



PENBERTHY SIGHT FLOW INDICATORS

ANSI 150, 300 and 600 pressure class sight flow indicators are the industry standard for common or powerful process flow stream pressures



FEATURES

- No power or special installation requirements.
- Available with threaded or flanged connections.
- Four indication styles available.
- Single piece cast body.
- Wide variety of special materials to suit the most diverse applications.
- Lined units available to satisfy most corrosive environments.
- Single, inexpensive means of monitoring flow.
- Visible indication allows flow characteristic to be observed.
- Instrument taps allow insertion of additional monitoring equipment.
- FM approval available for dual window models.

GENERAL APPLICATION

These ANSI rated units are used in power piping, refrigeration, petroleum, petrochemical and general processing industries.

TECHNICAL DATA

Body materials:	Iron, bronze, carbon steel, stainless steel, Alloy 20
Sizes	
Threaded:	1/4" to 3" (DN 8 to 80)
Flanged:	1/2" to 8" (DN 15 to 200)
Connections	
SF/DW:	Threaded NPT or flanged
SM/SH:	Threaded NPT or flanged
STW:	Threaded Window NPT
Pressure range:	Up to 1480 psig
Temperature range:	-325°F (-199°C) to 500°F (260°C)

PENBERTHY SIGHT FLOW INDICATORS

OVERVIEW

SIGHT FLOW INDICATORS

Sight flow indicators provide a window into piping. The process flow stream can be monitored by observation through the glass window. Special mechanisms can be mounted in most sight flow indicator models to enhance visibility when observing a liquid.

The four basic components of sight flow indicators are:

Body: provides in-line attachment capability and rigidity to the sight flow indicator.

Glass: provides the viewing window to the process flow stream.

Gasket: compresses to seal the gap tightly and prevent leaking between the glass, body, and cover.

Cover: provides a compression surface for the bolts to hold the gasket and glass tightly against the sight flow body.

There are four basic indicator types:

Plain

A plain sight flow indicator can be used in a liquid application where there is a visual contrast between the liquid presence and its absence. Contrast in the forms of color, tint, hue, clarity or turbulence indicates variation in flow. Any orientation of flow can be observed.

Flapper

A flapper sight flow indicator can be used in a liquid application where there is a great enough liquid mass impact to move the weight of the flapper. A hinged flapper indicates variation in flow by its position. Transparent or slightly opaque fluids can be monitored. Horizontal and vertically upward flow can be observed.

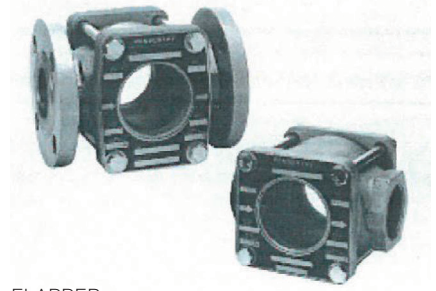
Rotator

A rotator sight flow indicator can be used in a fluid application where there is a great enough liquid mass impact to spin the Teflon® rotator paddle wheels. A spinning motion indicates variation in flow, ideal for darker color solutions where color contrast is better, translucent liquids and clear solutions. Any orientation of flow can be observed.

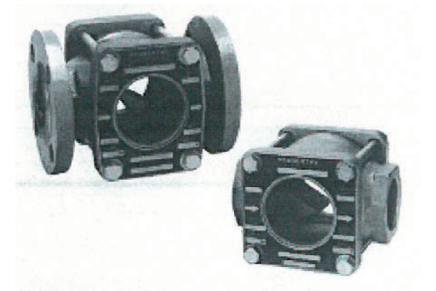
Drip tube

A drip tube sight flow indicator can be used in a fluid application where there is formation of liquid droplets. Condensation collecting on the tube indicates variation in flow. Distillation and similar processes with intermittent flow can be monitored. Horizontal and vertically downward flow can be observed.

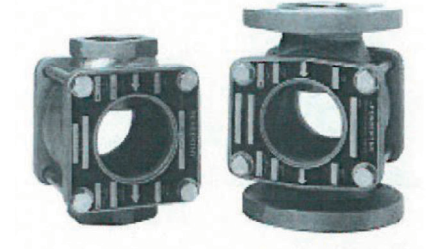
PLAIN



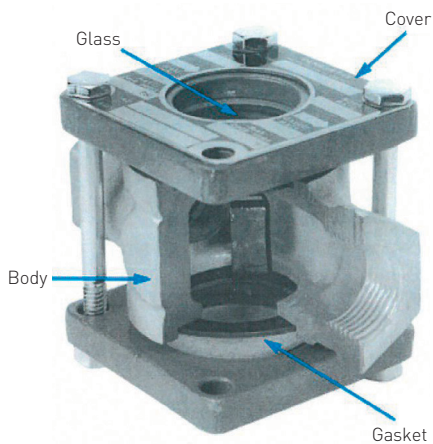
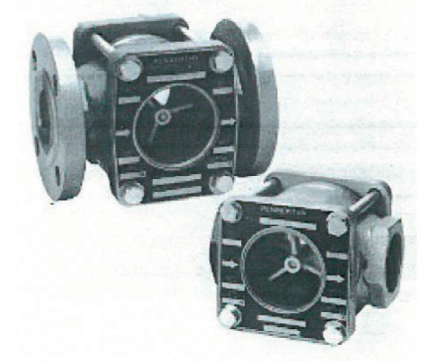
FLAPPER



DRIP TUBE



ROTATOR



PENBERTHY SIGHT FLOW INDICATORS

TEFLON® AND TEFZEL® LINED SIGHT FLOW INDICATORS

These lined sight flow indicators can safeguard against chemical reactions in corrosive environments.

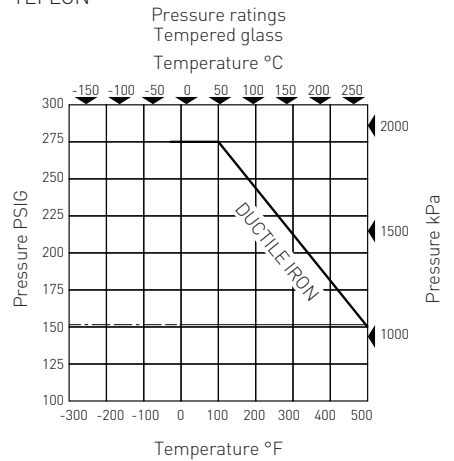
Lined sight flow indicators are designed for viewing corrosive media. Except for the borosilicate glass, the lining of the indicator covers all otherwise wetted parts. The lining provides protection from attack by chemicals and solvents which can cause rapid deterioration of standard plastics and common metals. Lined bodies are available with plain, drip-tube or single-sheet flutter flapper indicators.

Teflon® resins are essentially chemically inert. The only known chemicals that react with Teflon® are molten alkali metals, turbulent fluorine and a few fluoro-chemicals and halogenated organic chemicals. Teflon® lined bodies are available with drip tube and flutter flapper style indicators. With Teflon® lining the body can only be constructed of iron. Pressure and temperature ratings are shown on the graph at the right.

Tefzel® fluoropolymer resin is inert to strong mineral acids, inorganic bases, halogens and metal salt solutions. The material is ineffective with organic bases and very strong oxidizing acids near their boiling point. Consult the factory to obtain information about Tefzel® chemical use/temperature guide.

Tefzel® has excellent mechanical strength, stiffness and abrasion resistance and an effective temperature range from -370°F (-223°C) to 300°F (150°C). Tefzel® lining is available in all Penberthy sight flow indicator plain flanged bodies 1" or larger. Pressure and temperature ratings will depend on materials of construction and sight flow indicator model selected.

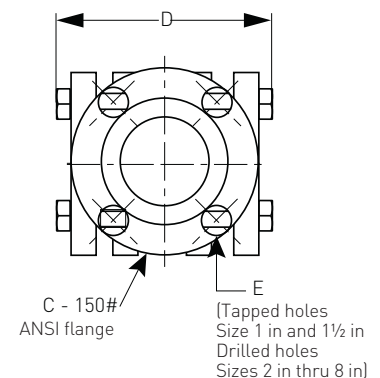
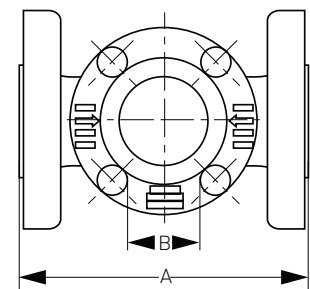
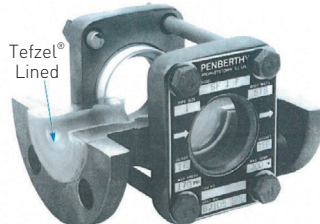
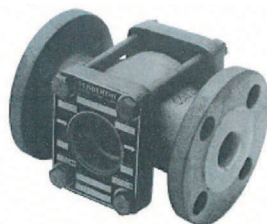
TEFLON®



Teflon® Lined



Tefzel® Lined



TEFLON® DIMENSIONS

Unit size	Dimensions									
	A		B		C		D		E	
	in.	cm	in.	cm	in.	cm	in.	cm	in.	cm
1	7	17.8	1½	3.8	1	2.5	4½	11.7	½ - 13	1.3
1½	8	20.3	2¾	6.0	1½	3.8	5½	14.3	½ - 13	1.3
2	9	22.9	2¾	7.3	2	5.1	6½	16.8	¾	1.9
3	11	27.9	3¾	9.5	3	7.6	8¾	21.0	¾	1.9
4	13	33.0	4¾	12.1	4	10.2	9¾	23.5	¾	1.9
6	16	40.6	7	17.8	6	15.2	12¾	32.4	7/8	2.2
8	18	45.7	9	22.9	8	20.3	16½	41.0	7/8	2.2

PENBERTHY SIGHT FLOW INDICATORS

ANSI 150 PRESSURE CLASS SIGHT FLOW INDICATORS

Series SF

The industry standard for common process flow stream pressures

Available in NPT threaded-end and flanged designs, these sight flow indicators meet most standard installation requirements. Made from single-piece cast-construction bodies, these SFIs are available with all four styles of Penberthy indication.

Models

- SF: NPT SFI (plain)
- SFF: NPT SFI (flapper)

- SFR: NPT SFI (rotator)
- SFD: NPT SFI (drip tube)
- SF-F: Flanged SFI (plain)
- SFF-F: Flanged SFI (flapper)
- SFR-F: Flanged SFI (rotator)
- SFD-F: Flanged SFI (drip tube)

Optional:

- ASTM 494 Monel® gr. M-30C
- ASTM A494 Hastelloy® C CW12MW
- ASTM A734 Alloy 20 CN7M
- Consult factory for other materials.

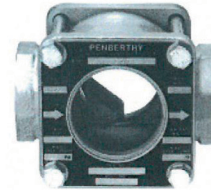
Materials of construction for body

- Standard:
- ASTM A395 Gr. 60 – 40 – 18 Ductile Iron
- ASTM B148 Alloy C95800 Alum-Bronze
- ASTM A216 steel gr. WCB
- ASTM A351/316/316L STS gr. CF3M

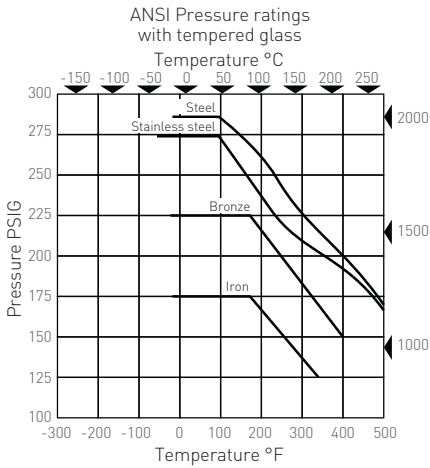
FLANGED



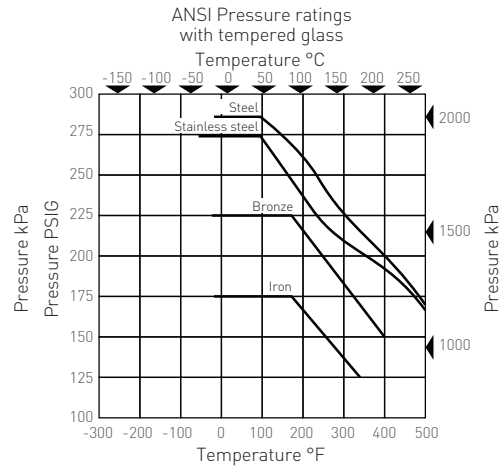
NPT



150 P-CL NPT



150 P-CL FLANGED

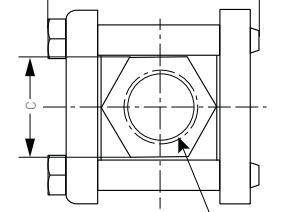
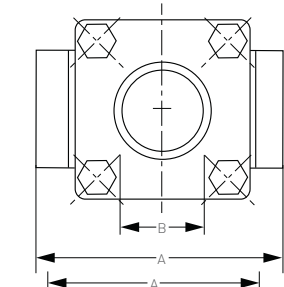


150 P-CL NPT DIMENSIONS

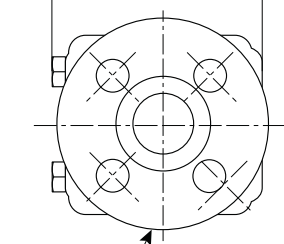
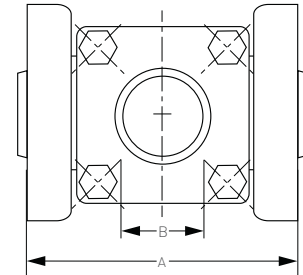
Unit size	Dimensions									
	A		B		C		D		E	
	in.	cm	in.	cm	in.	cm	in.	cm	in.	cm
1/4	3	7.6	7/8	2.2	1	2.5	2 ¹⁵ / ₁₆	7.5	1/4	0.6
3/8	3	7.6	7/8	2.2	1	2.5	2 ¹⁵ / ₁₆	7.5	3/8	1.0
1/2	3 3/4	9.5	1 1/4	3.2	1 1/2	3.8	3 ¹⁵ / ₁₆	10.0	1/2	1.3
3/4	3 3/4	9.5	1 1/4	3.2	1 1/2	3.8	3 ¹⁵ / ₁₆	10.0	3/4	1.9
1	4 1/4	10.8	1 1/2	3.8	2	5.1	4 ¹¹ / ₁₆	11.9	1	2.5
1 1/4	5 1/2	14.0	2 3/8	6.0	2 1/2	6.4	5 3/4	14.6	1 1/4	3.2
1 1/2	5 1/2	14.0	2 3/8	6.0	2 1/2	6.4	5 3/4	14.6	1 1/2	3.8
2	6 1/4	15.9	2 7/8	7.3	3 1/4	8.3	7 3/8	18.7	2	5.1
2 1/2	8 1/2	21.6	3 3/4	9.5	4 1/8	10.5	9 3/16	23.3	2 1/2	6.4
3	8 1/2	21.6	3 3/4	9.5	4 1/8	10.5	9 3/16	23.3	3	7.6

150 P-CL FLANGED DIMENSIONS

Unit size	Dimensions							
	A		B		C		D	
	in.	cm	in.	cm	in.	cm	in.	cm
1/2	4 5/8	11.7	1 1/4	3.2	1/2	1.3	3 ¹⁵ / ₁₆	10.0
3/4	4 5/8	11.7	1 1/4	3.2	3/4	1.9	3 ¹⁵ / ₁₆	10.0
1	5 5/8	14.3	1 1/2	3.8	1	2.5	4 5/8	11.7
1 1/4	6 1/2	16.5	2 3/8	6.0	1 1/4	3.2	5 7/8	14.9
1 1/2	6 1/2	16.5	2 3/8	6.0	1 1/2	3.8	5 7/8	14.9
2	7 7/8	20.0	2 7/8	7.3	2	5.1	7 3/8	18.7
2 1/2	9 3/8	23.8	3 3/4	9.5	2 1/2	6.4	9 3/16	23.3
3	9 3/8	23.8	3 3/4	9.5	3	7.6	9 3/16	23.3
4	11	27.9	4 3/4	12.1	4	10.2	11 3/8	28.9
6	14 1/4	36.2	7	17.8	6	15.2	15 15/16	40.5
8	16 1/8	41.0	9	22.9	8	20.3	18 5/16	46.5



E - NPT



C - 150 P-Cl ANSI flange

PENBERTHY SIGHT FLOW INDICATORS

ANSI 300 AND 600 PRESSURE CLASS HIGH PRESSURE SIGHT FLOW INDICATORS

Series SM and SH

Powerful flow streams are mastered by heavy duty construction

Available in flanged models only, these sight flow indicators meet tough ANSI standards for 300 and 600 pressure class requirements. Made from single-piece, cast-construction bodies, these SFIs are available with all four styles of Penberthy indication.

Models

300 pressure class series

SM:	NPT SFI (plain)
SMF:	NPT SFI (flapper)
SMR:	NPT SFI (rotator)
SMD:	NPT SFI (drip tube)
SM-F:	Flanged SFI (plain)
SMF-F:	Flanged SFI (flapper)
SMR-F:	Flanged SFI (rotator)
SMD-F:	Flanged SFI (drip tube)

600 pressure class series

SH:	NPT SFI (plain)
SHF:	NPT SFI (flapper)
SHR:	NPT SFI (rotator)
SHD:	NPT SFI (drip tube)
SH-F:	Flanged SFI (plain)
SHF-F:	Flanged SFI (flapper)
SHR-F:	Flanged SFI (rotator)
SHD-F:	Flanged SFI (drip tube)

High pressure sight flow indicator applications

Naturally occurring high pressure wells (natural gas, petroleum, geothermal steam) and long-distance pumping (transportation) of liquids and gases require high pressure sight flow indicators to observe fluid dynamics.

Chemical processes often require that fluids be in their liquid state. To achieve this, the chemical must remain under pressure at all times so that it can be transported using high pressure pumps. Observing the flow of chemicals such as Argon, Hydrogen, Nitrogen, Oxygen, Carbon Monoxide, Propane, Ethyl Methyl Ether, Butane, Isobutane, Pentane in their liquid state requires high pressure sight flow indicators.

Industrial areas where high pressure pipelines are used include:

- Power piping - Steam electric generation stations; industrial and institutional plants; central and district heating plants.
- Refrigeration piping.
- Petroleum - Petroleum refinery piping; loading terminal; gas metering; main and service lines; bulk plant and compressor stations compounding plant; storage facilities; gas pipelines.
- Agricultural piping.
- Pharmaceutical/chemical- Alkylation/ carboxylation; dehydration/halogenation; condensation/cyclization; other complex chemical conversions.

Materials of construction for body

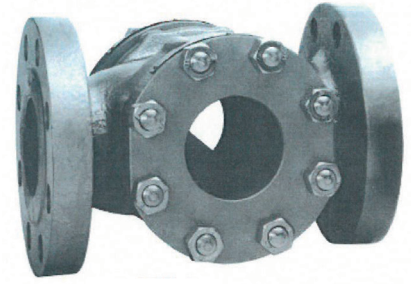
Standard:

ASTM A216 steel gr. WCB
ASTM A351/316/316L316 STS gr. CF3M

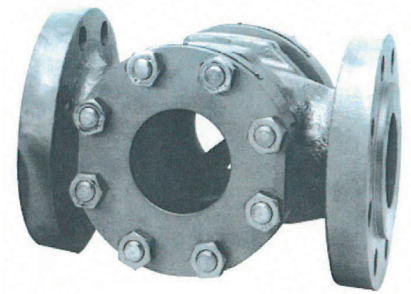
Optional:

ASTM 494 Monel® gr. M-30C
ASTM A494 Hastelloy® C CW12MW
ASTM A734 Alloy 20 CN7M
Consult factory for other materials.

300 P-CL



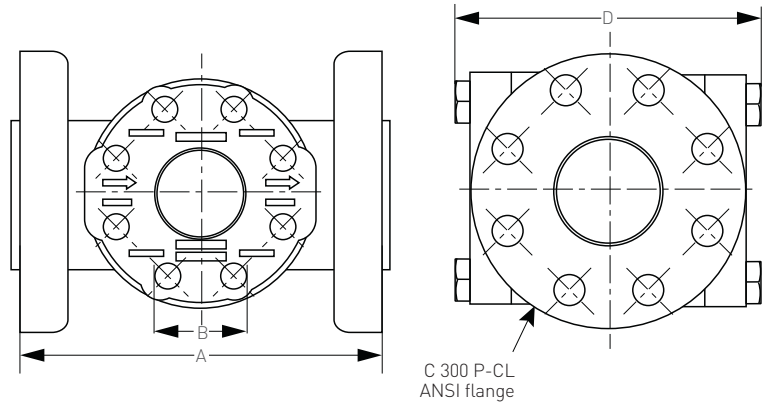
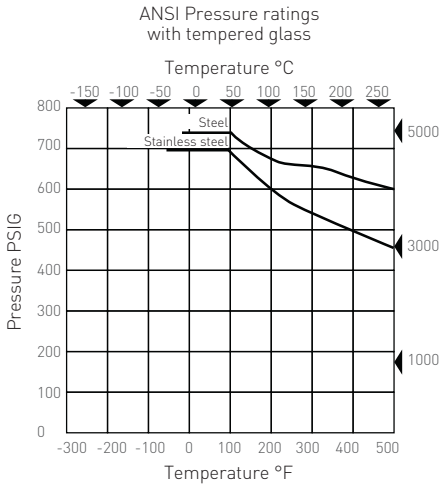
600 P-CL



PENBERTHY SIGHT FLOW INDICATORS

ANSI 300 AND 600 PRESSURE CLASS HIGH PRESSURE SIGHT FLOW INDICATORS

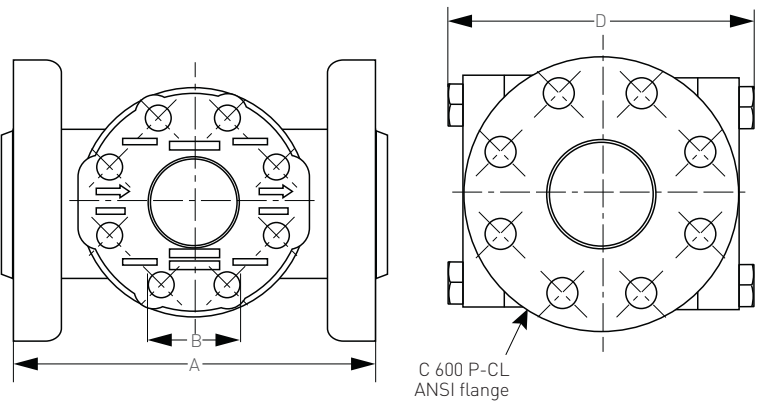
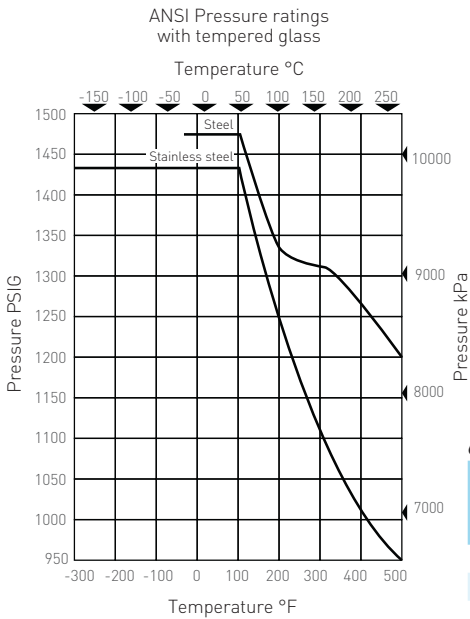
300 P-CL



300 P-CL DIMENSIONS

Unit size	Dimensions							
	A		B		C		D	
	in.	cm	in.	cm	in.	cm	in.	cm
1/2	5 7/8	14.9	1 1/4	3.2	1/2	1.3	5	12.7
3/4	5 7/8	14.9	1 1/4	3.2	3/4	1.9	5	12.7
1	6 7/8	17.5	1 3/8	3.5	1	2.5	5 5/8	14.3
1 1/4	7 1/2	19.1	2	5.1	1 1/4	3.2	7 7/8	18.1
1 1/2	7 1/2	19.1	2	5.1	1 1/2	3.8	7 7/8	18.1
2	8 5/8	21.9	2 1/8	5.4	2	5.1	8 7/8	22.5
2 1/2	11 3/8	28.9	3 3/16	8.1	2 1/2	6.4	11 3/8	29.5
3	11 3/8	28.9	3 3/16	8.1	3	7.6	11 3/8	29.5
4	13 1/4	33.7	4 1/4	10.8	4	10.2	14	35.6
6	21 3/8	54.3	6 1/4	15.9	6	15.2	20 1/4	51.4
8	22 3/8	56.8	6 1/4	15.9	8	20.3	20 1/4	51.4

600 P-CL



600 P-CL DIMENSIONS

Unit size	Dimensions							
	A		B		C		D	
	in.	cm	in.	cm	in.	cm	in.	cm
1/2	6 1/4	15.9	1 1/4	3.2	1/2	1.3	5 3/4	14.6
3/4	6 1/4	15.9	1 1/4	3.2	3/4	1.9	5 3/4	14.6
1	7 1/4	18.4	1 3/8	3.5	1	2.5	6 1/4	15.9
1 1/4	7 7/8	20.0	2	5.1	1 1/4	3.2	8 3/8	21.3
1 1/2	7 7/8	20.0	2	5.1	1 1/2	3.8	8 3/8	21.3
2	9	22.9	2 1/8	5.4	2	5.1	10 5/8	27.0
2 1/2	11 3/4	29.8	3 3/16	8.1	2 1/2	6.4	13 7/8	35.2
3	11 3/4	29.8	3 3/16	8.1	3	7.6	13 7/8	35.2
4	14 1/4	36.2	4 1/4	10.8	4	10.2	16 3/4	42.5

PENBERTHY SIGHT FLOW INDICATORS

DUAL-WINDOW SIGHT FLOW INDICATORS

Series DW

Added protection for pipeline systems in high traffic or confined areas

Dual-window sight flow indicators provide two glass discs on each side, so that if either glass should fail for any reason, the other window can withstand pressures temporarily until the unit can be repaired or replaced. Dual-window sight flow indicators and Factory Mutual System approved dual-window sight flow indicators are available in 150 pressure class NPT models and 150 and 300 pressure class flanged models.

Models

150 pressure class NPT dual-window

- DWF: Dual-window NPT SFI (plain)
- DWFF: Dual-window NPT SFI (flapper)
- DWFR: Dual-window NPT SFI (rotator)
- DWFD: Dual-window NPT SFI (drip tube)

150 pressure class flanged dual-window

- DWF-F: Dual-window flanged SFI (plain)
- DWFF-F: Dual-window flanged SFI (flapper)
- DWFR-F: Dual-window flanged SFI (rotator)
- DWFD-F: Dual-window flanged SFI (drip tube)

300 pressure class flanged dual-window

- DWM-F: Dual-window flanged SFI (plain)
- DWMF-F: Dual-window flanged SFI (flapper)
- DWMR-F: Dual-window flanged SFI (rotator)
- DWMD-F: Dual-window flanged SFI (drip tube)

Dual windows comprise two glass discs on each side held in position by a metallic housing, internal shims and gaskets.

The double, tempered glass window design provides added protection in applications where there is:

- External mechanical impact - if the outer glass is cracked or shattered, the inner glass can temporarily continue in service until the unit can be repaired or replaced.
- Abnormal compressive forces - in maintenance or replacement situations, the housing assists in alignment of the glass and can absorb uneven or excessive compression.
- Thermal shock - in high temperature applications, the inner and outer glass protect one another from an extreme thermal gradient. The air pocket between the glass provides an insulative effect.
- Corrosion - if the inner glass is weakened and it breaks, the outer glass can temporarily contain the fluid, withstand the pressure and continue in service until the unit can be repaired or replaced.

Materials of construction for FM-approved dual-window bodies

Standard:
 ASTM A216 steel gr. WCB*
 ASTM A351/316/316L STS gr. CF3M*

Optional:
 ASTM A494 Monel® gr. M-30C
 ASTM A494 Hastelloy® C CW12MW*
 ASTM A473 Alloy 20 CN-7M*

Gaskets:
 Grafoil®
 Garlock IFG-5500®

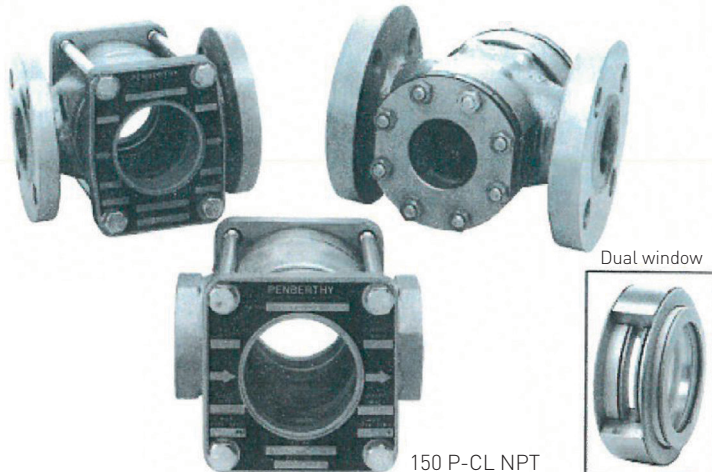
Consult factory for other materials.

NOTE

* Materials of construction for dual-window 300 pressure class flanged body.

150 P-CL FLANGED

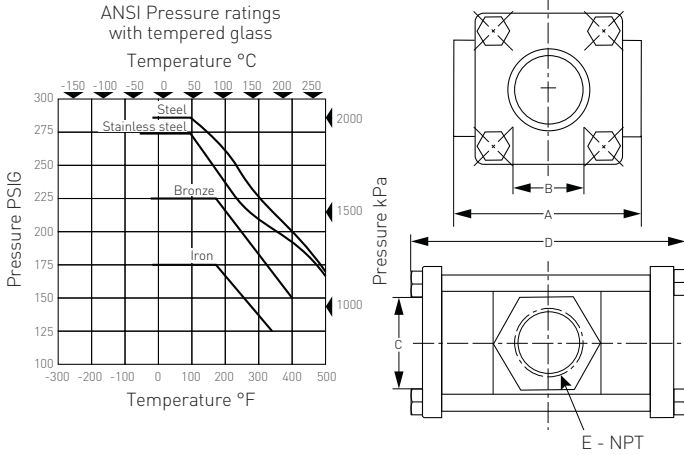
300 P-CL FLANGED



PENBERTHY SIGHT FLOW INDICATORS

DUAL-WINDOW SIGHT FLOW INDICATORS

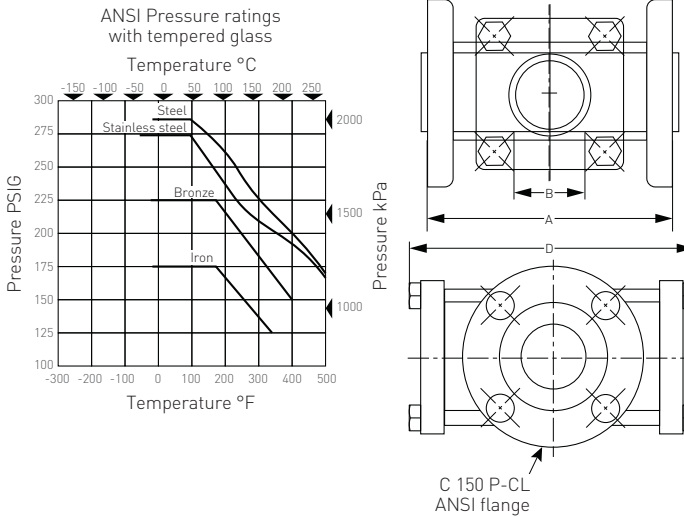
150 P-CL NPT



150 P-CL NPT DIMENSIONS

Unit size	Dimensions									
	A		B		C		D		E	
	in.	cm	in.	cm	in.	cm	in.	cm	in.	cm
1/4	3	7.6	7/8	2.2	1	2.5	3 ¹¹ / ₁₆	9.4	1/4	0.6
3/8	3	7.6	7/8	2.2	1	2.5	3 ¹¹ / ₁₆	9.4	3/8	1.0
1/2	3 ³ / ₄	9.5	1 ¹ / ₄	3.2	1 ¹ / ₂	3.8	5 ³ / ₁₆	13.2	1/2	1.3
3/4	3 ³ / ₄	9.5	1 ¹ / ₄	3.2	1 ¹ / ₂	3.8	5 ³ / ₁₆	13.2	3/4	1.9
1	4 ¹ / ₄	10.8	1 ¹ / ₂	3.8	2	5.1	5 ⁷ / ₈	14.9	1	2.5
1 ¹ / ₄	5 ¹ / ₂	14.0	2 ³ / ₈	6.0	2 ¹ / ₂	6.4	7 ⁵ / ₈	19.4	1 ¹ / ₄	3.2
1 ¹ / ₂	5 ¹ / ₂	14.0	2 ³ / ₈	6.0	2 ¹ / ₂	6.4	7 ⁵ / ₈	19.4	1 ¹ / ₂	3.8
2	6 ¹ / ₄	15.9	2 ⁷ / ₈	7.3	3 ¹ / ₄	8.3	9 ⁵ / ₈	24.4	2	5.1
2 ¹ / ₂	8 ¹ / ₂	21.6	3 ³ / ₄	9.5	4 ¹ / ₈	10.5	12 ⁵ / ₁₆	31.3	2 ¹ / ₂	6.4
3	8 ¹ / ₂	21.6	3 ³ / ₄	9.5	4 ¹ / ₈	10.5	12 ⁵ / ₁₆	31.3	3	7.6

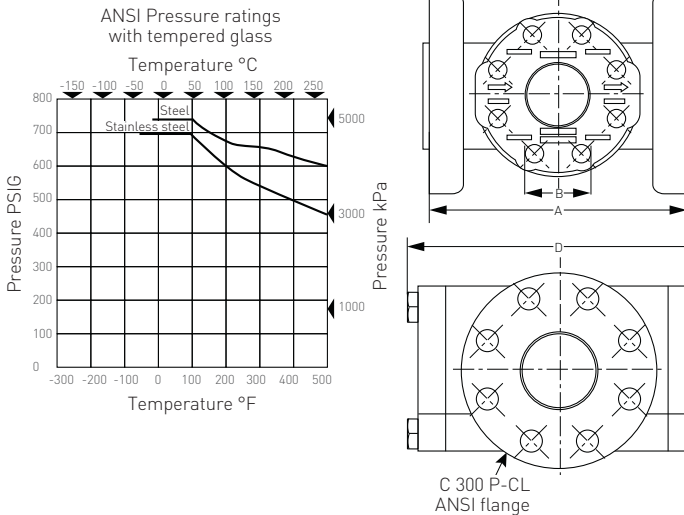
150 P-CL FLANGED



150 P-CL FLANGED DIMENSIONS

Unit size	Dimensions							
	A		B		C		D	
	in.	cm	in.	cm	in.	cm	in.	cm
1/2	4 ⁵ / ₈	11.7	1 ¹ / ₄	3.2	1/2	1.3	5 ³ / ₁₆	13.2
3/4	4 ⁵ / ₈	11.7	1 ¹ / ₄	3.2	3/4	1.9	5 ³ / ₁₆	13.2
1	5 ⁵ / ₈	14.3	1 ¹ / ₂	3.8	1	2.5	5 ⁷ / ₈	14.9
1 ¹ / ₄	6 ¹ / ₂	16.5	2 ³ / ₈	6.0	1 ¹ / ₄	3.2	7 ³ / ₄	19.7
1 ¹ / ₂	6 ¹ / ₂	16.5	2 ³ / ₈	6.0	1 ¹ / ₂	3.8	7 ³ / ₄	19.7
2	7 ⁷ / ₈	20.0	2 ⁷ / ₈	7.3	2	5.1	9 ⁵ / ₈	24.4
2 ¹ / ₂	9 ³ / ₈	23.8	3 ³ / ₄	9.5	2 ¹ / ₂	6.4	12 ⁵ / ₁₆	31.3
3	9 ³ / ₈	23.8	3 ³ / ₄	9.5	3	7.6	12 ⁵ / ₁₆	31.3
4	11	27.9	4 ³ / ₄	12.1	4	10.2	14 ⁷ / ₈	37.8
6	14 ¹ / ₄	36.2	7	17.8	6	15.2	21 ¹³ / ₁₆	55.4
8	16 ¹ / ₈	41.0	9	22.9	8	20.3	25	63.5

300 P-CL FLANGED



300 P-CL FLANGED DIMENSIONS

Unit size	Dimensions							
	A		B		C		D	
	in.	cm	in.	cm	in.	cm	in.	cm
1/2	5 ⁷ / ₈	14.9	1 ¹ / ₄	3.2	1/2	1.3	6 ⁵ / ₈	16.8
3/4	5 ⁷ / ₈	14.9	1 ¹ / ₄	3.2	3/4	1.9	6 ⁵ / ₈	16.8
1	6 ⁷ / ₈	17.5	1 ³ / ₈	3.5	1	2.5	7 ³ / ₄	19.7
1 ¹ / ₄	7 ¹ / ₂	19.1	2	5.1	1 ¹ / ₄	3.2	8 ¹ / ₈	20.6
1 ¹ / ₂	7 ¹ / ₂	19.1	2	5.1	1 ¹ / ₂	3.8	8 ¹ / ₈	20.6
2	8 ⁵ / ₈	21.9	2 ¹ / ₈	5.4	2	5.1	12 ¹ / ₈	30.8
2 ¹ / ₂	11 ³ / ₈	28.9	3 ³ / ₁₆	8.1	2 ¹ / ₂	6.4	16 ³ / ₈	41.6
3	11 ³ / ₈	28.9	3 ³ / ₁₆	8.1	3	7.6	16 ³ / ₈	41.6
4	13 ¹ / ₄	33.7	4 ¹ / ₄	10.8	4	10.2	20	50.8
6	21 ³ / ₈	54.3	6 ¹ / ₄	15.9	6	15.2	27 ³ / ₄	70.5
8	22 ³ / ₈	56.8	6 ¹ / ₄	15.9	8	20.3	27 ³ / ₄	70.5

PENBERTHY SIGHT FLOW INDICATORS

THREADED WINDOW SIGHT FLOW INDICATORS

Series STW

A slender body with easy access windows is a popular alternative to traditional sight flow indicators

Threaded window sight flow indicators are labelled with the company logo as well as pressure and temperature ratings. Available in NPT threaded-end designs, all threaded window sight flow indicator sizes meet ANSI 150 pressure class standards. They are available with all four styles of Penberthy indication.

Models

- STW: NPT threaded window SFI (plain)
- STWF: NPT threaded window SFI (flapper)
- STWR: NPT threaded window SFI (rotator)
- STWD: NPT threaded window SFI (drip tube)

The windows are screwed into the single-piece cast sight flow body.

The threaded window design is an alternative style that is interchangeable with most applications using ANSI 150 pressure class sight flow indicators with bolt-on covers. Instead of unbolting the outer glass covers, these threaded windows are removed for cleaning or replacement with a spanner wrench.

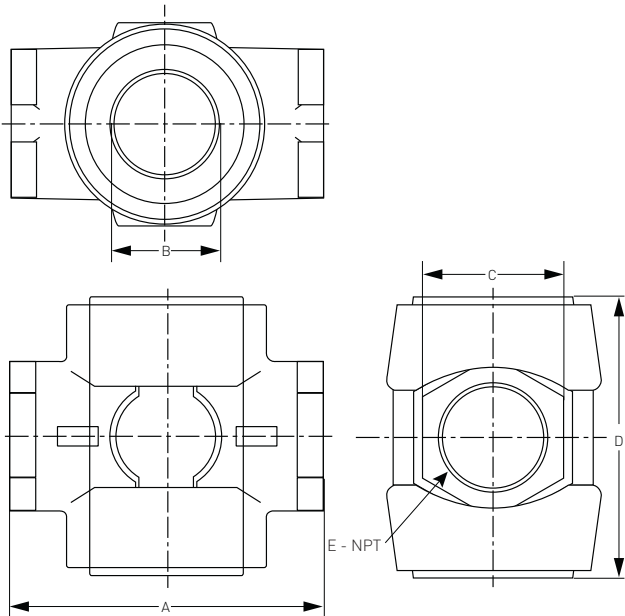
Spanner wrenches for removing windows are available. The spanner wrenches have a 1/2" drive socket to be used with a torque wrench.

Materials of construction for all threaded window bodies

- Standard:
- ASTM A395 Gr. 60-40-18 Ductile iron
- ASTM B148 Alloy C95800 Bronze
- ASTM A216 steel gr. WCB
- ASTM A351/316/316L STS gr. CF3M

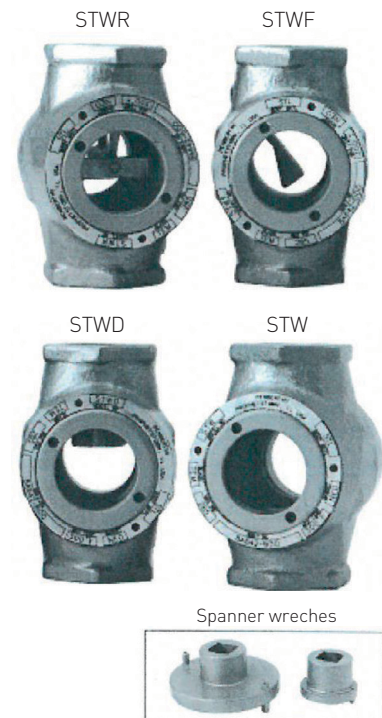
Optional:
 ASTM 494 Monel® gr. M-30C
 ASTM A494 Hastelloy® C CW12MW
 ASTM A734 Alloy 20 CN7M
 Consult factory for other materials.

Material of construction for covers
 Brass and 316 stainless barstock
 All bodies are ANSI 150 pressure class regardless of size.



THREADED WINDOW SIGHT FLOW INDICATORS

Unit size	Dimensions									
	A		B		C		D		E	
	in.	cm	in.	cm	in.	cm	in.	cm	in.	cm
1/4	3	7.6	13/16	2.1	1	2.5	27/16	6.2	1/4	0.6
3/8	3	7.6	13/16	2.1	1	2.5	27/16	6.2	3/8	1.0
1/2	3 3/4	9.5	1 3/16	3.0	1 1/2	3.8	3 5/16	8.4	1/2	1.3
3/4	3 3/4	9.5	1 3/16	3.0	1 1/2	3.8	3 5/16	8.4	3/4	1.9
1	4 1/4	10.8	1 7/16	3.7	2	5.1	3 3/4	9.5	1	2.5
1 1/4	5 1/2	14.0	2 1/4	5.7	2 1/2	6.4	4 1/2	11.4	1 1/4	3.2
1 1/2	5 1/2	14.0	2 1/4	5.7	2 1/2	6.4	4 1/2	11.4	1 1/2	3.8
2	6 1/4	15.9	2 7/8	7.3	3 1/4	8.3	6	15.2	2	5.1



PENBERTHY SIGHT FLOW INDICATORS

AVAILABLE MATERIALS OF CONSTRUCTION

Ductile iron

ASTM A395 Gr 60-40-18

Carbon steel

ASTM A216 Gr WCB

ASTM A352 Gr LCB

Nickel alloys

ASTM A494/A494M Gr M-30C Monel®

ASTM A494 Gr CW12MW Hastelloy® C

ASTM A494 Gr N-12MV Hastelloy® B

Stainless steel

ASTM A351 Gr CF3 (304/304L)

ASTM A351 Gr CF3M (316/316L)

ASTM 743 Gr CN-7M (Alloy 20)

Bronze

ASTM B148 Alloy C95800

ASTM B584 Alloy C89836

ASTM B584 (B61) Alloy C92200

Navy 'M'

Call factory for special material inquiries

Cushions

Neoprene®

Garlock IFG-5500®

Buna N

Viton®

Shields

Mica

PCTFE (Kel-F®)

Glass disks

Borosilicate (tempered)

Quartz

Metaglas®

Gasket materials

Neoprene®

Garlock IFG-5500®

Buna N

PTFE (Teflon®)

Viton®

Grafoil®

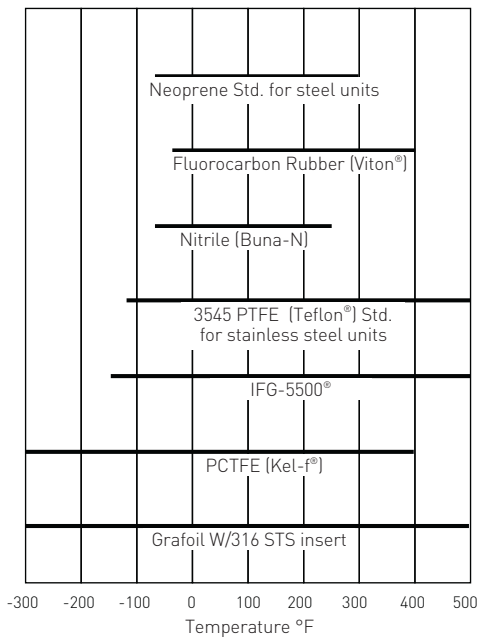
PCTFE (Kel-F®)

Options

Socket weld connections; special material bolts and nuts; instrument plug; corrosion protection (paint, protector, STS fasteners).

Sight flow indicators can be made to conform to NACE MR0175 or MR0103 standards, consult factory.

Design limits of gasket material



Grafoil® is a registered trademark of GrafTech Inc.
 PCTFE (Kel-F®) is a registered trademark of 3M Company, now manufactured by Daikin.
 3545 and IFG 5500® are registered trademarks of Garlock.
 Neoprene®, Tefzel® and Viton® are registered trademarks of E.I. DuPont de Nemours and Co.

PENBERTHY SIGHT FLOW INDICATORS

THREADED SIGHT WINDOWS

A quick solution for pipe or tank observation

Available with brass or stainless steel retaining rings, these sight windows can be used anywhere that a 1/4" to 3" piping 'T' or a female NPT exists.

The Threaded Sight Windows are rated at ANSI 150 P-CL using tempered borosilicate glass.

Models

WTSL.....Threaded Sight Windows

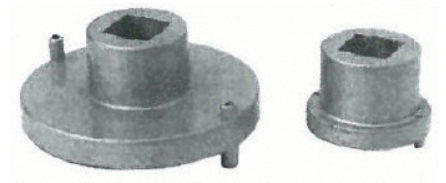
The Threaded Sight Window is similar in design to the Threaded Window Sight Flow Indicator.

The outer retaining ring compresses the glass between the gasket and cushion.

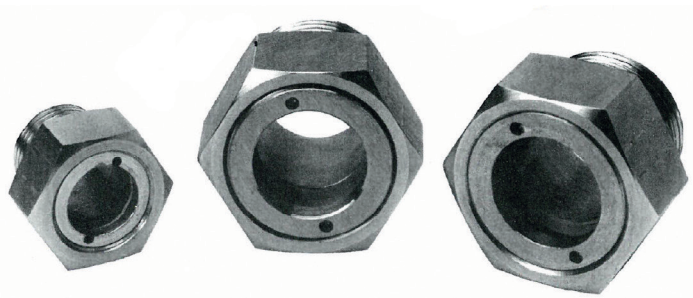
Spanner wrenches for window removal are available from Penberthy. The spanner wrenches have a 1/4" or 1/2" drive socket for torque wrench. All Threaded Sight Windows are machined from hex barstock.

Materials of construction for threaded glass housing

Hex Brass, Carbon Steel and Stainless Steel barstock. Consult factory for other material.

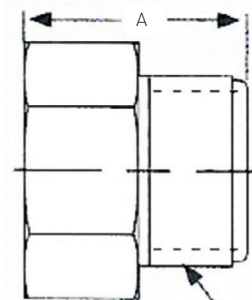
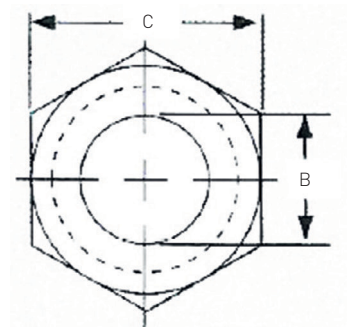


Spanner wrenches



THREADED SIGHT WINDOWS

Unit size	Dimensions							
	A		B		C		D	
	in.	cm	in.	cm	in.	cm	in.	cm
1/4	29/32	2.3	11/32	0.9	7/8	2.2	1/4	0.6
3/8	1	2.5	15/32	1.2	1	2.5	3/8	1.0
1/2	1 1/8	2.9	19/32	1.5	1 1/8	2.9	1/2	1.3
3/4	1 3/8	3.5	3/4	1.9	1 3/8	3.5	3/4	1.9
1	1 9/16	4.0	15/16	2.4	1 9/16	4.1	1	2.5
1 1/4	1 13/16	4.6	1 9/32	3.3	2	5.1	1 1/4	3.2
1 1/2	1 15/16	4.9	1 9/16	4.0	2 1/4	5.7	1 1/2	3.8
2	2 7/32	5.8	1 15/16	4.9	2 3/4	7.0	2	5.1
2 1/2	2 11/16	6.8	2 5/16	5.9	3 1/2	8.9	2 1/2	6.4
3	3 1/8	7.9	2 15/16	7.5	4 1/2	11.4	3	7.6



'D' NPT

Specifications subject to change without notice

PENBERTHY SIGHT FLOW INDICATORS

CROSS REFERENCE GUIDE

Use Emerson's Penberthy sight flow indicators or settle for second best. When designing a new process flow system or replacing an existing model, incorporate Penberthy models by using this cross reference chart and install with confidence.

Description	Penberthy	Jacoby-Tarbox	Papailias Co.
ANSI 150 P-CL SFI - Flapper	SFF	100-S	FIS-F
ANSI 150 P-CL SFI - NPT Rotator	SFR	200-S	FIS-R
ANSI 150 P-CL NPT - Drip tube	SFD	300-S	FIS-D
ANSI 300 P-CL High pressure SFI	SM-F	F-910-HP 300 P-CL	FIF-F/HP3
ANSI 600 P-CL High pressure SFI	SH-F	F-910-HP 600 P-CL	FIF-F/HP6
FM Approved 300 P-CL Dual window SFI-Flanged	DWM-F	F-910-HP (FM)	-
FM Approved 150 P-CL Dual window SFI-Flanged	DWF-F	910F (NF)(FM)	-
FM Approved 150 P-CL Dual window SFI-Flanged	DWF	S-100-HP (FM)	-
Threaded window SFI - Flapper	STWF	100-S	-
Threaded window SFI - Rotator	STWR	300-S	-
Threaded window SFI - Drip tube	STWD	200-S	-
Threaded sight window 150 P-CL	WTSL	S-5400	-

SPECIAL SIGHT FLOW INDICATORS

In addition to the broad standard range of Penberthy sight flow indicators, Emerson has the ability to create innumerable variants and unique solutions. Our metallurgy staff is capable of creating unique casting designs, with SFIs up to 16" having been produced.

Some industries require special connections with high precision machining needed to achieve the mandatory tight tolerances. We can use our skilled machinists to create a large variety of connection ends including butt-weld or socket weld end connections. Flat surfaces are cast into bodies to provide for gaging and sampling ports.

PENBERTHY SIGHT FLOW INDICATORS

ORDERING INFORMATION SIGHT FLOW PART 1

SELECTION GUIDE

PART 2 - PAGE 14

Example:	SF	P	A	C	S	M	X	N	G	B	X	E	A	C	D	E
Model description																
SF	P CL 150															
SM	P CL 300															
SH	P CL 600															
DWF	Dual window P CL 150															
DWM	Dual window P CL 300															
STW	Threaded window P CL 150															
Operation style																
P	Plain															
R	Rotator															
F	Flapper															
D	Drip tube															
Size																
A	1/4"															
J	2"															
B	3/8"															
K	2 1/2"															
C	1/2"															
L	3"															
E	3/4"															
M	4"															
F	1"															
N	6"															
G	1 1/4"															
P	8"															
H	1 1/2"															
Wetted parts material																
C	Carbon steel															
M	Monel															
S	316-316L SST															
A	Alloy 20															
B	Bronze															
H	Hastelloy C															
G	Dugtile iron															
J	304/304 L SST															
Cover material																
C	Carbon steel															
M	Monel															
S	316-316L SST															
A	Alloy 20															
B	Bronze															
H	Hastelloy C															
G	Dugtile iron															
J	304/304 L SST															
Bolting material																
C	STL A193 B7/A194 2H															
N	STL NACE A193 B7M/A194 2HM															
S	SST A193 B8M/A194 8M															
G	STL A320 L7/A194 Gr.4															
M	Monel 400 B164															
J	SST A193 B8/A194 8															
NACE MR-01-75 and/or MR-01-03																
X	None															
W	NACE wetted															
E	Environmental															
Connection type																
N	NPT female															
F	Flat face flanged (bronze/iron)															
R	Raised face flanged															
S	Socket weld female															

PENBERTHY SIGHT FLOW INDICATORS

ORDERING INFORMATION SIGHT FLOW PART 2

SELECTION GUIDE

Example:	G	B	X	E	A	C	D	E
Gasket material								
G Grafoil w/Mylar insert								
N Neoprene								
A Garlock IFG-5500								
P PCTFE								
S Grafoil w/SST insert								
T PTFE 3545								
J Gylon 3500								
U Buna-N								
K Garlock 3300								
V Viton								
L Gylon 3510								
Y Gylon 3504								
Cushion material								
G Grafoil w/Mylar insert								
N Neoprene								
A Garlock IFG-5500								
T PTFE 3545								
S Grafoil w/SST insert								
U Buna-N								
J Gylon 3500								
V Viton								
K Garlock 3300								
Y Gylon 3504								
L Gylon 3510								
Paint specification								
X None								
F Inter. 228, 228								
S Standard								
G Ameron D9, 2, 450H								
O Offshore Spec 2600 paint								
H Amercoat 872								
A Offshore Spec 2600 paint only								
J Ameron D9								
D Ameron D9, 450H								
K Inter. 269, 990								
E Ameron D9, PSX892HS								
Option 1 description								
X None								
C PCTFE shields								
E Quartz								
T TFE lined body								
M Metaglas								
R Metaglas/PCFTE shields								
A Mica shields V-4								
Option 2 description								
X None								
B 125-250 AARH finish								
A Nameplate on back side								
Option 3 description								
X None								
D 316 SST flapper								
A Bolt-on flange protectors								
E Special Teflon flapper								
B Screw heads on back side								
F Tefzel lined body								
C Hastelloy C rotator pin								
Option 4 description								
X None								
E Cover Offshore painted								
A Belleville washers								
F Origin not China/India/EEUR								
C Screw heads on back side								
G Dye penetrant test casting								
D Place of origin not China								
Option 5 description								
X None								
E USA origin only								
A For John C. Ernst Co.								
F Special thickness								
B For cleveland gear								
G Ultrasonic test casting								
C Special screw length								
H Radiographic test casting								
D For archon								

PENBERTHY SIGHT FLOW INDICATORS

ORDERING INFORMATION SIGHT WINDOW

SELECTION GUIDE

Example:		WTSL	A	C	S	X
Model description						
WTSL NPT male sight window 150 P CL						
Size						
A	1/4"		G	1/4"		
B	3/8"		H	1/2"		
C	1/2"		J	2"		
E	3/4"		K	2 1/2"		
F	1"		L	3"		
Body material						
C	Carbon steel		A	Alloy 20		
S	316-316L SST		H	Hastelloy C		
M	Monel		B	Bronze		
Cover material						
S	316-316L SST		B	Bronze		
NACE MR-01-75 and/or MR-01-03						
X	None					
W	NACE wetted					
E	Environmental					

SELECTION GUIDE (CONTINUED)

Example:		G	S	X	A
Gasket material					
G	Grafoil w/Mylar insert		U	Buna-N	
S	Grafoil w/SST insert		V	Viton	
A	Garlock IFG-5500		N	Neoprene	
T	PTFE 3545				
Cushion material					
G	Grafoil w/Mylar insert		A	Garlock IFG-5500	
S	Grafoil w/SST insert		T	PTFE 3545	
Paint specification					
X	None		S	Standard	
Option 1 description					
X	None		A	USA only	

Neither Emerson, Emerson Automation Solutions, nor any of their affiliated entities assumes responsibility for the selection, use or maintenance of any product. Responsibility for proper selection, use, and maintenance of any product remains solely with the purchaser and end user.

Penberthy is a mark owned by one of the companies in the Emerson Automation Solutions business unit of Emerson Electric Co. Emerson Automation Solutions, Emerson and the Emerson logo are trademarks and service marks of Emerson Electric Co. All other marks are the property of their respective owners.

The contents of this publication are presented for informational purposes only, and while every effort has been made to ensure their accuracy, they are not to be construed as warranties or guarantees, express or implied, regarding the products or services described herein or their use or applicability. All sales are governed by our terms and conditions, which are available upon request. We reserve the right to modify or improve the designs or specifications of such products at any time without notice.

Emerson.com/FinalControl