Reflex Gages

On Daniel reflex Close Hook-up Gages with ½" NPT connections the center-to-center dimension is the same as the overall length on standard gages. On Close Hook-up Gages with ¾"NPT connections the center-to-center dimension is the same as the overall length on standard gages plus 3/8". All gage bodies are drilled and tapped for close hook-up.

Materials

BODY (LIQUID CHAMBER): Accurately machined from square tubes to provide perfect gasket seating for gage glasses. Glass is recessed for protection. Body materials include Type 304 and 316 stainless steels and carbon steel.

COVER: Daniel gage covers are made of carbon steel or stainless steel (Type 304) in all their sizes and pressure ratings for higher strength ad dependable sevice. Carbon steel covers are rust-proofed. All covers are machined to provide recessed seating protection for the glass.

GLASS: All standard Daniel Reflex Gages use tempered borosilicate glass in nine standard lengths. Each glass has expertly molded reflecting prisms.

GASKETS & CUSIONS: High grade non-asbestos is used in gaskets and chsions for Daniel gages. The machined recess in the gage body and cover protects the gasket and cushion as well as the glass.

Bolts: Daniel gage bolts are made of alloy steel, A.S.T.M. A-193 Grade B7, and rust-proofed for long life.

Nuts: Gage nuts are made of steel, A.S.T.M., A-194 Grade 2H, and are rust-proofed. (Torgue instructions for gage bolts are on back Cover.)

Typical Reflex Top/Bottom

Typical-Reflex Close Hook-Up

Reflex Gages contd.

Gage glasses may fail from improper external mechanical stress or accident rather than from internal pressure, but both factors should be considered. Four basic precautions when heeded will assure the gage glass user of safe, satisfactory performance:

- Proper glass selection
- Correct installation
- Periodic inspection and cleaning
- Replacement as necessary

Proper glass selection involves size, pressure rating and quality of glass. Flat and tubular glasses should fit perfectly without stress; glass should be crystal clear and without blemish; length determines pressure rating; if longer glass results in breakage, a multiple-section gage with shorter glasses should be considered.

Installation involves proper seating on gaskets and cushions; glass-to-metal contact should not occur; do not install any glass with scratches or chipped edges; do not tighten gage bolts when gage is in use; use torque instructions provided with agge; use gage valves with ball checks that shut-off automatically if breakage occurs; make sure vessel center-to-centers are correct and vertical.

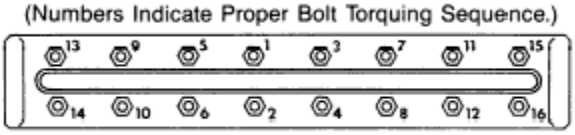
Proper tightening of bolts with torque wrench is extremely important, so that no unusual stress is introduced into the glass.

Clean outside of glass with ordinary glass cleaners, not harsh chemicals; check for scratches, chipped edge on glass; inspect glass for clarity.

Glass should be replaced if any blemish mars surface. If gage is taken apart, glass, gaskets and cushions should be automatically replaced to reduce risk; make sure gage or tubular valve surfaces are clean and dry before installing glasses.

For safety purposes, glasses in high temperature service should be replaced more often than similar glasses used in low temperature service.

Daniel Gage Assembly



Gage Series	Torque (Tighten in 4-5 Ft.-Lb. Steps)
Low Press. Large Cham.	20 Ft.-Lb.
Mid-Press.	32 Ft.-Lb.
High Press.	40 Ft.-Lb.

Offset Valves

Type 1S & 1U (Stem Threads Into body)
Type 2S & 2U (Renewable Internal Stem Bonnet)

The Teflon ring is standard and used in services up to 450 F. For temperatures to 700F, valves are fitted with special wire graphite packing. Both valves have stainless steel ball checks to shut off the flow automatically in case of gage glass breakage.

The "offset" feature permits easy cleaning of gages. A 1/16" eccentric tailpiece on Type 1 valves permits an overall vertical adjustment of 1/8" if the gage center-to-centers are not precisely located. Installation is quicker and gage strain is eliminated.

Type 2 Valves have an optional backseating stem, allowing the packing to be changed without shutting down the vessel.

4000 psig CWP
6000 psig Test
3/4" NPT Male Union Tank Connection
1/2" NPT Female Gage Connection
1/2" NPT Female Drain Connection

PRESSURE — TEMPERATURE RATING			
Teflon Packing		Wire-Graphite Packing	
4000 psi	100°F	2950 psi	500°F
3730 psi	200°F	2700 psi	600°F
3470 psi	300°F	2430 psi	700°F
3200 psi	400°F		

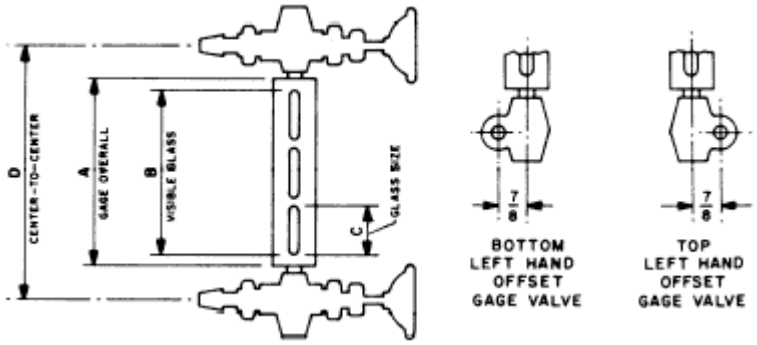
Parts

ITEM NO.	NAME	STANDARD MATERIAL	304 S.S. WETTED PARTS MATERIAL	316 S.S. WETTED PARTS MATERIAL
1	BODY	ASTM A350 LF2	304 S.S.	316 S.S.
2	UNION NUT	CARBON STEEL	CARBON STEEL	CARBON STEEL
3	PACKING NUT	CARBON STEEL	CARBON STEEL	CARBON STEEL
4	PACKING FOLLOWER	316 S.S.	316 S.S.	316 S.S.
5	PACKING RING	TEFLON	TEFLON	TEFLON
6	PACKING WASHER	17-4 PH S.S.	17-4 PH S.S.	17-4 PH S.S.
7	STEM	304 S.S.	304 S.S.	316 S.S.
8	STEM NUT	CARBON STEEL	CARBON STEEL	CARBON STEEL
9	NAME PLATE	304 S.S.	304 S.S.	304 S.S.
10	HAND WHEEL	ALLOY ZINC	ALLOY ZINC	ALLOY ZINC

ITEM NO.	NAME	STANDARD MATERIAL	304 S.S. WETTED PARTS MATERIAL	316 S.S. WETTED PARTS MATERIAL
11	BALL	440 S.S.	316 S.S.	316 S.S.
12	BALL RETAINER	316 S.S.	316 S.S.	316 S.S.
*13	MALE CONNECTOR	CARBON STEEL	304 S.S.	316 S.S.
14	BONNET	416 S.S.	304 S.S.	316 S.S.
15	SEAT	416 S.S.	304 S.S.	316 S.S.
17	FEMALE CONNECTOR	CARBON STEEL	304 S.S.	316 S.S.

* Item No. 13 has hole with 1/16 eccentricity for +- 1/8 maximum misalignment on the overall center-to-center. Note: valve shown is for bottom left hand (or top right hand) location. Opposite hand is reversed. Valves are furnished in pairs of one bottom left hand and one top left hand.
Note: 304 S.S. and 316 S.S. wetted parts not available in Type 1 valves.

Assembly Information



Note: A, B, C & D Dimensions are in inches.

SIZE NO.		A GAGE OVERALL	B VISIBLE GLASS	C GLASS SIZE	D* MINIMUM VALVE CENTER-TO-CENTER WITH GAGE CONNECTION							
					FOR GAGES TAPPED ½" NPT				FOR GAGES TAPPED ¾" NPT			
Glass No.	No. Sect.				**½"-NPT Female Screwed CAT. 1S, 2S, 4S	**½"-NPT Female Union¹ CAT. 1U, 2U, 4U	½"-NPT Male Union Fig. VIII	½"-NPT Male Spherical Fig. XIV	**¾"-NPT Female Screwed CAT. 1S, 2S, 4S	¾"-NPT Female Union** CAT. 1U, 2U, 4U	¾"-NPT Male Union Fig. XI	¾"-NPT Male Spherical Fig. X
1	1	5¼	3¾	3¾	8½	11	11⅝	12¾	8¾	11⅝	11½	12⅜
2	1	6¼	4¾	4¾	9½	12	12⅝	13¾	9¾	12⅝	12½	13⅜
3	1	7¼	5¾	5¾	10½	13	13⅝	14¾	10¾	13⅝	13½	14⅜
4	1	8¼	6¾	6¾	11½	14	14⅝	15¾	11¾	14⅝	14½	15⅜
5	1	9⅜	7⅞	7⅞	12⅜	15⅛	15¾	16⅞	12⅞	15¾	15⅝	16¾
6	1	10⅜	9⅛	9⅛	13⅜	16⅜	17	18⅛	14⅛	17	16⅞	18
7	1	11¾	10¼	10¼	15	17½	18⅛	19¼	15¼	18⅛	18	19⅛
8	1	13⅜	11⅞	11⅞	16⅝	19⅛	19¾	20⅞	16⅞	19¾	19⅝	20¾
9	1	14⅛	12⅝	12⅝	17⅜	19⅞	20½	21⅝	17⅝	20½	20⅜	21½
3	2	14½	13	5¾	17¾	20¼	20⅞	22	18	20⅞	20¾	21⅞
4	2	16½	15	6¾	19¾	22¼	22⅞	24	20	22⅞	22¾	23⅞
5	2	18¾	17⅛	7⅞	22	24½	25⅛	26¼	22¼	25⅛	25	26¼
6	2	21¼	19¾	9⅛	24½	27	27⅝	28¾	24¾	27⅝	27½	28⅜
7	2	23½	22	10¼	26¾	29¼	29⅞	31	27	29⅞	29¾	30⅞
8	2	26¾	25⅛	11⅞	30	32½	33⅛	34¼	30¼	33⅛	33	34⅛
9	2	28¼	26¾	12⅝	31½	34	34⅝	35¾	31¾	34⅝	34½	35⅝
6	3	31⅞	30⅜	9⅛	35⅛	37⅝	38¼	39⅜	35⅜	38¼	38⅛	39¼
7	3	35¼	33¾	10¼	38½	41	41⅝	42¾	38¾	41⅝	41½	42⅝
8	3	40⅛	38⅜	11⅞	43⅜	45⅞	46½	47⅝	43⅜	46½	46⅜	47½
9	3	42⅜	40⅞	12⅝	45⅝	48⅛	48¾	49⅞	45⅞	48¾	48⅝	49¾
7	4	47	45½	10¼	50¼	52¾	53⅜	54½	50½	53⅜	53¼	54⅜
8	4	53½	52	11⅞	56¾	59¼	59⅞	61	57	59⅞	59¾	60⅞
9	4	56½	55	12⅝	59¾	62¼	62⅞	64	60	62⅞	62¾	63⅞
7	5	58¾	57¼	10¼	62	64½	65⅛	66¼	62¼	65⅛	65	66⅛
8	5	66⅞	65⅜	11⅞	70⅛	72⅝	73¼	74⅜	70⅜	73¼	73⅛	74¼
9	5	70⅝	69⅛	12⅜	73⅞	76⅜	77	78⅛	74⅛	77	76⅞	78
8	6	80¼	78¾	11⅞	83½	86	86⅝	87¾	83¾	86⅜	86½	87⅜
9	6	84¾	83¼	12⅝	88	90½	91⅛	92¼	88¼	91⅛	91	92⅛
8	7	93⅜	92⅛	11⅞	96⅞	99⅜	100	101⅛	97⅛	100	99⅞	101
9	7	98⅞	97⅜	12⅜	102⅛	104⅝	105¼	106⅜	102⅜	105¼	105⅛	106¼
8	8	107	105½	11⅞	110¼	112¾	113⅜	114½	110½	113⅜	113¼	114⅜
9	8	113	111½	12⅜	116¼	118¾	119⅜	120½	116½	119⅜	119¼	120⅜
8	9	120⅜	118⅛	11⅞	123⅜	126⅛	126¾	127⅞	123⅞	126¾	126⅝	127¾
9	9	127⅛	125⅝	12⅝	130⅜	132⅞	133½	134⅝	130⅝	133½	133⅜	134½

*Dimensions in column "D" apply to low-pressure (series "L"), mid-pressure (series "M"), ½" NPT high-pressure (series "H"), frost-free (all series), and internally heated/cooled reflex and transparent level gages tapped ½" NPT. For installation dimensions on other level gages see footnote.
**These dimensions use close pipe nipples. For short ½" nipple add ¾"; for short ¾" nipple add 1-1/4".
Note: Use the following constants for other level gages:

- Low pressure (series "L") large chamber, add 1" to above "A" and "D" dimensions.
- Low pressure (series "L"), mid-pressure (series "M") externally heated/cooled, add 2-1/4" to above "d" dimensions.
- For valve Types 3, 5, or 7, add 7/8" to Column "D" to obtain minimum centers.
- For High Pressure (series "H") with ¾" NPT, add 1-1/2" to dimensions "A" and "D".
- For a ½" NPT Female Spherical Gage connection (Figure XXIX), add 1-7/8".