PENBERTHY Series 700 OS&Y Offset Pattern Flat Glass Gagecocks

Model 700

Model 780

FEATURES

- Offset pattern allows easy cleaning.
- Outside screw and yoke design isolates the stem thread from the liquid.
- Solid shank vessel connection.
- Union, rigid or stuffing box gauge connections.
- Ball check shut-off prevents loss of process fluid in the event of an accidental breakage of the gauge glass.
- Threaded renewable seat.
- Backseating stem.
- Can be supplied to meet ASME requirements.

GENERAL APPLICATION

Outside screw and yoke gaugecocks are used for high temperature or corrosive-liquid applications in conjunction with direct reading flat glass gauges in the petroleum, chemical and general process industries.

TECHNICAL DATA

Materials:	Forged steel, stainless steel
Sizes:	½" to 1" (DN 15 to 25)
Gauge connection	
Model 720:	Union
Model 730:	Rigid
Model 780:	Stuffing box
Pressure (max.):	4000 psi @ 100°F (275.8 bar @ 38°C)
Temperature range:	-20°F to 750°F (-29°C to 399°C)

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PENBERTHY SERIES 700 OS&Y OFFSET PATTERN FLAT GLASS GAGECOCKS
OVERVIEW

PRODUCT OVERVIEW

With a 1500 P-Cl ANSI rating, outside screw and yoke gaugecocks are used for high temperature or corrosive-liquid applications. The OS&Y design isolates the stem threads from the liquid. The stem seats in a reciprocative instead of a rotary fashion.

Offset gaugecocks have the advantage of permitting the inside of the gauge glass to be cleaned easily with a minimum of disassembly. By removing the vent and drain plugs (or other connection), a straight passage is opened through the gauge chamber. A brush can be inserted through the gaugecock vent and drain for glass cleaning.

Gaugecock seat leakage is Class I per ISA RP39.6, FCI 70-2 (formerly ASME B16. 105) and/or IEC 60534-4.

Optional materials can be specified for the gaugecock body and trim (trim consists of the stem, stem packing retainer, ball check and seat). Standard and optional materials conform to ASTM specifications.

CENTER-TO-CENTER DIMENSIONS, in (cm)

Model	Dimension X	Dimension Y
720	6⅜ (16.8)	4⅛ (11.1)
730	4⅜ (11.7)	2⅛ (6.0)

To obtain the maximum length permissible for given vessel center-to-center dimension using ½" nipples:

Maximum gauge length = (gaugecock center-to center dimension) - (dimension X)

To determine the overall length of nipples needed to make up a gauge set for fixed vessel centerto-center dimension using ½" nipples:

Combined nipple length = (gaugecock center-to-center dimension) - (gauge length + dimension Y)

Overall nipple length can be divided between nipples to suit the application. Minimum length required for each nipple is: 1⅛" for ½" NPT nipple; 1⅜" for ¾" NPT nipple.

MODELS 720, 730 - PRESSURE/TEMPERATURE

	Maximum working pressure, psi (kPa) at temperatures to:							
Construction	-20°F [-29°C]	100°F [38°C]	200°F [93°C]	300°F [149°C]	400°F [204°C]	500°F [260°C]	550°F [288°C]	750°F [399°C]
Forged steel	4000 [27580]	4000 [27580]	3900 [26890]	3815 [26300]	3730 [25720]	3525 [24300]	3355 [23130]	2620 [18060]
Stainless steel Wetted	4000 [27580]	4000 [27580]	3900 [26890]	3815 [26300]	3730 [25720]	3525 [24300]	3355 [23130]	2755 [18990]

MODEL 780 - PRESSURE/TEMPERATURE USING STANDARD GASKET MATERIAL[1]

	Maximum working pressure, psi (kPa) at temperatures to:							
Construction	-20°F [-29°C]	100°F [38°C]	200°F [93°C]	300°F [149°C]	400°F [204°C]	500°F [260°C]	550°F [288°C]	750°F [399°C]
Forged steel	850 (5860)	850 (5860)	850 (5860)	850 (5860)	850 (5860)	850 (5860)	850 (5860)	850 (5860)
Stainless steel wetted	850 (5860)	850 (5860)	850 (5860)	850 (5860)	850 (5860)	850 (5860)	850 (5860)	850 (5860)
Forged steel w/ locking collar	1800 (12410)	1800 (12410)	1800 (12410)	1800 (12410)	1800 (12410)	1800 (12410)	1800 (12410)	1800 (12410)
Stainless steel wetted w/locking collar	1800 (12410)	1800 (12410)	1800 (12410)	1800 (12410)	1800 (12410)	1800 (12410)	1800 (12410)	1800 (12410)

1. Optional packing material may result in a derated maximum pressure for the gaugecock

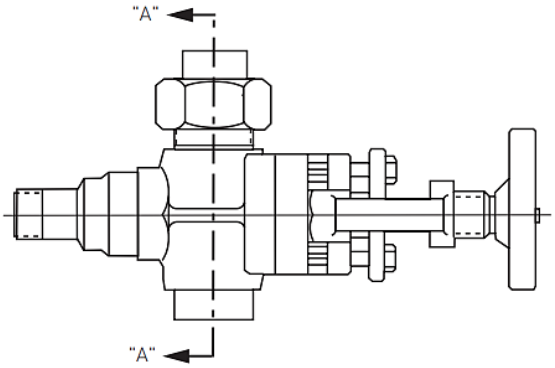
AUTOMATIC BALL CHECK SHUT-OFF

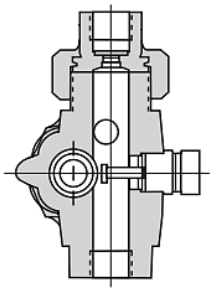
To prevent rapid loss of fluid in the event of accidental glass breakage, Penberthy gaugecocks are supplied with automatic ball check shut-off. Should the glass break, the pressure drop causes the ball checks to seat to prevent loss of tank contents. To unseat these ball checks during the liquid level readings, the tip of the gaugecock stem has an extension that pushes the ball away from its seat while allowing the gauge column to fill as liquid contents pass around the ball.

Both upper and lower gaugecocks in each set are equipped with horizontal ball checks. Balls are located on the vessel side of the gaugecock seats.

ASME Boiler Code
Gaugecocks with ball checks omitted meet ASME boiler requirements. As an alternative method to ASME boiler requirements, the lower gaugecock on Models 720 and 780 is available with an optional vertical rising ball check located in the offset portion of the gaugecock body and the upper gaugecock has a leaky seat.

VERTICALLY RISING BALL CHECK





Section "A-A"

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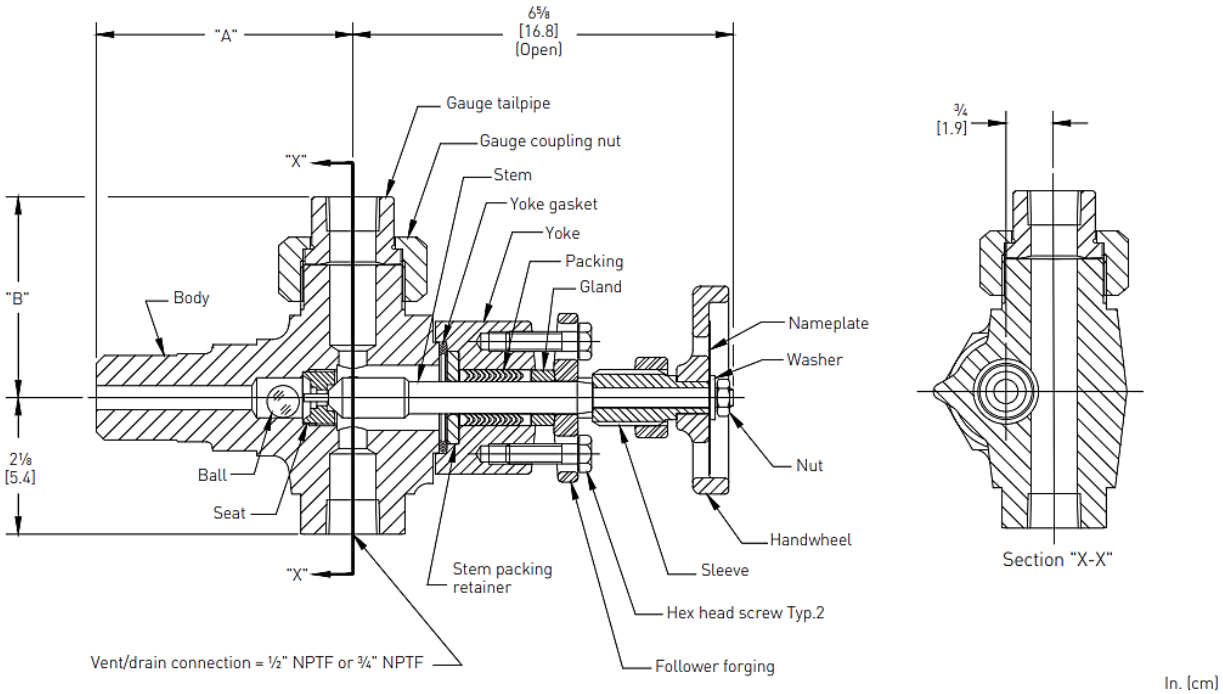
PENBERTHY SERIES 700 OS&Y OFFSET PATTERN FLAT GLASS GAGECOCKS

DIMENSIONS



In. (cm)

DIMENSIONS

Connection	Dimension 'A' inches [cm]	Dimension 'B' Inches [cm] Standard	Dimension 'B' Inches [cm] 720 option side connect
Union			
½" NPTF		3⅛ [7.9]	
½" NPTM		3¾ [9.5]	4 7/16 [11.3]
¾" NPTF		3⅛ [7.9]	
¾" NPTM		3¾ [9.5]	4 7/16 [11.3]
Rigid			
½" NPTF		2⅛ [5.4]	
¾" NPTF		2⅛ [5.4]	
Solid shank			
½" NPTM	4 [10.2]		
¾" NPTM	4 [10.2]		
1" NPTM	4 [10.2]		
Socketweld			
½" Female union		3⅛ [7.9]	
½" Female rigid		2⅛ [5.4]	
½" Male union		3¾ [9.5]	4 7/16 [11.3]
½" Male rigid	4 [10.2]		
¾" Female rigid		2⅛ [5.4]	
¾" Male union		3¾ [9.5]	4 7/16 [11.3]
¾" Male rigid	4 [10.2]		
1" Male rigid	4 [10.2]		
Spherical union			
½" NPTF		4½ [11.4]	
½" NPTM		4½ [11.4]	
¾" NPTM		4½ [11.4]	

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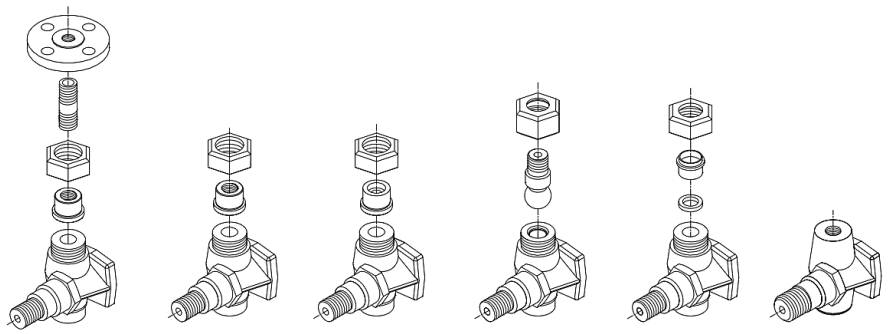
PENBERTHY SERIES 700 OS&Y OFFSET PATTERN FLAT GLASS GAGECOCKS

DIMENSIONS

DIMENSIONS - FLANGED CONNECTION

	Dimension A inches [cm]		Dimension 'B' inches [cm]	
Flanged connection	**RF Threaded**	**RF Slip on**	**RF Threaded**	**RF Slip on**
Union				
½" - 150 P-Cl (F)			4 1/16 [10.3]	4 3/16 [10.6]
½" - 300 P-Cl (F)			4 5/16 [11.0]	4 5/16 [11.0]
½" - 600 P-Cl (F)			4 9/16 [11.6]	4 9/16 [11.6]
½" - 1500 P-Cl (F)			5 3/16 [13.2]	5 1/8 [13.0]
Rigid				
½" - 150 P-Cl (M)	4 1/8 [10.5]	4 1/4 [10.8]	3 11/16 [9.4]	3 5/8 [9.2]
½" - 300 P-Cl (M)	4 1/8 [10.5]	4 1/4 [10.8]	3 13/16 [9.7]	3 3/4 [9.5]
½" - 600 P-Cl (M)	4 3/8 [11.1]	4 1/4 [10.8]	4 1/16 [10.3]	4 1/16 [10.3]
½" - 1500 P-Cl (M)	4 5/8 [11.7]	4 1/4 [10.8]	4 13/16 [12.2]	4 3/4 [12.1]
Union				
¾" - 150 P-Cl (F)			4 5/16 [11.0]	
¾" - 300 P-Cl (F)			4 9/16 [11.6]	
¾" - 600 P-Cl (F)			4 13/16 [12.2]	
¾" - 1500 P-Cl (F)			5 5/16 [13.5]	
Rigid				
¾" - 150 P-Cl (M)	4 1/8 [10.5]	4 1/4 [10.8]	3 13/16 [9.7]	3 3/4 [9.5]
¾" - 300 P-Cl (M)	4 1/8 [10.5]	4 1/4 [10.8]	4 1/16 [10.3]	4 1/16 [10.3]
¾" - 600 P-Cl (M)	4 1/2 [11.4]	4 1/4 [10.8]	4 5/16 [11.0]	4 5/16 [11.0]
¾" - 1500 P-Cl (M)	4 3/4 [12.1]	4 1/4 [10.8]	4 15/16 [12.5]	4 7/8 [12.4]
1" - 150 P-Cl (M)	4 1/16 [10.3]	4 1/4 [10.8]	3 13/16 [9.7]	3 3/4 [9.5]
1" - 300 P-Cl (M)	4 1/16 [10.3]	4 1/4 [10.8]	4 1/16 [10.3]	4 1/16 [10.3]
1" - 600 P-Cl (M)	4 1/2 [11.4]	4 1/4 [10.8]	4 5/16 [11.0]	4 5/16 [11.0]
1" - 1500 P-Cl (M)	4 3/4 [12.1]	4 1/4 [10.8]	5 1/8 [13.0]	5 1/8 [13.0]

GAUGE CONNECTIONS



Flanged
720 Option

Union
720 Standard

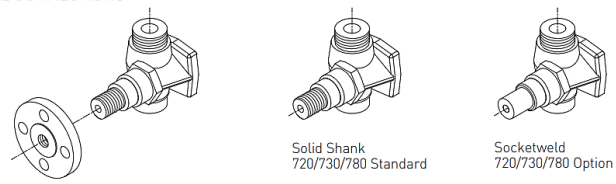
Socketweld
720 Option

Spherical Union
720 Option

Stuffing Box
780 Option

Rigid
730 Standard

VESSEL CONNECTIONS



Flanged
720/730/780 Option

Solid Shank
720/730/780 Standard

Socketweld
720/730/780 Option

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PENBERTHY SERIES 700 OS&Y OFFSET PATTERN FLAT GLASS GAGECOCKS
MATERIALS

MATERIALS

Ref. no.	Description		Standard materials: Carbon steel to -20°F	Standard materials: Wetted 316 STS to -20°F	Standard materials: Sour gas service to -20°F	Standard materials: Low-temp. to -50°F	Optional materials
11	Body		ASTM A105 (forged) carbon steel	ASTM A351 316/316L STS (cast) Gr. CF3M	ASTM A105 (forged) carbon steel per NACE MR0175 &/or MR0103	ASTM A350 (forged) carbon steel Gr. LF2 Cl. 1	ASTM A351 304/304L STS Gr. CF3 ASTM A182 Gr. F51 Duplex 2205 STS ASTM A494 Hastelloy B® Gr. N-12MV ASTM A352 carbon steel Gr. LCC ASTM A743 Alloy 20 Gr. CN7M ASTM B564 Monel® 400 N04400 ASTM A494 Hastelloy C® Gr. CW12MW
15	TRIM	Ball	ASTM A493, A262, or A276 316 STS				ASTM B574 Hastelloy C® 276 Borosilicate Glass ASTM B473 Alloy 20 (CARP 20Cb-3)® ASTM B164 Monel® 400 ASTM B335 Hastelloy B® CRS 304 STS ASTM A276 Duplex 2205 STS
16	TRIM	Seat	ASTM A276 316/316L STS				ASTM A276 316/316L STS
17	TRIM	Stem	ASTM A582 416 STS	ASTM A276 316/316L STS	ASTM A276 410 STS per NACE MR0175 &/or MR0103	ASTM A582 416 STS or ASTM A276 410 STS	ASTM A276 304/304L STS ASTM A276 Duplex 2205 STS ASTM B164 Monel® 400 ASTM B473 Alloy 20 (CARP 20Cb-3)®
18	TRIM	Stem packing retainer	ASTM A108 carbon steel AISI C1018	ASTM A276 316/316L STS	ASTM A108 carbon steel AISI C1018 per NACE MR0175 &/or MR0103	ASTM A276 316/316L STS	B335 Hastelloy B® ASTM B574 Hastelloy C® 276
19	Stem packing gland		Copper infiltrated iron		ASTM A276 316/316L STS		None
22	Yoke cap screw		ASTM A193 carbon steel Gr. B7		ASTM A193 carbon steel Gr. B7M	ASTM A320 carbon steel Gr. L7	None
23	Packing gland cap screw						
24	Gland follower		ASTM A105 (forged) carbon steel			ASTM A350 (forged) carbon steel Gr. LF2 Cl. 1	ASTM A351 316/316L STS Gr. CF3M
25	Stem packing		Graphite composite				Teflon® chevron style
28	Handwheel		ASTM A536 ductile iron			ASTM A216 carbon steel Gr. WCB	None
30	Handwheel nut		SAE J995 carbon steel Gr. 2				None
42	Yoke gasket		Non-asbestos w/ 316 STS insert				Teflon® w/Monel® insert
45	Yoke		ASTM A105 (forged) carbon steel			ASTM A350 (forged) carbon steel Gr. LF2 Cl. 1	ASTM A351 316/316L STS Gr. CF3M
125	Washer		Cadmium plated steel				None
228	Stem sleeve		ASTM A582 416 STS				ASTM A276 316/316L STS
720 Gaugecock							
31	Gauge tailpipe		ASTM A108 carbon steel AISI C1018	ASTM A276 316/316L STS	ASTM A108 carbon steel AISI C1018 per NACE MR0175 &/or MR0103	ASTM A350 (forged) carbon steel Gr. LF2 Cl. 1	ASTM A276 304/304L STS ASTM A276 Duplex 2205 STS ASTM B164 Monel® 400 ASTM B473 Alloy 20 (CARP 20Cb-3)® B335 Hastelloy B® ASTM B574 Hastelloy C®
32	Gauge coupling nut		ASTM A108 carbon steel AISI C1018	ASTM A108 carbon steel AISI C1018		Investment cast 316 STS	
780 Gaugecock							
34	Glass packing		Graphite composite				Teflon®
36	Glass packing gland		MPIF SS-316N2-33 316 STS (sintered)			ASTM A350 (forged) carbon steel Gr. LF2 Cl. 1	ASTM A276 304/304L STS ASTM A276 Duplex 2205 STS ASTM B164 Monel® 400
37	Glass packing nut		ASTM A108 carbon steel AISI C1018	ASTM A108 carbon steel AISI C1018	ASTM A108 carbon steel AISI C1018	Investment cast 316 STS	ASTM B473 Alloy 20 (CARP 20Cb-3)® B335 Hastelloy B® ASTM B574 Hastelloy C®

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PENBERTHY SERIES 700 OS&Y OFFSET PATTERN FLAT GLASS GAGECOCKS

STANDARD/OPTIONAL FEATURES

		720		730		780	
Feature		**Std.**	**Opt.**	**Std.**	**Opt.**	**Std.**	**Opt.**
Pattern							
Offset		X		X		X	
OS&Y							
OS&Y		X		X		X	
Gauge connection							
Union	½" NPTF	X					
	½" NPTM		X				
	¾" NPTF		X				
	¾" NPTM		X				
Rigid	½" NPTF			X			
	¾" NPTF				X		
Socketweld	½" Female		X		X		
	½" Male		X				
	¾" Female				X		
	¾" Male		X				
Flanged			X		X		
Spherical union	½" NPTF		X				
	½" NPTM		X				
	¾" NPTM		X				
Stuffing box	¾" adapter diameter					X	
Vessel connection (solid shank)							
Threaded	½" NPTM		X		X		X
	¾" NPTM	X		X		X	
	1" NPTM		X		X		X
Socketweld	½" Male		X		X		X
	¾" Male		X		X		X
	1" Male		X		X		X
Flanged			X		X		X
Vent/drain connection							
½" NPTF		X		X		X	
¾" NPTF			X		X		X
Ball check shut-off							
Horizontal lower and upper gaugecocks		X		X		X	
Vertical lower/horizontal upper gaugecock*			X				X
Omitted*			X		X		X
Seat							
Threaded (renewable)		X		X		X	
Backseating stem		X		X		X	
Handwheel							
w/standard pitch threads		X		X		X	
w/quick closing thread (¼ turn)			X		X		X

* Acceptable for ASME service

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PENBERTHY SERIES 700 OS&Y OFFSET PATTERN FLAT GLASS GAGECOCKS
SELECTION GUIDE – PART 1

SELECTION GUIDE

Example:	720	C	C	X	E
Model					
720 Model 720					
722 Model 722 with gasketed gauge tailpipe					
730 Model 730					
750 Model 750 Fugitive Emissions 5 PPM					
751 Model 751 Fugitive Emissions PPM					
780 Model 780					
Body Material					
C Carbon steel (standard)					
S 316/316L Stainless					
L Low-temp carbon steel					
M Monel®					
A Alloy 20					
H Hastelloy C®					
D Duplex 2205					
F 304/304L Stainless					
I Incoloy 625					
N A105 N					
Trim Material					
C 416 Stainless steel (standard)					
S 316/316L Stainless					
B 410 Stainless Steel					
M Monel®					
A Alloy 20					
H Hastelloy C®					
D Duplex 2205					
F 304/304L Stainless					
I Incoloy 625					
NACE MR-01-75 and/or MR-0103					
X None					
W NACE Wetted					
E Environmental					
Vessel Connection Size					
C ½"					
E ¾" (standard)					
F 1"					
G 1¼" (flange only)					
H 1½" (flange only)					
J 2" (flange only)					
K 2½" (flange only)					
L 3" (flange only)					

PART 2 - PAGE 9
J X C A

PART 3 - PAGE 10
X C A C

PART 4 - PAGE 11
A G S S

PART 5 - PAGE 12
X X X X X

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PENBERTHY SERIES 700 OS&Y OFFSET PATTERN FLAT GLASS GAGECOCKS
SELECTION GUIDE – PART 2

PART 1 - PAGE 8

720	C	C	X	E

SELECTION GUIDE - PART 2

Example:	J	X	C	A
Vessel Connection Type				
J Solid shank NPTM (standard)				
K Solid Shank SW Male				
N Raised face SO flange				
P Flat face SO flange				
R RTJ SO flange				
S Raised face SW flange				
T Flat face SW flange				
U RTJ SW flange				
V Raised face WN flange				
W Flat face WN flange				
Y RTJ WN flange				
Vessel Connection Pressure Class (If Flanged)				
X None				
1 150 P-Cl				
3 300 P-Cl				
6 600 P-Cl				
9 900 P-Cl				
F 1500 P-Cl				
T 2500 P-Cl				
Gauge Connection Size				
C ½" (standard)				
E ¾" (standard on Model 780)				
F 1" (flange only)				
G 1¼" (flange only)				
H 1½" (flange only)				
J 2" (flange only)				
K 2½" (flange only)				
L 3" (flange only)				
Gauge Connection Type				
A NPTF union (standard on Model 72X)				
D Socket weld female union				
G Spherical union NPTF				
H Spherical union NPTM				
J Spherical union SWF				
K Spherical union SWM				
Y NPTF rigid (standard on Model 730)				
Z SWF rigid				
L Raised face SO flange				
M Flat face SO flange				
N RTJ SO flange				
P Raised face SW flange				
R Flat face SW flange				
S RTJ SW flange				
T Raised face WN flange				
U Flat face WN flange				
V RTJ WN flange				
1 NPTM union				
B NPTM union 1 11/16 L				
C NPTM union 2⅜ L				
E SWM union 1 11/16 L				
F SWM union 2⅜ L				
2 Socket weld female Coupling				
3 Stuffing box female Union (standard on Model 780)				

PART 3 - PAGE 10

X	C	A	C

PART 4 - PAGE 11

A	G	S	S

PART 5 - PAGE 12

X	X	X	X	X

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PENBERTHY SERIES 700 OS&Y OFFSET PATTERN FLAT GLASS GAGECOCKS

SELECTION GUIDE – PART 3

PART 1 - PAGE 8

720	C	C	X	E

PART 2 - PAGE 9

J	X	C	A

SELECTION GUIDE - PART 3

Example:	X	C	A	C

Gauge Connection Pressure Class (If Flanged)

X	None
1	P CL 150
3	300 P-Cl
6	600 P-Cl
9	900 P-Cl
F	1500 P-Cl
T	2500 P-Cl

Vent Connection Size

X	None
C	½" (standard)
E	¾"
F	1" (flange only)
G	1¼" (flange only)
H	1½" (flange only)
J	2" (flange only)
K	2½" (flange only)
L	3" (flange only)

Vent Connection Type

X	None
A	NPTF (standard)
B	Socket weld female
C	Raised face SO flange
D	Flat face SO flange
E	RTJ SO flange
F	Raised face SW flange
G	Flat face SW flange
H	RTJ SW flange
J	Raised face WN flange
K	Flat face WN flange
L	RTJ WN flange
M	Socket weld plugged
N	Socket weld male
P	NPT plugged

Drain Connection Size

X	None
C	½" (standard)
E	¾"
F	1" (flange only)
G	1¼" (flange only)
H	1½" (flange only)
J	2" (flange only)
K	2½" (flange only)
L	3" (flange only)

PART 4 - PAGE 11

A	G	S	S

PART 5 - PAGE 12

X	X	X	X	X

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PENBERTHY SERIES 700 OS&Y OFFSET PATTERN FLAT GLASS GAGECOCKS

SELECTION GUIDE – PART 4

PART 1 - PAGE 8

720	C	C	X	E

PART 2 - PAGE 9

J	X	C	A

PART 3 - PAGE 10

X	C	A	C

SELECTION GUIDE - PART 4

PART 5 - PAGE 12

Example:	A	G	S	S	X	X	X	X	X

Drain Connection Type

X	None
A	NPTF (standard)
B	Socket weld female
C	Raised face SO flange
D	Flat face SO flange
E	RTJ SO flange
F	Raised face SW flange
G	Flat face SW flange
H	RTJ SW flange
J	Raised face WN flange
K	Flat face WN flange
L	RTJ WN flange
M	Socket weld plugged
N	Socket weld male
P	NPT plugged

Stem Packing Material

G	Grafoil (standard)
T	Teflon®
V	Viton® A
F	Kalrez® (standard for Model 75X)

Stem Operation

S	Standard
A	Quick close stem w/lever
B	Quick close stem w/handwheel
F	Standard close stem w/lever

Paint Specification

X	None
S	Standard
O	Offshore spec 2600 paint

PENBERTHY®

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PENBERTHY SERIES 700 OS&Y OFFSET PATTERN FLAT GLASS GAGECOCKS

SELECTION GUIDE – PART 5

PART 1 - PAGE 8

720	C	C	X	E

PART 2 - PAGE 9

J	X	C	A

PART 3 - PAGE 10

X	C	A	C

PART 4 - PAGE 11

A	G	S	S

SELECTION GUIDE - PART 5

Example:	X	X	X	X	X

Option 1

X	None
M	Schedule XXS Nipples
N	Vacuum Service Vessel
P	Schedule 160 Piping

Option 2

X	None
A	A193 Gr. B7M Yoke Bolting
B	Pre-heat Welds to 200°F

Option 3

X	None
B	For Steam service
C	For -50°F service
F	No China
G	ASME "S" stamping required
M	Post weld heat treat required
N	Stainless Steel Construction w/ Painted Iron Handwheel

Option 4

X	None
A	Per UOP Spec. 6-20
B	ASME Vertical Ball L-Valve Plug
C	ASME Ball Checks Omitted
E	Vacuum Service Vessel Connection
F	Radiographic Exam Welds
J	Dye Penetrant Exam Welds
L	Pickle & Passivate Stainless Steel
M	Per UOP Spec. 6-20-4
Y	Stem Seat Surface Stellite

Option 5

X	None
D	No China
E	No China, India, EEU
F	USA Origin Only
K	Dye Penetrant Exam Welds
P	Radiographic Exam Welds
U	Magnetic Particle Exam Welds
Y	Schedule 160 Nipples
4	Post Weld Heat Treat Required

NOTES

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