tyco/Flow Control/ Tyco Valves & Controls

Penberthy

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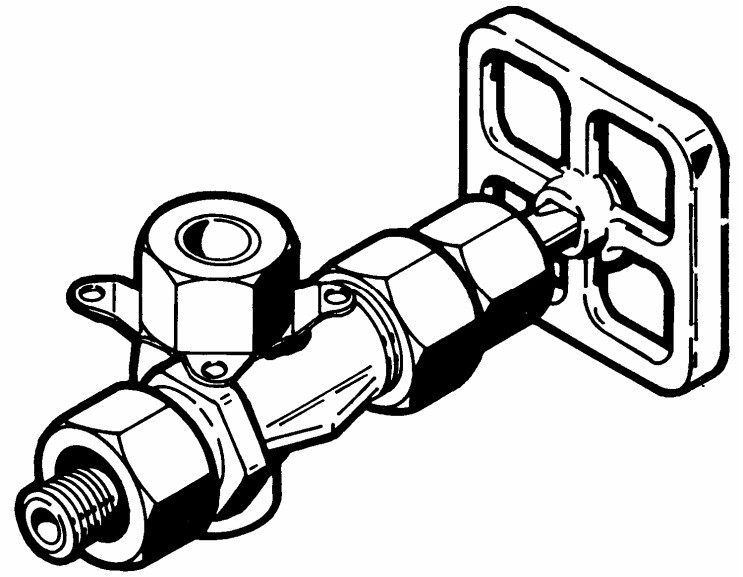
PENBERTHY®

Tubular Gagecocks

Series N2, K2



Installation, Operation and Maintenance Instructions

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PENBERTHY PRODUCT WARRANTY

Tyco Valves & Controls Prophetstown warrants its Penberthy products as designed and manufactured by TV&C Prophetstown to be free of defects in the 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. TV&C Prophetstown 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 TV&C Prophetstown and obtain written authorization to return the product. Thereafter, the product shall be returned to TV&C in Prophetstown, Illinois, with freight paid.

This warranty shall not apply if the product has been disassembled, tampered with, repaired or otherwise altered outside of TV&C Prophetstown factory, or if it has been subject to misuse, neglect or accident.

The responsibility of TV&C Prophetstown hereunder is limited to repairing or replacing the product at its expense. TV&C Prophetstown shall not be liable for loss, damage or expenses related directly or indirectly to the installation or use of its products, or from any other cause or for consequential damages. It is expressly understood that TV&C Prophetstown is not responsible for damage or injury caused to other products, buildings, personnel or property, by reason of the installation or use of its products.

THIS IS TV&C PROPHETSTOWN'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 TV&C Prophetstown unless made in writing and signed by the General Manager or Director of Engineering of TV&C Prophetstown.

INSTALLATION, OPERATION and MAINTENANCE MANUAL
FOR PENBERTHY SERIES N2 & K2 GAGECOCKS

1.0 About the Manual

This manual has been prepared as an aide and guide for personnel involved in installation or maintenance. All instructions must be read and understood thoroughly before attempting any installation, operation or maintenance.

SAFETY INSTRUCTIONS

Penberthy does not have any control over the manner in which its gagecocks are handled, installed or used. Penberthy cannot and will not guarantee that a gagecock is suitable or compatible for the user's specific application.

WARNING

Vessel fluids may be pressurized and can unexpectedly exit vessel connections due to apparatus or material failure. Safety glasses should be worn when installing a gagecock. Failure to follow *any* instruction could possibly result in a malfunction of the gagecock with resulting sudden release of pressure, severe physical injury or property damage.

2.0 Introduction

Penberthy tubular gagecocks are used to isolate tubular glass or other apparatus from the holding or pressure vessel when it becomes necessary to drain and service the tubular gage. Penberthy Series N2 and K2 gagecocks are supplied in pairs, (upper and lower), that house each end of a transparent sight glass tube and are available with socketweld, flanged or NPT connections. This gagecock/glass combination forms a gage that accurately indicates fluid level as well as fluid characteristics.

These gagecocks are equipped, as a standard feature, with a union vessel connection and ball check shut-offs to prevent leakage of contained fluid in case of accidental tubular glass breakage.

Series N2 and K2 gagecocks for process use should include ball check shut-off feature. Gagecocks without the ball check shut-off feature will not automatically stop leakage of contained fluid in the event of accidental tubular glass breakage.

2.1 System Description

Penberthy tubular gagecocks are comprised of six basic components. Each component may vary slightly, depending on the desired physical and mechanical properties for the gagecock. Use the exploded parts view in Section 11.0 as additional reference material.

Body- a pressure retaining structure through which fluid passes to enter a tubular glass or other apparatus. Provides a rigid, union, or spherical union connection to the vessel and seating surfaces for most gagecock components. Series N2 and K2 are offset pattern bodies.

Ball Checks- sphere installed loosely within the body of the gagecock that seats to prevent significant leakage when a differential pressure surge occurs (e.g., mechanical failure). Ball checks for ASME steam service incorporate a vertically rising lower and leaky horizontal upper or omit ball checks completely. "Reverse acting" ball checks are available for vacuum service.

Trim- wetted parts that mechanically control the fluid path from the vessel to the tubular glass or other apparatus. The ball and stem act to seal and release the fluid. In the event of mechanical failure, the ball will seat to prevent large quantities of the contained fluid from exiting the vessel. Fluid is allowed to exit the vessel into the tubular glass or other apparatus when the stem is screwed away from its seated position. The fluid is sealed when the stem is screwed into its seated position.

The stem packing retainer provides a compression surface between the process fluid and the stem packing. A stem packing gland is used to compress the packing against the retainer and around the stem to prevent leakage.

Stem Packing- under compression the stem packing is forced to mold around the stem and prevent leakage of fluid during operation.

Gage Connection- provides connection between the gagecock and the tubular glass or other apparatus. A stuffing box style which allows for the glass packing to be forced to mold around the tubular glass and prevent leakage of fluid during operation.

Handwheel/Lever- rotated to engage threads and provide screw action of stem.

3.0 Available Models

Tubular gagecock standard features are listed in the table below:

Model	N2	K2
Offset Pattern	X	X
Integral Bonnet	X	
Union Bonnet		X
Stuffing Box Connection	X	X
Screwed in Seat		X
Integral Seat	X	

Table 1

3.1 Design Ratings at Maximum and Minimum Operating Temperatures

To determine the maximum allowable working pressure for a specific temperature within the design limits stated below, the user must refer to Penberthy Application Reports, or when provided, the specifically stated design limits on a Penberthy product proposal.

Gagecock Series	Material of Construction	Maximum Allowable Working Pressure	
		Teflon® packing	Grafoil® packing
N2A K2A	Carbon Steel 316 STS Construction	675 psig [4650 kPa] at -20°F [-29°C] to 100°F [38°C] 555 psig [3830 kPa] at 500°F [260°C]	675 psig [4650 kPa] at -20°F [-29°C] to 100°F [38°C] 400 psig [2760 kPa] at 750°F [399°C]
		675 psig [4650 kPa] at -300°F [-184°C] to 100°F [38°C] 555 psig [3830 kPa] at 500°F [260°C]	675 psig [4650 kPa] at -300°F [-184°C] to 100°F [38°C] 400 psig [2760 kPa] at 750°F [399°C]
N2B N2C	Carbon Steel	750 psig [5170 kPa] at -20°F [-29°C] to 100°F [38°C] 610 psig [4210 kPa] at 500°F [260°C]	750 psig [5170 kPa] at -20°F [-29°C] to 100°F [38°C] 450 psig [3100 kPa] at 750°F [399°C]
K2B K2C	316 STS Construction	750 psig [5170 kPa] at -300°F [-184°C] to 100°F [38°C] 610 psig [4210 kPa] at 500°F [260°C]	750 psig [5170 kPa] at -300°F [-184°C] to 100°F [38°C] 450 psig [3100 kPa] at 750°F [399°C]

Table 2

Pressure/temperature ranges in above table are subject to the limitations of the tubular glass. See Table 3 below.

TUBULAR GLASS - RATINGS
5/8" (16 mm) and 3/4" (19 mm) OD

Center To Center Distance For Vessel Connections	No Corrosion Up To 150°F [66°C]			Steam Boiler Service Up To 425°F [218°C]		
	High Pressure	Heavy Wall	Red Line	High Pressure	Heavy Wall	Red Line
Inches [mm]	psig [kPa]			psig [kPa]		
10 [254]	410 [2830]	600 [4140]	340 [2340]	310 [2140]	345 [2380]	275 [1900]
15 [381]	385 [2650]	600 [4140]	310 [2140]	280 [1930]	325 [2240]	265 [1830]
20 [508]	355 [2450]	600 [4140]	285 [1960]	265 [1830]	315 [2170]	260 [1790]
25 [635]	300 [2070]	580 [4000]	260 [1790]	250 [1720]	300 [2070]	250 [1720]
30 [762]	275 [1900]	550 [3790]	230 [1590]	Not Recommended		
35 [889]	240 [1650]	500 [3450]	200 [1380]			
40 [1016]	210 [1450]	420 [2890]	180 [1240]			
45 [1143]	200 [1380]	360 [2480]	170 [1170]			
50 [1270]	180 [1240]	340 [2340]	160 [1100]			
55 [1397]	150 [1030]	N/A	140 [970]			
60 [1524]	140 [970]	N/A	120 [830]			
65 [1651]	125 [860]	N/A	100 [690]			
70 [1778]	100 [690]	N/A	90 [620]			

N/A - Not Available

Table 3

NEVER exceed these design ratings or application data. Exceeding design ratings or application data may result in mechanical failure of gagecock components resulting in serious personal injury or property damage.

3.2 Steam Application

Penberthy series N2 and K2 gagecocks are designed for process conditions. In low pressure steam/water applications (≤ 350 psig [2410 kPa] at 434°F [223°C], Penberthy allows the use of N2 and K2 series gagecocks because the potential mechanical stress imposed on the gagecock assembly by the thermodynamic steam environment is relatively small. Request a copy of Penberthy Application Report No. 2781 for more detailed information.

4.0 Inspection

Upon receipt of a gagecock set, check all components carefully for damage incurred in shipping. If damage is evident or suspected, do not attempt any installation. Notify carrier immediately and request damage inspection. Refer to exploded view drawing in Section 11.0 to inventory parts.

4.1 User Rating Inspection

The user should confirm that:

1. The gagecock set model number and pressure/temperature rating stamped on nameplate conforms to the description on the user's purchase order
2. The operating conditions described in the purchase order agree with the actual operating conditions at the installation site
3. The actual operating conditions at the installation site are within the application data shown on the Penberthy Technical Data Bulletin or product proposal referred to previously
4. The materials of construction of the gagecock set are compatible with both the contained fluid and the surrounding atmosphere in the specific application.

SAFETY INSTRUCTIONS

If the size, model or performance data of the gagecock set as received does not conform with any of the criteria above, do not proceed with installation. Contact an authorized Penberthy distributor for assistance.

5.0 Installation

Installation should only be undertaken by qualified personnel who are familiar with this equipment. They should have read and understood all of the instructions in this manual. The user should refer to Penberthy dimension sheets or Penberthy product proposal to obtain dimensional information for specific size and model gagecock set.

Penberthy recommendations on tubular gagecock installations are limited to the installation of tubular glass liquid level gages when used as liquid level indicating devices. The number of different types of gagecock installations is too great to adequately explain in an installation manual. Therefore, it is the user's responsibility to assure that knowledgeable installation personnel plan and carry out the installation in a safe manner. The following procedures are some of the guidelines that should be employed.

5.1 Mounting

1. Prior to installation, turn the handwheel or lever of each gagecock clockwise until the stem closes against the seat.
2. Remove union vessel connections from gagecocks, where applicable, and apply heavy grease (where allowable) to tailpipe seat. (The grease minimizes galling of the seat surfaces when tightening the coupling nuts.)
3. Wrench tighten tailpipes of upper and lower gagecocks to the vessel using Teflon® tape, or equivalent, on all male tapered pipe thread connections as shown in Figure 1. Make sure the coupling nuts are in place on the tailpipes prior to assembling to vessel. If the gagecock is flanged or weld mount, use proper industry standard procedures.
4. Mount upper and lower gagecocks to vessel tailpipes making certain that tubular glass connections are aligned vertically and to vessel centers as called for on application specification. Union vessel connection should only be snug at this time.

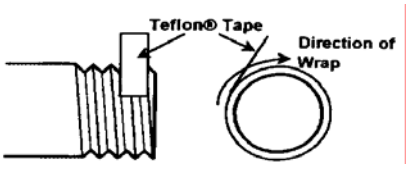


Figure 1

5.2 Tubular Glass Installation

1. Turn upper gagecock counterclockwise (approx. 1/8 turn).
2. Loosen glass packing nut to insure there is no compressive force on glass packing.
3. Insert tubular glass up into upper gagecock stuffing box connection.
4. Return upper gagecock to its original position while holding tubular glass in place with upward force to insure its clearing of lower stuffing box connection. Check vertical alignment of gagecocks.
5. Loosen glass packing nut on lower gagecock and pull glass down into lower gagecock stuffing box connection to a positive stop.
6. Tighten upper and lower vessel coupling nuts.
7. Tighten upper and lower glass packing nuts.

Note: In some circumstances, it may be necessary to remove glass packing nut, glass packing gland and glass packing, and mount them on tubular glass prior to insertion of glass into upper and lower gagecock bodies. See Figure 2 for proper assembly sequence.

5.3 Guard Rod Installation

Guard rods (four required) are assembled downward through upper gagecock star with swaged portion of rods at the top. Bottom of rods are positioned into respective holes in the lower gagecock star.

6.0 Operation

Before initializing gagecock operation, check that all installation procedures have been completed. Use only qualified experienced personnel who are familiar with tubular gagecock equipment and thoroughly understand the implications of the tables and all the instructions. Check to determine that all connections are pressure tight.

Gagecock installations should be brought into service slowly. The tubular glass used in gagecocks is tempered and can withstand minimal thermal shock and mechanical stress. Gagecocks should be opened slightly, and the gagecock assembly temperature and pressure allowed to slowly equalize. If the gagecocks are equipped with ball checks, the gagecocks must be opened all the way after the pressure and temperature have equalized to permit operation of the automatic ball check in the event of tubular glass failure. Failure to follow the recommended operating procedures can result in severe personal injury or property damage.

6.1 Hydrostatic Test

Take all precautions necessary to handle the possibility of leakage during the test. Hydrostatic pressure test all installations to 100 psig (690 kPa) and correct any leakage before proceeding.

7.0 Maintenance

WARNING

Use only qualified experienced personnel who are familiar with tubular gagecock equipment and thoroughly understand the implications of the tables and all the instructions. DO NOT proceed with any maintenance unless the gagecock assembly has been relieved of all pressure or vacuum, has been allowed to reach ambient temperature and has been drained or purged of all fluids. Failure to do so can cause serious personal injury and property damage.

The user must create maintenance schedules, safety manuals and inspection details for each gagecock. These will be based upon the users own operating experience with their specific application. Realistic maintenance schedules can only be determined with full knowledge of the services and application situations involved.

During system shutdown, the gagecocks should be left open to permit the tubular glass to lose pressure and cool with the rest of the system. Failure to leave the gagecocks open during system shutdown may trap high-pressure fluid in the tubular glass.

7.1 Preventative Maintenance

On all installations the following items should be regularly evaluated by the user for purposes of maintenance:

1. Leakage around stem area
2. Internal stem leak
3. Leakage around stuffing box connection
4. Internal or external corrosion

The user must determine, upon evaluation of his or her own operating experience, an appropriate maintenance schedule necessary for his or her own specific application. Realistic maintenance schedules can only be determined with full knowledge of the services and application situation involved.

7.2 Ball Check Shut-Off

SAFETY INSTRUCTIONS

Ball checks, when installed, may fail to seat due to corrosion of the ball or seat, foreign material in ball chamber or viscous material in the ball chamber. A routine operational test of the ball check can prevent significant seepage of fluid in the event of tubular glass breakage.

An operational check can be performed on the gagecock ball check by closing both the upper and lower gagecock stems completely. Drain contents from and relieve pressure on tubular glass to an appropriate safe container/area. **NOTE**: Some loss of process fluid to the drain line is expected with this test procedure.

WARNING

Use only qualified experienced personnel who are familiar with tubular gagecock equipment and thoroughly understand the implications of the tables and all the instructions. DO NOT proceed with any maintenance unless the gagecock assembly has been relieved of all pressure or vacuum, has been allowed to reach ambient temperature, and has been drained or purged of all fluids. Failure to do so can cause serious personal injury and property damage.

With drain line in place, open **BOTTOM** gagecock as rapidly as possible. Listen for "click" sound, which will indicate that the ball has seated. If possible, observe the quantity of flow from the drain line. Flow should either stop completely or be no greater than single drips (no solid stream). Close lower gagecock. Repeat above procedure for **UPPER** gagecock. There must be a pressure differential of at least 5 psig (35 kPa) for the above procedure to work properly.

If the above procedure is not successful, the only alternative is to isolate the tubular gagecock assembly from the vessel or to shut the process down completely. Disassemble the gagecock as outlined in section 8.1 using the exploded parts drawing in Section 11.0 as a reference. Visibly inspect ball check and ball seats in the gagecock body. Remove any foreign matter and/or replace with new ball checks if inspection indicates this is required. If the ball seat is damaged, consider replacing the gagecock or the seat (if it is removable). Reassemble gagecocks as outlined in Section 8.2.

7.3 Troubleshooting

STEM PACKING LEAKAGE can often be stopped by tightening the stem packing nut. If leak persists, the stem packing should be replaced by following steps 1) through 4) of the Disassembly and 1) through 7) of the Reassembly instructions

INTERNAL SEAT LEAKAGE is an indication of a worn or damaged stem or seat. To replace the stem follow steps 1) through 4) of the Disassembly and 1) through 7) of the Reassembly instructions. To renew the seat surface (Series N2), follow steps 1) through 3) of the Disassembly instructions. Renew the seats by using a fine lapping compound and a mandrel the same size, shape and seat angle as the stem. Flush the gagecock body clean and reassemble by following steps 4) through 7) of the Reassembly instructions.

Renewable Threaded Seats (Series K2). Remove the seat by inserting a 1/4" (6 mm) square driver in the seat and turning it counterclockwise. Install the new seat by turning it clockwise using the square driver, making sure that the ball check, if used, is replaced in the body. Tighten the seat in place.

LEAKAGE AROUND UNION connections can often be stopped by tightening the union coupling nut or remake connection using Teflon® tape, or equivalent, on all male pipe threads as shown in Figure 1.

LEAKAGE AROUND STUFFING BOX connection is an indication of worn out glass packing or improper compression of glass packing. To replace glass packing, follow steps 7) through 13) of the Disassembly and 8) through 16) of the Reassembly instructions. In the event of improper packing compression, leakage can be stopped by tightening the glass packing nut.

INTERNAL OR EXTERNAL CORROSION could be an indication of a misapplication. An investigation should immediately be carried out to determine the cause of the problem. It is the user's responsibility to choose a material of construction compatible with both the contained fluid and the surrounding atmosphere.

BROKEN TUBULAR GLASS replacement, follow steps 7) through 12) of the Disassembly and 10) through 16) of the Reassembly instructions.

8.0 Removal - Disassembly - Reassembly

Use only qualified experienced personnel who are familiar with tubular gagecock equipment and thoroughly understand the implications of the tables and all the instructions. DO NOT proceed with any maintenance unless the gagecock assembly has been relieved of all pressure or vacuum, has been allowed to reach ambient temperature and has been drained or purged of all fluids. Failure to do so can cause serious personal injury and property damage.

8.1 Disassembly

Refer to the exploded parts drawing in Section 11.0 for additional reference during disassembly and reassembly of the gagecocks.

1) Remove handwheel nut (30), nameplate (163) (lower gagecock only) and handwheel (28) or lever (261) from stem.
2) Loosen and remove stem packing nut (26).
3) Remove stem by turning counterclockwise, along with stem packing gland (19), stem packing (25) and stem packing retainer (18).
4) Slip the stem packing gland (19), stem packing (25) and stem packing retainer (18) off stem (17).
5) On Series K2 gagecocks, remove bonnet nut (21) and bonnet (20).
6) To replace seat on Series K2 gagecocks, follow instructions as described in maintenance procedures, section 7.3.
7) Remove guard rods (40) if present.
8) Loosen glass packing nut (37) on both upper and lower gagecocks.
9) Loosen vessel coupling nut (13) on upper gagecock.
10) Slide tubular glass (48) upward into upper gagecock until bottom of tubular glass clears the stuffing box connection on the lower gagecock.
11) While holding tubular glass (48) in this upward position, rotate upper gagecock counterclockwise (approximately 1/8 turn) to allow clearance to remove tubular glass from upper gagecock.
12) Remove tubular glass (48) from upper gagecock.
13) Remove glass packing nut (37), glass packing gland (36) and glass packing (34) from both upper and lower gagecocks.

8.2 Reassembly

Refer to the exploded parts drawing in Section 11.0 for additional reference during disassembly and reassembly of the gagecocks.

1) Prepare for installation of new packing by cleaning all packing chambers and glands of upper and lower gagecocks.
2) On Series K2 gagecocks, replace bonnet (20) and bonnet nut (21) and tighten securely in place.
3) Slip stem packing retainer (18) on stem.
4) Install new stem packing (25) and stem packing gland (19) on stem.
5) Thread stem assembly into gagecock by turning clockwise until stem seats and then back off one turn.
6) Assemble stem packing nut (26) and tighten in place.

7) Assemble handwheel (28) or lever (261), nameplate (163) (lower gagecock only) and handwheel nut (30) on stem and tighten securely in place.
8) Replace glass packing nut (37), glass packing gland (36), and new glass packing (34) on each end of tubular glass (48).
9) Loosen vessel coupling nut (13) of the upper gagecock.
10) With upper gagecock turned (approximately 1/8 turn) counterclockwise from vertical, insert one end of tubular glass (48) into the stuffing box connection in the upper gagecock to sufficient depth to insure clearance of the lower gagecock.
11) Rotate the upper gagecock clockwise to the original position while holding the tubular glass (48) in place with upward force to insure its clearing the lower tubular glass connection. Check vertical alignment of gagecocks.
12) Slide tubular glass (48) down into lower gagecock stuffing box connection to a positive stop.
13) Tighten vessel coupling nut (13) on upper gagecock.
14) Tighten glass packing nut (37) on both upper and lower gagecocks.
15) Close both gagecocks by turning handwheel (28) or lever (261) clockwise until stem seats.
16) Replace guard rods (40) if required.

Refer to Section 6.0 for operation of the gagecock when returned to service.

9.0 Disposal at End of Useful Life

Penberthy Series N2 and K2 gagecocks are used in a variety of fluid applications. By following the appropriate federal and industry regulations, the user must determine the extent of preparation and treatment the Series N2 and K2 gagecocks must incur before their disposal. A Material Safety Data Sheet (MSDS) may be required before disposal services accept certain components.

Metal, glass and polymers should be recycled whenever possible. Refer to order and TV&C - Prophetstown Material Specification sheets for materials of construction.

10.0 Telephone Assistance

If you are having difficulty with your Series N2 or K2 gagecock, contact your local Penberthy distributor. You may also contact the factory direct at (815) 537-2311 and ask for an applications engineer. So that we may assist you more effectively, please have as much of the following information available as possible when you call:

Model #
Name of the company from whom you purchased the Penberthy Series N2 or K2 gagecocks
Invoice # and date
Process conditions (pressure, flow rates, tank shape, etc)
A brief description of the problem
Trouble shooting procedures that failed

If attempts to solve your problem fail, you may request to return your Penberthy Series N2 or K2 gagecocks to the factory for intensive testing. You must obtain a Return Authorization (R.A.) number from TV&C Prophetstown before returning anything. Failure to do so will result in the unit being returned to you without being tested, freight collect. To obtain an R.A. number, the following information (in addition to that above) is needed:

Reason for return
Person to contact at your company
"Ship To" address

There is a minimum charge for evaluation of non-warranty units. You will be contacted before any repairs are initiated should the cost exceed the minimum charge. If you return a unit under warranty, but is not defective, the minimum charge will apply.

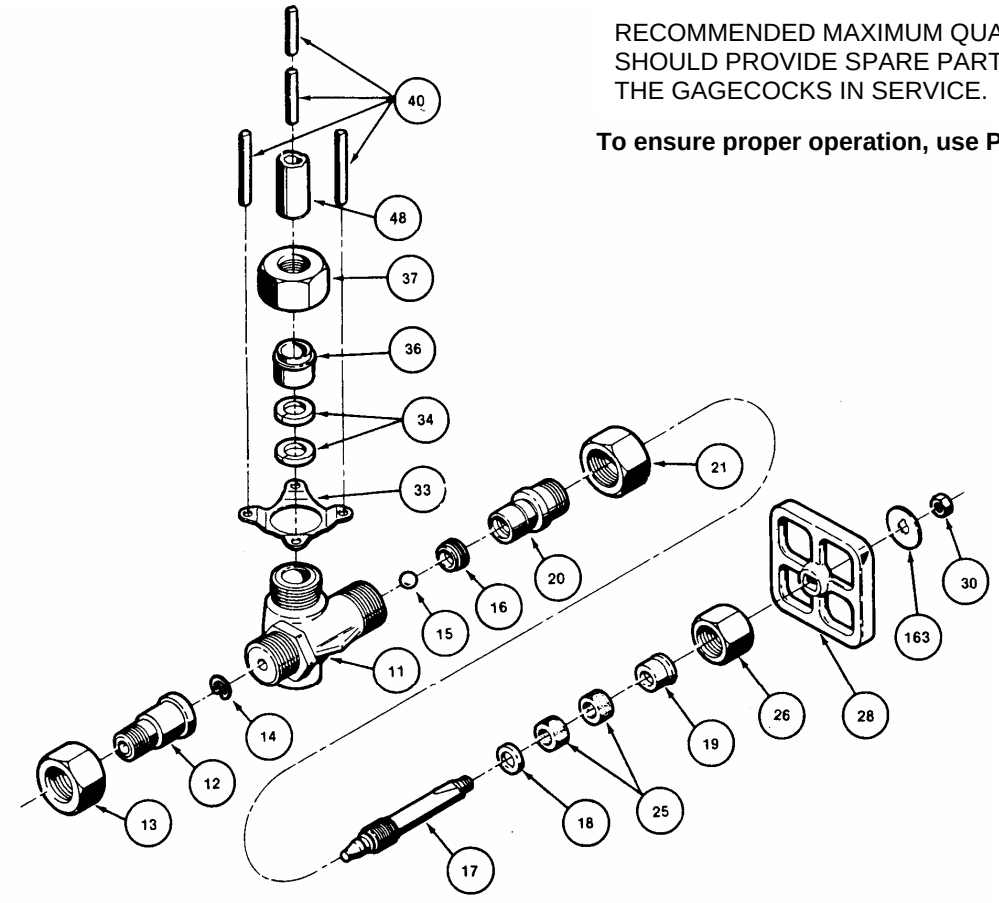
11.0 Exploded Parts Drawing

RECOMMENDED SPARE PARTS

REF. NO.	ITEM	MIN. QTY.
18	Retainer, Stem Packing	2
25	Packing, Stem	4
26	Nut, Stem Packing	1
34	Packing, Glass	4
36	Gland, Glass Packing	2
37	Nut, Glass Packing	1
48	Glass	1

RECOMMENDED MAXIMUM QUANTITIES SHOULD PROVIDE SPARE PARTS FOR 10% OF THE GAGECOCKS IN SERVICE.

To ensure proper operation, use Penberthy spare parts.



11 Body
12 Tailpipe, Vessel
13 Nut, Vessel Coupling
14 Retainer, Ball
15 Ball
16 Seat
17 Stem
18 Retainer, Stem Packing
19 Gland, Stem Packing
20 Bonnet
21 Nut, Bonnet
25 Packing, Stem
26 Nut, Stem Packing
28 Handwheel
30 Nut, Handwheel
33 Star
34 Packing, Glass
36 Gland, Glass Packing
37 Nut, Glass Packing
40 Rod
48 Glass
163 Nameplate
261 Lever

Figure 2

Note: Seat (16), Bonnet (20), and Bonnet Nut (21) are to be used on Series K2 gagecocks only.

PENBERTHY

DECLARATION of CONFORMITY

Application of EU Council Directives:
92/59/EEC; 87/404/EEC; 89/392/EEC

Standards to which conformity is declared:
EN 10213-1:4; ISO 7-1; BS 10; BS 21; BS 759;
BS 1502; BS 1506; BS 1560; BS 1965; BS 3076;
BS 3463; BS 3605; BS 3643; BS 3799; BS 4504;
ASME B&PV Code, Section VIII;
ANSI/ASME B1.1; ANSI/ASME B1.20.1;
ANSI/ASME B16.5; ANSI/ASME B18.2.1;
ANSI/ASME B18.2.2; ANSI/ASME B18.3;
ANSI/ASME B31.3

Manufacturer's Name: Tyco Valves & Controls

Manufacturer's Address: 320 Locust Street
Prophetstown, IL 61277-1147 U.S.A.

Type of Equipment: Pressure Vessel – Armored and Tubular Gage Glass Gagecocks

Equipment Class: Industrial Instrumentation – Hazardous Area

Model Designations: 100, 200, 300, 400, 500, 600, 700 series
N2, K2, N6, N7, A5

I, the undersigned, hereby declare that the equipment specified above conforms to the above Directive(s) and Standard(s).

Date: 05 May 2004

Signature: _____
Name: David J. Williams, C.Q.E.
Position: Quality Assurance Manager

Technical Construction File is available at stated address. Signatory is contact person.

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