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FLUIDVISION™

Sight Flow Indicators/Sight Windows

PENBERTHY



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TABLE OF CONTENTS

Penberthy Overview	4-5
Sight Flow Indicator Overview.	6
Gaseous Sight Flow Indicator	7
Teflon®, Tefzel® Lined Sight Flow Indicators	8
ANSI 150# Sight Flow Indicators	9
ANSI 300#, 600# HP Sight Flow Indicators	10-11
Dual-Window Sight Flow Indicators (FM Approved)	12-13
Full-View Sight Flow Indicators	14-15
Armored Full-View Sight Flow Indicators.....	16-17
Threaded Window Sight Flow Indicators.....	18
Special Sight Flow Indicators.....	19
Available Materials of Construction.....	20
Threaded Sight Windows	21
Conventional Sight Windows.....	22-23
Oblong Sight Windows.....	24
Cross Reference Guide	25
Terms and Conditions - Warranty	26
Penberthy Full Line.....	27

Helping Industry Put Quality in Their Process for Over 100 Years

Mission

Superior customer service and the production of the highest quality products available anywhere constitute Penberthy's formula for success. We offer expert applications assistance, a dedicated customer service department, and a worldwide distribution network to serve your needs in a timely fashion. Our commitment to ISO 9000 guarantees high-quality products time and time again. We have been meeting the needs of customers like yourself for over 100 years.



Penberthy, circa 1900

History

Penberthy began manufacturing operations in Detroit, Michigan when Mr. S.O. Johnson purchased William Penberthy's boiler feedwater injector patent in 1886. By the late 1930's Penberthy had developed a variety of jet pumps (eductors, ejectors, injectors) and was establishing itself in the liquid level gage and valve market.

Today, in Prophetstown, Illinois, we continue to expand our product base by listening to customers, through market evaluation, and with innovative product design. We offer a wide array of products including liquid level gages and valves, jet pumps, FLUIDVISION™ sight flow indicators, LEVELMARK™ level instrumentation, MULTIVIEW™ magnetic liquid level meters, and PENTEMP™ temperature sensors. Our innovative engineering department, exclusive foundry, and manufacturing facility have helped make us an industry leader in the design, manufacture and support of these product lines.

Product Design

Application expertise is one of our underlying strengths. With over 100 years of design and manufacturing



experience, we have acquired a vast amount of practical knowledge and useful data. We have a multitude of performance curves and design criteria for our standard products. As a result, standard models can meet applications with any number of pressure, temperature, flow or process material characteristics.



We also have engineered thousands of specialty products with unusual configurations and performance characteristics. In many instances, only minor changes to existing products such as special connections or materials of construction may be needed to meet special customer requirements. For applications outside typical design parameters, we can apply our vast design experience to find unique solutions for customer applications. We have the ability to evaluate any number of performance conditions.

A few of the tools available for research, development, and testing include: a pressure, temperature, and humidity controlled vessel to simulate unique environmental conditions; an instrumentation lab; and dedicated steam, air/gases and water for use as motive pressure/test fluids.





Exclusive Foundry

Casting a component can be significantly less expensive than machining from barstock. Our captive on-site foundry is extremely flexible and responsive when casting to customer requirements. The ability to modify patterns or pour any of 29 standard materials of construction on a moment's notice provides our customers with one of the most versatile resources in the industry.

While most companies are at the mercy of a "job-shop" foundry, we can do instant spectrometer monitoring of casting quality and immediate expediting when requested. Controlling the production process from metal forming through processing to shipping contributes to our overall product excellence.

Material Conversion

Machining precision also helps put quality and performance into our products. Highly productive, versatile NC machines are found throughout our facility. The latest machining technology, coupled with experienced machinists and quality control personnel, help make possible our commitment to the highest quality products.

Penberthy also operates a Just-In-Time manufacturing facility. Short throughput

times, small lot sizes, quick change tooling and flexibility give the manufacturing department the tools necessary to respond to emergency and specialty requirements. JIT provides our customers with a timely and cost effective production system.

Customer Service

Penberthy's product quality, value, and applications assistance is highly accessible. With over 150 distributors and over 30 representatives worldwide, we can provide you with information and products whenever you need them. In an effort to bring the best possible solutions to our customers, we continuously train and support our distributors and representatives.

Since prompt delivery is important to our customers, our distributors and representatives have local inventory on hand to deliver the products you need when you need them. If parts or components are not immediately available, you can be assured that our customer service representatives will make every effort to ensure on-time delivery.

Our commitment to you, the customer, makes your process equipment and instrumentation choice simple. You'll put quality into your process when you use Penberthy equipment.



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 as follows:

Body:

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

Glass:

provides the viewing window to the process flow stream.

Gasket:

compressed to tightly seal the gap and prevent leaking between the glass and body.

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 (below)

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



Flapper (below)

A flapper sight flow indicator can be used in a liquid application where there is a great enough liquid mass impact to lift 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 (right)

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 (above)

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 or vertically downward flow can be observed.



Gaseous Sight Flow Indicators

When common indicators can't provide the sensitivity your application demands, turn to the Gaseous Sight Flow Indicator.

The Gaseous Sight Flow Indicator is the answer to detecting low velocity fluid streams. A Gaseous Sight Flow Indicator can be used in a fluid application where there is an air equivalent mass impact at a velocity of 2 feet per second or greater. Fluid medium can be either dry or wet gas.

A lightweight composite of Fluon®, Teflon®, and glass provides an excellent material for the gaseous indication flapper. The material has excellent wear-resistance, heat resistance, and anti-friction characteristics. The indicator material meets MIL-1-18746A specifications.

The composite material is dimensionally stable under heat and pressure and is resistant to cut-through and cold-flow. The indicator material is adequate for temperatures ranging from -400° F (-205° C) to 500° F (260° C). Steam may be the fluid medium in Gaseous Sight Flow Indicators with mica shields up to the design temperature of 500° F (260° C). The gaseous indication flapper material has excellent resistance to all solvents, acids, fuels, weathering, moisture, and chemicals except fluorine at high temperatures and certain complex organic halogens, like Freon.

The indicator is similar in operation to a hinged flapper. When the fluid meets the fringed indicator sheet, the material flutters, indicating flow. Transparent or slightly opaque fluids can be monitored effectively. The Gaseous Sight Flow Indicator is most effective in horizontal applications but can be used in vertically upward flow applications.



The Gaseous Sight Flow Indicator is ideal for industries such as:

- Petroleum/light fuel/solvents
- Laboratory and industrial chemical process
- HVAC (heating, venting, air conditioning)
- Sinking/dewatering wellpoint
- Flue gas
- Sewage treatment (raw, sludge, treated, effluent)

The indicator can be used to indicate:

- System gas leaks
- Chemical reaction pressures exceeding that of atmospheric
- Low velocity flow streams from natural gas wells
- Presence of superheated steam (superheat temperature must not exceed 500° F (260° C).

Gaseous Sight Flow Indicators are available in most Penberthy sight flow indicator models. The Gaseous Sight Flow Indicators are constructed similarly to the flapper model indicators. If a sight flow indicator is available with a flapper, it can be converted to a gaseous model. The Gaseous Sight Flow Indicator models are designated in each product class by the final letter "G".

Specifications subject to change without notice.

Teflon® and Tefzel® Lined Sight Flow Indicators

Teflon® Lined



Tefzel® Lined



Tefzel® Lined



Teflon® and Tefzel® are registered trademarks of DuPont.

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 special Teflon® drip tube or single-sheet flutter flapper indicators.

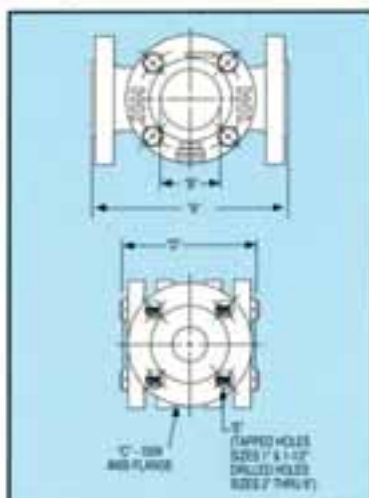
Teflon® resins are essentially chemically inert. The only known chemicals that react with Teflon® are molten alkali metals, turbulent fluorine and a few fluoro-chemicals and halogenated organic chemicals. Teflon® lined bodies are available with drip tube and flutter flapper style indicators. With Teflon® 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 Penberth® Sight Flow Indicator plain flanged bodies 1" or larger. Pressure and temperature ratings will depend on the materials of construction and sight flow indicator model selected.

Teflon®



Teflon® Dimensions

UNIT SIZE	DIMENSIONS IN INCHES & (CM)				
	"A"	"B"	"C"	"D"	"E"
1	7 (17.8)	1-1/2 (3.8)	1 (2.5)	4-5/8 (11.7)	1/2-1/3 (1.3)
1-1/2	8 (20.3)	2-3/8 (6.0)	1-1/2 (3.8)	5-5/8 (14.3)	1/2-1/3 (1.3)
2	9 (22.9)	2-7/8 (7.3)	2 (5.1)	6-5/8 (16.8)	3/4 (1.9)
3	11 (27.9)	3-3/4 (9.5)	3 (7.6)	8-1/4 (21.0)	3/4 (1.9)
4	13 (33.0)	4-3/4 (12.1)	4 (10.2)	9-1/4 (23.5)	3/4 (1.9)
6	16 (40.6)	7 (17.8)	6 (15.2)	12-3/4 (32.4)	7/8 (2.2)
8	18 (45.7)	9 (22.9)	8 (20.3)	16-1/8 (41.0)	7/8 (2.2)

Specifications subject to change without notice.

ANSI 150# Sight Flow Indicators

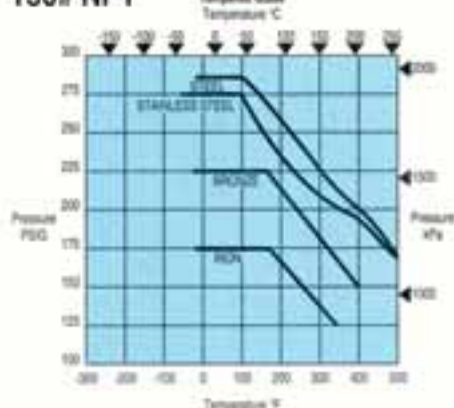
For common process flow stream pressures, use the industry standard...

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 SFI's are available with all five styles of Penberthy indication.

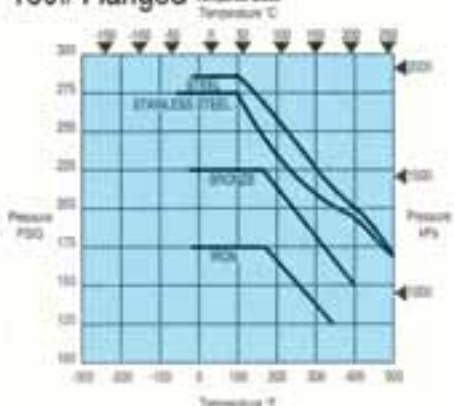
Models

SF Plain NPT Sight Flow Indicator
 SFF NPT SFI (Flapper)
 SFR NPT SFI (Rotator)
 SFD NPT SFI (Drip Tube)
 SFG NPT SFI (Gaseous)
 SF - F Plain Flanged Sight Flow Indicator
 SFF - F Flanged SFI (Flapper)
 SFR - F Flanged SFI (Rotator)
 SFD - F Flanged SFI (Drip Tube)
 SFG - F Flanged SFI (Gaseous)

150# NPT



150# Flanged



Materials of construction for body

Standard:
 ASTM A126 Iron Class B
 ASTM B62 Bronze Alloy 836
 ASTM A216 Steel Gr WCB
 ASTM A351/A296 316 STS Gr CF8M

Optional:
 ASTM 494 Monel Gr M-35-1
 ASTM A494 Hastelloy C CW12MW
 ASTM A743 Alloy 20 CN7M
 Consult Factory and pg. 20 for other materials/components

Flanged



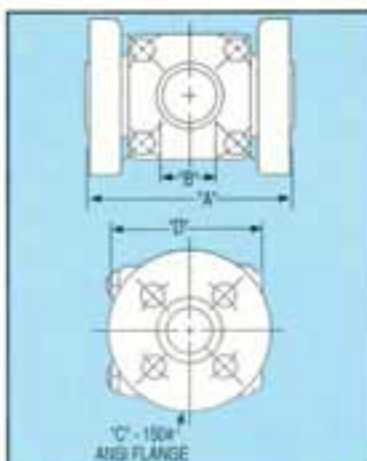
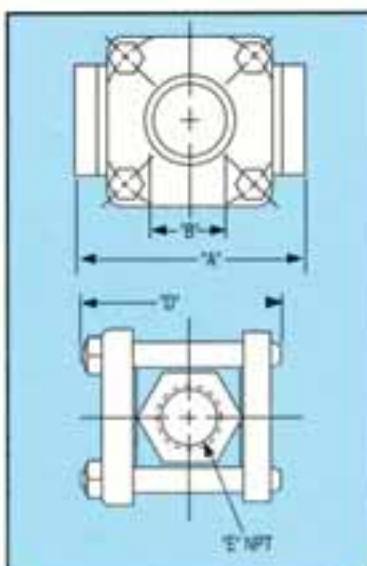
NPT

150# NPT Dimensions

UNIT SIZE	DIMENSIONS IN INCHES & CM				
	"A"	"B"	"C"	"D"	"E"
1/4	3 (7.6)	7/8 (2.2)	1 (2.5)	2-11/16 (6.8)	1/4 (0.6)
3/8	3 (7.6)	7/8 (2.2)	1 (2.5)	2-11/16 (6.8)	3/8 (1.0)
1/2	3-3/4 (9.5)	1-1/4 (3.2)	1-1/2 (3.8)	3-3/16 (8.1)	1/2 (1.3)
3/4	3-3/4 (9.5)	1-1/4 (3.2)	1-1/2 (3.8)	3-3/16 (8.1)	3/4 (1.9)
1	4-1/4 (10.8)	1-1/2 (3.8)	2 (5.1)	4-1/4 (10.8)	1 (2.5)
1-1/4	5-1/2 (14.0)	2-3/8 (6.0)	2-1/2 (6.4)	5 (12.7)	1-1/4 (3.2)
1-1/2	5-1/2 (14.0)	2-3/8 (6.0)	2-1/2 (6.4)	5 (12.7)	1-1/2 (3.8)
2	6-1/4 (15.9)	2-7/8 (7.3)	3-1/4 (8.3)	6-5/16 (16.0)	2 (5.1)
2-1/2	8-1/2 (21.6)	3-3/4 (9.5)	4-1/8 (10.5)	8-1/8 (20.6)	2-1/2 (6.4)
3	8-1/2 (21.6)	3-3/4 (9.5)	4-1/8 (10.5)	8-1/8 (20.6)	3 (7.6)

150# Flanged Dimensions

UNIT SIZE	DIMENSIONS IN INCHES & CM			
	"A"	"B"	"C"	"D"
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)	4-1/2 (11.4)
1-1/4	6-1/2 (16.5)	2-3/8 (6.0)	1-1/4 (3.2)	5-3/4 (14.6)
1-1/2	6-1/2 (16.5)	2-3/8 (6.0)	1-1/2 (3.8)	5-3/4 (14.6)
2	7-7/8 (20.0)	2-7/8 (7.3)	2 (5.1)	7-3/8 (18.7)
2-1/2	8-3/8 (23.8)	3-3/4 (9.5)	2-1/2 (6.4)	8-15/16 (22.7)
3	8-3/8 (23.8)	3-3/4 (9.5)	3 (7.6)	8-15/16 (22.7)



Specifications subject to change without notice.

ANSI 300# and 600# High Pressure Sight Flow Indicators



300#



600#

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# requirements. Made from single-piece, cast-construction bodies, these SFIs are available with all five styles of Penberthy indication.

Models

300# SERIES

- SM-F.....Plain Flanged Sight Flow Indicator
- SMF-F.....Flanged SFI (Flapper)
- SMR-F.....Flanged SFI (Rotator)
- SMD-F.....Flanged SFI (Drip Tube)
- SMG-F.....Flanged SFI (Gaseous)

600# SERIES

- SH-F.....Plain Flanged Sight Flow Indicator
- SHF-F.....Flanged SFI (Flapper)
- SHR-F.....Flanged SFI (Rotator)
- SHD-F.....Flanged SFI (Drip Tube)
- SHG-F.....Flanged SFI (Gaseous)

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.

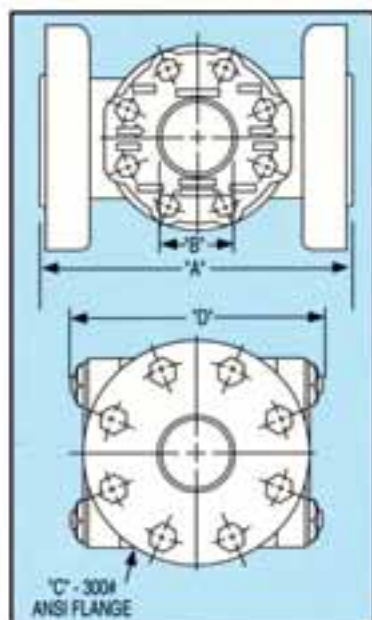
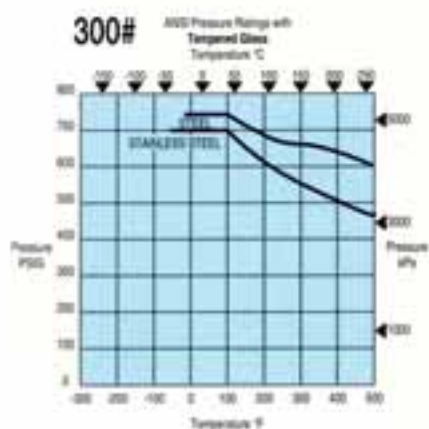
Materials of Construction for Body

Standard:

- ASTM A216 Steel Gr WCB
- ASTM A351/A296 316 STS Gr CF8M

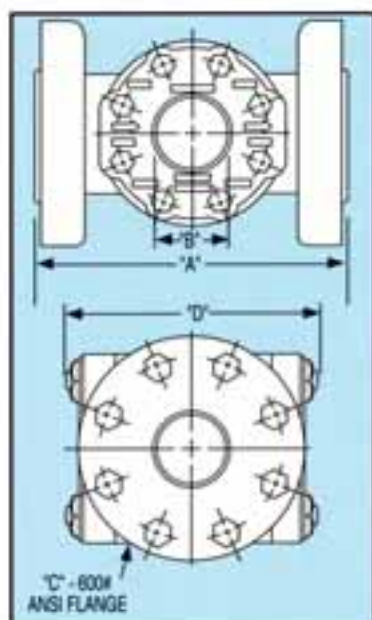
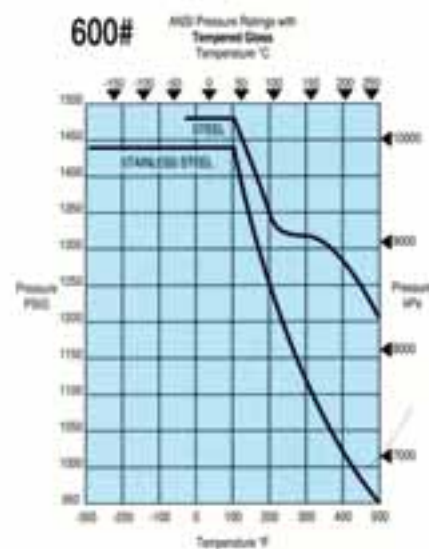
Optional:

- ASTM 494 Monel Gr M-35-1
- ASTM A494 Hastelloy C CW12MW
- ASTM A473 Alloy 20 CN7M
- Consult Factory and pg. 20 for other materials/components



300# Dimensions

UNIT SIZE	DIMENSIONS IN INCHES & CM			
	"A"	"B"	"C"	"D"
1/2	5-7/8 (14.9)	1-1/4 (3.2)	1/2 (1.3)	4-1/8 (10.5)
3/4	5-7/8 (14.9)	1-1/4 (3.2)	3/4 (1.9)	4-1/8 (10.5)
1	6-7/8 (17.5)	1-3/8 (3.5)	1 (2.5)	4-7/8 (12.4)
1-1/4	7-1/2 (19.1)	2 (5.1)	1-1/4 (3.2)	5-7/8 (14.9)
1-1/2	7-1/2 (19.1)	2 (5.1)	1-1/2 (3.8)	5-7/8 (14.9)
2	8-5/8 (21.9)	2-1/8 (5.4)	2 (5.1)	7-3/8 (18.7)
2-1/2	11-3/8 (29.9)	3-3/16 (8.1)	2-1/2 (6.4)	9-5/8 (24.4)
3	11-3/8 (29.9)	3-3/16 (8.1)	3 (7.6)	9-5/8 (24.4)
4	13-1/4 (33.7)	4-1/4 (10.8)	4 (10.2)	11-1/2 (29.2)
6	21-3/8 (54.3)	6-1/4 (15.9)	6 (15.2)	17 (43.2)
8	22-3/8 (56.8)	6-1/4 (15.9)	8 (20.3)	17 (43.2)



600# Dimensions

UNIT SIZE	DIMENSIONS IN INCHES & CM			
	"A"	"B"	"C"	"D"
1/2	6-1/4 (15.9)	1-1/4 (3.2)	1/2 (1.3)	5 (12.7)
3/4	6-1/4 (15.9)	1-1/4 (3.2)	3/4 (1.9)	5 (12.7)
1	7-1/4 (18.4)	1-3/8 (3.5)	1 (2.5)	5-3/4 (14.6)
1-1/4	7-7/8 (20.0)	2 (5.1)	1-1/4 (3.2)	7-1/8 (18.1)
1-1/2	7-7/8 (20.0)	2 (5.1)	1-1/2 (3.8)	7-1/8 (18.1)
2	9 (22.9)	2-1/8 (5.4)	2 (5.1)	8-5/8 (21.9)
2-1/2	11-3/4 (29.8)	3-3/16 (8.1)	2-1/2 (6.4)	11-7/8 (30.2)
3	11-3/4 (29.8)	3-3/16 (8.1)	3 (7.6)	11-7/8 (30.2)
4	14-1/4 (36.2)	4-1/4 (10.8)	4 (10.2)	14-1/2 (36.8)
6	23-3/8 (59.4)	5-3/8 (13.7)	6 (15.2)	19-3/4 (50.2)
8	24-5/8 (62.5)	5-3/8 (13.7)	8 (20.3)	19-3/4 (50.2)

Dual-Window Sight Flow Indicators

In high traffic or confined areas add protection to your pipeline system...

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 temporarily withstand pressures 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# NPT Models and 150# and 300# Flanged Models.

Models

150# NPT Dual-Window

DWF Plain Dual-Window NPT SFI
 DWFF Dual-Window NPT SFI (Flapper)
 DWFR Dual-Window NPT SFI (Rotator)
 DWFD Dual-Window NPT SFI (Drip Tube)
 DWFG Dual-Window NPT SFI (Gaseous)

150# Flanged Dual-Window

DWF-F Plain Dual-Window
 Flanged NPT SFI
 DWFF-F Dual-Window NPT SFI
 Flanged (Flapper)
 DWFR-F Dual-Window NPT SFI
 Flanged (Rotator)
 DWFD-F Dual-Window NPT SFI
 Flanged (Drip Tube)
 DWFG-F Dual-Window NPT SFI
 Flanged (Gaseous)

300# Flanged Dual-Window

DWM - F Plain Dual-Window
 Flanged NPT SFI
 DWMF - F Dual-Window NPT SFI
 Flanged (Flapper)
 DWMR-F Dual-Window NPT SFI
 Flanged (Rotator)
 DWMD-F Dual-Window NPT SFI
 Flanged (Drip Tube)
 DWMG-F Dual-Window NPT SFI
 Flanged (Gaseous)

Dual windows are comprised of two glass discs held in position by a metallic housing, internal shims and gaskets (pictured above).



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/erosion - 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 A126 Steel Gr WCB
 ASTM A351/A296 316 STS Gr CF8M
 ASTM A473 Alloy 20 CN7M

Optional:

ASTM 494 Monel Gr M-35-1
 ASTM A494 Hastelloy C CW12MW

Gaskets:

Grafoil®
 Nobestos®
 Asbestos

Materials of Construction for Dual-Window 150 PSIG NPT or Flanged Body

Standard:

ASTM A126 Iron Class B
 ASTM B62 Bronze Alloy 836
 ASTM A216 Steel Gr WCB*
 ASTM A351/A296 316 STS Gr CF8M*

Optional:

ASTM 494 Monel Gr M-35-1
 ASTM A494 Hastelloy C CW12MW*
 ASTM A743 Alloy 20 CN7M*
 Consult Factory and pg 20 for other materials/ components
 *Materials of Construction for Dual-Window 300# Flanged Body

150# NPT Dimensions

UNIT SIZE	DIMENSIONS IN INCHES & (CM)				
	"A"	"B"	"C"	"D"	"E"
1/4	3 (7.6)	7/8 (2.2)	1 (2.5)	3-7/8 (9.8)	1/4 (0.6)
3/8	3 (7.6)	7/8 (2.2)	1 (2.5)	3-7/8 (9.8)	3/8 (1.0)
1/2	3-3/4 (9.5)	1-1/4 (3.2)	1-1/2 (3.8)	4 (10.0)	1/2 (1.3)
3/4	3-3/4 (9.5)	1-1/4 (3.2)	1-1/2 (3.8)	4 (10.0)	3/4 (1.9)
1	4-1/4 (10.8)	1-1/2 (3.8)	2 (5.1)	5-1/4 (13.1)	1 (2.5)
1-1/4	5-1/2 (14.0)	2-3/8 (6.0)	2-1/2 (6.4)	6-1/2 (16.3)	1-1/4 (3.2)
1-1/2	5-1/2 (14.0)	2-3/8 (6.0)	2-1/2 (6.4)	6-1/2 (16.3)	1-1/2 (3.8)
2	6-1/4 (15.9)	2-7/8 (7.3)	3-1/4 (8.3)	8-1/2 (21.3)	2 (5.1)
2-1/2	8-1/2 (21.6)	3-3/4 (9.5)	4-1/8 (10.5)	10-3/4 (27.3)	2-1/2 (6.4)
3	8-1/2 (21.6)	3-3/4 (9.5)	4-1/8 (10.5)	10-3/4 (27.3)	3 (7.6)

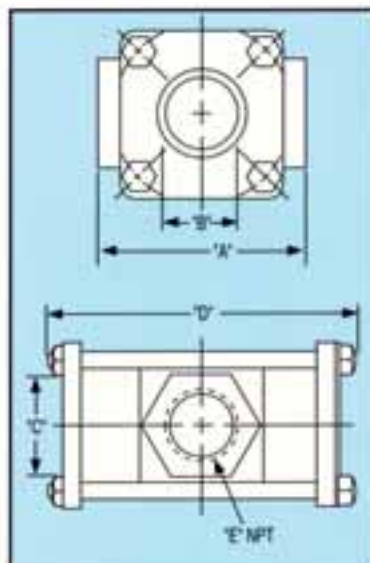
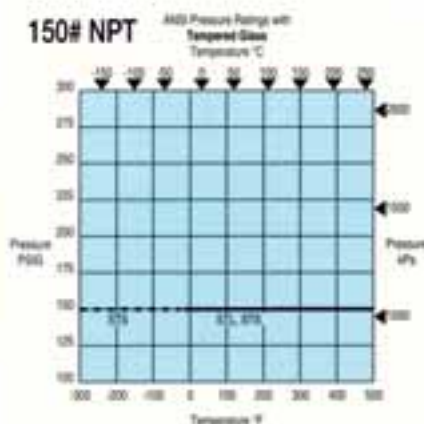
150# Flanged Dimensions

UNIT SIZE	DIMENSIONS IN INCHES & (CM)			
	"A"	"B"	"C"	"D"
1/2	4-5/8 (11.7)	1-1/4 (3.2)	1/2 (1.3)	4-11/16 (11.9)
3/4	4-5/8 (11.7)	1-1/4 (3.2)	3/4 (1.9)	4-11/16 (11.9)
1	5-5/8 (14.3)	1-1/2 (3.8)	1 (2.5)	5-3/4 (14.6)
1-1/4	6-1/2 (16.5)	2-3/8 (6.0)	1-1/4 (3.6)	7-1/4 (18.4)
1-1/2	6-1/2 (16.5)	2-3/8 (6.0)	1-1/2 (3.8)	7-1/4 (18.4)
2	7-7/8 (20.0)	2-7/8 (7.3)	2 (5.1)	9-5/16 (23.7)
2-1/2	9-3/8 (23.8)	3-3/4 (9.5)	2-1/2 (6.4)	11-15/16 (30.3)
3	9-3/8 (23.8)	3-3/4 (9.5)	3 (7.6)	11-15/16 (30.3)
4	11 (27.9)	4-3/4 (12.1)	4 (10.2)	11-5/8 (29.2)
6	14-1/4 (36.2)	7 (17.8)	6 (15.2)	14-5/8 (36.8)
8	16-1/8 (41.0)	9 (22.9)	8 (20.3)	16-1/2 (41.9)

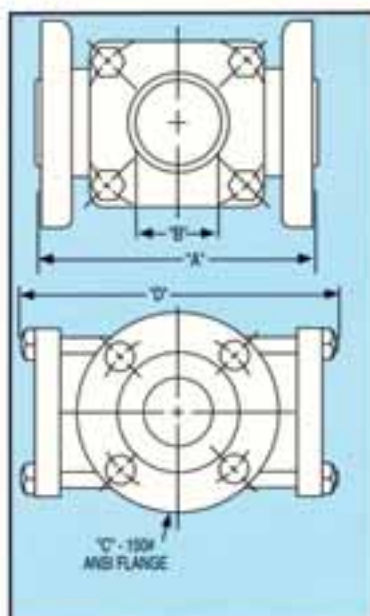
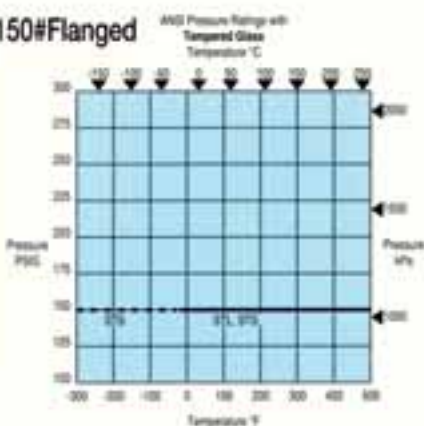
300# Flanged Dimensions

UNIT SIZE	DIMENSIONS IN INCHES & (CM)			
	"A"	"B"	"C"	"D"
1/2	5-7/8 (14.9)	1-1/4 (3.2)	1/2 (1.3)	5-1/4 (13.3)
3/4	5-7/8 (14.9)	1-1/4 (3.2)	3/4 (1.9)	5-1/4 (13.3)
1	6-7/8 (17.5)	1-3/8 (3.5)	1 (2.5)	6-7/16 (16.4)
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)	9-5/8 (24.5)
2-1/2	11-3/8 (28.9)	3-3/16 (8.1)	2-1/2 (6.4)	13-3/8 (34.0)
3	11-3/8 (28.9)	3-3/16 (8.1)	3 (7.6)	13-3/8 (34.0)
4	13-1/4 (33.7)	4-1/4 (10.8)	4 (10.2)	16-1/2 (41.9)
6	21-3/8 (54.3)	6-1/4 (15.9)	6 (15.2)	23-3/4 (60.3)
8	22-3/8 (56.8)	6-1/4 (15.9)	8 (20.3)	23-3/4 (60.3)

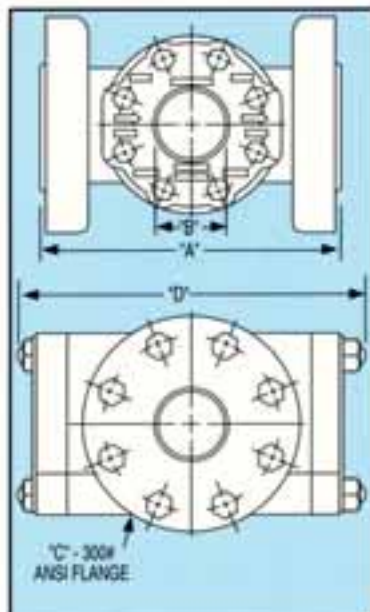
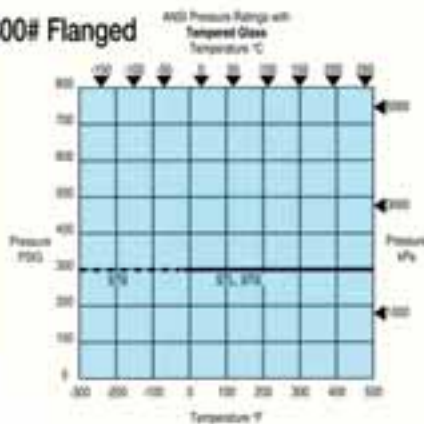
150# NPT



150# Flanged



300# Flanged



Specifications subject to change without notice.

Full-View Sight Flow Indicators



SNV



SNL



SNV-F

Full-View Sight Flow Indicators provide maximum, 360° viewing of fluid dynamics...

Available in NPT threaded-end and flanged designs, these Sight Flow Indicators are designed to enhance the visibility of process media as it passes through the glass cylinder. Full 360° viewing area expands the number of positions and locations in which the unit can be mounted for full visibility.

Models

SNV Plain NPT FV Sight Flow Indicator
 SNVD NPT FV SFI (Drip Tube)
 SNL Plain Large Cylinder FV SFI
 SNV-F Plain Flanged FV Sight Flow Indicator
 SNVD-F Flanged FV SFI (Drip Tube)

The Full-View Sight Flow Indicators are recommended for low-pressure applications where maximum visibility is needed. In addition to standard length models, Penberthy offers customized lengths up to 48", in 1/8" increments.

Full-View Sight Flow Indicators are unique because the "character" of the liquid can be viewed. In other words, a typical sight flow allows observation of liquids through a glass

pane. The Full-View sight flow allows observation of liquids in transit through a more dynamic, 3-dimensional pipeline. Designing the Full-View to match the pipe diameter streamlines the liquid flow through the sight flow and helps avoid solids settling.

Units are best suited for vertical applications. Horizontal mounting is acceptable if there is no mechanical strain imposed on the glass cylinder. Flange mounting studs are provided with SNV-F and SNVD-F flanged models for convenient flange-to-flange connections. Providing customized studs reduces the possibility of damaging the glass or flange by selecting an inappropriate bolt size or torquing the Full-View Sight Flow Indicator beyond its proper limit. To enhance quality and performance, the Full-View Sight Flow Indicator uses ductile iron rather than gray iron as the standard material of construction.

Industrial areas where low pressure viewing is needed:

Distillation - essential oils; fuels

Consumer Products - soaps and detergents; food and beverage

Chemical/Dyes - dye colors; degree of disassociation

Agricultural - slurries, fertilizers

Polymers - degree of pelletization

Pharmaceuticals - drugs and cosmetics

Materials of Construction for all Models and Bodies

Standard:

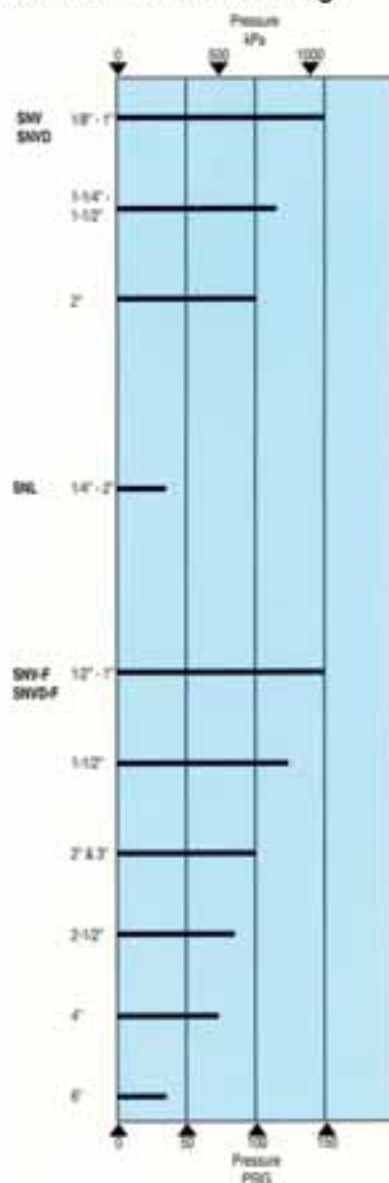
ASTM A536 Ductile Iron Gr 65-45-12
 ASTM B62 Bronze Alloy 836
 ASTM A216 Steel Gr WCB
 ASTM A351/A296 316 STS Gr CF8M

Optional:

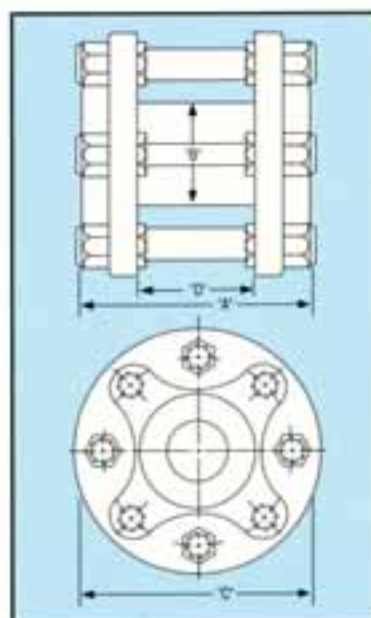
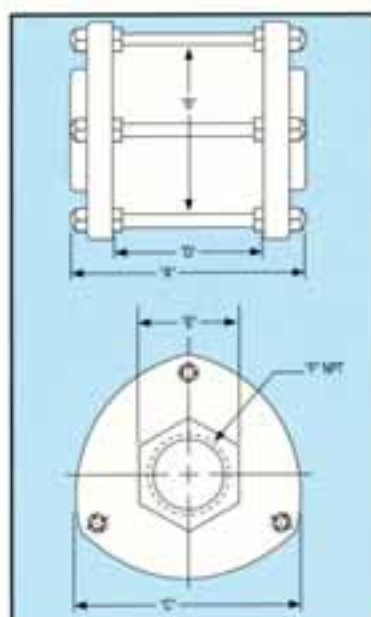
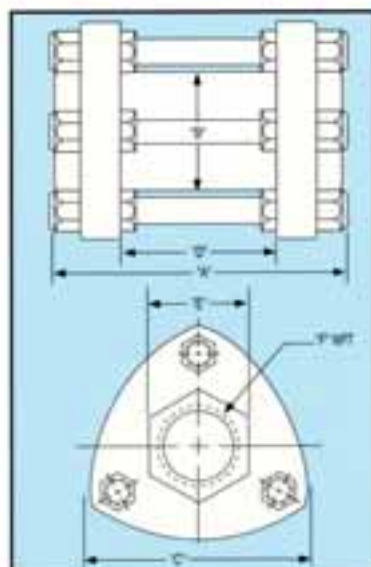
ASTM 494 Monel Gr M-35-1
 ASTM A494 Hastelloy C CW12MW
 ASTM A743 Alloy 20 CN7M
 Consult Factory and pg 20 for other materials/components

Models SNV, SNVD, and SNL are available in PVC Type 1 and Polypropylene.

Full View Pressure Ratings



Temperature rating dependent on gasket material. See page 20 for information.



SNV Dimensions

UNIT SIZE	DIMENSIONS IN INCHES & CM					
	"A"	"B"	"C"	"D"	"E"	"F"
1/8	4-3/8 (11.1)	1-3/4 (4.4)	3-3/4 (9.5)	2.625 (6.7)	1-3/8 (3.5)	1/8
1/4	4-3/8 (11.1)	1-3/4 (4.4)	3-3/4 (9.5)	2.625 (6.7)	1-3/8 (3.5)	1/4
3/8	4-3/8 (11.1)	1-3/4 (4.4)	3-3/4 (9.5)	2.625 (6.7)	1-3/8 (3.5)	3/8
1/2	4-3/8 (11.1)	1-3/4 (4.4)	3-3/4 (9.5)	2.625 (6.7)	1-3/8 (3.5)	1/2
3/4	4-3/8 (11.1)	1-3/4 (4.4)	3-3/4 (9.5)	2.625 (6.7)	1-3/8 (3.5)	3/4
1	4-1/2 (11.4)	2 (5.1)	4-1/4 (10.8)	2.5 (6.4)	1-3/4 (4.4)	1
1-1/4	4-3/4 (12.1)	2-1/2 (6.4)	4-3/4 (12.1)	2.5 (6.4)	2-1/2 (6.4)	1-1/4
1-1/2	4-3/4 (12.1)	2-1/2 (6.4)	4-3/4 (12.1)	2.5 (6.4)	2-1/2 (6.4)	1-1/2
2	5-1/2 (14.0)	3 (7.6)	5-3/4 (14.6)	3 (7.6)	3 (7.6)	2

SNL Dimensions

UNIT SIZE	DIMENSIONS IN INCHES & CM					
	"A"	"B"	"C"	"D"	"E"	"F"
1/4	6-3/4 (17.1)	5 (12.7)	8-1/4 (21.0)	4.25 (10.8)	3 (7.6)	1/4
3/8	6-3/4 (17.1)	5 (12.7)	8-1/4 (21.0)	4.25 (10.8)	3 (7.6)	3/8
1/2	6-3/4 (17.1)	5 (12.7)	8-1/4 (21.0)	4.25 (10.8)	3 (7.6)	1/2
3/4	6-3/4 (17.1)	5 (12.7)	8-1/4 (21.0)	4.25 (10.8)	3 (7.6)	3/4
1	6-3/4 (17.1)	5 (12.7)	8-1/4 (21.0)	4.25 (10.8)	3 (7.6)	1
1-1/4	6-3/4 (17.1)	5 (12.7)	8-1/4 (21.0)	4.25 (10.8)	3 (7.6)	1-1/4
1-1/2	6-3/4 (17.1)	5 (12.7)	8-1/4 (21.0)	4.25 (10.8)	3 (7.6)	1-1/2
2	6-3/4 (17.1)	5 (12.7)	8-1/4 (21.0)	4.25 (10.8)	3 (7.6)	2

SNV-F Dimensions

UNIT SIZE	DIMENSIONS IN INCHES & CM			
	"A"	"B"	"C"	"D"
1/2	3-7/8 (9.8)	1-1/4 (3.2)	3-1/2 (8.9)	2.25 (5.7)
3/4	3-7/8 (9.8)	1-1/2 (3.8)	3-7/8 (9.8)	2 (5.1)
1	4 (10.2)	1-3/4 (4.4)	4-1/4 (10.8)	2.125 (5.4)
1-1/2	4 (10.2)	2-1/2 (6.4)	5 (12.7)	2.125 (5.4)
2	4-3/4 (12.1)	3 (7.6)	6 (15.2)	2.625 (6.7)
2-1/2	5-3/8 (13.7)	3-1/2 (8.9)	7 (17.8)	3 (7.6)
3	5-3/8 (13.7)	4 (10.2)	7-1/2 (19.1)	3 (7.6)
4	7-1/2 (19.1)	5 (12.7)	9 (22.9)	4.875 (12.4)
6	10-1/4 (26.0)	7 (17.8)	11 (27.9)	7.25 (18.4)

Specifications subject to change without notice.

Armored Full-View Sight Flow Indicators



SAV



SAV-F



SAV-S

The best view, with the strength to fight mechanical strain...

Available in NPT and flanged models, Armored Full-View Sight Flow Indicators are designed to provide additional strength and to enhance the visibility of process media as it passes through the cylinder. Indicator viewing area is over 200°.

Models

SAVNPT Armored Full-View SFI
SAV-S.....Screw-in Armored Full-View SFI
SAV-F.....Flanged Armored Full-View SFI

The Armored Full-View Sight Flow Indicators are recommended for low-pressure applications where maximum visibility is needed. Units can be mounted in vertical or horizontal orientations. The glass sheath is designed to protect the glass from external mechanical hits.

To enhance quality and performance, the bodies (sheaths) of the SAV and SAV-F Armored Full-View models use ASTM A536 Ductile Iron Gr 65-45-12 rather than Gray Iron as the standard material of construction. The body of the SAV-S uses ASTM B62 Bronze Alloy 836 as the standard material of construction. The body of the Armored Full-View Sight Flow is not considered a wetted component. The medium passing through the Armored Full-View Sight Flow Indicator comes in contact with only the glass and the connection ends.

Similar to the Full-View, the Armored Full-View Sight Flow Indicators are unique because the "character" of the liquid can be viewed. The Armored Full-View Sight Flow allows observation of liquids in transit through a more dynamic, 3-dimensional pipeline. Designing the Armored Full-View to match the pipe diameter streamlines the liquid flow through the sight flow and helps avoid solids settling.

Flange mounting studs are provided with SAV-F flanged models for convenient flange-to-flange connections. Providing customized studs reduces the possibility of damaging the glass or flange by selecting an inappropriate bolt size or torquing the Armored Full-View Sight Flow Indicator beyond its proper limit.

Industrial areas where low pressure viewing is needed:

Distillation - essential oils; fuels

Consumer Products - soaps and detergents; fuel and beverage

Chemicals/Dyes - dye colors; degree of disassociation

Agricultural - slurries, fertilizers

Polymers - degree of pelletization

Pharmaceuticals - drugs and cosmetics

Material of Construction for SAV NPT Connections and SAV-F Flanged Connections

Standard:

ASTM A536 Ductile Iron Gr 65-45-12
ASTM B62 Bronze Alloy 836
ASTM A216 Steel Gr WCB
ASTM A351/A296 316 STS Gr CF8M

Optional:

ASTM 494 Monel Gr M-35-1
ASTM A494 Hastelloy C CW12MW
ASTM A743 Alloy 20 CN7M
Consult Factory and pg. 20 for other materials/components

Material of Construction for SAV-S Screw-in Ends

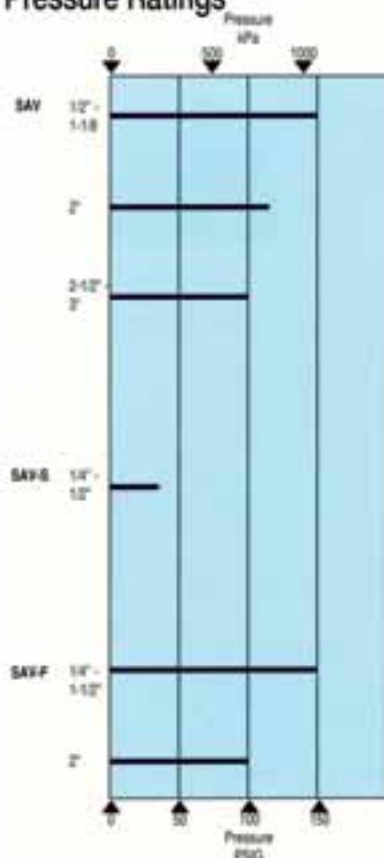
Standard:

Hex Brass, Carbon Steel, and 316 Stainless Barstock

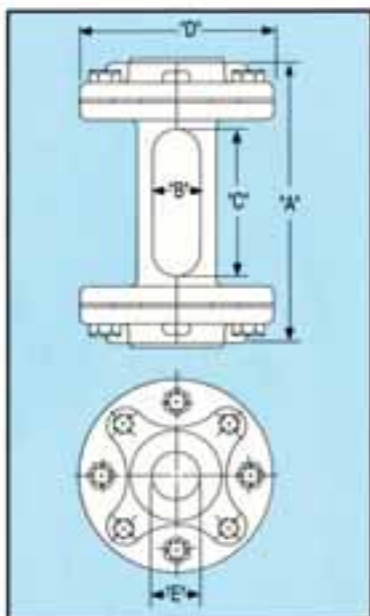
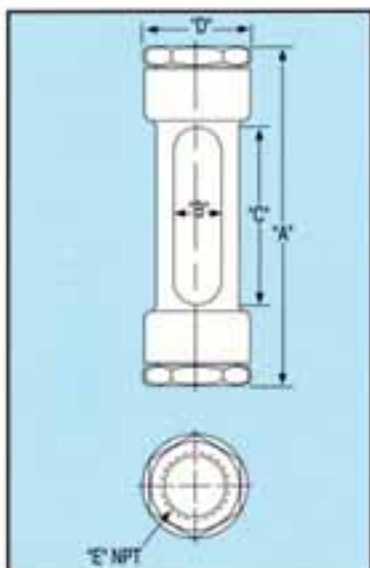
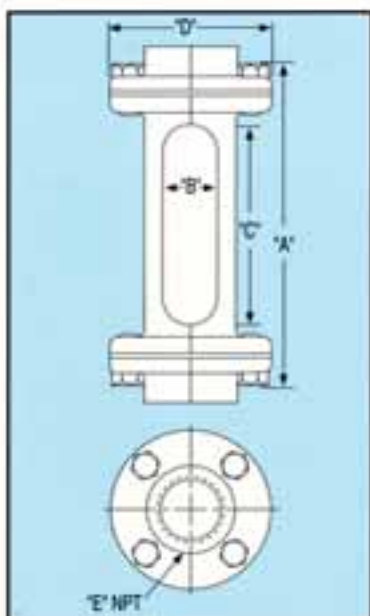
Optional:

Other barstock material-consult factory

Armored Full-View Pressure Ratings



Temperature rating dependent on gasket material. See page 20 for information.



SAV Dimensions

UNIT SIZE	DIMENSIONS IN INCHES & (CM)				
	"A"	"B"	"C"	"D"	"E"
1/4	7 (17.8)	7/8 (2.2)	4-1/8 (10.5)	2-3/4 (7.0)	1/4 (0.6)
1/2	7 (17.8)	7/8 (2.2)	4-1/8 (10.5)	2-3/4 (7.0)	1/2 (1.3)
3/4	7 (17.8)	1-1/8 (2.9)	3-15/16 (10.0)	3-1/8 (7.9)	3/4 (1.9)
1	7 (17.8)	1-1/8 (2.9)	3-15/16 (10.0)	3-1/8 (7.9)	1 (2.5)
1-1/4	7-5/8 (19.4)	1-1/2 (3.8)	4-3/8 (11.1)	4-1/8 (10.5)	1-1/4 (3.2)
1-1/2	7-5/8 (19.4)	1-1/2 (3.8)	4-3/8 (11.1)	4-1/8 (10.5)	1-1/2 (3.8)
2	7-5/8 (19.4)	3 (7.6)	4-3/16 (10.6)	5-1/4 (13.3)	2 (5.1)

SAV-S Dimensions

UNIT SIZE	DIMENSIONS IN INCHES & (CM)				
	"A"	"B"	"C"	"D"	"E"
1/4	4-7/8 (12.4)	5/8 (1.6)	2-9/16 (6.5)	1-1/2 (3.8)	1/4 (0.6)
3/8	4-7/8 (12.4)	5/8 (1.6)	2-9/16 (6.5)	1-1/2 (3.8)	3/8 (1.0)
1/2	6 (15.2)	3/4 (1.9)	3-1/2 (8.9)	1-3/4 (4.4)	1/2 (1.3)
3/4	6-5/8 (16.8)	1 (2.5)	3-1/2 (8.9)	2 (5.1)	3/4 (1.9)
1	6-5/8 (16.8)	1 (2.5)	3-1/2 (8.9)	2 (5.1)	1 (2.5)
1-1/4	8-7/8 (22.5)	1-3/8 (3.5)	5-1/2 (14.0)	2-7/8 (7.3)	1-1/4 (3.2)
1-1/2	8-7/8 (22.5)	1-3/8 (3.5)	5-1/2 (14.0)	2-7/8 (7.3)	1-1/2 (3.8)

SAV-F Dimensions

UNIT SIZE	DIMENSIONS IN INCHES & (CM)				
	"A"	"B"	"C"	"D"	"E"
1/2	8-1/8 (15.6)	13/16 (2.1)	3-1/8 (7.9)	3-1/2 (8.9)	3/4 (1.9)
3/4	8-3/8 (18.2)	1-1/16 (2.7)	3-1/4 (8.3)	3-7/8 (9.8)	15/16 (2.4)
1	8-3/8 (18.2)	1-1/16 (2.7)	3-1/4 (8.3)	4-1/4 (10.8)	1-1/8 (2.9)
1-1/2	8-3/4 (17.1)	1-5/8 (4.1)	3-5/8 (9.2)	5 (12.7)	1-3/4 (4.4)
2	7-5/8 (19.4)	2 (5.1)	4 (10.2)	6 (15.2)	2-1/8 (5.4)
2-1/2	7-7/8 (20.0)	2-3/8 (6.0)	4 (10.2)	7 (17.8)	2-1/4 (5.7)
3	8-1/8 (20.6)	2-3/4 (7.0)	4-1/8 (10.5)	7-1/2 (19.1)	2-3/4 (7.0)

Specifications subject to change without notice

Threaded Window Sight Flow Indicators

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

Threaded Window Sight Flow Indicators are labeled with company logo as well as pressure and temperature ratings. Available in NPT threaded-end designs, all Threaded Window Sight Flow Indicators sizes meet ANSI 150# standards.

Models

STW	Plain NPT Threaded Window SFI
STWF	NPT Threaded Window SFI (Flapper)
STWR	NPT Threaded Window SFI (Rotator)
STWD	NPT Threaded Window SFI (Drip Tube)
STWG	NPT Threaded Window SFI (Gaseous)

The windows are screwed into the single-piece cast sight flow body. These sight flow indicators are available with all five styles of Penberthy indication.

The threaded window design is an alternative style that is interchangeable with most applications using ANSI 150# 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 from Penberthy. The spanner wrenches have a 1/2" drive socket to be used with a torque wrench. Use the following part numbers to order the appropriate wrench size.

Part Number	Sizes (All Models)
8A651-000	1/4" and 3/8"
8A651-010	1/2" and 3/4"
8A651-020	1"
8A651-030	1-1/4" and 1-1/2"
8A651-040	2"



Spanner wrenches

Material of Construction for All Threaded Window Bodies

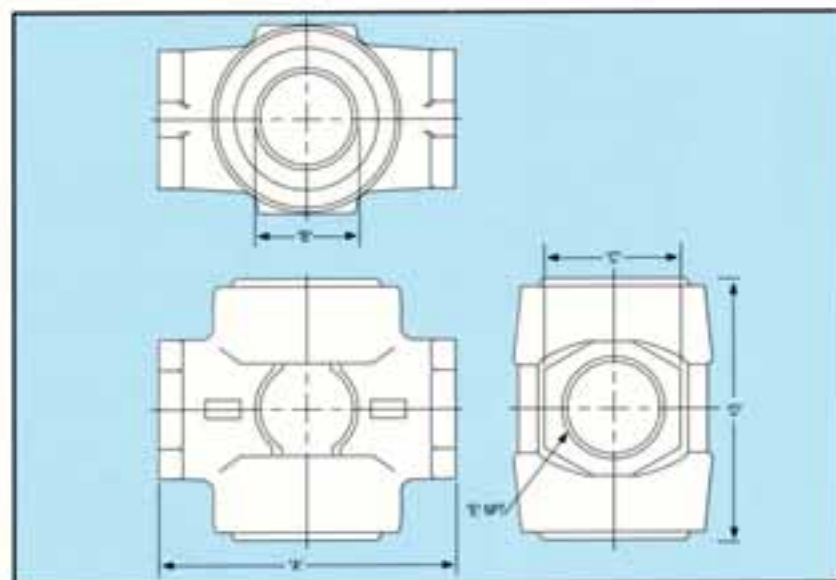
Standard:
 ASTM A536 Ductile Iron Gr 65-45-12
 ASTM B62 Bronze Alloy 836
 ASTM A216 Steel GR WCB
 ASTM A351/A296 316 STS Gr CF8M

Optional:
 ASTM 494 Monel Gr M-35-1
 ASTM A494 Hastelloy C CW12MW
 ASTM A743 Alloy 20 CN7M
 Consult Factory and page 20 for other material/components

Material of Construction for Covers

Brass and 316 Stainless Barstock

All Bodies are ANSI 150# regardless of size.



UNIT SIZE	DIMENSIONS IN INCHES & (MM)				
	"A"	"B"	"C"	"D"	"E"
1/4	3 (7.6)	13/16 (2.1)	1 (2.5)	2-1/8 (5.4)	1/4 (0.6)
3/8	3 (7.6)	13/16 (2.1)	1 (2.5)	2-1/8 (5.4)	3/8 (1.0)
1/2	3-3/4 (9.5)	1-3/16 (0.9)	1-1/2 (0.8)	2-7/8 (7.3)	1/2 (1.3)
3/4	3-3/4 (9.5)	1-3/16 (0.9)	1-1/2 (0.8)	2-7/8 (7.3)	3/4 (1.9)
1	4-1/4 (10.8)	1-7/16 (0.7)	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)	2-3/8 (7.3)	3-1/4 (8.3)	6 (15.2)	2 (5.1)

Specifications subject to change without notice.

Special Sight Flow Indicators

Bigger than Life

Creating this sight flow indicator for our customer required a unique casting design. Our metallurgy staff is proud of this 16", 150# sight flow indicator. This unit is placed next to a 6", 150# sight flow indicator to demonstrate the size difference between the two units.



Select Applications

Some industries require special surface finishes and tri-clamp connection ends. When our customer required these special connections, our design staff produced this sight flow indicator with tri-clamp ends. High precision machining was needed to achieve the mandatory tight tolerances.



Connections to Fit Any Need

A pipeline with no flange or NPT connections was required by the customer who ordered a sight flow indicator with butt-weld end connections. A socket weld connection is another weld end variation. Our broad customer industry base has unique connection needs. Penberthy can use its dedicated foundry and skilled machinists to create a large variety of connection ends. Flat surfaces are cast into bodies to provide for gaging or sampling ports.



Specifications subject to change without notice.

Available Materials of Construction

Gray Cast Iron

ASTM A126 Class B (31,000 Tensile)
ASTM A126 Class C (41,000 Tensile)

Ductile Iron

ASTM A395/A536 Gr 60-40-18
ASTM A536 Gr 65-45-12
ASTM A536 Gr 80-55-06

Carbon Steel

ASTM A216 Gr WCB
ASTM A352 Gr LCB
Cast 4140
Cast 8630
0.50 Carbon

Nickel Alloys

ASTM A494/A494M Gr M-35-1 Monel
ASTM A494/A494M Gr M-30C Monel
ASTM A494 Gr CS12MW Hastelloy C
ASTM A494 Gr N-12MV Hastelloy B

Stainless Steel

ASTM A351 Gr CF3 (304L)
ASTM A351 Gr CF8 (304)
ASTM A351 Gr CF3M (316L)
ASTM A351 Gr CF8M (316)
ASTM A743 Gr CN-7M (Alloy 20)
HK (310)
HIJ Heat Resistant Alloy
347 Stainless Steel
317 Stainless Steel
321 Stainless Steel

Bronze

ASTM B584 (B145-4B) (B82) 85-5-5-5
ASTM B584 (145-4B) 81-3-7-9
ASTM B584 (B143-2A)(B61)
Navy "M" 88-6-1.5-4.5
ASTM B584 (B143-1A) 88-10-0-2
ASTM B584 (B144-3A)
Anti-Acid Bronze 80-10-10
Call factory for special material inquiries.

Options

Socket Weld Connections; Glass Flange Covers;
Special Material Bolts and Nuts; Instrument
Plug; Corrosion Protection (Paint, Protector,
STS Fasteners)

Sight Flow indicators can be made to conform
to NACE MRO175 standards, consult factory.

Cushions

Neoprene
Nobestos®
Buna N
Viton®

Shields

Mica
Kel-F®

Glass Disks

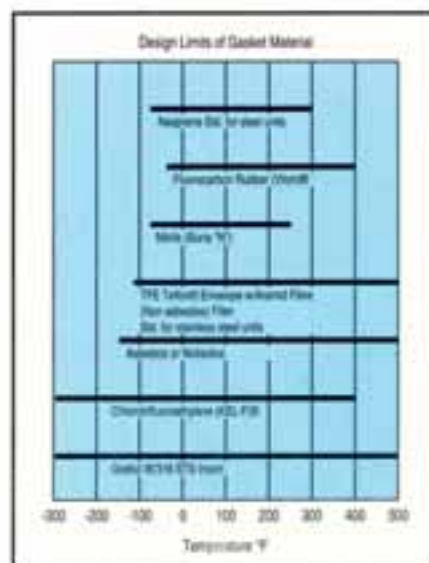
Borosilicate (Tempered)
Borosilicate (Annealed)
Quartz
Metaglas®

Glass Tubes

Borosilicate (Pyrex®)

Gasket Materials

Neoprene
Nobestos®
Buna N
Teflon®
Viton®
Grafol®
Kel-F®
Asbestos



Nobestos is a registered trademark of Lydall, Inc.
Viton is a registered trademark of DuPont.
Kel-F is a registered trademark of 3M.
Grafol is a registered trademark of Union Carbide.
Metaglas is a registered trademark of Schausglassplatten.
Pyrex is a registered trademark of Corning Glass.



Specifications subject to change without notice.

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 two available Threaded Sight Windows are rated at ANSI 150# and 300# using tempered borosilicate glass. There are no dimensional differences between the 150# and 300# models.

Models

WTSL Threaded Sight Window (150#)
WTSM Threaded Sight Window (300#)

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.

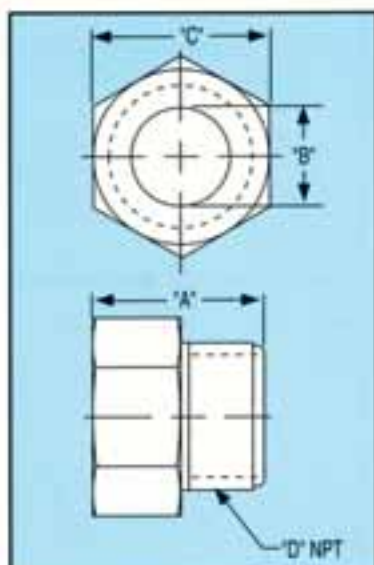
Spanner wrenches for window removal are available from Periberthy. The spanner wrenches have a 1/4" or 1/2" drive socket for torque wrench. All Threaded Sight Windows are machined from hex barstock.

Materials of Construction for Threaded Glass Housing

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



Spanner Wrenches



UNIT SIZE	DIMENSIONS IN INCHES & (CM)			
	"A"	"B"	"C"	"D"
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)	1-5/8 (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	2-9/32 (5.8)	1-15/16 (4.9)	2-3/4 (7.0)	2 (5.1)
2-1/2	2-11/16 (6.5)	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)

Specifications subject to change without notice.

Conventional Sight Windows



Radius Pad



Flat Pad

Observe the possibilities of our sight windows...

Available in eight models, Penberthy sight windows materials conform to ASTM specifications. Conventional Sight Windows are available with vision diameters ranging from 1-1/16" to 9" depending on the model and size selected.

Models

WP	.....	Flat Pad
WPR	.....	Radius Pad
WS	.....	Socketweld
WW	.....	Weldneck
WTM	.....	Threaded (NPT Male)
WTF	.....	Threaded (NPT Female)
WF	.....	Flanged
WFW	.....	Weldneck Flanged

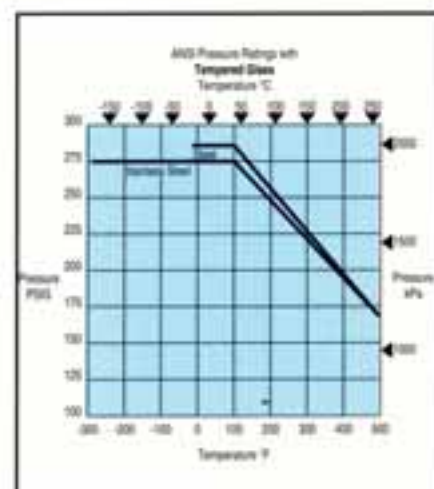
Sight windows are used when direct reading is required for liquid processes. Windows can be directly mounted to the vessel wall or they can be adapted to a multitude of connection styles.

Materials of Construction for Glass Housing and Pad

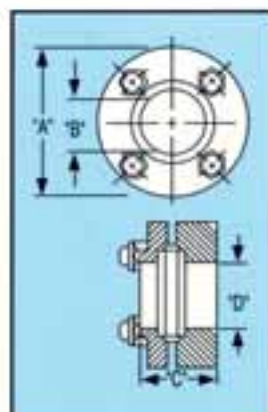
WP, WPR:
SA-515 GR 70 Steel; SA-240 Gr STS 316L

WTF, WF:
SA-515 GR 70 Steel; SA-240 Gr STS 316

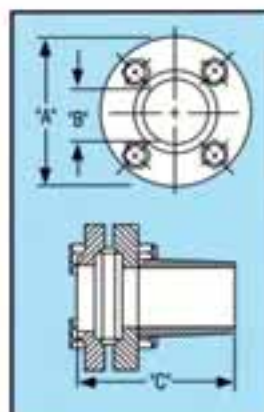
WW, WFW, WTM, WS:
ASTM A105 Gr II Steel; ASTM 182 Gr STS F316L



WP - Flat Pad



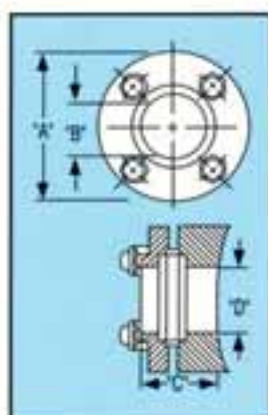
UNIT SIZE	DIMENSIONS IN INCHES & (CM)			
	"A"	"B"	"C"	"D"
1	4-1/4 (10.8)	1-1/2 (3.8)	1-3/4 (4.4)	1-1/2 (3.8)
1-1/2	5 (12.7)	2-3/8 (6.0)	2 (5.1)	2-3/8 (6.0)
2	6 (15.2)	2-7/8 (7.3)	2-1/2 (6.4)	2-7/8 (7.3)
3	7-1/2 (19.1)	3-3/4 (9.5)	2-3/4 (7.0)	3-3/4 (9.5)
4	9 (22.9)	4-3/4 (12.1)	2-7/8 (7.3)	4-3/4 (12.1)
6	11 (27.9)	7 (17.8)	3-7/8 (9.8)	7 (17.8)
8	13-1/2 (34.3)	9 (22.9)	4-3/8 (11.1)	9 (22.9)



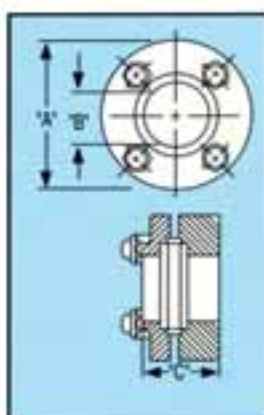
WTM - Threaded (NPT Male)

UNIT SIZE	DIMENSIONS IN INCHES & (CM)		
	"A"	"B"	"C"
1	4-1/4 (10.8)	1-1/16 (2.7)	4-3/8 (11.1)
1-1/2	5 (12.7)	1-5/8 (4.1)	5-3/8 (13.7)
2	6 (15.2)	2-1/16 (5.2)	6-3/8 (16.2)
3	7-1/2 (19.1)	3-1/16 (7.8)	7-3/8 (18.7)

WPR - Radius Pad



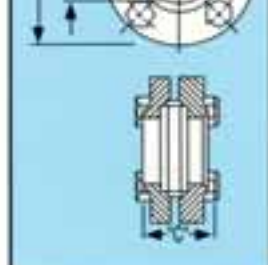
UNIT SIZE	DIMENSIONS IN INCHES & (CM)			
	"A"	"B"	"C"	"D"
1	4-1/4 (10.8)	1-1/2 (3.8)		1-1/2 (3.8)
1-1/2	5 (12.7)	2-3/8 (6.0)		2-3/8 (6.0)
2	6 (15.2)	2-7/8 (7.3)		2-7/8 (7.3)
3	7-1/2 (19.1)	3-3/4 (9.5)		3-3/4 (9.5)
4	9 (22.9)	4-3/4 (12.1)		4-3/4 (12.1)
6	11 (27.9)	7 (17.8)		7 (17.8)
8	13-1/2 (34.3)	9 (22.9)		9 (22.9)



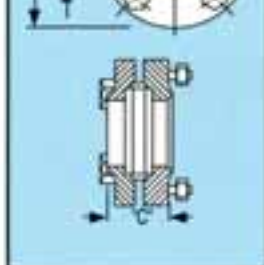
WTF - Threaded (NPT Female)

UNIT SIZE	DIMENSIONS IN INCHES & (CM)		
	"A"	"B"	"C"
1	4-1/4 (10.8)	1-1/16 (2.7)	2 (5.1)
1-1/2	5 (12.7)	1-5/8 (4.1)	2-3/8 (6.0)
2	6 (15.2)	2-1/16 (5.2)	2-7/8 (7.3)
3	7-1/2 (19.1)	3-1/16 (7.8)	3-3/8 (8.6)

WS - Socketweld



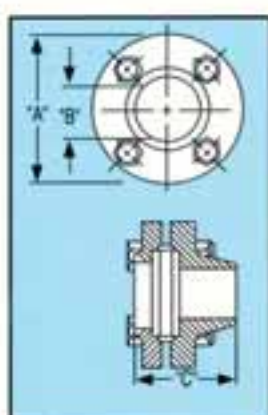
UNIT SIZE	DIMENSIONS IN INCHES & (CM)		
	"A"	"B"	"C"
1	4-1/4 (10.8)	1-1/16 (2.7)	1-1/2 (3.8)
1-1/2	5 (12.7)	1-5/8 (4.1)	2 (5.1)
2	6 (15.2)	2-1/16 (5.2)	2-3/8 (6.0)
3	7-1/2 (19.1)	3-1/16 (7.8)	2-7/8 (7.3)



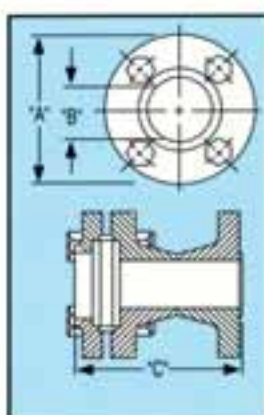
WF - Flanged

UNIT SIZE	DIMENSIONS IN INCHES & (CM)		
	"A"	"B"	"C"
1	4-1/4 (10.8)	1-1/2 (3.8)	1-3/4 (4.4)
1-1/2	5 (12.7)	2-3/8 (6.0)	2 (5.1)
2	6 (15.2)	2-7/8 (7.3)	2-1/2 (6.4)
3	7-1/2 (19.1)	3-3/4 (9.5)	2-3/4 (7.0)
4	9 (22.9)	4-3/4 (12.1)	2-7/8 (7.3)
6	11 (27.9)	7 (17.8)	3-7/8 (9.8)
8	13-1/2 (34.3)	9 (22.9)	4-3/8 (11.1)

WW - Weldneck Flanged



UNIT SIZE	DIMENSIONS IN INCHES & (CM)		
	"A"	"B"	"C"
1	4-1/4 (10.8)	1-1/16 (2.7)	3 (7.6)
1-1/2	5 (12.7)	1-5/8 (4.1)	3-1/2 (8.9)
2	6 (15.2)	2-1/16 (5.2)	3-7/8 (9.8)
3	7-1/2 (19.1)	3-1/16 (7.8)	4-3/8 (11.1)
4	9 (22.9)	4 (10.2)	4-3/4 (12.1)
6	11 (27.9)	6-1/16 (15.4)	6 (15.2)
8	13-1/2 (34.3)	8 (20.3)	7 (17.8)



WFW - Weldneck Flanged

UNIT SIZE	DIMENSIONS IN INCHES & (CM)		
	"A"	"B"	"C"
1	4-1/4 (10.8)	1-1/16 (2.7)	5-1/4 (13.3)
1-1/2	5 (12.7)	1-5/8 (4.1)	6 (15.2)
2	6 (15.2)	2-1/16 (5.2)	6-3/8 (16.2)
3	7-1/2 (19.1)	3-1/16 (7.8)	7-1/4 (18.4)
4	9 (22.9)	4 (10.2)	7-7/8 (20.0)
6	11 (27.9)	6-1/16 (15.4)	9-5/8 (24.4)
8	13-1/2 (34.3)	8 (20.3)	11 (27.9)

Specifications subject to change without notice.

Oblong Sight Windows

These extended vision windows are quite a sight...

These Oblong Sight Windows increase the viewing length beyond that of conventional sight windows. The angle of vision into a tank or vessel is enhanced so that more of the process liquid can be observed from a single viewing location.

Models

WPO.....Oblong Sight Window (Flat Pad)

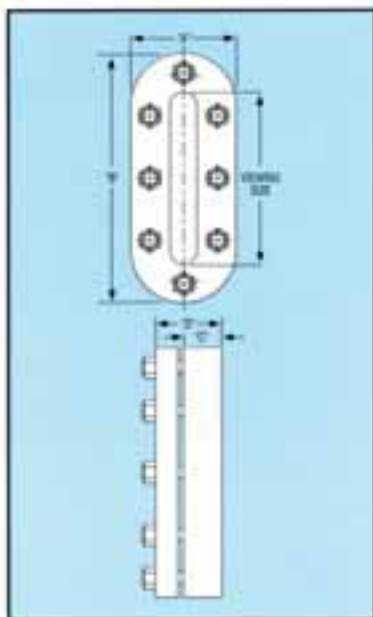
WPOR.....Oblong Sight Window (Radius Pad)

Designed for 150 PSIG operating pressure and 500°F (260°C), these sight windows can be specified with a flat or radius welding pad. The Oblong Sight Window is mounted directly to the vessel wall.

Materials of Construction

Carbon Steel

Stainless Steel



MODEL NUMBER	VIEWING SIZE	DIMENSIONS IN INCHES & (CM)			
		"A"	"B"	"C"	"D"
WPO 11	1x6	3-5/8 (9.2)	8-5/8 (21.8)	1-1/4 (3.2)	2-3/16 (5.8)
WPOR 11					
WPO 22	2x12	5 (12.7)	15 (38.1)	1-1/4 (3.2)	2-7/16 (6.2)
WPOR 22					
WPO 32	3x12	6 (15.2)	18 (40.6)	1-1/2 (3.8)	2-13/16 (7.1)
WPOR 32					
WPO 33	3x18	6 (15.2)	22 (55.8)	1-1/2 (3.8)	2-13/16 (7.1)
WPOR 33					
WPO 44	4x24	7 (17.8)	28 (71.1)	1-1/2 (3.8)	3-1/4 (8.3)
WPOR 44					



Specifications subject to change without notice.

Cross Reference Guide

Use Penberthy, 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# SFI—Flapper (Gaseous Flow)	SFG		
ANSI 150# SFI—Flapper	SFF	100-S	FIS-F
ANSI 150# SFI—NPT Rotator	SFR	200-S	FIS-R
ANSI 150#-NPT Drip Tube	SFD	300-S	FIS-D
ANSI 300# High Pressure SFI	SM-F	F-910-HP 300#	FIF-F/HP3
ANSI 600# High Pressure SFI	SH-F	F-910-HP 600#	FIF-F/HP6
FM Approved 300# Dual Window SFI-Flanged	DWM-F	F-910-HP(FM)	
FM Approved 150# Dual Window SFI-Flanged	DWF-F	910F(NF)(FM)	
FM Approved 150# Dual Window SFI-Flanged	DWF	S-100-HP(FM)	
Full-View SFI—NPT	SNV	805-S	LIS
Full-View SFI—Large Cylinder	SNL	850-S	
Full-View SFI—Flanged	SNV-F	830-F	LIF
Armored Full-View SFI—NPT	SAV	1000-S	
Armored Full-View SFI—Screw-in	SAV-S	4000-S	
Armored Full-View SFI—Flanged	SAV-F	860-F	
Threaded Window SFI—Flapper (Gaseous Flow)	STWG		
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#	WTS�	S-5400	
Threaded Sight Window 300#	WTSM	S-5400	
Flat Pad Sight Window	WP	5200PVQ	NW
Radius Pad Sight Window	WPR	5200PVQ	NW
Socketweld Sight Window	WS	S-5100	NW-FT
Weldneck Sight Window	WW	W-5000	NW-BW
Threaded (NPT Male)Sight Window	WTM		
Threaded (NPT Female)Sight Window	WTF	S-5100	NW-FT
Flanged Sight Window	WF	5005DW	NW-RF
Weldneck Flanged Sight Window	WFW		
Oblong Sight Window - Flat Pad	WPO	5300	
Oblong Sight Window - Radius Pad	WPOR	5300	

Terms and Conditions - Warranty

Penberthy Inc., warrants its products as designed and manufactured by Penberthy to be free of defects in material and workmanship for a period of one year after the date of installation or eighteen months after the date of manufacture, whichever is earliest. Penberthy will, at its option, replace or repair any products which fail during the warranty period due to defective material or workmanship.

Prior to submitting any claim for warranty service, the owner must submit proof of purchase to Penberthy and obtain written authorization to return the product. Thereafter, the product shall be returned to Penberthy in Prophetstown, Illinois, with freight prepaid.

This warranty shall not apply if the product has been disassembled, tampered with, repaired or altered outside of the Penberthy factory, or if it has been subjected to misuse, neglect or accident.

Penberthy's responsibility hereunder is limited to repairing or replacing the product at its expense. Penberthy shall not be liable for loss, damage, or expenses directly or indirectly related to the installation or use of its products, or from any other cause or for consequential damages. It is expressly understood that Penberthy is not responsible for damage or injury caused to other products, building, property or persons, by reason of the installation or use of its products.

THIS IS PENBERTHY'S SOLE WARRANTY AND IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED WHICH ARE HEREBY EXCLUDED, INCLUDING IN PARTICULAR ALL WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

This document and the warranty contained herein may not be modified and no other warranty, expressed or implied, shall be made by or on behalf of Penberthy unless modified or made in writing and signed by the President or a Vice President of Penberthy.

Providing the Process Industries with the Highest Quality Products

Liquid Level Gages and Valves

Penberthy manufactures flat glass and tubular styles, with or without valves, for direct visual indication of process level. Models available for many applications and conditions, transparent or reflex glass. Penberthy also offers unique PENGAGE™ Gage & Valve Selection Software.

Jet (Eductor/Ejector) Products

Penberthy offers a complete line of eductors, ejectors, and injectors, using Bernoulli's principle to perform process tasks. Models available to pump, mix, or heat and mix.

Tank Mixing Eductor (TME)

The Penberthy Tank Mixing Eductor (TME) offers an inexpensive, highly effective way to improve agitation and mixing in tanks or other vessels. It's particularly effective in solutions where solids must remain in suspension, such as agricultural and electro-coat paint applications.

MULTIVIEW™ Magnetic Liquid Level Meter

Penberthy's MULTIVIEW™ Magnetic Liquid Level Meter features highly visible level indication,



MULTIVIEW™ Magnetic Liquid Level Meter

FM-approved level switch control, and continuous 4-20mA level measurement capability. Our unique magnet structure, anodized chrome indicator, and FM-approved mercury-free 5 Amp level switches make this one of the best values available today.



Mechanical Products



LEVELMARK™ Products

NEW WAVE CAPACITANCE™ Level Instruments - LEVELMARK™ Products

Penberthy's NEW WAVE CAPACITANCE™ technology ushers in a new age of level measurement and control that far surpasses conventional RF capacitance, admittance or impedance technology. The line provides system accuracy of $\pm 0.25\%$, the industry's only FM-approved explosion-proof probes, "non-leak" probes, and a complete line of single, dual and multi-point level switches, as well as 2-, and 4-wire continuous level transmitters.

Ultrasonic Point Level Switches - LEVELMARK™ Products

These level controls employ ultrasonic gap sensing technology to provide level indication in nearly any liquid. Models 614 and 616 provide single and dual-point level indication. Models 624 (single point) and 626 (dual point) utilize a two-wire 4-20mA loop, which facilitates the use of intrinsically safe barriers for an added measure of safety. All are FM-approved and CSA Certified.



Tank Mixing Eductor (TME)

Ultrasonic Continuous Level Transmitters- LEVELMARK™ Products

The Model 680 features microprocessor-based circuitry and an alphanumeric display to detect liquid levels up to 42 feet. The nearly identical Model 680LR has a maximum range of 85 feet. The transducers (sensors) are constructed of a wide variety of materials.

PENTEMP™ Temperature Products

Penberthy's PENTEMP™ line of temperature products can be used to measure the temperature of liquids, gases, or solids at temperatures ranging from -436°F to 4352°F (-260°C to 2400°C). Our Thermocouples and RTD's (Resistance Temperature Detectors) combined with Thermowells, Protection Tubes or Transmitters can be used to solve virtually any temperature measurement problems you may have.



PENTEMP™ Temperature Products

FLUIDVISION™ Sight Flow Indicators/Sight Windows - Meeting the Needs of the World's Process Industries...

ANSI 150# Sight Window for use at a fuel pipeline station.

ANSI 150# Gaseous Sight Flow Indicator for use at a bio-gas/digester plant.

Oblong Sight Window for use at a petroleum refinery.

Lined Body Sight Flow Indicator for use at a distilled spirits production plant.

Threaded Sight Window for use at a wastewater treatment plant.

Full-View Sight Flow Indicator for use at a polymer resin plant.

Armored Full View Sight Flow Indicator for use at a dye factory.

150 PSI FM Approved Dual-Window Sight Flow Indicator for use at a sulfuric acid plant.

300 PSI FM-Approved Dual-Window Sight Flow Indicator for use at a crude oil pumping site.

High Pressure ANSI 300# Sight Flow Indicator for use at a natural gas pipeline.

PENBERTHY
Putting Quality Into The Process

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Tel. (815) 537-2311 • Fax (815) 537-5764
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