 6-7/16 | 5-3/8 | 9-13/16 | 9-1/4 | 19-1/16 | 1/8 | 6-7/8 | 7-3/4 | 108 | 5575 PSI |
| 3 | ** | 7-3/8 | 6-3/4 | 11-13/32 | 10-1/2 | 22-5/16 | 1/8 | 8-5/16 | 9 | 165 | |
| 4 | | 9-3/4 | 8 | 14 | 12-1/4 | 26-1/4 | 1/8 | 10-7/8 | 9-1/2 | 251 | |
| *AVAILABLE IN OTHER BORES **BORE TO BE SPECIFIED | | | | | | | | | | | |

**MODEL 4055 DUAL CHAMBER ORIFICE FITTINGS
DIMENSIONS—FLANGED TYPE WITH RING TYPE JOINT FLANGES**

| SIZE | DIAMETER OF INTERNAL BORE | CENTERLINE TO TOP | CENTERLINE TO BOTTOM | DOWNSTREAM LENGTH FROM CENTERLINE TO FACE AT END | UPSTREAM LENGTH FROM CENTERLINE TO FACE AT END | OVERALL LENGTH END TO END | ORIFICE PLATE THICKNESS | OPERATING CLEARANCE FROM CENTER WITH CHAMBER LID OPEN | BODY CLEARANCE | APPROXIMATE WEIGHT, LBS. | HYDROSTATIC TEST PRESSURE, TEMP. LESS THAN 125°F |
|---|---------------------------|-------------------|----------------------|--|--|---------------------------|-------------------------|---|----------------|--------------------------|--|
| FLANGED TYPE, 600LB. A.N.S.I. - RING TYPE JOINT FLANGE - 1480 PSI. C.W.P. | | | | | | | | | | | |
| 2 | 2.067' | 6-7/16 | 5-3/8 | 8-3/4 | 8-1/8 | 16-7/8 | 1/8 | 6-7/8 | 6-1/4 | 75 | 2225 PSI |
| 3 | 3.068* | 7-3/8 | 6-3M | 10-1/64 | 9-1/16 | 19-5/64 | 1/8 | 8-5/16 | 8-1/2 | 105 | |
| 4 | 4.026* | 9-3/4 | 8 | 13-1/4 | 11-5/16 | 24-9/16 | 1/8 | 10-7/8 | 9-1/2 | 225 | |
| 6 | 6.065* | 11-7/8 | 10-3/4 | 15-1/8 | 13-9/16 | 28-45/64 | 1/8 | 13-1/2 | 14 | 491 | |
| FLANGED TYPE, 900LB. A.N.S.I. - RING TYPE JOINT FLANGE - 2220 PSI. C.W.P. | | | | | | | | | | | |
| 2 | 1.939* | 6-7/16 | 5-3/8 | 9-7/8 | 9-5/16 | 19-3/16 | 1/8 | 6-7/8 | 7-3/4 | 108 | 3350 PSI |
| 3 | 2.900* | 7-3/8 | 6-3/4 | 10-29/32 | 10 | 20-29/32 | 1/8 | 8-5/16 | 9 | 127 | |
| 4 | 3.826* | 9-3/4 | 8 | 13-3/4 | 12 | 25-3/4 | 1/8 | 10-7/8 | 9-1/2 | 251 | |
| FLANGED TYPE, 1500LB. A.N.S.I. - RING TYPE JOINT FLANGE - 3705 PSI. C.W.P. | | | | | | | | | | | |
| 2 | ** | 7-3/8 | 5-3/8 | 9-7/8 | 9-1/4 | 19-1/8 | 1/8 | 6-7/8 | 7-3/4 | 108 | 5575 PSI |
| 3 | ** | 7-3/8 | 6-3/4 | 11-13/32 | 10-1/2 | 21-29/32 | 1/8 | 8-5/16 | 9 | 165 | |
| 4 | ** | 9-3/4 | 8 | 14 | 12-1/4 | 26-1/4 | 1/8 | 10-7/8 | 9-1/2 | 251 | |
| *AVAILABLE IN OTHER BORES **BORE TO BE SPECIFIED | | | | | | | | | | | |

**MODEL 4055 DUAL CHAMBER ORIFICE FITTINGS
DIMENSIONS—FLANGEWELD TYPE WITH RAISED FACE FLANGES**

| SIZE | DIAMETER OF INTERNAL BORE | CENTERLINE TO TOP | CENTERLINE TO BOTTOM | DOWNSTREAM LENGTH FROM CENTERLINE TO FACE AT END | UPSTREAM LENGTH FROM CENTERLINE TO FACE AT END | OVERALL LENGTH END TO END | ORIFICE PLATE THICKNESS | OPERATING CLEARANCE FROM CENTER WITH CHAMBER LID OPEN | BODY CLEARANCE | APPROXIMATE WEIGHT, LBS. | HYDROSTATIC TEST PRESSURE, TEMP. LESS THAN 125°F |
|--|---------------------------|-------------------|----------------------|--|--|---------------------------|-------------------------|---|----------------|--------------------------|--|
| | A | B | C | D | E | F | G | H | J | | |
| FLANGEWELD TYPE, 150LB. A.N.S.I. - RAISED FACE FLANGE - 285 PSI. C.W.P. | | | | | | | | | | | |
| 2 | 2.067* | 6-7/16 | 5-3/8 | 8-5/64 | 4-7/8 | 12-15/16 | 1/8 | 6-7/8 | 6-1/4 | 61 | 450 PSI |
| 3 | 3.068* | 7-3/8 | 6-3/4 | 9-1/4 | 5-1/2 | 14-3/4 | 1/8 | 8-5/16 | 7-3/4 | 81 | |
| 4 | 4.026* | 9-3/4 | 8 | 11-57/64 | 7 | 18-57/64 | 1/8 | 10-7/8 | 8-9/16 | 166 | |
| 6 | 6.065* | 11-7/8 | 10-3/4 | 13-3/4 | 8-5/8 | 22-3/8 | 1/8 | 13-1/2 | 14 | 350 | |
| FLANGEWELD TYPE, 300LB. A.N.S.I. - RAISED FACE FLANGE - 740 PSI. C.W.P. | | | | | | | | | | | |
| 2 | 2.067* | 6-7/16 | 5-3/8 | 8-21/64 | 4-7/8 | 13-3/16 | 1/8 | 6-7/8 | 6-3/4 | 63 | 1125 PSI |
| 3 | 3.068* | 7-3/8 | 6-3/4 | 9-21/32 | 5-1/2 | 15-9/64 | 1/8 | 8-5/16 | 8-1/2 | 87 | |
| 4 | 4.026* | 9-3/4 | 8 | 12-1/4 | 7 | 19-1/4 | 1/8 | 10-7/8 | 9-1/8 | 176 | |
| 6 | 6.065* | 11-7/8 | 10-3/4 | 14-1/8 | 8-5/8 | 22-3/4 | 1/8 | 13-1/2 | 14 | 380 | |
| FLANGEWELD TYPE, 600LB. A.N.S.I. - RAISED FACE FLANGE - 1480 PSI. C.W.P. | | | | | | | | | | | |
| 2 | 2.067* | 6-7/16 | 5-3/8 | 8-11/16 | 4-7/8 | 13-37/64 | 1/8 | 6-7/8 | 6-3/4 | 65 | 2225 PSI |
| 3 | 3.068* | 7-3/8 | 6-3/4 | 10-1/64 | 5-1/2 | 15-33/64 | 1/8 | 8-5/16 | 8-1/2 | 87 | |
| 4 | 4.026* | 9-3/4 | 8 | 13-1/8 | 7 | 20-1/8 | 1/8 | 10-7/8 | 9-1/2 | 187 | |
| 6 | 6.065* | 11-7/8 | 10-3/4 | 15-1/8 | 8-5/8 | 23-3/4 | 1/8 | 13-1/2 | 14 | 420 | |
| FLANGEWELD TYPE, 900LB. A.N.S.I. - RAISED FACE FLANGE - 2220 PSI. C.W.P. | | | | | | | | | | | |
| 2 | 1.939' | 6-7/16 | 5-3/8 | 9-13/16 | 4-7/8 | 14-11/16 | 1/8 | 6-7/8 | 8-5/16 | 84 | 3350 PSI |
| 3 | 2.900* | 7-3/8 | 6-3/4 | 10-3/4 | 5-1/2 | 16-1/4 | 1/8 | 8-5/16 | 9 | 98 | |
| 4 | 3.826* | 9-3/4 | 8 | 13-5/8 | 7 | 20-5/8 | 1/8 | 10-7/8 | 9-1/2 | 200 | |
| FLANGEWELD TYPE, 1500LB. A.N.S.I. - RAISED FACE FLANGE - 3705 PSI. C.W.P. | | | | | | | | | | | |
| 2 | ** | 6-7/16 | 5-3/8 | 9-13/16 | 4-7/8 | 14-11/16 | 1/8 | 6-7/8 | 8-3/4 | 84 | 5575 PSI |
| 3 | ** | 7-3/8 | 6-3/4 | 11-13/16 | 5-1/2 | 17-5/16 | 1/8 | 8-5/16 | 9 | 117 | |
| 4 | ** | 9-3/4 | 8 | 14 | 7 | 21 | 1/8 | 10-7/8 | 9-1/2 | 200 | |
| *AVAILABLE IN OTHER BORES **BORE TO BE SPECIFIED | | | | | | | | | | | |

**MODEL 4055 DUAL CHAMBER ORIFICE FITTINGS
DIMENSIONS—FLANGEWELD TYPE WITH RING TYPE JOINT FLANGES**

| SIZE | DIAMETER OF INTERNAL BORE | CENTERLINE TO TOP | CENTERLINE TO BOTTOM | DOWNSTREAM LENGTH FROM CENTERLINE TO FACE AT END | UPSTREAM LENGTH FROM CENTERLINE TO FACE AT END | OVERALL LENGTH END TO END | ORIFICE PLATE THICKNESS | OPERATING CLEARANCE FROM CENTER WITH CHAMBER LID OPEN | BODY CLEARANCE | APPROXIMATE WEIGHT, LBS. | HYDROSTATIC TEST PRESSURE, TEMP. LESS THAN 125°F |
|--|---------------------------|-------------------|----------------------|--|--|---------------------------|-------------------------|---|----------------|--------------------------|--|
| FLANGEWELD TYPE, 600LB. A.N.S.I. - RING TYPE JOINT FLANGE - 1480 PSI. C.W.P. | | | | | | | | | | | |
| 2 | 2.067' | 6-7/16 | 5-3/8 | 8-3/4 | 4-7/8 | 13-5/8 | 1/8 | 6-7/8 | 6-3/4 | 65 | 2225 PSI |
| 3 | 3.068* | 7-3/8 | 6-3M | 10-1/64 | 5-1/2 | 15-33/64 | 1/8 | 8-5/16 | 8-1/2 | 87 | |
| 4 | 4.026* | 9-3/4 | 8 | 13-1/4 | 7 | 20-1/4 | 1/8 | 10-7/8 | 9-1/2 | 187 | |
| 6 | 6.065* | 11-7/8 | 10-3/4 | 15-1/8 | 8-5/8 | 23-3/4 | 1/8 | 13-1/2 | 14 | 421 | |
| FLANGEWELD TYPE, 900LB. A.N.S.I. - RING TYPE JOINT FLANGE - 2220 PSI. C.W.P. | | | | | | | | | | | |
| 2 | 1.939* | 6-7/16 | 5-3/8 | 9-7/8 | 4-7/8 | 14-3/4 | 1/8 | 6-7/8 | 7-3/4 | 84 | 3350 PSI |
| 3 | 2.900* | 7-3/8 | 6-3/4 | 10-29/32 | 5-1/2 | 16-13/32 | 1/8 | 8-5/16 | 9 | 98 | |
| 4 | 3.826* | 9-3/4 | 8 | 13-3/4 | 7 | 20-3/4 | 1/8 | 10-7/8 | 9-1/2 | 200 | |
| FLANGEWELD TYPE, 1500LB. A.N.S.I. - RING TYPE JOINT FLANGE - 3705 PSI. C.W.P. | | | | | | | | | | | |
| 2 | ** | 7-3/8 | 5-3/8 | 9-15/16 | 4-7/8 | 14-13/16 | 1/8 | 6-7/8 | 7-3/4 | 84 | 5575 PSI |
| 3 | ** | 7-3/8 | 6-3/4 | 11-13/32 | 5-1/2 | 16-29/32 | 1/8 | 8-5/16 | 9 | 117 | |
| 4 | ** | 9-3/4 | 8 | 14 | 7 | 21 | 1/8 | 10-7/8 | 9-1/2 | 251 | |
| *AVAILABLE IN OTHER BORES | | | | | | | | | | | |
| **BORE TO BE SPECIFIED | | | | | | | | | | | |

**RECOMMENDED SPARE PARTS
MODEL 4055 DUAL CHAMBER ORIFICE FITTINGS**

| SIZE | DESCRIPTION | PART NO. | QTY. |
|------|--------------------------|-----------------|------|
| 2" | Dovetail Ring | 40712-001-04000 | 1 |
| | O-Ring for Orifice Plate | 40700-005-06000 | 2 |
| | O-Ring for Chamber Lid | 40552-051-06000 | 2 |
| 3" | Dovetail Ring | 40713-006-04000 | 1 |
| | O-Ring for Orifice Plate | 40702-025-06000 | 2 |
| | O-Ring for Chamber Lid | 40553-051-06000 | 2 |
| 4" | Dovetail Ring | 40714-010-04000 | 1 |
| | O-Ring for Orifice Plate | 40714-052-06000 | 2 |
| | O-Ring for Chamber Lid | 40714-059-06000 | 2 |
| 6" | Dovetail Ring | 40706-080-04000 | 1 |
| | O-Ring for Orifice Plate | 40706-098-06000 | 2 |
| | O-Ring for Chamber Lid | 40556-038-06000 | 2 |



Use only spare parts identified in this manual. Cameron bears no legal responsibility for the performance of a product that has been serviced or repaired with parts that are not authorized by Cameron.

**REDRESS KITS
MODEL 4055 DUAL CHAMBER ORIFICE FITTINGS**

| SIZE | DESCRIPTION | PART NO. |
|------|--------------------------------|--|
| 2" | ORIFICE FITTING PART NO. 40552 | SWEET 150# - 300# 40837-X00-03000 |
| | | (H ₂ S) SOUR 150# - 300# 40837-X00-06000 |
| | | SWEET 600# - 1500# 40837-Y00-03000 |
| | | (H ₂ S) SOUR 600# - 1500# 40837-Y00-06000 |
| 3" | ORIFICE FITTING PART NO. 40553 | SWEET 150# - 300# 40838-X00-03000 |
| | | (H ₂ S) SOUR 1500# - 300# 40838-X00-06000 |
| | | SWEET 600# - 1500# 40838-Y00-03000 |
| | | (H ₂ S) SOUR 600# - 1500# 40838-Y00-06000 |
| 4" | ORIFICE FITTING PART NO. 40554 | SWEET 150# - 300# 40839-X00-03000 |
| | | (H ₂ S) SOUR 150# - 300# 40839-X00-06000 |
| | | SWEET 600# - 1500# 40839-Y00-03000 |
| | | (H ₂ S) SOUR 600# - 1500# 40839-Y00-06000 |
| 6" | ORIFICE FITTING PART NO. 40556 | SWEET 150# - 300# 40840-X00-03000 |
| | | (H ₂ S) SOUR 150# - 300# 40840-X00-06000 |
| | | SWEET 600# 40840-Y00-03000 |
| | | (H ₂ S) SOUR 600# 40840-Y00-06000 |

NOTE: Specify pressure rating when ordering redress kits.

Model 4042 Single Chamber Orifice Fittings

The NuFlo Single Chamber Orifice Fitting is designed for use in installations in which the line can be depressurized to change or inspect the orifice plate. Economical and lightweight, the single chamber features a simplicity of design with a minimum number of parts. A quick and easy method for removing orifice plates minimizes shutdown time. The interchangeability of the orifice plates and retainers between the NuFlo Dual Chamber and Single Chamber orifice fittings also provides an economy in inventory requirements.

Standard Specifications

Single chamber orifice fittings are available in flangeweld and weldneck types. All NuFlo single chamber orifice fittings meet AGA/API specifications. Two sets of 1/2" NPT flange taps are provided on all single chamber orifice fittings. They are available in 2", 3" and 4" sizes.

When Ordering, Specify:

- Quantity
- Assembly part number
- Type of single chamber orifice fitting (flangeweld, weldneck)
- Service (sweet, (H₂S) sour)
- Flange rating
- Flange type (raised face, ring type joint)
- Pipe schedule
- Orifice plate bore size(s)

Installation and Maintenance

Install the NuFlo single chamber orifice fitting with the two 1/2" NPT flange taps and instruction plate facing upward. The flow arrow cast on the body chamber lid must correspond with flow direction of line. The orifice fitting is shipped with an orifice plate installed. Remove the orifice plate before flushing or purging the line. Maintenance is minimal; lubrication is not required.

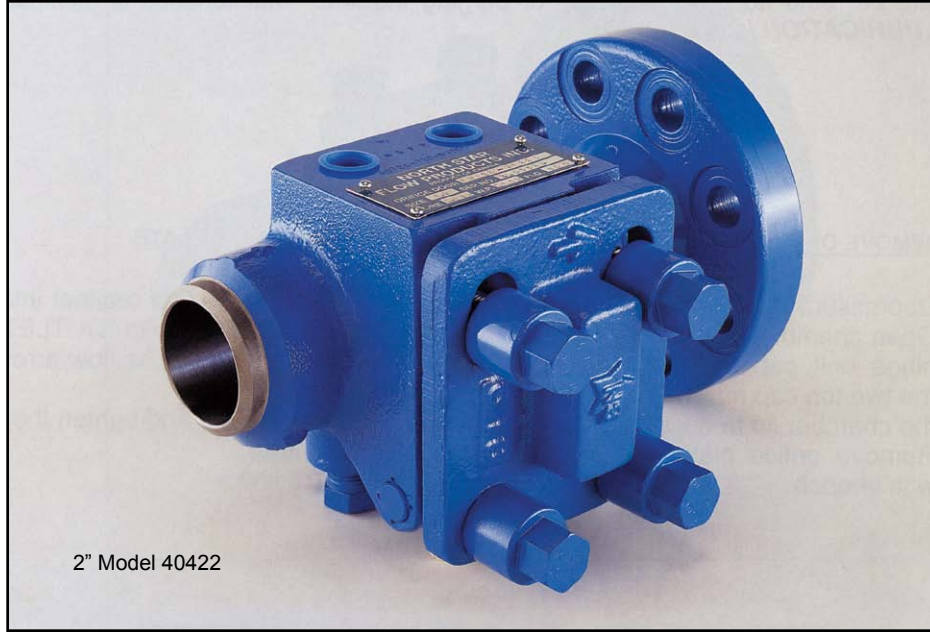
Operating Instructions

Removing Orifice Plate

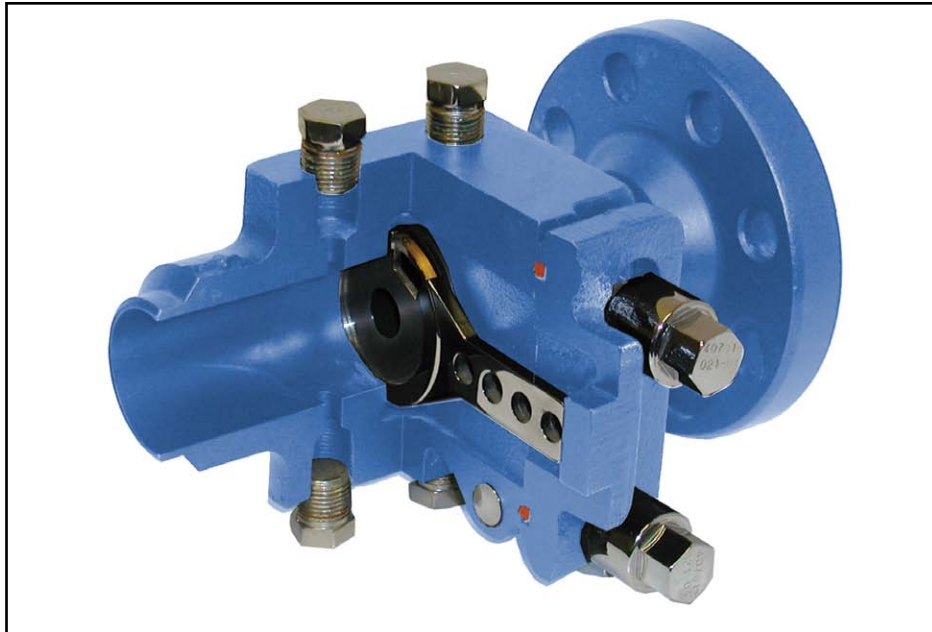
1. Depressurize line.
2. Open chamber lid by loosening the hinge bolt cap nuts and removing the two top cap nuts. This will allow the chamber lid to open freely.
3. Remove orifice plate and retainer.

Replacing Orifice Plate

1. Place orifice plate and retainer into the slot of the fitting with "OUTLET" facing same direction as flow arrow on chamber lid.
2. Close chamber lid and tighten the four cap nuts.
3. Pressurize line.



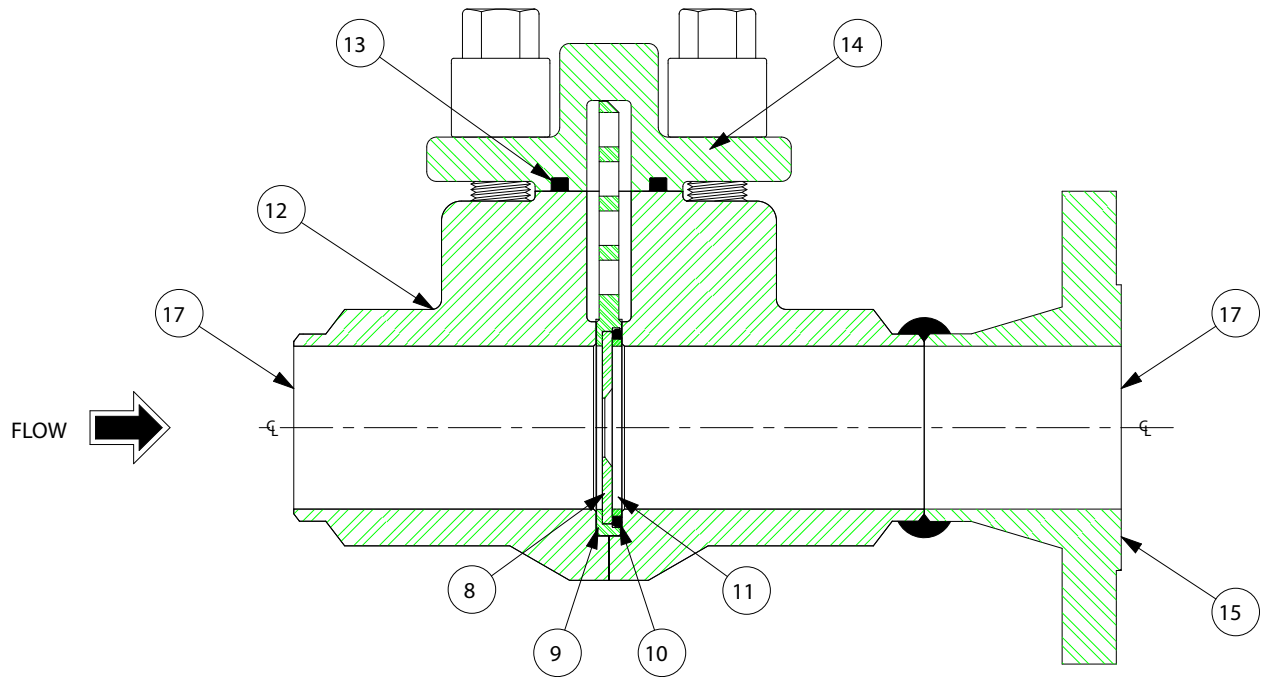
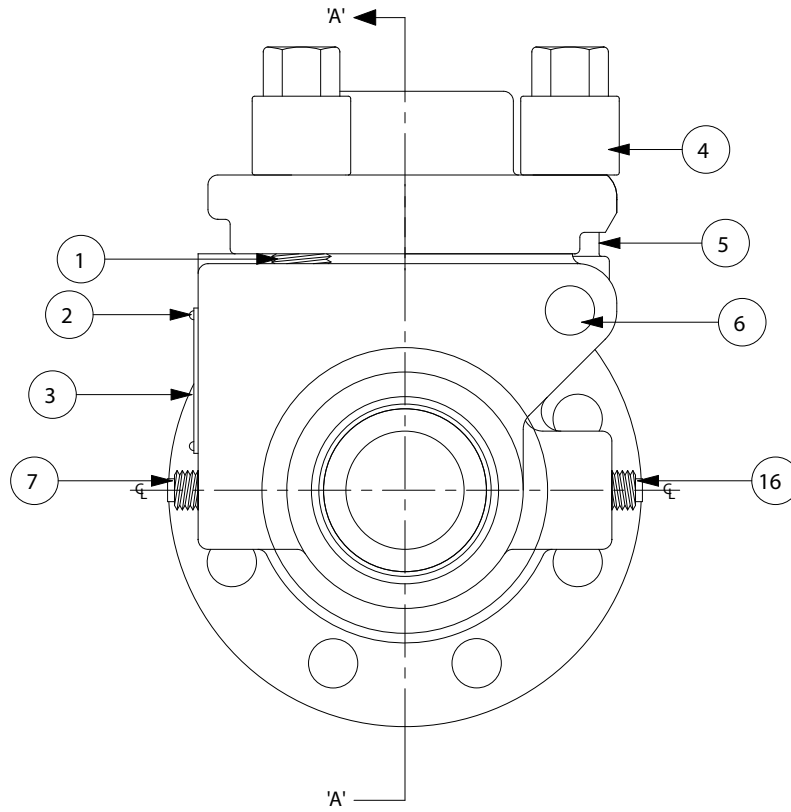
Single chamber orifice fitting, flangeweld type



Cut-away, single chamber orifice fitting, flangeweld type

| | | | |
|------------------------------------|-----------------------------|------------------------------|------------------------------|
| ORIFICE FITTING SIZES | 2" | 3" | 4" |
| ASSEMBLY PART NUMBER | 40422 | 40423 | 40424 |
| ANSI FLANGE PRESSURE RATINGS | 150 THROUGH 1500 | 150 THROUGH 1500 | 150 THROUGH 1500 |
| INTERNAL DIAMETER | SCH 40 THROUGH SCH XX | SCH 40 THROUGH SCH 160 | SCH 40 THROUGH SCH 160 |

MODEL 4042 SINGLE CHAMBER ORIFICE FITTINGS



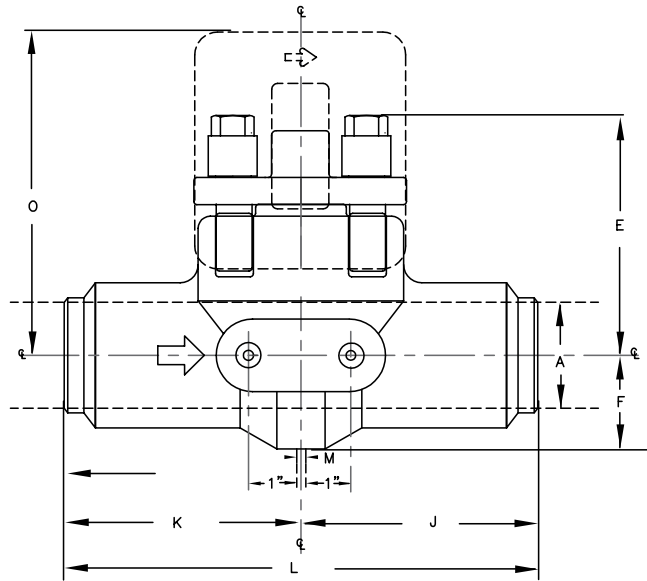
SECTION A-A

PARTS LIST
2", 3" AND 4" MODEL 4042 SINGLE CHAMBER ORIFICE FITTINGS

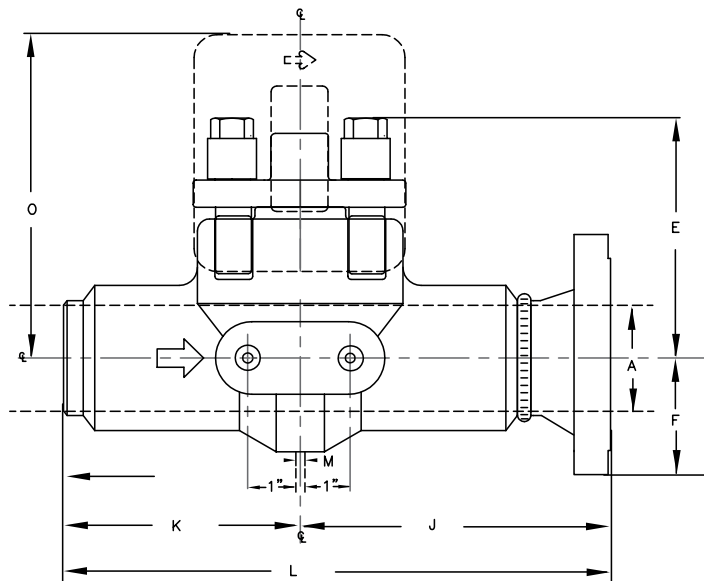
| ITEM | DESCRIPTION | QTY. | ASSY.NO.40422 (2") | | ASSY.NO.40422 (3") | | ASSY.NO.40422 (4") | |
|------|--|------|---|--------|------------------------------------|--------|------------------------------------|--------|
| | | | PART NO. | NOTE | PART NO. | NOTE | PART NO. | NOTE |
| 1 | STUD BOLT | 2 | 40726-006-04000 | C | 40703-026-04000 | C | 40704-019-04000 40724-002-04000 | A B |
| 2 | DIPI VE SCREW #4 - 1/4" TYPE U | 4 | NCN | | NCN | | NCN | |
| 3 | IDENTIFICATION PLATE | 1 | 40726-014-04000 | | 40726-014-04000 | | 40726-014-04000 | |
| 4 | HEX NUT | 4 | 40701-021-04000 | C | 40703-025-04000 | C | 40704-021-04000 | C |
| 5 | HINGE BOLT | 2 | 40726-005-04000 | C | 40703-027-04000 | C | 40704-018-04000 40424-001-04000 | A B |
| 6 | HINGE | 1 | 40726-008-04000 | C | 40728-011-04000 | C | 40729-008-04000 40424-008-04000 | A B |
| 7 | PLASTIC PIPE PLUG | 2 | NCN | | NCN | | NCN | |
| 8 | STANDARD ORIFICE PLATE 316 S.S. | 1 | 40552-052-00000 | | 40553-055-00000 | | 40554-049-00000 | |
| 9 | STANDARD ORIFICE PLATE RETAINER ORIFICE PLATE RETAINER (TEFLON) | 1 | 40552-062-04000 40552-069-04000 | A B | 40553-062-04000 40553-065-04000 | A B | 40554-063-04000 40554-065-04000 | A B |
| 10 | O-RING PLATE RETAINER O-RING (TEFLON) PLATE RE-TAINER | 1 | 40700-005-06000 40552-059-06000 | | 40702-025-06000 40553-060-06000 | | 40714-052-06000 40554-059-06000 | |
| 11 | DOVETAIL RING | 1 | 40712-001-04000 | | 40713-006-04000 | | 40714-010-04000 | |
| 12 | ORIFICE FITTING BODY WELDNECK 150# - 600# RATING SCH 40 WELDNECK 150# - 600# RATING SCH 80 | 1 | 40726-010-04000 40726-020-04000 | | 40728-007-04000 40728-014-04000 | | 40729-010-04000 40729-025-04000 | |
| | WELDNECK 900# - 1500# RATING WELDNECK 900# - 1500# RATING | 1 | 40726-020-04000 40726-042-04000 | D E | 40728-026-04000 40728-024-04000 | D E | 40424-003-04000 40424-004-04000 | D E |
| 13 | O-RING CHAMBER LID | 1 | 40552-051-06000 | C | 40553-051-06000 | C | 40714-059-06000 | |
| 14 | CHAMBER LID | 1 | 40726-032-04000 | C | 40728-021-04000 | C | 40729-021-04000 40424-006-04000 | A B |
| 15 | FLANGE 150# RF SCH 40 | 1 | 40552-001-04000 | | 40553-001-04000 | | 40554-001-04000 | |
| | 300# RF SCH 40 | 1 | 40552-002-04000 | | 40553-002-04000 | | 40554-002-04000 | |
| | 600# RF SCH 40 600# RF SCH 80 | 1 | 40552-005-04000 40552-003-04000 | | 40553-004-04000 40553-006-04000 | | 40554-003-04000 40554-005-04000 | |
| | 600# RTJ SCH 40 600# RTJ SCH 80 900# RF SCH 40 | 1 | 40552-016-04000 40552-017-04000 40552-014-04000 | | 40553-040-04000 40553-041-04000 | | 40554-032-04000 40551-033-04000 | |
| | 900# RF SCH 80 900# RF SCH 160 900# RTJ SCH 40 | 1 | 40552-009-04000 40552-007-04000 40552-020-04000 | | 40553-010-04000 | | 40554-007-04000 | |
| | 900# RTJ SCH 80 900# RTJ SCH 160 1500# RF SCH 80 | 1 | 40552-019-04000 40552-018-04000 40552-009-04000 | | 40553-043-04000 40553-014-04000 | | 40551-034-04000 | |
| | 1500# RF SCH 160 1500# RTJ SCH 80 | 1 | 40552-007-04000 40552-019-04000 | | 40553-044-04000 | | 40554-036-04000 | |
| | 1500# RTJ SCH 160 | 1 | 40552-018-04000 | | | | | |
| 16 | 1/2" STEEL PIPE PLUG | 2 | 35364-004-04000 | | 35364-004-04000 | | 35364-004-04000 | |
| 17 | PLASTIC BORE PLUGS | 2 | NCN | | NCN | | NCN | |

NOTES: A) FOR 150# THROUGH 600# RATING
B) FOR 900# THROUGH 1500# RATING
C) FOR 150# THROUGH 1500# RATING
D) SCH 80
E) SCH 160

DIMENSIONAL DATA
MODEL 4042 SINGLE CHAMBER ORIFICE FITTINGS



FLANGEWELD TYPE SINGLE CHAMBER



WELDNECK TYPE SINGLE CHAMBER

**MODEL 4042 SINGLE CHAMBER
DIMENSIONS—FLANGEWELD TYPE WITH RAISED FACE FLANGES**

| SIZE | DIAMETER OF INTERNAL BORE | CENTERLINE TO TOP | CENTERLINE TO BOTTOM | CENTERLINE OF ORIFICE PLATE TO FACE AT END | CENTERLINE OF ORIFICE PLATE TO FACE AT END | OVERALL LENGTH FACE TO END | ORIFICE PLATE THICKNESS | OPERATING CLEARANCE FROM CENTER WITH CHAMBER LID OPEN | APPROXIMATE WEIGHT, LB |
|---|---------------------------|-------------------|----------------------|--|--|----------------------------|-------------------------|---|------------------------|
| | A | E | F | J | K | L | M | O | |
| FLANGEWELD TYPE, 150 LB. A.N.S.I. - RAISED FACE FLANGE - 285 PSI. C.W.P. | | | | | | | | | |
| 2 | 2.067* | 5-1/4 | 3 | 6-5/8 | 4 | 10-5/8 | 1/8 | 7 | 33 |
| 3 | 3.068* | 6-3/8 | 6-3/4 | 7 | 4-1/8 | 11-1/8 | 1/8 | 9 | 57 |
| 4 | 4.026* | 7-3/8 | 4-1/2 | 7-11/16 | 4-9/16 | 12-1/4 | 1/8 | 10-3/4 | 79 |
| FLANGEWELD TYPE, 300 LB. A.N.S.I. - RAISED FACE FLANGE - 740 PSI. C.W.P. | | | | | | | | | |
| 2 | 2.067* | 5-1/4 | 3-1/4 | 6-7/8 | 4 | 10-7/8 | 1/8 | 7 | 36 |
| 3 | 3.068* | 6-3/8 | 4-1/8 | 7-3/8 | 4-1/8 | 11-1/2 | 1/8 | 9 | 63 |
| 4 | 4.026* | 7-3/8 | 5 | 8-1/16 | 4-9/16 | 12-5/8 | 1/8 | 10-3/4 | 89 |
| FLANGEWELD TYPE, 600 LB. A.N.S.I. - RAISED FACE FLANGE -1480 PSI. C.W.P. | | | | | | | | | |
| 2 | 2.067* | 5-1/4 | 3-1/4 | 7-1/4 | 4 | 11-1/4 | 1/8 | 7 | 38 |
| 3 | 3.068* | 6-3/8 | 4-1/8 | 7-3/4 | 4-1/8 | 11-7/8 | 1/8 | 9 | 63 |
| 4 | 4.026* | 7-3/8 | 5-3/8 | 8-15/16 | 4-9/16 | 13-1/2 | 1/8 | 10-3/4 | 99 |
| FLANGEWELD TYPE, 900 LB. A.N.S.I. - RAISED FACE FLANGE - 2220 PSI. C.W.P. | | | | | | | | | |
| 2 | 1.939* | 5-1/4 | 4-1/4 | 8-3/8 | 4 | 12-3/8 | 1/8 | 7 | 51 |
| 3 | 2.900* | 6-3/8 | 4-3/4 | 8-1/2 | 4-1/8 | 12-5/8 | 1/8 | 9 | 79 |
| 4 | 3.826* | 7-3/8 | 5-3/4 | 9-7/16 | 4-9/16 | 14 | 1/8 | 10-3/4 | 127 |
| FLANGEWELD TYPE, 1500 LB. A.N.S.I. - RAISED FACE FLANGE - 3705 PSI. C.W.P. | | | | | | | | | |
| 2 | ** | 5-1/4 | 4-1/4 | 8-3/8 | 4 | 12-3/8 | 1/8 | 7 | 51 |
| 3 | ** | 6-3/8 | 5-1/4 | 9-1/8 | 4-1/8 | 13-1/4 | 1/8 | 9 | 98 |
| 4 | ** | 7-3/8 | 6-1/8 | 9-13/16 | 4-9/16 | 14-3/8 | 1/8 | 10-3/4 | 145 |
| *AVAILABLE IN OTHER BORES | | | | | | | | | |
| ** BORE TO BE SPECIFIED | | | | | | | | | |

**MODEL 4042 SINGLE CHAMBER
DIMENSIONS—FLANGEWELD TYPE WITH RING TYPE JOINT FLANGES**

| SIZE | DIAMETER OF INTERNAL BORE | CENTERLINE TO TOP | CENTERLINE TO BOTTOM | CENTERLINE OF ORIFICE PLATE TO FACE AT END | CENTERLINE OF ORIFICE PLATE TO FACE AT END | OVERALL LENGTH FACE TO END | ORIFICE PLATE THICKNESS | OPERATING CLEARANCE FROM CENTER WITH CHAMBER LID OPEN | APPROXIMATE WEIGHT, LB |
|---|---------------------------|-------------------|----------------------|--|--|----------------------------|-------------------------|---|------------------------|
| | A | E | F | J | K | L | M | O | |
| FLANGEWELD TYPE, 600 LB. A.N.S.I. - RING TYPE JOINT FLANGE -1480 PSI. C.W.P. | | | | | | | | | |
| 2 | 2.067* | 5-1/4 | 3 -1/4 | 7-5/16 | 4 | 11-5/16 | 1/8 | 7 | 38 |
| 3 | 3.068* | 6-3/8 | 4-1/8 | 7-3/4 | 4-1/8 | 11-7/8 | 1/8 | 9 | 63 |
| 4 | 4.026* | 7-3/8 | 5-3/8 | 8-15/16 | 4-9/16 | 13-1/2 | 1/8 | 10-3/4 | 99 |
| FLANGEWELD TYPE, 900 LB. A.N.S.I. - RING TYPE JOINT FLANGE - 2220 PSI. C.W.P. | | | | | | | | | |
| 2 | 1.939* | 5-1/4 | 4-1/4 | 8-1/2 | 4 | 12-1/2 | 1/8 | 7 | 51 |
| 3 | 2.900* | 6-3/8 | 4-3/4 | 8-5/8 | 4-1/8 | 12-3/4 | 1/8 | 9 | 79 |
| 4 | 3.826* | 7-3/8 | 5-3/4 | 9-7/16 | 4-9/16 | 14 | 1/8 | 10-3/4 | 127 |
| FLANGEWELD TYPE, 1500 LB. A.N.S.I. - RING TYPE JOINT FLANGE - 3705 PSI. C.W.P. | | | | | | | | | |
| 2 | ** | 5-1/4 | 4-1/4 | 8-1/2 | 4 | 12-1/2 | 1/8 | 7 | 51 |
| 3 | ** | 6-3/8 | 5-1/4 | 9-1/8 | 4-1/8 | 13-1/4 | 1/8 | 9 | 98 |
| 4 | ** | 7-3/8 | 6-1/8 | 9-13/16 | 4-9/16 | 14-3/8 | 1/8 | 10-3/4 | 145 |
| *AVAILABLE IN OTHER BORES | | | | | | | | | |
| ** BORE TO BE SPECIFIED | | | | | | | | | |

**MODEL 4042 SINGLE CHAMBER
DIMENSIONS—WELDNECK TYPE**

| SIZE | DIAMETER OF INTERNAL BORE | CENTERLINE TO TOP | CENTERLINE TO BOTTOM | CENTERLINE OF ORIFICE PLATE TO FACE AT END | CENTERLINE OF ORIFICE PLATE TO FACE AT END | OVERALL LENGTH FACE TO END | ORIFICE PLATE THICKNESS | OPERATING CLEARANCE FROM CENTER WITH CHAMBER LID OPEN | APPROXIMATE WEIGHT, LB |
|--|---------------------------|-------------------|----------------------|--|--|----------------------------|-------------------------|---|------------------------|
| | A | E | F | J | K | L | M | O | |
| WELDNECK TYPE, 600 LB. A.N.S.I. -1480 PSI. C.W.P. | | | | | | | | | |
| 2 | 2.067* | 5-1/4 | 1-15/16 | 4 | 4 | 8 | 1/8 | 7 | 27 |
| 3 | 3.068* | 6-3/8 | 2-1/2 | 4-1/8 | 4-1/8 | 8-1/4 | 1/8 | 9 | 45 |
| 4 | 4.026* | 7-3/8 | 2-7/8 | 4-9/16 | 4-9/16 | 9-1/8 | 1/8 | 10-3/4 | 62 |
| WELDNECK TYPE, 900 LB. A.N.S.I. - 2220 PSI. C.W.P. | | | | | | | | | |
| 2 | 1.939* | 5-1/4 | 1-15/16 | 4 | 4 | 8 | 1/8 | 7 | 27 |
| 3 | 2.900* | 6-3/8 | 2-1/2 | 4-1/8 | 4-1/8 | 8-1/4 | 1/8 | 9 | 50 |
| 4 | 3.826* | 7-3/8 | 2-7/8 | 4-9/16 | 4-9/16 | 9-1/8 | 1/8 | 10-3/4 | 76 |
| WELDNECK TYPE, 1500 LB. A.N.S.I. - 3705 PSI. C.W.P. | | | | | | | | | |
| 2 | ** | 5-1/4 | 1-15/16 | 4 | 4 | 8 | 1/8 | 7 | 27 |
| 3 | ** | 6-3/8 | 2-1/2 | 4-1/8 | 4-1/8 | 8-1/4 | 1/8 | 9 | 50 |
| 4 | ** | 7-3/8 | 2-7/8 | 4-9/16 | 4-9/16 | 9-1/8 | 1/8 | 10-3/4 | 76 |
| *AVAILABLE IN OTHER BORES | | | | | | | | | |
| ** BORE TO BE SPECIFIED | | | | | | | | | |

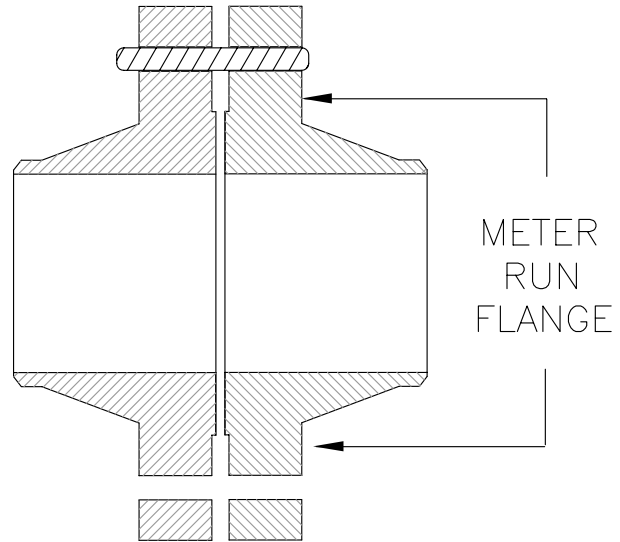
Meter Runs

The meter runs are fabricated by trained manufacturing personnel with complete facilities for machining, welding, gauging and inspection. This produces a product with quality and metering accuracy not possible with field-fabricated units.

All meter runs are factory-aligned and welded with special equipment that guarantees a straight, smooth meter run without defects. Standard lengths meet AGA/API requirements.

Meter Run Alignment

Orifice fitting to meter run alignment can be specified with dowel pins. This option assures proper bore alignment.

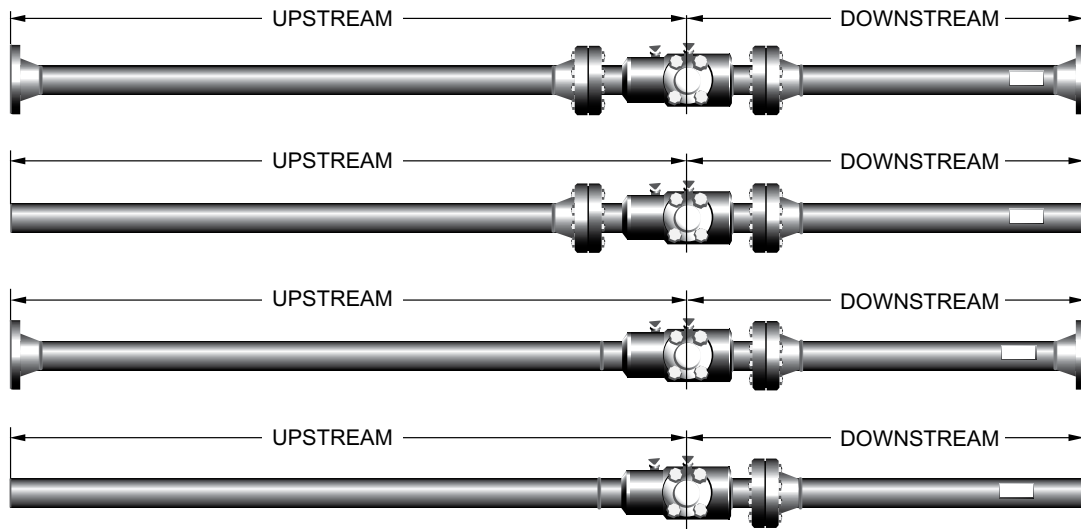


Technical Data

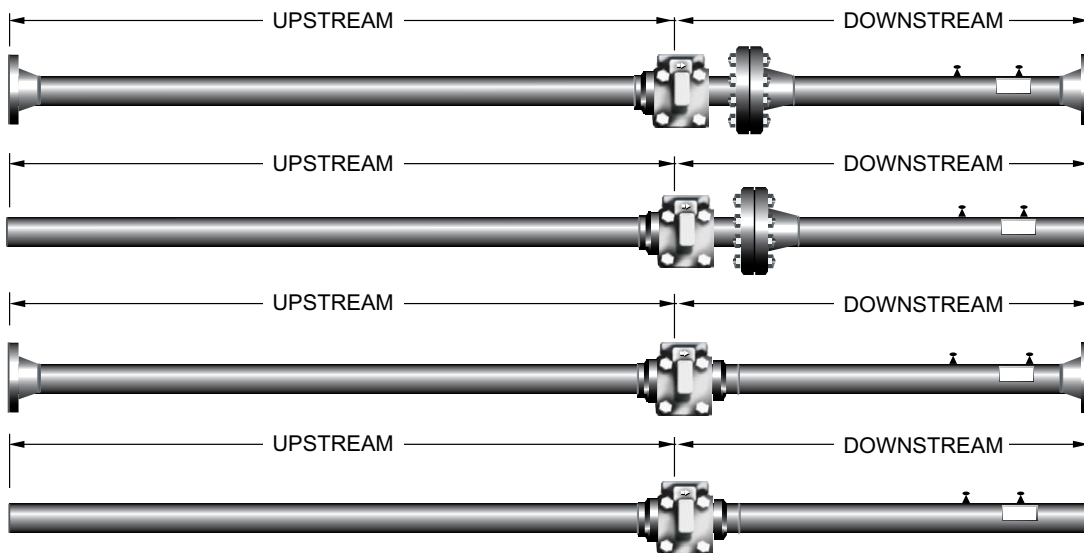
| METER RUN I.D. FOR NOMINAL DIMENSIONS | | | | |
|---------------------------------------|-------|-------|-------|-------|
| SCH | 2" | 3" | 4" | 6" |
| 40 | 2.067 | 3.068 | 4.026 | 6.065 |
| 80 | 1.939 | 2.900 | 3.826 | 5.761 |
| 160 | 1.687 | 2.624 | 3.438 | 5.187 |

| ANSI Rating | Working Pressure (psi) | Test Pressure (psi) |
|-----------------------------|------------------------|---------------------|
| 150 | 285 | 450 |
| 300 | 740 | 1125 |
| 600 | 1480 | 2225 |
| 900 | 2220 | 3350 |
| 1500 | 3705 | 5575 |
| TEMPERATURE: -20°F TO 100°F | | |

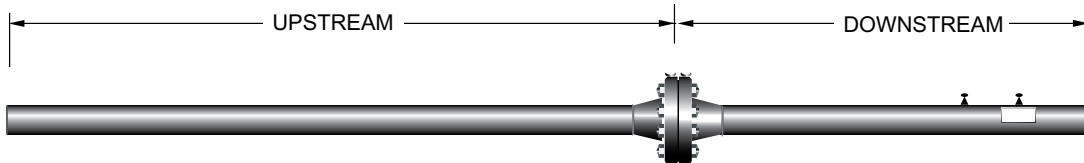
MODEL 4055 DUAL CHAMBER METER RUNS



MODEL 4042 SINGLE CHAMBER METER RUNS



ORIFICE FLANGE UNION METER RUNS



NOTES: METER RUNS CAN BE MANUFACTURED TO SPECIFIC CUSTOMER REQUIREMENTS. METER RUNS CAN BE SUPPLIED WITH THREADOLETS FOR 1/2", 3/4" AND 1" NPT AND ANY COMBINATION OF BEVELED FOR WELDING OR FLANGED ENDS.

Orifice Flange Unions

Orifice flange unions are available in 300 lb. ANSI through 2500 lb. ANSI. They are available in SA 105N, SA350 LF2, 304 ST/STL, 316 ST/STL or MONEL materials. All flanges conform to the ANSI B16.5 Flange Piping Code. All flanges are machined to close tolerances and are carefully inspected before shipment. Orifice flange assemblies are provided with studs, nuts, gaskets, jack screws and pipe plugs.

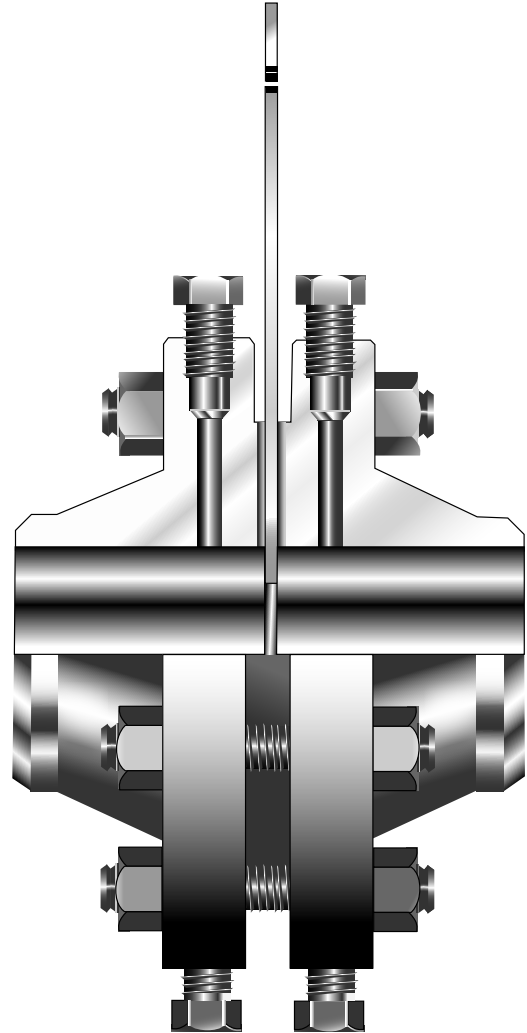
Paddle Type Orifice Plates

Note: Paddle type orifice plates must be ordered separately.

NuFlo paddle type orifice plates are designed for use between orifice flange unions. The line size, flange rating, material and bore size are stamped on the handle. Paddle plates are available in type 304 or 316 stainless steel. Other materials are available on special order.

When Ordering, Specify:

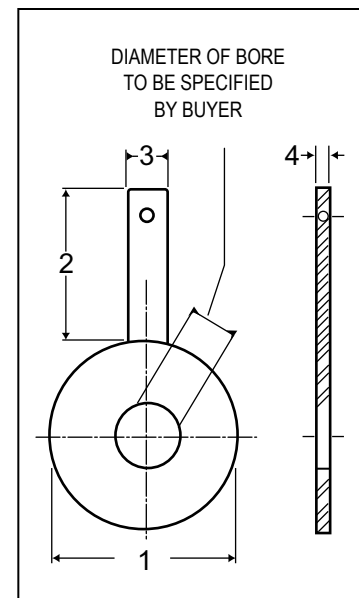
- Quantity
- Size, flange rating, pipe schedule
- Material (flange, studs, nuts and gaskets)
- Orifice bore size
- Orifice plate thickness
- Orifice plate material



Paddle Plate Dimensions

| SIZE * | 300 lb | 600 lb | For All Pressure Ratings | | |
|--------|--------|--------|--------------------------|--------|------|
| | ANSI | ANSI | 300 - 1500 lb ANSI | | |
| | 1 | 1 | 2 | 3 | 4 |
| 2" | 4-3/8" | 4-3/8" | 4" | 1" | 1/8" |
| 3" | 5-7/8" | 5-7/8" | 4" | 1-1/4" | 1/8" |
| 4" | 7-1/8" | 7-5/8" | 4" | 1-1/4" | 1/8" |

*Other sizes available on request



Orifice Plate Assembly

The orifice plate retainer assembly is used in both the dual and single chamber orifice fittings. The orifice retainer and chamber lid are designed to assure the center alignment of orifice bore with the line bore. The chamber lid cannot be closed without centering the orifice in the correct position. If the plate is not correctly centered, closing the lid will align the plate automatically. The plate retainer and the dovetail ring are nickel plated for corrosion resistance.

The orifice retainer, dovetail ring and O-ring together hold the orifice plate in a rigid position and perpendicular to the bore at all times.

Universal orifice plates are stocked in 1/8-in. increments, beginning at 0.125 inch. The orifice bore size and outlet are clearly etched on each plate. All AGA/API requirements are specifically met.

The NuFlo orifice plate is interchangeable with other universal type plates. Standard orifice plates are constructed of 316 stainless steel; however, they are available in other material upon special request. Each orifice plate has a 15-30 micro-inch finish.



Universal Orifice Plates and Plate Dimensions

| SIZE | 2" | 3" | 4" | 6" | NOTES |
|--------------------|-----------------|-----------------|-----------------|-----------------|---|
| PLATE RETAINERS | 40552-062-04000 | 40553-062-04000 | 40554-063-04000 | 40556-076-04000 | 150 - 600# RATING 900 - 1500# RATING |
| | 40552-069-04000 | 40553-065-04000 | 40554-065-04000 | 40556-083-04000 | |
| DOVETAIL RING | 40712-001 | 40713-006 | 40714-010 | 40706-080-04000 | |
| O-RING | 40700-005-06000 | 40702-025-06000 | 40714-052-06000 | 40706-098-06000 | 150 - 600# RATING 900 - 1500# RATING |
| | 40552-059-04000 | 40553-060-06000 | 40554-059-06000 | 40556-074-06000 | |

| | Material: 304 S.S. | Material: 316 S.S. |
|------|--------------------|--------------------|
| Size | Part Number | Part Number |
| 2" | 40700-022 | 40552-052 |
| 3" | 40702-003 | 40553-055 |
| 4" | 40704-091 | 40554-049 |
| 6" | 40706-023 | 40556-046 |
| 8" | 40558-061 | 40558-070 |
| 10" | 40540-012 | 40540-024 |

| Size | Plate Thickness | Plate Diameter |
|------|-----------------|----------------|
| 2" | 1/8 | 2.437 |
| 3" | 1/8 | 3.437 |
| 4" | 1/8 | 4.406 |
| 6" | 1/8 | 6.437 |
| 8" | 1/8 | 8.437 |
| 10" | 1/8 | 10.687 |

Straightening Vanes

The use of straightening vanes in meter runs serves a twofold purpose: (1) the turbulence often created in a complex piping system is straightened and smoothed to a normal flow pattern and (2) the amount of straight pipe required preceding an orifice is reduced. Cameron offers both flanged and pin type straightening vanes.

Vanes are available with carbon steel, 304 or 316 stainless steel tubing welded together and securely attached into the meter run. The tubes are reamed as thin as is practical at both ends and are constructed so as to minimize the possibility of vibration. All vanes are manufactured according to the latest AGA/API specifications.



FLANGE TYPE



PIN TYPE

| VANE MODEL | 2" | | 3" | | 4" | | 6" | |
|-------------|--------------|-----------------|--------------|-----------------|--------------|-----------------|--------------|-----------------|
| | Carbon Steel | Stainless Steel | Carbon Steel | Stainless Steel | Carbon Steel | Stainless Steel | Carbon Steel | Stainless Steel |
| Flange Type | 40807 | 40807 | 40813 | 40813 | 40814 | 40814 | 40818 | 40818 |
| Pin Type | 40806 | 40806 | 40812 | 40812 | 40815 | 40815 | 40819 | 40819 |
| Vane Length | 6" | | 8" | | 10" | | 12" | |

Other sizes available on request.

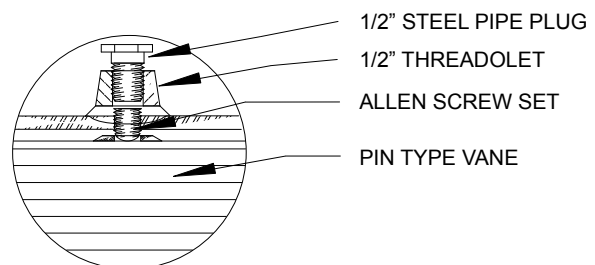
When ordering specify: part number, type of material and pipe bore size.

Installation

The flange type straightening vane is held in place by a flange ring between two pipe flanges.

The pin type straightening vane is held in place by an allen set screw. The set screw seats into a countersunk hole in the center of a welded pad that is welded to the straightening vane itself. The tapped hole in the pipe is sealed off by welding a threadolet around the hole. A pipe plug is installed into the threadolet.

PIN TYPE INSTALLATION



AGA/API MINIMUM LENGTHS FOR METER RUN WITH FLANGE TAPS USING .70 BETA RATIO (AGA REP. NO. 3. -ANSI/API MPMS 14.3.2 1991)

FIGURE 3A

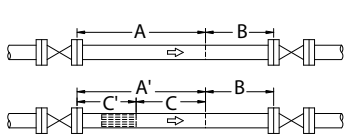


FIGURE 3B

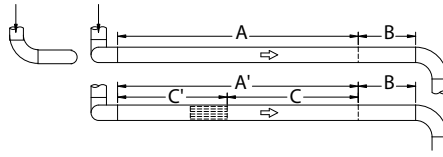


FIGURE 3C

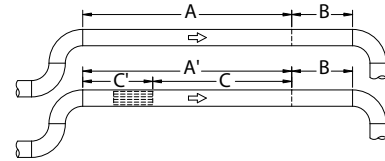


FIGURE 3D

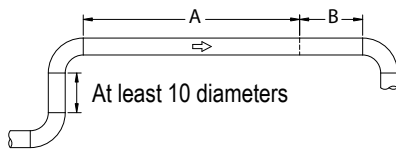


FIGURE 3E



* AS REQUIRED BY PRECEDING FITTING.

| NORMAL PIPE SIZE | 2" | 3" | 4" | 6" |
|------------------|-----|--|------|------|
| | | AGA FIGURE 3A-Fitting or Regulator | | |
| A | 78" | 117" | 155" | 233" |
| A' | 31" | 47" | 62" | 93" |
| B | 21" | 25" | 30" | 38" |
| C | 13" | 20" | 26" | 39" |
| C' | 18" | 27" | 36" | 54" |
| | | AGA FIGURE 3B-Two Ells in Different Planes | | |
| A | 63" | 95" | 126" | 189" |
| A' | 28" | 42" | 55" | 83" |
| B | 21" | 25" | 30" | 38" |
| C | 13" | 20" | 26" | 39" |
| C' | 15" | 22" | 29" | 44" |
| | | AGA FIGURE 3C-Two Ells in Same Plane | | |
| A | 38" | 57" | 75" | 113" |
| A' | 25" | 37" | 49" | 74" |
| B | 21" | 25" | 30" | 38" |
| C | 13" | 20" | 26" | 39" |
| C' | 12" | 17" | 23" | 34" |
| | | AGA FIGURE 3D | | |
| A | 28" | 42" | 56" | 84" |
| A' | -- | -- | -- | -- |
| B | 21" | 25" | 30" | 38" |
| C | -- | -- | -- | -- |
| C' | -- | -- | -- | -- |
| | | AGA FIGURE 3E Reducer | | |
| A | 25" | 37" | 49" | 74" |
| A' | -- | -- | -- | -- |
| B | 21" | 25" | 30" | 38" |
| C | -- | -- | -- | -- |
| C' | -- | -- | -- | -- |

Note 1: For Pipe Taps: A, A' and C' should be increased by 2 pipe diameters.

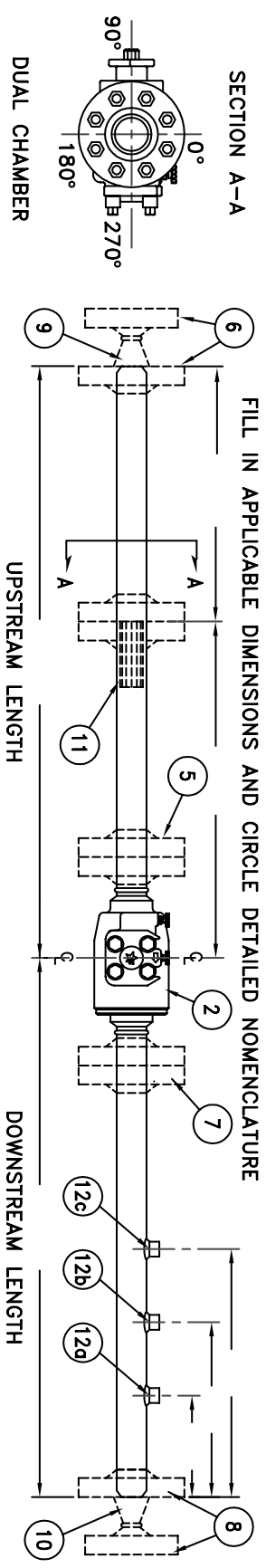
Note 2: In Figure 3B, when two ells are closely preceded by a third which is not in the same plane as the middle or second ell, the piping requirements shown by A should be doubled.

DATA REQUIREMENTS FOR ORIFICE BORE CALCULATIONS

| | | | | | |
|--|--|--|--|--|--|
| Plate Type: Paddle <input type="checkbox"/> Universal <input type="checkbox"/> Other _____ Concentric <input type="checkbox"/> Other <input type="checkbox"/> Material: 316 <input type="checkbox"/> 304 <input type="checkbox"/> Other _____ Bore: Maximum Rate <input type="checkbox"/> Nearest 1/8" <input type="checkbox"/> Tap Location: Flange <input type="checkbox"/> Corner <input type="checkbox"/> Other _____ Up _____ Down _____ Flange Rating: _____ | | | | | |
| GENERAL | Tag No. | | | | |
| | Line No. | | | | |
| | Fluid | | | | |
| | Flow Temperature °F | | | | |
| | Flow Pressure psig | | | | |
| | Actual Orifice I.D. | | | | |
| | Line Flange I.D. | | | | |
| | Meter Type (Mercury or Dry) | | | | |
| | S. G. of Seal @ Ambient T. | | | | |
| | Diff. Range H ₂ O | | | | |
| | Static Range psig | | | | |
| | Chart or Scale Range | | | | |
| | Chart Multiplier | | | | |
| LIQUIDS | Flow Units | | | | |
| | Maximum Flow | | | | |
| | Normal Flow | | | | |
| | Specific Gravity @ 60°F | | | | |
| | Specific Gravity @ Flowing Cond. | | | | |
| | Viscosity cp @ Flowing Cond. | | | | |
| VAPOR/GAS | Flow Units | | | | |
| | Maximum Flow | | | | |
| | Normal Flow | | | | |
| | Specific Gravity | | | | |
| | Molecular Weight | | | | |
| | Flowing Density lbs/ft ³ | | | | |
| | Barometric Pressure or Elev. of Plant Site (approx.) | | | | |
| | Pressure Base | | | | |
| | Temperature Base | | | | |
| | Supercom Factor | | | | |
| | @ Flowing T. & P. | | | | |
| Viscosity cp @ Flowing T. & P. | | | | | |
| STEAM | Flow Units | | | | |
| | Maximum Flow | | | | |
| | Quality % or Superheat °F | | | | |

NUFLO PRODUCTS MODEL 4055 DUAL CHAMBER METER RUN ORDERING FORM

DATE _____ CUSTOMER _____ TAG _____ ASSEMBLY NO _____
 DISTRICT _____ QUANTITY ORDERED _____ L.S.D. _____ SHIPPING ADDRESS _____
 DESIRED SHIPPING DATE _____ ORDERED BY _____ END USER _____



FILL IN APPLICABLE DIMENSIONS AND CIRCLE DETAILED NOMENCLATURE

1. Nominal Size Meter Run (inches)
 2 - 3 - 4 - 6
2. Type of orifice fitting: Dual Chamber
3. Pressure Rating (ANSI)
 150 - 300 - 600 - 900 - 1500
4. Wall Schedule of Meter Run
 40 - 80 - 160
5. Upstream Connection to Orifice Fitting
 Welded - RF Flange - RTJ Flange
 Threaded - Socket Weld
6. Upstream Outer End of Meter Run
 Beveled - RF Flange - RTJ Flange
 Reducer - Threaded - Elbow @ _____
7. Downstream Connection to Orifice Fitting
 Welded - RF Flange - RTJ Flange
 Threaded - Socket Weld
8. Downstream Outer End of Meter Run
 Beveled - RF Flange - RTJ Flange
 Reducer - Threaded - Elbow @ _____
9. Size of Upstream Reducer/ Elbow if used,
 Inches,
 None - Threaded - Beveled - Elbow @ _____
10. Size of Downstream Reducer/ Elbow if used
 Inches,
 None - Threaded - Beveled- Elbow @ _____
11. Straightening Vanes/ Flow Conditioner
 None - Pin Type - Flange Type
 Carbon Steel - Stainless Steel
12. Size of Downstream Couplings if used.
 Numbered from outer end of downstream tube
 a. 1/2" 3/4" - 1" - None - 3000 Lbs. - 6000 Lbs.
 b. 1/2" 3/4" - 1" - None - 3000 Lbs. - 6000 Lbs.
 c. 1/2" 3/4" - 1" - None - 3000 Lbs. - 6000 Lbs.
 Orientation _____
13. Size of installed Orifice Plate,
 Inches.
 a. 45° or Vertical _____ a.
 b. 45° or Vertical _____ b.
 c. 45° or Vertical _____ c.
14. Install Thermowell: Yes _____ No _____
 Description _____
15. Special Coating: None/Prime/Paint _____
16. Are MTRS/ Calibration Sheets desired with Meter Run
 Yes _____ No _____
17. Purchase order No. _____

| METER TUBE I.D. FOR NOMINAL DIMENSIONS | 2" | 3" | 4" | 6" |
|--|-------|-------|-------|-------|
| SCH. 40 | 2.067 | 3.068 | 4.026 | 6.065 |
| 80 | 1.939 | 2.900 | 3.826 | 5.761 |
| 160 | 1.687 | 2.624 | 3.438 | 5.187 |

| ANSI RATING | WORKING PRESSURE (PSI) | TEST PRESSURE (PSI) |
|-------------|------------------------|---------------------|
| 150 | 285 | 450 |
| 300 | 740 | 1125 |
| 600 | 1480 | 2225 |
| 900 | 2220 | 3350 |
| 1500 | 3705 | 5575 |

TEMPERATURE: -20° F TO 100° F

SPECIAL INSTRUCTIONS: _____

TYPE OF SERVICE: _____

SERVICE TEMP.: _____

X RAY: YES NO

M.P.I. YES NO

PWHT: YES NO

HYDRO REPORTS YES NO

API/AGA-3 (2000) YES NO

AGA FIGURE#: _____ BETA: _____

WELD PROCEDURES: TOL'S: _____

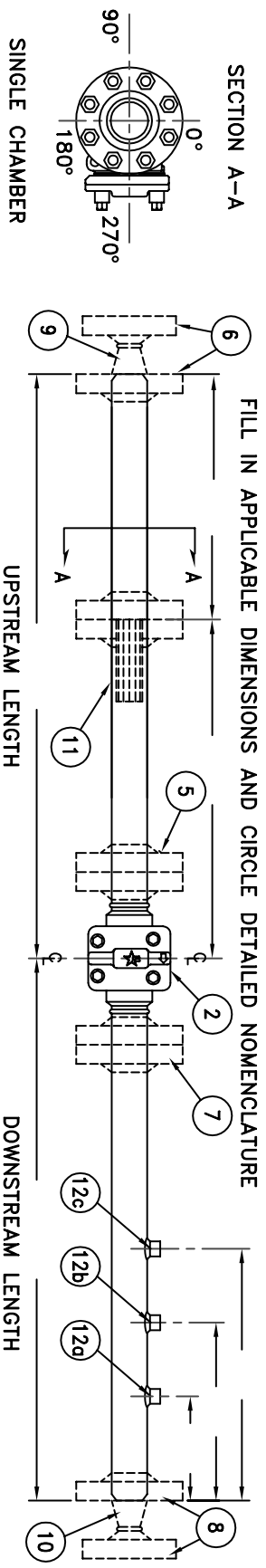
WELD PROCEDURES: PIPE,BODY,FLANGE: _____

OTHER: _____

FORM NUMBER: NS-3A
 REVISION NUMBER: 3
 REVISION DATE: 10/26/04

NUFLO PRODUCTS MODEL 4042 SINGLE CHAMBER METER RUN ORDERING FORM

DATE _____ CUSTOMER _____ TAG _____ ASSEMBLY NO _____
 DISTRICT _____ QUANTITY ORDERED _____ L.S.D. _____ SHIPPING ADDRESS _____
 DESIRED SHIPPING DATE _____ ORDERED BY _____ END USER _____



| METER TUBE I.D. FOR NOMINAL DIMENSIONS | 2" | 3" | 4" |
|--|-------|-------|-------|
| SCH. 40 | 2.067 | 3.068 | 4.026 |
| 80 | 1.939 | 2.900 | 3.826 |
| 160 | 1.687 | 2.624 | 3.438 |

| ANSI RATING | WORKING PRESSURE (PSI) | TEST PRESSURE (PSI) |
|-------------|------------------------|---------------------|
| 150 | 285 | 450 |
| 300 | 740 | 1125 |
| 600 | 1480 | 2225 |
| 900 | 2220 | 3350 |
| 1500 | 3705 | 5575 |

TEMPERATURE: -20 °F TO 100 °F

1. Nominal Size Meter Run (inches)
2 - 3 - 4
2. Type of orifice fitting: Single Chamber
3. Pressure Rating (ANSI)
150 - 300 - 600 - 900 - 1500
4. Wall Schedule of Meter Run
40 - 80 - 160
5. Upstream Connection to Orifice Fitting
Welded - RF Flange - RTJ Flange
Threaded - Socket Weld
6. Upstream Outer End of Meter Run
Beveled - RF Flange - RTJ Flange
Reducer - Threaded - Elbow @ _____
7. Downstream Connection to Orifice Fitting
Welded - RF Flange - RTJ Flange
Threaded - Socket Weld
8. Downstream Outer End of Meter Run
Beveled - RF Flange - RTJ Flange
Reducer - Threaded - Elbow @ _____
9. Size of Upstream Reducer/Elbow if used, _____ Inches,
None - Threaded - Beveled - Elbow @ _____
10. Size of Downstream Reducer/Elbow if used _____ Inches,
None - Threaded - Beveled - Elbow @ _____
11. Straightening Vanes/Flow Conditioner
None - Pin Type - Flange Type
Carbon Steel - Stainless Steel
12. Size of Downstream Couplings if used. Numbered from outer end of downstream tube
a. 1/2" 3/4" - 1" - None - 3000 Lbs. - 6000 Lbs.
b. 1/2" 3/4" - 1" - None - 3000 Lbs. - 6000 Lbs.
c. 1/2" 3/4" - 1" - None - 3000 Lbs. - 6000 Lbs.
Orientation
a. °45° or Vertical
b. °45° or Vertical
c. °45° or Vertical
13. Size of installed Orifice Plate, _____ Inches.
14. Install Thermowell: Yes No
Description _____
15. Special Coating: None/Prime/Paint _____
16. Are MTRS/Calibration Sheets desired with Meter Run
Yes No
17. Purchase order No. _____

SPECIAL INSTRUCTIONS:

TYPE OF SERVICE: _____

SERVICE TEMP.: _____

X RAY: YES NO

M.P.I. YES NO

PWHT: YES NO

HYDRO REPORTS YES NO

API/AGA-3 (2000) YES NO

AGA FIGURE#: _____ BETA: _____

WELD PROCEDURES: TOL'S: _____

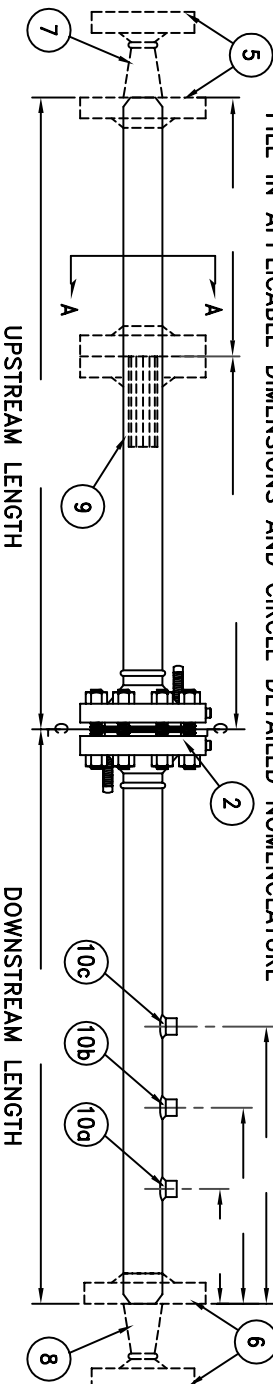
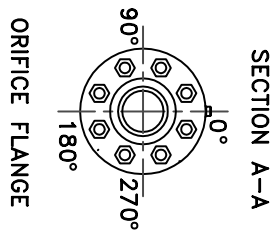
WELD PROCEDURES: PIPE,BODY,FLANGE: _____

OTHER: _____

FORM NUMBER: NS-3B
 REVISION NUMBER: 3
 REVISION DATE: 10/26/04

NUFLO PRODUCTS ORIFICE FLANGE METER RUN ORDERING FORM

DATE _____ CUSTOMER _____ TAG _____ ASSEMBLY NO _____
 DISTRICT _____ QUANTITY ORDERED _____ VIA _____ SHIPPING ADDRESS _____
 DESIRED SHIPPING DATE _____ ORDERED BY _____ END USER _____



FILL IN APPLICABLE DIMENSIONS AND CIRCLE DETAILED NOMENCLATURE

| METER TUBE I.D. FOR NOMINAL DIMENSIONS | | | | | | | |
|--|-------|-------|-------|-------|------|-------|--------|
| SCH. | 2" | 3" | 4" | 6" | SCH. | 8" | 10" |
| 40 | 2.067 | 3.068 | 4.026 | 6.065 | 30 | 8.071 | 10.136 |
| 80 | 1.939 | 2.900 | 3.826 | 5.761 | 40 | 7.981 | 10.020 |
| 160 | 1.687 | 2.624 | 3.438 | 5.187 | 80 | 7.625 | 9.564 |

- Nominal Size Meter Run (inches)
1 - 2 - 3 - 4 - 6 - 8 - 10
- Type of orifice fitting: Orifice Flange
- Pressure Rating (ANSI)
150 - 300 - 600 - 900 - 1500 - 2500
- Wall Schedule of Meter Run
40 - 80 - 160
- Upstream Outer End of Meter Run
Beveled - RF Flange - RTJ Flange
Reducer - Threaded - Elbow @ _____
- Downstream Outer End of Meter Run
Beveled - RF Flange - RTJ Flange
Reducer - Threaded - Elbow @ _____
- Size of Upstream Reducer/ Elbow if used, _____ Inches,
None - Threaded - Beveled - Elbow @ _____
- Size of Downstream Reducer/ Elbow if used _____ Inches,
None - Threaded - Beveled - Elbow @ _____
- Straightening Vanes/ Flow Conditioner
None - Pin Type - Flange Type
Carbon Steel - Stainless Steel
- Size of Downstream Couplings if used.
Numbered from outer end of downstream tube
a. 1/2" 3/4" - 1" - None - 3000 Lbs. - 6000 Lbs.
b. 1/2" 3/4" - 1" - None - 3000 Lbs. - 6000 Lbs.
c. 1/2" 3/4" - 1" - None - 3000 Lbs. - 6000 Lbs.
Orientation
a. 45° or Vertical _____
b. 45° or Vertical _____
c. 45° or Vertical _____
- Size of installed Orifice Plate, _____ Inches.
- Install Thermowell: Yes _____ No _____
Description _____
- Special Coating: None/ Prime/ Paint _____
- Are MTRS/ Calibration Sheets desired with Meter Run
Yes _____ No _____
- Purchase order No. _____

| ANSI RATING | WORKING PRESSURE (PSI) | TEST PRESSURE (PSI) |
|-------------|------------------------|---------------------|
| 150 | 285 | 450 |
| 300 | 740 | 1125 |
| 600 | 1480 | 2225 |
| 900 | 2220 | 3350 |
| 1500 | 3705 | 5575 |
| 2500 | 6170 | 9275 |

TEMPERATURE: -20 °F TO 100 °F

SPECIAL INSTRUCTIONS:

TYPE OF SERVICE: _____

SERVICE TEMP.: _____

X RAY: YES NO

M.P.I. YES NO

P.W.H.T. YES NO

HYDRO REPORTS YES NO

API/AGA-3 (2000) YES NO

AGA FIGURE#: _____ BETA: _____

WELD PROCEDURES: TOL'S: _____

WELD PROCEDURES: PIPE, FLANGE: _____

OTHER: _____

STANDARD MATERIALS FOR PARTS USED ON MODEL 4055 DUAL CHAMBER ORIFICE FITTINGS

| ITEM | MIN -20°F (-29°C) | | MIN -50°F (-45°C) | | REMARKS |
|------|---|---------------------------------|---------------------------------|---------------------------------|--|
| | SWEET SERVICE | (H ₂ S) SOUR SERVICE | SWEET SERVICE | (H ₂ S) SOUR SERVICE | |
| 1 | 316 S.S. | 316 S.S. | 316 S.S. | 316 S.S. | |
| 2 | 316 S.S. | 316 S.S. | 316 S.S. | 316 S.S. | |
| 3 | AISI 4130 | AISI 4130 | AISI 4130 | AISI 4130 | W/NYLON SEAT & VITON, HSN O-RING & HANDLES |
| 4 | ALUMINUM | 316 S.S. | ALUMINUM | 316 S.S. | |
| 5 | SPLIT | SPLIT STL | SPLIT STL | SPLIT STL | |
| 6 | AISI 1020 | AISI 1020 | AISI 1020 | AISI 1020 | |
| 7 | N/A | N/A | N/A | N/A | |
| 8 | AISI 1020 CSTG. | AISI 1020 CSTG. | AISI 1020 CSTG. | AISI 1020 CSTG. | |
| 9 | AISI 4140 | AISI 4140 | AISI 4140 | AISI 4140 | HRc 18-22 |
| 10 | AISI 4130 | AISI 4130 | AISI 4130 | AISI 4130 | ON 4" AND 6" SIZE ONLY |
| 11 | AISI 4130 | AISI 4130 | AISI 4130 | AISI 4130 | ON 4" AND 6" SIZE ONLY |
| 12 | VITON - B, HSN | VITON - B, HSN | VITON - B, HSN | VITON - B, HSN | 70 DURO |
| 13 | AISI 4140 | AISI 4140 | AISI 4140 | AISI 4140 | HRc 18-22 |
| 14 | TEFLON® | TEFLON® | TEFLON® | TEFLON® | |
| 15 | VITON - B, HSN | VITON - B, HSN | VITON - B, HSN | VITON - B, HSN | 70 DURO |
| 16 | N/A | N/A | N/A | N/A | ON 4" SIZE ONLY |
| 17 | VITON-B, HSN | VITON-B, HSN | VITON-B, HSN | VITON-B, HSN | 70 DURO |
| 18 | ASTM SA-216 GR. WCB | ASTM SA-216 GR. WCB | ASTM SA-216 GR. WCB | ASTM SA-216 GR. WCB | |
| 19 | SAE1075 | INCONEL X 750 | SAE 1075 | INCONEL X 750 | INCONELX-TEMPERED |
| 20 | AISI 4130 | AISI 4130 | AISI 4130 | AISI 4130 | ELECTROLESS NI-PLATED 0.0027/SIDE |
| 21 | 316 S.S. | 316 S.S. | 316 S.S. | 316 S.S. | |
| 22 | AISI 4130 | AISI 4130 | AISI 4130 | AISI 4130 | ELECTROLESS NI-PLATED |
| 23 | DISOGRIN, VITON, HSN OR TEFLON® | DISOGRIN, VITON, HSN OR TEFLON® | DISOGRIN, VITON, HSN OR TEFLON® | DISOGRIN, VITON, HSN OR TEFLON® | DISOGRIN, VITON, HSN OR TEFLON® |
| 24 | ASTM SA-216 GR. WCB | ASTM SA-216 GR. WCB | ASTM SA-352 GR. LCC | ASTM SA-352 GR. LCC | NORMALIZED & TEMPERED TO 18-22 HRc RANGE. IMPACT TEST @ -50°F (-45°C) FOR LOW TEMP SERVICE |
| 25 | 1015-18 STEEL | 1015-18 STEEL | 1015-18 STEEL | 1015-18 STEEL | |
| 26 | ASTM SA-487 CLASS 4N | ASTM SA-487 CLASS 4N | ASTM SA-487 CLASS 4N | ASTM SA-487 CLASS 4N | NT TO HRc 18-22 RANGE ELECTROLESS NI-PLATED 0.0027/SIDE |
| 27 | 1015-18 STEEL | 1015-18 STEEL | 1015-18 STEEL | 1015-18 STEEL | |
| 28 | ASTM SA-105 (N) | ASTM SA-105 (N) | ASTM SA-350 LF2 | ASTM SA-350 LF2 | HARDNESS RANGE BETWEEN 18-22 HRc IMPACT TEST @ -50°F (-45°C) FOR LOW TEMP SERVICE |
| 29 | ASTM SA-216 GR. WCB | ASTM SA-216 GR. WCB | ASTM SA-352 GR. LCC | ASTM SA-352 GR. LCC | NT TO 18-22 HRc RANGE. IMPACT TEST @ -50°F (-45°C) FOR LOW TEMP SERVICE |
| 30 | VITON - B, HSN | VITON - B, HSN | VITON - B, HSN | VITON - B, HSN | 70 DURO |
| 31 | ASTM SA-193 B7 | ASTM SA-193 B7 | ASTM SA-320 L7M | ASTM SA-320 L7M | |
| 32 | AISI 4130 | AISI 4130 | SA-320 L7 | SA-320 L7 | |
| 33 | AISI 4140 | AISI 4140 | SA-320 L7 | SA-320 L7M | |
| 34 | ASTM SA-194 2H | ASTM SA-194 2HM | ASTM SA-320 L7 | ASTM SA-320 L7M | |
| 35 | VITON - B, HSN | VITON - B, HSN | VITON - B, HSN | VITON - B, HSN | 70 DURO |
| 36 | 1015-18 RING W/MOLY-TEFLON® SEAL INSERT VITON, HSN O-RING | | | | |
| 38 | ASTM SA-105 (N) | ASTM SA-105 (N) | ASTM SA-350 LF2 | ASTM SA-350 LF2 | |
| 39 | ASTM SA-36 | ASTM SA-36 | ASTM SA-36 | ASTM SA-36 | GA-12 PLATE |

**STANDARD MATERIALS FOR PARTS USED ON
MODEL 4055 DUAL CHAMBER ORIFICE FITTINGS (cont'd)**

| ITEM | MIN -20°F (-29°C) | | MIN -50°F (-45°C) | | REMARKS |
|---|-------------------|---------------------------------|-------------------|---------------------------------|----------------------|
| | SWEET SERVICE | (H ₂ S) SOUR SERVICE | SWEET SERVICE | (H ₂ S) SOUR SERVICE | |
| 40 | PLASTIC | PLASTIC | PLASTIC | PLASTIC | PLASTIC |
| 41 | ASTM SA-105 (N) | ASTM SA-105 (N) | ASTM SA-350 LF2 | ASTM SA-350 LF2 | AVAILABLE IN 316 S.S |
| 45 | 316 S.S. | 316 S.S. | 316 S.S. | 316 S.S. | |
| 46 | 316 S.S. | 316 S.S. | 316 S.S. | 316 S.S. | |
| 47 | NYLON | NYLON | NYLON | NYLON | |
| 48 | ASTM SA-36 | ASTM SA-36 | ASTM SA-36 | ASTM SA-36 | GA-12 PLATE |
| NOTES: 1. MTR'S, HEAT TREAT CHARTS, AND OTHERS NDT RECORDS AVAILABLE UPON REQUEST. 2. WELDING PROCEDURES IN ACCORDANCE WITH ASME BOILER AND PRESSURE VESSEL CODE SECTION IX LATEST EDITION AND ADDENDA FOR GMAW AND SMAW PROCESSES. ALL POSITION, APPROVED BY ALBERTA BOILERS BRANCH, ARE AVAILABLE AT CAMERON'S EDMONTON PLANT. WELDS ARE MADE ON FITTINGS WHEN FLANGEWELD, OR FLANGED ORIFICE FITTINGS OR COMPLETE METER RUNS ARE ORDERED. | | | | | |

**STANDARD MATERIALS FOR PARTS USED ON
MODEL 4042 SINGLE CHAMBER ORIFICE FITTINGS**

| ITEM | MIN -20°F (-29°C) | | MIN -50°F (-45°C) | | REMARKS |
|------|-----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|---|
| | SWEET SERVICE | (H ₂ S) SOUR SERVICE | SWEET SERVICE | (H ₂ S) SOUR SERVICE | |
| 1 | ASTM SA-193 B7 | ASTM SA-193 B7M | ASTM SA-320 L7 | ASTM SA-320 L7M | |
| 2 | SPLIT STL. | SPLIT STL. | SPLIT STL. | SPLIT STL. | |
| 3 | ALUMINUM | 316 S.S. | ALUMINUM | 316 S.S. | |
| 4 | ASTM SA-194 2H | ASTM SA-194 2HM | ASTM SA-320 L7 | ASTM SA-320 L7M | |
| 5 | AISI 4130 | AISI 4130 | SA-320 L7 | SA-320 L7M | |
| 6 | AISI 4140 | AISI 4140 | SA-320 L7 | SA-320 L7M | |
| 7 | PLASTIC | PLASTIC | PLASTIC | PLASTIC | |
| 8 | 316 S.S. | 316 S.S. | 316 S.S. | 316 S.S. | |
| 9 | AISI 4130 | AISI 4130 | AISI 4130 | AISI 4130 | ELECTROLESS NI-PLATED 0.002" SIDE |
| 10 | DISOGRIN, VITON, HSN OR TEFLON | DISOGRIN, VITON, HSN OR TEFLON | DISOGRIN, VITON, HSN OR TEFLON | DISOGRIN, VITON, HSN OR TEFLON | |
| 11 | AISI 4130 | AISI 4130 | AISI 4130 | AISI 4130 | ELECTROLESS NI-PLATED 0.002" SIDE |
| 12 | ASTM SA-216 GR. WCB | ASTM SA-216 GR. WCB | ASTM SA-352 GR. LCC | ASTM SA-352 GR. LCC | NORMALIZED & TEMPERED TO 18-22 Hrc RANGE, IMPACT TEST @ -50°F (-45°C) FOR LOW TEMP SERVICE |
| 13 | VITON-B, HSN | VITON-B, HSN | VITON-B, HSN | VITON-B, HSN | 70 DURO |
| 14 | ASTM SA-216 GR. WCB | ASTM SA-216 GR. WCB | ASTM SA-352 LCC | ASTM SA-352 LCC | NORMALIZED & TEMPERED TO 18-22 Hrc RANGE, IMPACT TEST @ -50°F (-45°C) FOR LOW TEMP SERVICE |
| 15 | ASTM SA-105(N) | ASTM SA-105(N) | ASTM SA-350 LF2 | ASTM SA-350 LF2 | |
| 16 | ASTM SA-105(N) | ASTM SA-105(N) | ASTM SA-350 LF2 | ASTM SA-350 LF2 | |
| 17 | PLASTIC | PLASTIC | PLASTIC | PLASTIC | |

WARRANTY - LIMITATION OF LIABILITY: Seller warrants only title to the products, software, supplies and materials and that, except as to software, the same are free from defects in workmanship and materials for a period of one (1) year from the date of delivery. Seller does not warranty that software is free from error or that software will run in an uninterrupted fashion. Seller provides all software "as is". THERE ARE NO WARRANTIES, EXPRESS OR IMPLIED, OF MERCHANTABILITY, FITNESS OR OTHERWISE WHICH EXTEND BEYOND THOSE STATED IN THE IMMEDIATELY PRECEDING SENTENCE. Seller's liability and Buyer's exclusive remedy in any case of action (whether in contract, tort, breach of warranty or otherwise) arising out of the sale or use of any products, software, supplies, or materials is expressly limited to the replacement of such products, software, supplies, or materials on their return to Seller or, at Seller's option, to the allowance to the customer of credit for the cost of such items. In no event shall Seller be liable for special, incidental, indirect, punitive or consequential damages. Seller does not warrant in any way products, software, supplies and materials not manufactured by Seller, and such will be sold only with the warranties that are given by the manufacturer thereof. Seller will pass only through to its purchaser of such items the warranty granted to it by the manufacturer.

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