



ENGINEERED LIQUID FLOW SOLUTIONS



VISIBILITY AND RELIABILITY

SIGHT FLOW INDICATORS & SIGHT WINDOWS

SIGHT FLOW INDICATORS

KENCO Engineering Company offers a variety of Standard KSF (cast body), Full-view, and Armored Sight Flow Indicators, as well as, a line of Sight Windows. All products are hydrostatically tested to ensure reliability in harsh operating conditions. KENCO Sight Flow Indicators provide a window into piping. They are a cost effective and efficient way to visually monitor the flow of fluids, and to determine if any problems exist along the process pipeline. These inexpensive, simple devices, allow operators to observe flow rate, direction, color and clarity. These indicators can be deployed in one of two ways: (1) individually at critical points along fluid lines where changes, interruptions or contamination is likely to occur, or (2) in groups where simultaneous monitoring of multiple fluid lines is necessary.

APPLICATIONS

One of the advantages of sight flow indicators is their application versatility. Common applications involve monitoring fluid flow through filter, cooling, and intake / outlet pumping lines, as well as numerous other industrial processes. In addition, sight flow indicators are useful as backups for meters, switches and other control devices.

INDUSTRIES SERVED

CHEMICAL / PETROCHEMICAL

Filter Line Monitoring
Distilling Operations
Dye / Ink Color
Paint / Varnish Consistency
Chemical Conversion Processes
General Refinery Piping

PETROLEUM

Drilling Pump Operations
Oil / Water Separation
Loading Terminals

POWER

Turbine Lubricant Flow
Cooling Line Water Flow

WASTEWATER TREATMENT

Second Stage Aeration Tank Pumping Lines

OEM

Compressor Water Flow
Solvent Recirculation
Pre- and Post-Filter Trap Monitoring

KSF CAST BODY SIGHT FLOW INDICATORS

KENCO offers a wide variety of Standard KSF (cast body) Sight Flow Indicators. They are available in a complete range of sizes and styles to meet your application needs.

Selecting The Best Style

Sight flow indicators are an inexpensive way to identify and repair process line problem areas reliably and efficiently. Selecting the best type of sight flow indicator for a given application is crucial to getting the best performance possible.

PLAIN (BI-DIRECTIONAL)

A bi-directional Plain indicator is best when observing color & clarity is more important than flow.

FLAPPER (BI-DIRECTIONAL)

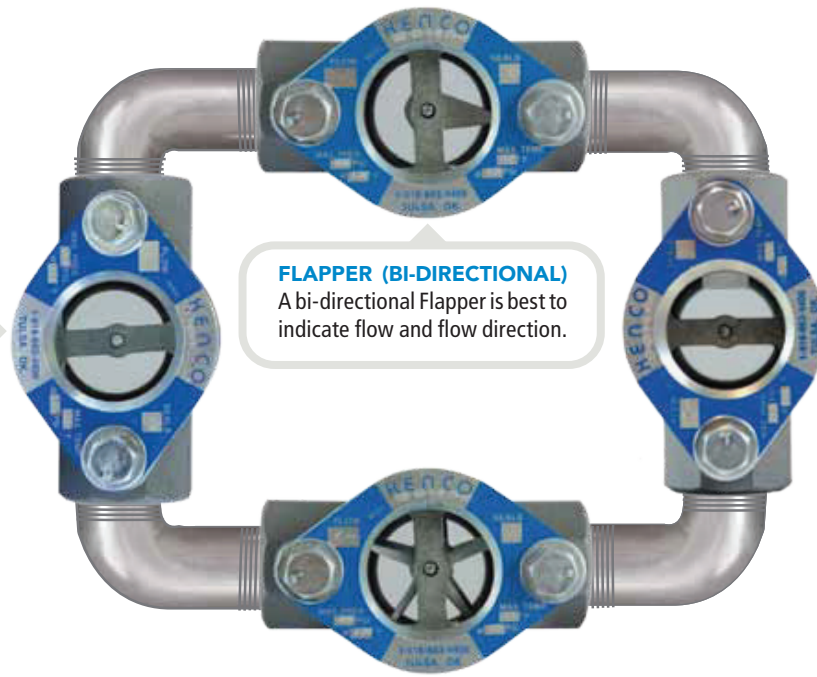
A bi-directional Flapper is best to indicate flow and flow direction.

DRIP TUBE

A Drip Tube, used in vertical lines, is ideal for gravity flow, or extremely low or intermittent flow.

ROTOR

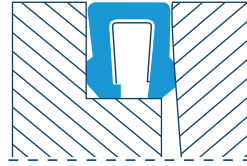
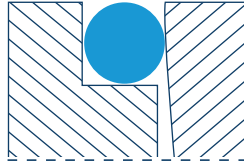
A Rotor indicator is ideal for opaque liquids. Flow from right-to-left is standard. Specify if left-to-right flow is needed. Not recommended for flow rates above 100 GPM. A low flow version is available for 1/4", 3/8", and 1/2" sizes.



LEAK-PROOF GUARANTEE

The most common complaint against sight flow indicators is that they leak. This is primarily caused by the failure of conventional flat seals. KENCO Standard KSF (cast body) Sight Flow Indicators are guaranteed not to leak for three full years under normal use. The reason we are sure that these indicators won't leak is the innovative radial sealing design:

Elastomeric radial seal with memory retention for shape creates a steady sealing force between the outside diameter of the glass and the indicator body.



PTFE lip/spring seal with constant spring expansion force maintains sealing by holding the edges of the PTFE lip seal against the outside diameter of the glass and the sight flow indicator body.

MODULAR DESIGN

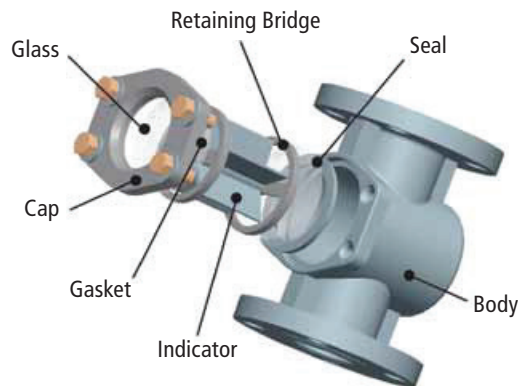


KENCO MODULAR DESIGN



COMPETITOR TIE-ROD DESIGN

KENCO's unique modular design fastens the flow assembly directly to the body with no special torquing sequence. This provides easy access to the unit from the front side, which eliminates clearance problems caused by the Tie-Rod design. The Tie-Rod design also presents challenges fastening the glass and seal to the body.



The KENCO modular design allows for maintenance to the internal parts of the indicator without removing the indicator from the pipeline. This optimizes uptime and reduces replacement costs.

Sight Flow Indicator Maximum Pressure / Temperature Ratings

KSF / KPJ Series Sight Flows	Maximum Pressure	Max. Temperature using Standard Seals
ST Series (1/4" - 2" Threaded) (3/4" - 4" Flanged)	200 psig @ 150°F	250°F @ 135 psig
ST Series (6" - 12" Flanged)	150 psig @ 150°F	150°F @ 150 psig
HT Series (1/4" - 2" Threaded)	400 psig @ 150°F	400°F @ 160 psig
HT Series (3/4" - 4" Flanged)	Carbon Steel 285 psig @ 100°F	Carbon Steel 400°F @ 200 psig
	316 Stainless Steel 275 psig @ 100°F	316 Stainless Steel 400°F @ 195 psig
HT Series (6" - 12" Flanged)	275 psig @ 100°F	Carbon Steel 400°F @ 200 psig
		316L Stainless Steel 400°F @ 195 psig

Seal / Indicator Temperature Ratings

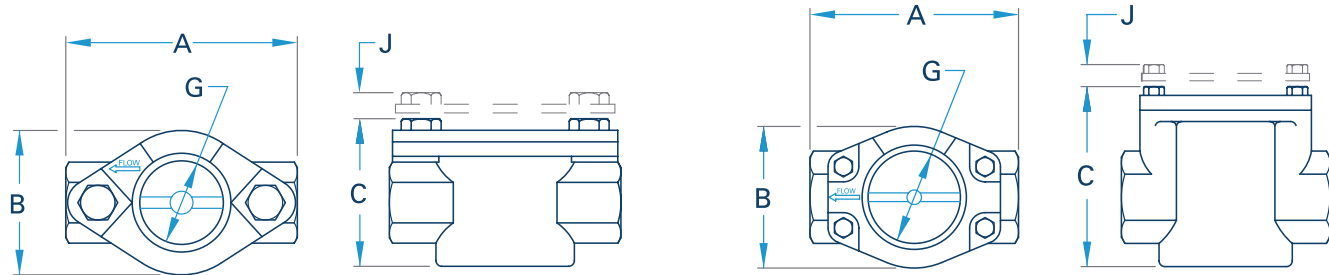
Seal Materials	
Neoprene (ST Standard)	-20° to 250°F
Fluorocarbon (HT Standard)	-20° to 400°F
Buna-N	-20° to 212°F
EPDM	-50° to 250°F
PTFE	-40° to 400°F
Kalrez®	0° to 500°F

Indicator Materials	
Delrin® (ST Standard)	-40° to 250°F
Ryton® (HT Standard)	-40° to 450°F
PTFE	-40° to 500°F

Note: Minimum / maximum temperature ratings are driven by the body material, seal material and flow indicator material.

PRODUCT DIMENSIONS - INCHES

THREADED KSF SIGHT FLOW INDICATORS



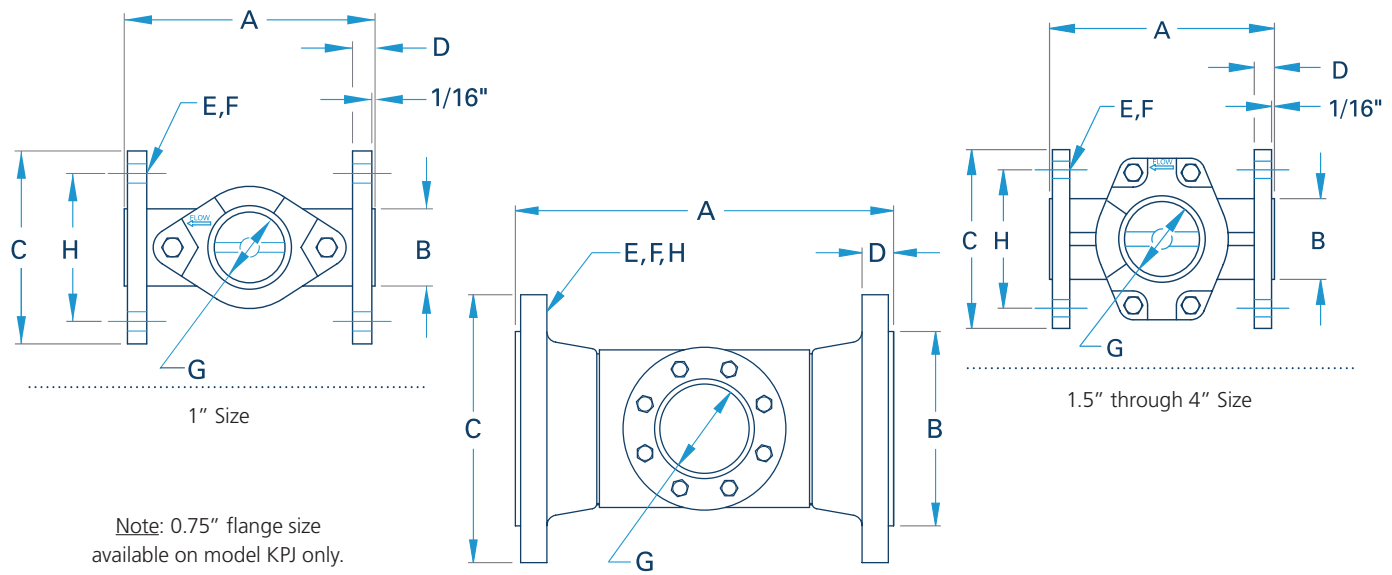
0.25" through 1" Size

1.25" through 2" Size

Indicator Size (inches)	0.25"	0.375"	0.5"	0.75"	1"	1.25"	1.5"	2"
A Overall Length	3.25 ¹	3.25 ¹	3.25 ¹	4.25 ²	4.25	5.25 ³	5.25 ³	5.50 ³
B Overall Width	2.00	2.00	2.00	2.56	2.56	3.31	3.31	3.31
C Overall Height (ST Series)	2.38	2.38	2.38	3.25	3.25	4.31	4.31	4.31
Overall Height (HT Series)	2.56	2.56	2.56	3.44	3.44	4.50	4.50	4.50
G Sight Opening Diameter	1.13	1.13	1.13	1.50	1.50	2.00	2.00	2.00
J Added Height Due to Shield	0.44	0.44	0.44	0.50	0.50	0.50	0.50	0.50
Weight (pounds)	1.60	1.60	1.40	3.00	2.70	8.40	7.90	6.60

1 316 SS Units are 3.63"; 2 Bronze Units are 4.13"; 3 316 SS Units are 5.63"

150# FLANGED KSF SIGHT FLOW INDICATORS



1" Size

1.5" through 4" Size

Note: 0.75" flange size available on model KPJ only.

6" through 12" Size

Indicator Size (inches)	1"	1.5"	2"	3"	4"	6"	8"	10"	12"
A Overall Length	5.00	6.50	7.00	8.00	9.00	14.25	16.13	16.13	17.13
B Raised Face Diameter	2.00	2.88	3.63	5.00	6.19	8.50	10.63	12.75	15.00
C Flange Diameter	4.25	5.00	6.00	7.50	9.00	11.00	13.50	16.00	19.00
D Flange Thickness	0.47	0.59	0.69	0.81	1.00	1.00	1.13	1.19	1.25
E Number of Bolt Holes	4.00	4.00	4.00	4.00	8.00	8.00	8.00	12.00	12.00
F Bolt Hole Diameter	0.63	0.63	0.75	0.75	0.75	0.75	0.75	0.88	0.88
G Sight Opening Diameter	1.50	2.00	2.00	3.00	3.00	4.00	4.00	4.00	4.00
H Bolt Circle Diameter	3.13	3.88	4.75	6.00	7.50	9.50	11.75	14.25	17.00
Weight (pounds)	5.40	11.10	15.00	29.30	35.00	85.00	125.00	165.00	250.00

DIMENSION MATCHING

KENCO Flanged Sight Flow Indicators are available in a version that matches the end-to-end dimension of sight flow indicators from Penberthy and Jacoby-Tarbox. The Model KPJ indicators are available in either Carbon Steel or 316SS materials, and Standard and High Pressure / High Temperature styles. All sizes are dimensionally interchangeable with these manufacturers' indicators, except 3/4", 2", 3", and 4" sizes, as noted in the table below.

Dimensions For Model KPJ Sight Flow Indicators

Indicator Size (inches)	3/4"	2"	3"	4"
A Overall Length	4.63	7.88	9.38	11.00
B Raised Face Diameter	1.69	3.63	5.00	6.19
C Flange Diameter	3.88	6.00	7.50	9.00
D Flange Thickness	0.50	0.69	0.81	1.00
E Number of Bolt Holes	4.00	4.00	4.00	8.00
F Bolt Hole Diameter	0.63	0.75	0.75	0.75
G Sight Opening Diameter	1.50	2.00	3.00	3.00
H Bolt Circle Diameter	2.75	4.75	6.00	7.50
Weight (pounds)	5.20	15.00	31.00	42.00

Construction Materials

Part	Style	Material
Body	All	Carbon Steel
		316 SS (1/4" to 4")
		316L SS (6" to 12")
		Bronze (Threaded Only)
Window	Standard (ST) – 1/4" to 2"	Tempered Soda Lime Glass
	Standard (ST) – 3" to 12" Flanged	Annealed Soda Lime Glass
	High Press./Temp. (HT)	Tempered Borosilicate Glass
Indicator	Standard (ST)	Delrin®
	High Press./Temp. (HT)	Ryton®
	Optional	PTFE
Seals	Standard (ST)	Neoprene
	High Press./Temp. (HT)	Fluorocarbon
	Optional	Buna-N, EPDM, Kalrez®



ORDERING SYSTEM

KSF Sight Flow Indicators

REQUESTED BY: _____ COMPANY: _____

ADDRESS: _____ CITY: _____ STATE: _____ ZIP: _____

PHONE: _____ FAX: _____ EMAIL: _____

Sight Flow Style KSF=Cast Body Sight Flow Indicator KPJ=Competitor Dimension Matched Cast Body Sight Flow Indicator	Design Rating ST=Standard HT=High Temp. / High Pressure	Connection Type F=Flanged (150#) F3=Flanged (300#) T=Threaded SW=Socket Weld	Connection Size <table border="0"> <tr> <td>Threaded</td> <td>Flanged</td> </tr> <tr> <td>0.25=1/4"</td> <td>0.75=3/4" (KPJ only)</td> </tr> <tr> <td>0.375=3/8"</td> <td>1.0=1"</td> </tr> <tr> <td>0.5=1/2"</td> <td>1.5=1-1/2"</td> </tr> <tr> <td>0.75=3/4"</td> <td>2.0=2"</td> </tr> <tr> <td>1.0=1"</td> <td>3.0=3"</td> </tr> <tr> <td>1.5=1-1/2"</td> <td>4.0=4"</td> </tr> <tr> <td>2.0=2"</td> <td>6.0=6"</td> </tr> <tr> <td></td> <td>8.0=8"</td> </tr> <tr> <td></td> <td>10.0=10"</td> </tr> <tr> <td></td> <td>12.0=12"</td> </tr> </table>	Threaded	Flanged	0.25=1/4"	0.75=3/4" (KPJ only)	0.375=3/8"	1.0=1"	0.5=1/2"	1.5=1-1/2"	0.75=3/4"	2.0=2"	1.0=1"	3.0=3"	1.5=1-1/2"	4.0=4"	2.0=2"	6.0=6"		8.0=8"		10.0=10"		12.0=12"
Threaded	Flanged																								
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2.0=2"	6.0=6"																								
	8.0=8"																								
	10.0=10"																								
	12.0=12"																								
Seal Material B=Buna-N N=Neoprene (ST Std.) E=Ethylene Propylene V=Fluorocarbon (HT Std.) T=PTFE K=Kalrez®	Material of Construction (Body) C=Carbon Steel B=Bronze (Threaded Connections only) S=316 Stainless Steel A20=Alloy 20 <u>Note:</u> Other materials available upon request	Indicator Style P=Plain R=Rotor (1/4" to 4" Sizes Only) F=Flapper D=Drip Tube LR=Low Flow Rotor (1/4", 3/8" & 1/2" Sizes Only)																							

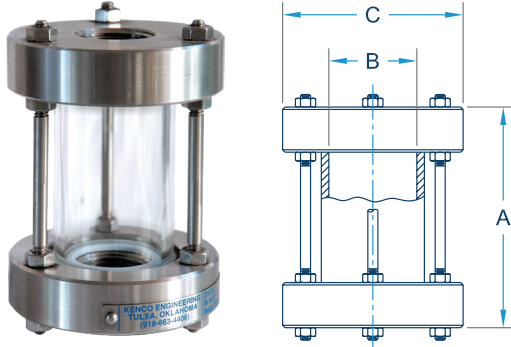
• Example Order Number: KSF-HT-F-1.0-T-S-R

FULL VIEW & ARMORED SIGHT FLOW INDICATORS

KENCO Full View Sight Flow Indicators provide for the maximum viewing area of all types of flow indicators. The open design allows 360° inspection of the liquid being observed. Available in NPT Threaded and Flanged models, these sight flow indicators are designed to enhance the visibility of the media as it passes through the glass cylinder. Full View Indicators are recommended for low pressure applications where maximum visibility is needed. They are best suited for vertically mounted applications.

PRODUCT DIMENSIONS

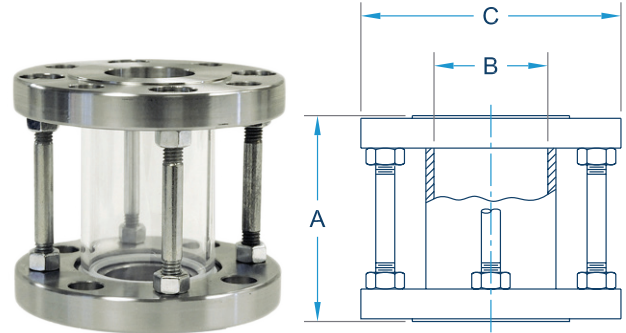
Full View: Threaded End Plates



Size (inches)	Dimensions			Pressure Rating (psig)
	*A	B (I.D.)	C	
1/2"	4.50"	1.44"	3.50"	150
3/4"	4.50"	1.44"	3.50"	150
1"	4.50"	1.63"	3.50"	150
1-1/4"	4.75"	2.13"	4.00"	120
1-1/2"	4.75"	2.13"	4.00"	120
2"	5.50"	2.63"	4.50"	100

*Dimension "A" is ± 0.13 "

Full View: 150 Lb. Flanged End Plates

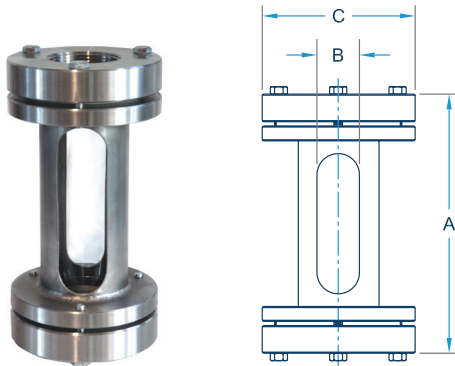


Size (inches)	Dimensions			Pressure Rating (psig)
	*A	B (I.D.)	C	
1/2"	3.88"	0.94"	3.50"	150
3/4"	3.88"	1.19"	3.88"	150
1"	4.00"	1.44"	4.25"	150
1-1/2"	4.00"	2.13"	5.00"	120
2"	4.75"	2.63"	6.00"	100
2-1/2"	5.38"	3.13"	7.00"	85
3"	5.38"	3.50"	7.50"	100
4"	7.50"	4.50"	9.00"	70
6"	10.38"	6.25"	11.00"	45

*Dimension "A" is ± 0.13 "

KENCO Armored Sight Flow Indicators provide the best mix between visibility and protection. The additional shielding provides protection, while still maintaining maximum visibility. These units can be mounted either vertically or horizontally. The body of the Flanged Armored Indicator is not a wetted part. Only the glass, seal and the PTFE flange facing are in contact with the process media.

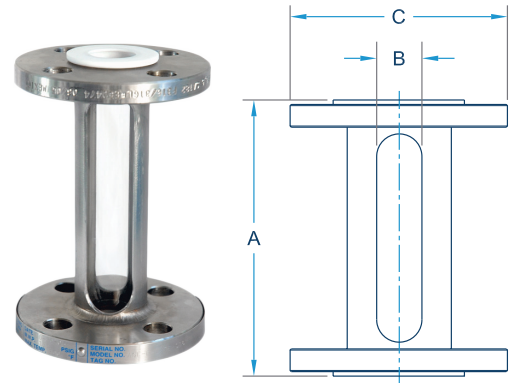
Armored: Threaded End Plates



Size (inches)	Dimensions			Pressure Rating (psig)
	*A	B	C	
1/2"	7.00"	0.63"	2.50"	150
3/4"	7.00"	0.88"	3.00"	150
1"	7.00"	1.00"	3.00"	150
1-1/4"	7.63"	1.25"	4.00"	150
1-1/2"	7.63"	1.25"	4.00"	150
2"	7.63"	1.25"	4.50"	120

*Dimension "A" is ± 0.13 "

Armored: 150 Lb. Flanged End Plates



Size (inches)	Dimensions			Pressure Rating (psig)
	*A	B	C	
1/2"	6.13"	0.63"	3.50"	150
3/4"	6.38"	0.88"	3.88"	150
1"	6.38"	1.00"	4.25"	150
1-1/2"	6.75"	1.25"	5.00"	150
2"	7.63"	1.25"	6.00"	120
2-1/2"	7.88"	1.50"	7.00"	100
3"	8.13"	1.75"	7.50"	85
4"	8.13"	1.75"	9.00"	90

*Dimension "A" is ± 0.13 "

ORDERING SYSTEM

Full View & Armored Sight Flow Indicators

REQUESTED BY: _____ COMPANY: _____

ADDRESS: _____ CITY: _____ STATE: _____ ZIP: _____

PHONE: _____ FAX: _____ EMAIL: _____

Sight Flow Style ASF=Armored FVSF=Full View	Connection Type F=Flanged T=Threaded	Connection Size Threaded 0.5=1/2" 0.75=3/4" 1.0=1" 1.25=1-1/4" 1.5=1-1/2" 2.0=2" Contact Factory for other sizes Flanged 0.5=1/2" 0.75=3/4" 1.0=1" 1.5=1-1/2" 2.0=2" 2.5=2-1/2" 3.0=3" 4.0=4" 6.0=6" (FVSF Only)
Seal Material A=Aflas B=Buna-N N=Neoprene E=Ethylene Propylene TE=FEP Encapsulated Silicone (ASF Only) V=Fluorocarbon K=Kalrez (ASF Only) TN=PTFE Envelope - Neoprene Filler (FVSF Only) TV=PTFE Envelope - Fluorocarbon Filler (FVSF Only)	Material of Construction (Body) N/A on FVSF (leave blank) CS=Carbon Steel S4=304 Stainless Steel S6=316 Stainless Steel	Material of Construction (End Plate) N/A on ASF-F (leave blank) CS=Carbon Steel S4=304 Stainless Steel S6=316 Stainless Steel A20=Alloy 20 HC=Hastelloy C 276 P=PVC CP=CPVC

• Example Order Numbers: ASF-F-1.0-N-CS; ASF-T-1.0-N-CS-S6; FVSF-F-1.0-N-CS; FVSF-T-1.0-N-CS

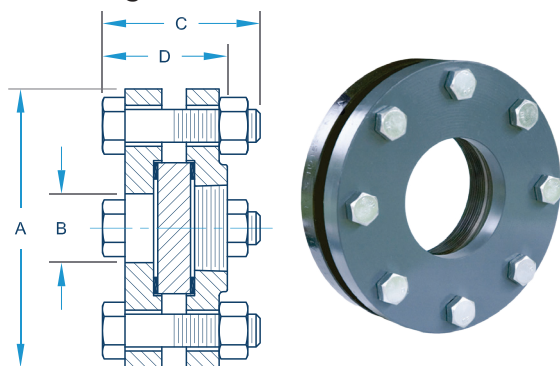
• Custom lengths available upon request.

SIGHT WINDOWS

KENCO Sight Windows are used to provide direct reading of process liquids. They can be mounted directly to the vessel wall, or to pipe, in a variety of configurations.

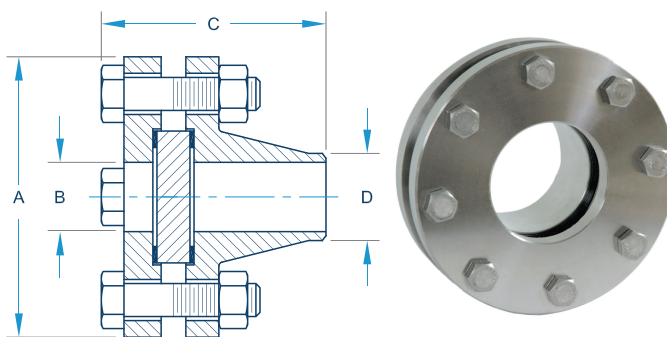
PRODUCT DIMENSIONS

Threaded Flange Window (TFW)



Size	A	B	C (STD)	C (ANSI)	D (STD)	D (ANSI)
1"	4.25"	1.05"	2.61"	2.61"	1.80"	1.80"
1.5"	5.00"	1.61"	2.86"	2.86"	2.24"	2.24"
2"	6.00"	2.07"	3.19"	3.44"	2.51"	2.63"
3"	7.50"	3.07"	3.94"	3.94"	3.10"	3.10"
4"	9.00"	4.03"	3.94"	3.94"	3.19"	3.19"
6"	11.00"	6.07"	4.27"	4.77"	3.59"	4.09"
8"	13.50"	7.98"	4.52"	5.02"	4.09"	4.59"

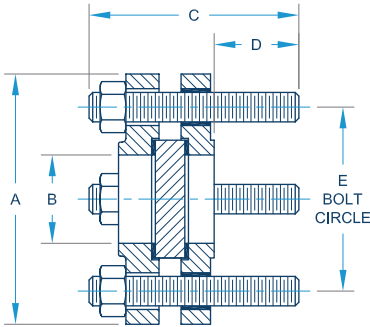
Weld Neck Window (WNW)



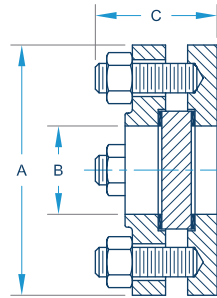
Size	A	B	C (STD)	C (ANSI)	D
1"	4.25"	1.05"	3.31"	3.31"	1.32"
1.5"	5.00"	1.61"	3.81"	3.81"	1.90"
2"	6.00"	2.07"	4.06"	4.19"	2.38"
3"	7.50"	3.07"	4.69"	4.69"	3.50"
4"	9.00"	4.03"	4.94"	4.94"	4.50"
6"	11.00"	6.07"	5.56"	6.06"	6.63"
8"	13.50"	7.98"	6.44"	6.94"	8.63"

PRODUCT DIMENSIONS - INCHES

Bolted Flange Window (BFW)



Flat Plate Window (FPW)



Size	A	B	C (STD)	C (ANSI)	D	E	STUD SIZE	STUD QTY.
1"	4.25"	1.38"	3.75"	3.75"	1.50"	3.13"	1/2"-13	4
1.5"	5.00"	1.97"	4.25"	4.25"	1.63"	3.88"	1/2"-13	4
2"	6.00"	2.46"	4.75"	4.88"	1.81"	4.75"	5/8"-11	4
3"	7.50"	3.60"	5.38"	5.38"	1.94"	6.00"	5/8"-11	4
4"	9.00"	4.60"	5.38"	5.38"	1.94"	7.50"	5/8"-11	8
6"	11.00"	6.75"	5.88"	6.38"	2.19"	9.50"	3/4"-10	8
8"	13.50"	8.75"	6.50"	7.00"	2.31"	11.75"	3/4"-10	8

Size	A	B	C (STD)	C (ANSI)
1"	4.25"	1.38"	2.41"	2.41"
1.5"	5.00"	1.97"	2.78"	2.78"
2"	6.00"	2.46"	3.09"	3.09"
3"	7.50"	3.60"	3.53"	3.53"
4"	9.00"	4.60"	3.53"	3.53"
6"	11.00"	6.75"	3.84"	4.34"
8"	13.50"	8.75"	4.47"	4.97"

Pressure Ratings

Pressure Style	Max. Temp.	Max. Pressure
Standard	300°F @ 150 psig	150 psig @ 100°F
ANSI	400°F @ 180 psig	275 psig @ 100°F

Seal Temperature Ratings

Material	Temperature
Neoprene	-20°F to 200°F
PTFE Envelope – Neoprene Filler	-20°F to 200°F
Fluorocarbon	-15°F to 400°F
PTFE Envelope – Fluorocarbon Filler	-15°F to 400°F
Non-Asbestos (ANSI Only)	0°F to 400°F

ORDERING SYSTEM

Sight Windows

REQUESTED BY: _____ COMPANY: _____
 ADDRESS: _____ CITY: _____ STATE: _____ ZIP: _____
 PHONE: _____ FAX: _____ EMAIL: _____

Window Style BFW=Bolted Flange FPW =Flat Plate TFW=Threaded Flange WNW=Weld Neck	Flange Style 10=1" 15=1-1/2" 20=2" 30=3" 40=4" 60=6" 80=8"	Sight Window Material C=Carbon Steel W=316 Stainless Steel Wetted w/Carbon Steel Cover Flange A= 316 Stainless Steel w/Stainless Steel Cover Flange X=Other (Specify)	Wetted Gasket Material N=Neoprene TN=PTFE Envelope- Neoprene Filler V=Fluorocarbon TV=PTFE Envelope- Fluorocarbon Filler A= Non-Asbestos Contact Factory for other materials	Pressure Classification S=Standard A=ANSI

• Example Order Number: FPW-20-A-N-A

Represented by:

Kenco Sales Offices:

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 Tulsa, OK 74146
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