

Introduction

This instruction manual is provided to familiarise the user with the seals listed above and their designated use. These instructions must be read and applied whenever work is done on the seal and kept available for future reference.

These instructions are for the installation and operation of a seal used in rotating machines and will help to avoid danger and increase reliability. Before use with other types of machines, John Crane should be consulted. These instructions must be read in conjunction with the instruction manuals for both the machine and any ancillary equipment.

If the seal is to be used for an application other than that originally intended or outside its recommended performance limits, John Crane must be contacted before its installation and use. Any warranty may be affected by improper handling, installation or use of this seal. Contact John Crane for information as to exclusive product warranty and limitations of liability.

If questions arise, contact your local John Crane Sales/Service Engineer or the original equipment manufacturer, as appropriate. John Crane mechanical seals are precision products and must be handled appropriately. Take particular care to avoid damage to lapped sealing faces.

Safety

The following symbols are used to highlight instructions of particular importance:

NOTE Refers to special information on how to install or operate the seal most efficiently.

ATTENTION Refers to special instructions or information to avoid damage to the seal or its surroundings.



Refers to mandatory instructions designed to prevent personal injury or extensive damage.



Refers to an environmental note.

- Installation, removal and maintenance of the seal must only be carried out by qualified personnel who have read and understood these installation instructions.
- The seal is designed exclusively for sealing rotating shafts. The manufacturer cannot be held liable for use of the seal for purposes other than this.
- The seal must be used in technically perfect conditions and must be operated within the recommended performance limits and in accordance with its designated use set out in this manual.
- If the process fluid is hazardous or toxic, appropriate precautions must be taken to ensure that any seal emissions are adequately contained. Further information on sealing hazardous or toxic fluids should be obtained from John Crane prior to seal installation.
- Fluorocarbon components should never be burned or incinerated, as the fumes and residues are highly toxic. If fluorocarbons are heated above 400°C (750°F) they can decompose. Therefore, personal protective equipment (PPE) should be worn as hydrofluoric acid may be present.

- PTFE components should never be burned or incinerated as the fumes are highly toxic. It is dangerous to smoke while handling products made from PTFE.
- Follow the relevant local guidelines for the safe and proper environmental disposal of assembly lubricants, supplied fluids and scrapped components.

Hazardous environments



Every working practice that compromises safety should be avoided.

Alarm systems are often included in the ancillary support system, and the operator must ensure appropriate action is taken promptly in the event of an alarm.

- In the event of an operating problem, the machine must be switched off and immediately made safe. Problems must be solved promptly.
- Minor emissions will occur during normal operation. Depending on the duty, this emission can appear as a gas, a liquid or a solid. For emissions which are hazardous or toxic, a safe collective system is required.
- Hot surfaces must be protected against accidental contact.
- To avoid unforeseen hazards, do not make unauthorised changes to the sealed fluid, the specific duty or the seal parts.
- Some mechanical seals are used in conjunction with an ancillary support system. This is clarified either by the flush plan description on the seal arrangement drawing or by contacting John Crane (Please see 'Mechanical Seal Piping Plans, page 7')
- It is important for the safe function of the seal that the support system is assembled and incorporated into the machine before operation. This manual should be read in conjunction with the appropriate documentation for auxiliary systems and rotating machinery.
- Maintenance with steel tools must be avoided in the presence of substances classed as Explosive Group LLC according to EN 60079-0:2012+A11:2013
- If the machine being used is an EN 60079-0:2012+A11:2013 Zone 21 or 22, regular cleaning of dust from exterior surfaces is required.

DOUBLE SEAL CARTRIDGE

Installation, Operation & Maintenance Instructions

Checking the machine

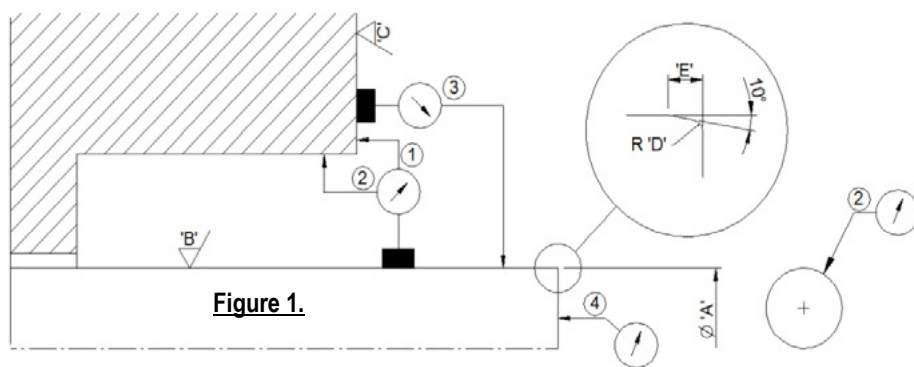


Figure 1.

Diameter 'A'	+0.00 / 0.5 mm
	+0.000 / 0.002 inch
Surface Finish 'C'	0.2-0.5 μ m Ra
	8-20 μ inch Ra
Surface Finish 'B'	1.6-3.2 μ m Ra
	63 - 125 μ inch Ra
Radius 'D'	1mm / 0.04 inch
Length 'E'	1.5mm / 0.06 inch

1	Squareness of shaft to seal chamber face	2	Concentricity seal chamber bore to shaft	3	Shaft runout	4	Shaft end play
	0.03 mm/mm diameter		<0.13 mm FIM		<0.05 mm FIM		<0.13 mm FIM
	0.001 inch/inch diameter		<0.005 inch FIM		<0.002 inch FIM		<0.005 inch FIM

Before installing the equipment

1. Ensure that the cartridge drive collar set screws and the gland plate retaining nuts have been correctly tightened.

ATTENTION The seal unit must be turned only in the direction indicated by the arrow marked on the unit.

2. Complete assembly of the equipment and turn the shaft by hand to ensure free rotation. Check the direction of rotation of the motor is correct.
3. Check that all pipework is correctly connected and the fittings are leak-free, particularly for the barrier gas supply.
4. Pressurise the seal with barrier gas to a min. of 30 psig (2 barg) above the seal chamber pressure. If the seal chamber pressure cannot be specified, the seal should be pressurised to a min. of 22 psig (1.5 barg) above discharge pressure.

NOTE The minimum barrier gas pressure required to ensure seal operation is 30 psig (2 barg)

Installation instructions

Before installing the mechanical seal read the instructions carefully. Keep for future use. Seal installation must only be carried out by a suitably qualified person.

1. Check machine as shown in Figure 1 (See page 2).
2. Check that machine is clean.
3. Unpack seal, inspect for damage, wipe clean.
4. Lubricate the machine shaft or sleeve with a suitable lubricant, unless the opposite is specified. See lubricant table for Pump Gas Seals in IOMGEN/Eng.
5. Ensure that the gland plate sealing ring is in position then slide the cartridge against the seal chamber.

6. Tighten the bolts, nuts and fasteners evenly to the torque recommended in the installation drawing. If not indicated, refer to the appropriate page of this document. Torque levels for gland plate studs must conform those given by the machine manufacturer.

7. Ensure the machine shaft is locked axially in its final correct position and evenly tighten the cartridge drive collar socket set screws according to the appropriate value. See page 9.

8. Remove any setting clips or spacers and store for future use in cartridge removal.

9. Turn the machine shaft by hand, if possible, to ensure free rotation with no shaft binding.

10. Complete the required piping to the seal. See the appropriate page of this document for extra information on how to connect the connections.

ATTENTION Take care not to use excessive thread sealant when making circulation pipe work connections. Unused tapped connections must be safely plugged before seal operation. All plastic plugs must be discarded, and only metal ones should be used.

11. Ensure the barrier pressure is always on and at least 2 bar over the seal chamber pressure or as recommended by John Crane. The pressure must be maintained even at stand-by situations to ensure no process fluid gets between the faces. Once fitted, no adjustment is possible during the life of the mechanical seal.

12. Assemble pipe work and purge with barrier gas before connection to seal. When the mechanical seal requires replacement, John Crane can supply a new or reconditioned seal to the original specification.

NOTE The following installation instructions refer to single seal installed as a non-cartridge. If seal is used as an outboard seal in a dual cartridge arrangement, please refer to the corresponding Installation Instructions.

DOUBLE SEAL CARTRIDGE

Installation, Operation & Maintenance Instructions

Before starting the machine

1. Check the machine at the coupling for the proper alignment of the driver.
2. Ensure that the Gland Plate nuts/bolts are securely tightened according to the machine manual instructions and that all screws are securely fastened.
3. Assemble the machine, ensure any setting spacers are removed from the seal and turn the shaft (by hand is possible) to ensure free rotation.
4. Consult all available machine instruction manuals to check for correctness of all piping and connections, particularly regarding seal re-circulation, heating or cooling requirements and services external to the seal. Ensure all unused ports are correctly plugged.
5. Check that the seal chamber pipework is open and free of any obstruction, and for liquid lubricated seals, ensure that the seal chamber is properly vented and filled.

ATTENTION Mechanical seals are normally designed to operate in a liquid so that the heat energy they create is adequately removed. Therefore, the following checks should be carried out not only after seal installation but also after any period of machine inactivity.

Except for dry-running or gas lubricated seals, which are designed to operate without liquid, wet seals that are operated without adequate liquid lubrication will often give rise to a "squealing" noise in the seal area and result in over-heating and scoring or other damage to the sealing surfaces, causing excessive emissions and a reduced seal life.

Seal installation should be handled only by qualified personnel. If questions arise, please contact the local John Crane Sales/Service Engineer.

Improper use and/or installation of this product could result in injury to the person and/or harmful emissions to the environment and may affect any warranty on the product.

Please contact John Crane for information as to exclusive product warranty and limitation of liability.



Before start-up, ensure that all personnel and equipment have been moved to a safe distance so there is no contact with rotating parts on the machine, seal, coupling or driver.

Maintenance

During operation, periodic visual external inspection of the seal should be carried out. A measure of seal condition is the level of emission of the process or barrier fluid and as no maintenance is possible while installed, the seal should be replaced when emissions become unacceptable. It is recommended that a spare seal be held in inventory to allow immediate replacement of a removed seal.



Machine adjustments that involve axial movement of the shaft may cause damage to the seal while installed.

Before attempting impeller clearance adjustment with a cartridge seal, refit the spacers then loosen all the drive collar socket set screws. With the shaft in its new working position, tighten with new socket set screws and remove the spacers. Keep the spacers for future use.

DECOMMISSIONING THE MACHINE

- Ensure that the machine is made safe to work on by using a secured isolation under the sole control of the person(s) working on the machine, including the following
- The driver is fully isolated from the machine using an appropriate secured isolation method
- Any pressure is safely and fully released
- Any liquid is safely drained
- Any gas safely vented
- Any chemicals are safely and fully removed
- Any other energy storage is safely and fully released
- The isolation is proved to be effective at the point of work before work is commenced



If the machine has been used on toxic or hazardous fluids, ensure that the machine is correctly decontaminated and made safe prior to commencing work. Remember that fluid is often trapped during draining and may be present inside the seal chamber. The machine instruction manual should be consulted to check for any special precautions.

REMOVING THE SEAL

NOTE

Remove from the machine with care. The seal may be suitable for reconditioning after service, if otherwise undamaged.

- Referring to the machine instruction manual, dismantle the machine sufficiently to expose the seal and the seal housing.



For a cartridge seal, the setting spacers must be refitted before starting the removal procedure.

- Deburr, clean and lubricate the shaft over which the seal will pass and remove the seal unit in the reverse order to installation
- A mechanical seal must always be serviced after removal from the machine. In order to maximise reliability and minimise safety risks, it is strongly recommended that used seals are returned to John Crane for rebuilding to as-new specification (essential for non-contacting gas seals). Alternatively, ask for John Crane service personnel to visit site. For seal dismantling and assembly instructions, refer to John Crane. See "Transportation and Storage" section regarding shipping.

NOTE

It is recommended that a low-pressure integrity test is carried out after repair and before installation on the machine.



TYPE 2800, 2800E, 2800EC, 2800EH, 2800EX, 2800XA, 2800XP, 2800XS, 2874 & 2874XP

DOUBLE SEAL CARTRIDGE

Installation, Operation & Maintenance Instructions

SPARE PARTS ONLY

John Crane spare parts should be used to recondition seals. It is advisable to stock on site sufficient spare seal cartridges or the replacement parts shown on the installation drawing or as advised by John Crane to allow immediate replacement of the seal in the machine. The order codes for spare parts can be found in the parts list on the installation drawing or from John Crane directly.

In the case of non-contacting gas seals, only complete cartridges should be stored.

The following data is necessary for spare part orders:

- Part number
- Quantity

Environmental aspects

COMPANY POLICY EXTRACT

"It is the policy of John Crane to manage its business activities in an environmentally responsible manner, comply with all relevant laws and regulations, prevent pollution, and continually improve its environmental performance, certification to the latest issue of ISO 14001 ensures compliance."

John Crane adopts the 'Design for the Environment' (DFE) principle in making this product. Using this product will benefit the environment directly by:

- Preserving valuable material resources through recycling of raw materials, the use of environmentally friendly packaging materials, the reuse of these high-quality durable seals due to their ability to be refurbished and minimised transportation using worldwide manufacturing and service centres.
- Reducing waste of precious resources through decreasing the risk of leakage
- Reducing energy consumption through seal selection using total life costs
- Preventing pollution through controlling harmful emissions to the atmosphere

RECYCLING PRODUCT REFURBISHMENT



This product has been designed for potential reuse. Depending on its post-operation condition, the seal may be repaired or rebuilt for further use. The metal components can generally be reused. The primary and mating rings may be re-lapped and re-used. Drive screws and springs are replaced. O-rings must be replaced. Please consult John Crane for assessment of seal condition and its potential reconditioning.

DISPOSAL

When the product is considered to be beyond economical repair and potential reuse, it should be disposed of by environmentally beneficial means. The product can be disassembled with ease, but appropriate PPE should be worn to prevent contact with any harmful residue that may be inside the seal.

SCRAPPED COMPONENTS

These should be handled with extra care due to possible contamination. They should be recycled through approved local industrial recycling plants.

SPECIAL MATERIALS

Follow the local relevant guidelines for the environmentally friendly disposal of assembly lubricants, supplied fluids and scrapped components. Please refer to the Safety section on page 1.

PACKAGING

All packaging materials used are made from recyclable, environmentally friendly materials. When in doubt or for further information and advice on this subject, please consult John Crane.

Quality assurance

This seal has been assembled in accordance with John Crane Quality Assurance Standards and, with proper machine maintenance and use, will give safe and reliable operation to the maximum recommended performance as shown in any relevant approved John Crane publication.

Mechanical seal piping plans

To create the optimum environment for the mechanical seal, it is usually necessary to add piping and, sometimes, extra equipment.

For advice on a specific application please contact John Crane. For liquid lubricated seals, venting of air trapped around the seal faces is essential for correct seal operation.

For horizontal machines, the best method of automatically achieving this is a piping connection at top dead centre (TDC).

For vertical machines, a piping connection above the seal faces is required.

Declaration of incorporation 2006/42/EC

For each standard product supplied into the EU, a Technical File and a Technical Record Sheet is required, satisfying the needs of 2006/42/EC.

When requested, a Declaration of Incorporation (for which a Technical File exists) will be raised and signed by a John Crane representative.

Website

These instructions and other seal information, can be found at www.johncrane.com

Fitting Lubricants

TABLE 1. FITTING LUBRICANTS

Elastomers and PTFE	Lubricants
General applications	Soft hand soap/water solution, glycerine (glycerol)
Food, pharmaceutical or similar	Consult Machine Manufacturer
Pump Gas Seals	Krytox

NOTE

Always use a lubricant that is compatible with the machine and any ancillary machine and sealed product. Use lubricant sparingly.



TYPE 2800, 2800E, 2800EC, 2800EH, 2800EX, 2800XA, 2800XP, 2800XS, 2874 & 2874XP

DOUBLE SEAL CARTRIDGE

Installation, Operation & Maintenance Instructions

Transportation and storage

Transport and store the seal in its original packaging. To ensure seals remain in good condition, they should be stored in the following environment:

- Dry and dust free.
- Ventilated at room temperature.
- Protected from direct effects from heat and ultraviolet light.
- All the elastomers used in the mechanical seal have a minimum shelf life of 5 years, except for butyl rubber, which has a minimum shelf life of 2 years. We recommend that the elastomers to be replaced at these intervals. It is also recommended that the elastomer replacement to be carried out by John Crane personnel.



If used seal parts are to be shipped, they must be cleaned and de-contaminated before shipping. It is the responsibility of the machine user to ensure that any parts being shipped have appropriate safehandling instructions externally attached to the package. Without this information there will be a refusal to handle the goods.

If required, a decontamination/transport certificate is available from John Crane. Refer to document EDS1001

For additional information on transportation and storage, contact your local John Crane facility and request a copy of document I-Storage. If any machine with an installed component seal has been stored with preservatives, the seal must be removed, cleaned and dried before being put back into operation. Particular attention must be applied to the cleanliness of the faces and condition of the elastomers. For an installed cartridge seal, we recommend returning the complete to John Crane for cleaning.

ATTENTION Ensure preservatives and cleaning agents do not affect the elastomers.

Once the seal is fitted on the machine and the position is set using setting devices, do not re-engage them for transportation and storage.

Tightening torques

TABLE 2. DRIVE COLLAR SET SCREWS

Drive collar socket set screw							
Tightening Torques (μ 0.125 lubricated)							
Thread Size	Size Code	Socket setscrew (ASTM A453-Gr 660)		Socket setscrew 316		Socket setscrew (High Tensile Steel 14.9)	
		GMC 0649		GMC 0550		GMC 0236	
		Nm	lbf-ft	Nm	lbf-ft	Nm	lbf-ft
M4	61040700000	-	-	1.5	1.1	2.3	1.7
M5	61050800000	-	-	3	2.2	4.5	3.3
M6	61061000000	6	4.4	4	3	7.5	5.5
M8	61081250000	15	11.1	11	8.1	18	13.3
M10	61101500000	30	22.1	16	11.8	36	26.6
M12	61121750000	50	36.9	40	29.5	60	44.3
1/4-20	11252000000	6	4.4	7.91	5.83	9.83	7.25
5/16-18	11311800000	-	-	14.69	10.83	18.64	13.75
3/8-16	11371600000	-	-	25.99	19.17	32.77	24.17
7/16-14	11431400000	-	-	31.64	23.33	48.58	35.83



TYPE

2800, 2800E, 2800EC, 2800EH, 2800EX, 2800XA,
2800XP, 2800XS, 2874 & 2874XP

DOUBLE SEAL CARTRIDGE

Installation, Operation & Maintenance Instructions

TABLE 3. SOCKET SET CAP SCREWS

Socket set cap screws (2800XA, 2800XP and 2800XS only)					
Tightening torques (μ 0.125 lubricated)					
Thread size	Size code	Steel screw (Class 12.9)		Steel screw (316 A4-70)	
		GMC 0225		GMC 0550	
		Nm	lbf-ft	Nm	lbf-ft
M4	71040700000	4.5	3.3	2	1.5
M5	71050800000	9.4	6.9	4	3
M6	71061000000	16	11.8	6.5	4.8
M8	71081250000	38	28	16	11.8
M10	71101500000	77	56.8	32	23.6
M12	71121750000	135	100	55	40.6
M14	71142000000	215	159	90	66.4
M16	71162000000	340	251	140	103
M20	71202500000	663	489	275	203

TABLE 4. GLAND PLATE BOLTING TORQUE (MM)

Gland plate bolting torque (2800E)			
Seal size code	Bolt sizes	Torque	
	mm	Nm	lbf-ft
0250	10	17	12
0280	10	18	13
0300	10	19	14
0330	10	19	14
0350	12	20	15
0380	12	22	16
0400	12	25	18
0430	12	27	20
0450	12	29	21
0500	12	32	24
0550	16	37	27
0600	16	52	38
0660	16	61	45
0800	16	86	63
1000	20	108	80

TABLE 5. GLAND PLATE BOLTING TORQUE (INCH)

Gland plate bolting torque (2800E)			
Seal size code	Bolt sizes	Torque	
	inch	Nm	lbf-ft
0250	7/16	19	14
0280	7/16	20	15
0300	7/16	22	16
0330	7/16	22	16
0350	1/2	23	17
0380	1/2	26	19
0400	1/2	27	20
0430	1/2	29	21
0450	1/2	31	23
0500	1/2	32	24
0550	5/8	37	27
0600	5/8	48	36
0660	5/8	57	42
0800	5/8	90	66
1000	3/4	104	77

Tightening torques for plan 74

DESCRIPTION

Plan 74 provides a pressurised gas, typically nitrogen, to dual-gas seals through the use of a control panel that removes moisture, filters the gas and regulates the barrier pressure.

ADVANTAGES

Lower costs and maintenance than systems used on dual-pressurised liquid systems. Leakage to atmosphere is an inert gas.

GENERAL

The barrier gas is usually a pressurised nitrogen line. For higher pressure applications, the system pressure can be supplemented with a gas pressure booster/amplifier.

DOUBLE SEAL CARTRIDGE

Installation, Operation & Maintenance Instructions

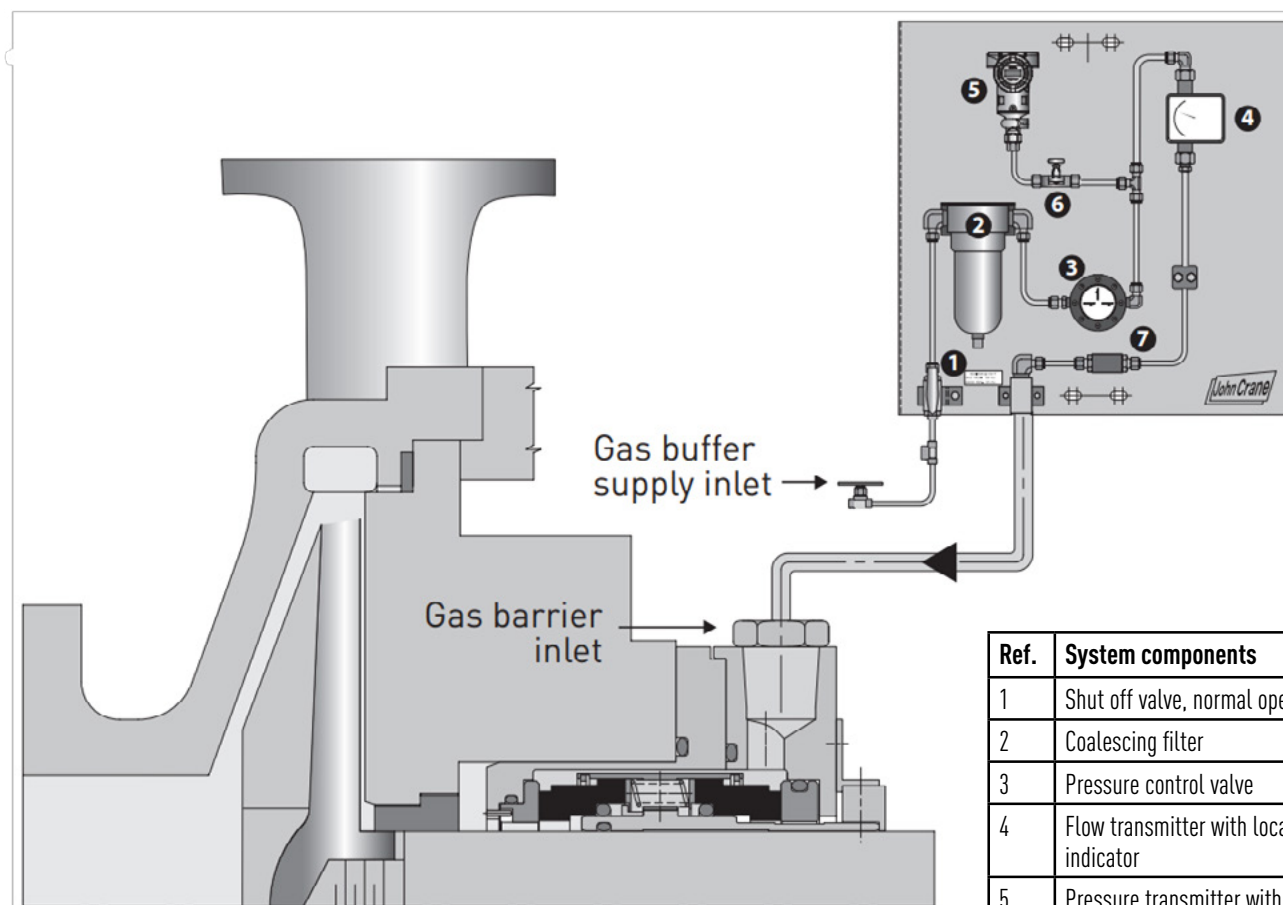
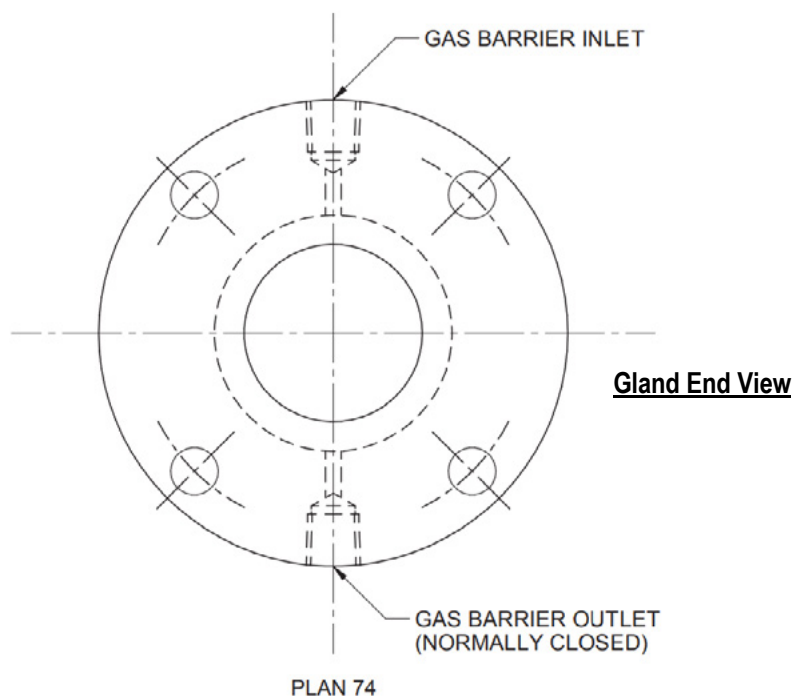


Figure 2. Plan 74 Dual Gas Seals

Ref.	System components
1	Shut off valve, normal open
2	Coalescing filter
3	Pressure control valve
4	Flow transmitter with local indicator
5	Pressure transmitter with local indicator
6	2 valve manifold
7	Check valve





TYPE 2800, 2800E, 2800EC, 2800EH, 2800EX, 2800XA, 2800XP, 2800XS, 2874 & 2874XP

DOUBLE SEAL CARTRIDGE

Installation, Operation & Maintenance Instructions

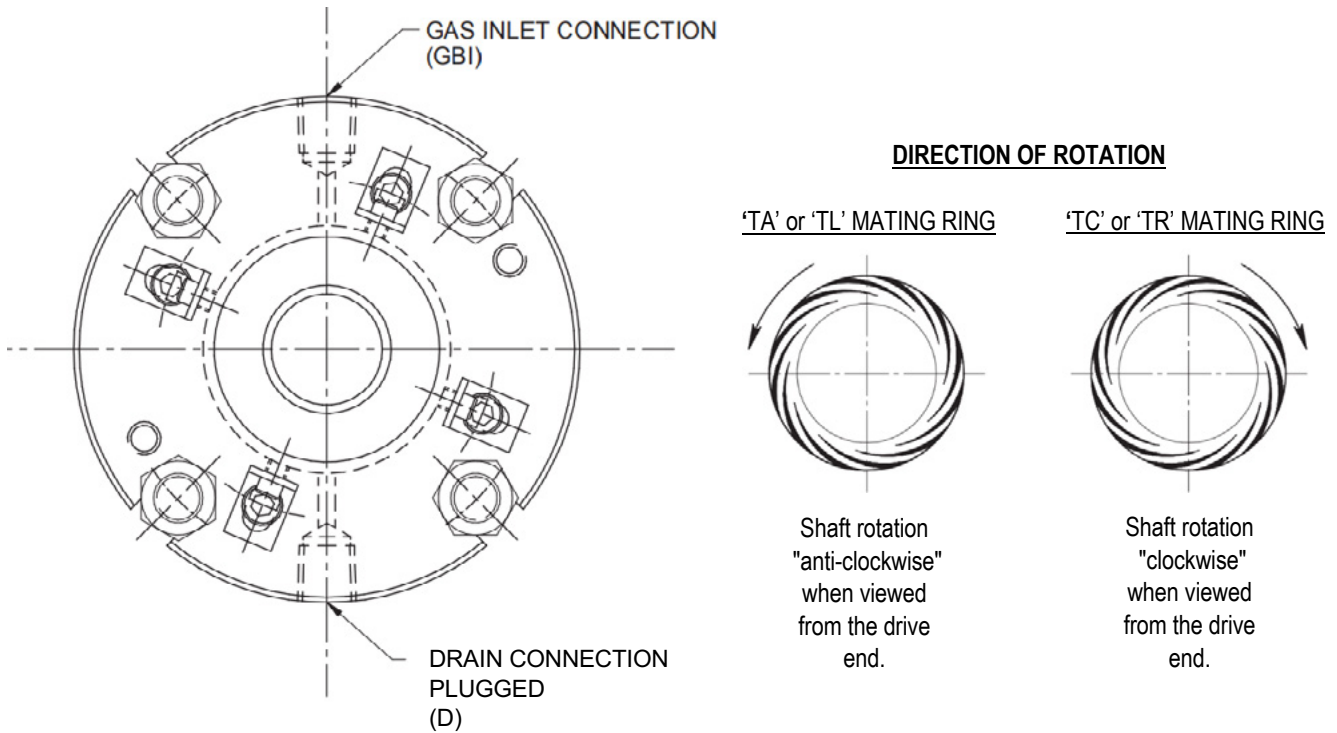


Figure 3. T2800 and 2800E Seal Family

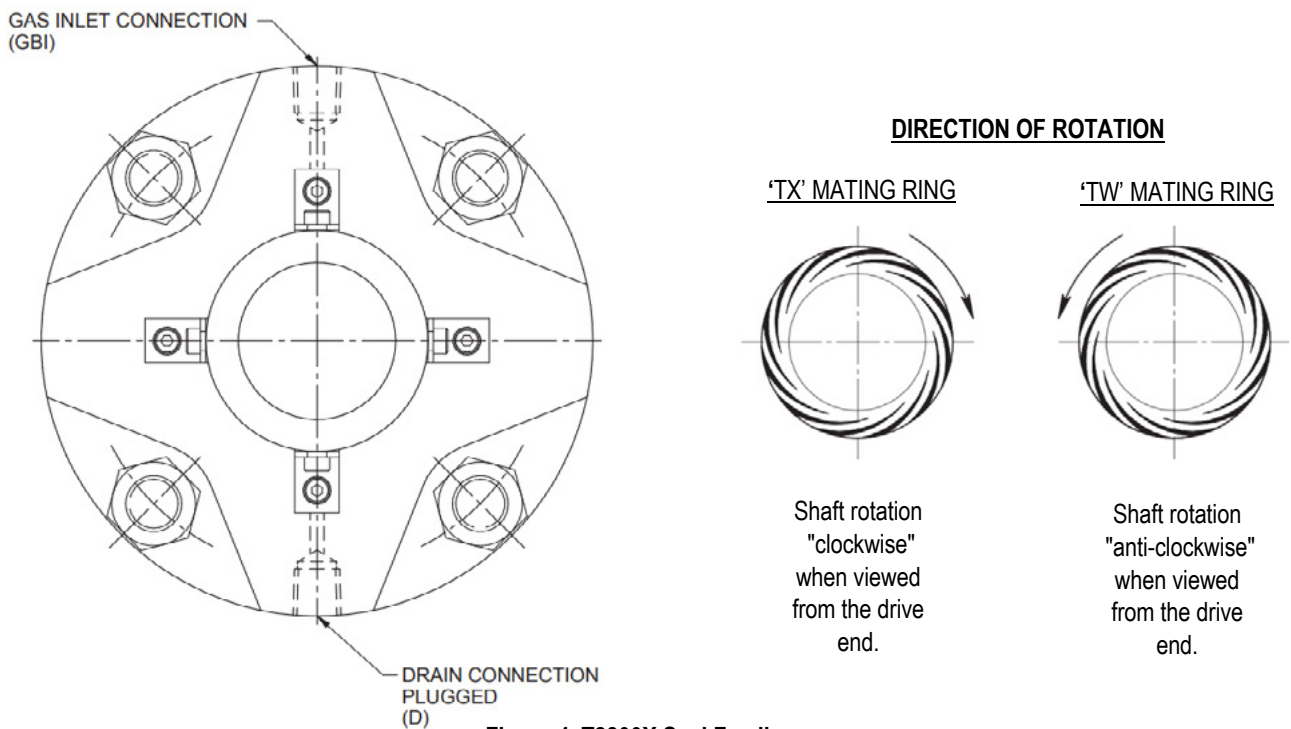


Figure 4. T2800X Seal Family

DOUBLE SEAL CARTRIDGE

Installation, Operation & Maintenance Instructions

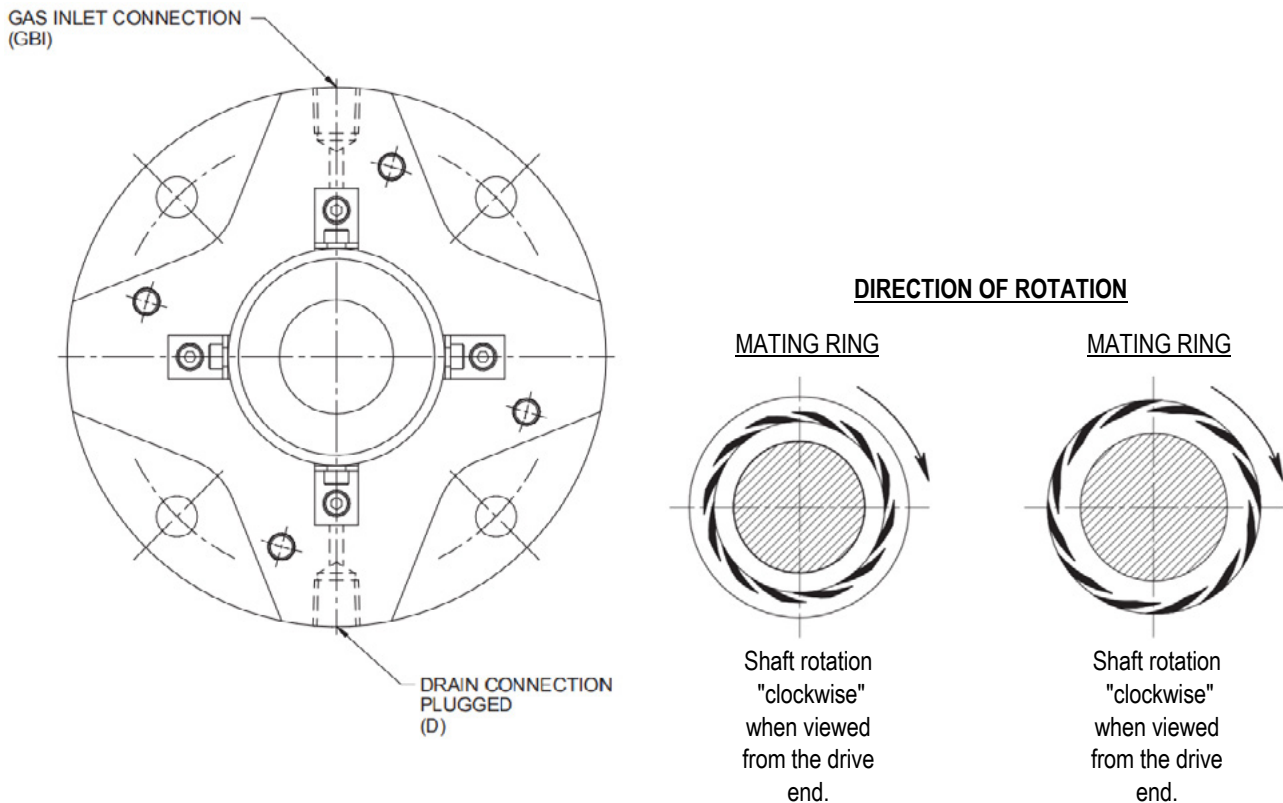


Figure 5. T2874 Seal Family

1. Direction of rotation is as viewed from the driver.
2. The gland plate is provided with two pipework connections.
3. One connection should be for the gas supply only (GBI), and the second used only as a drain (D) to check for the presence of liquid in the event of inboard seal failure. As supplied, one connection is fitted with a plastic blanking plug and the other sealed with a metal plug, but the connection can be reversed if required.
4. The inlet connection plastic plug is a temporary fitting for protection against contamination and should be left in place until the connection of the gas inlet pipe. The drain connection must remain plugged or suitably piped and isolated during seal operation or barrier gas pressure will be lost.
5. Gas lines must be in suitable material to avoid corrosion and contamination of the barrier gas.

DOUBLE SEAL CARTRIDGE

Installation, Operation & Maintenance Instructions

Cross-sections of seals and parts lists

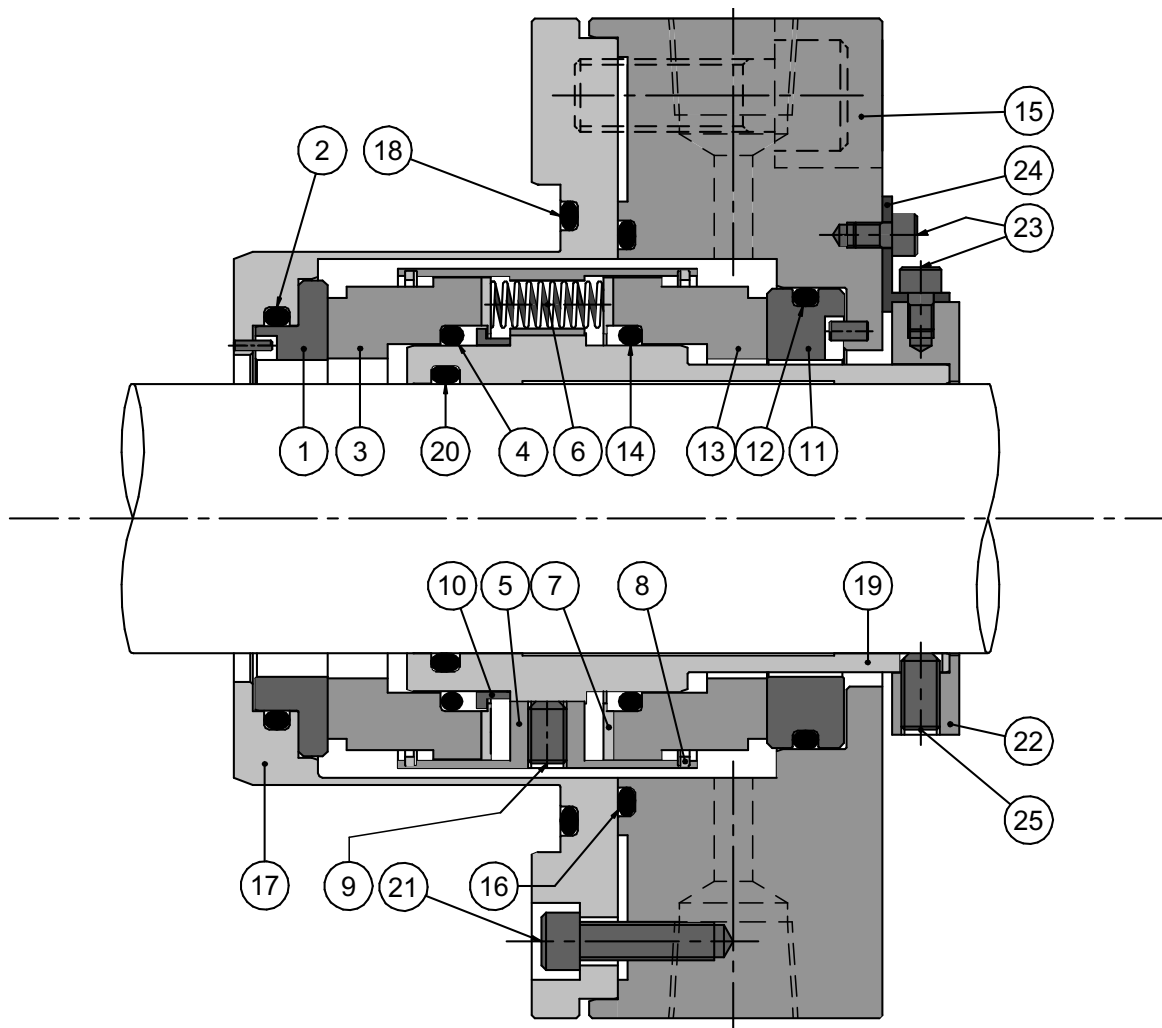


Figure 6. Typical T2800 Seal Cross Section

Ref.	Description
1	Inboard Mating Ring
2	Inboard Mating Ring O-Ring
3	Inboard Primary Ring
4	Inboard Primary Ring O-Ring
5	Retainer
6	Spring
7	Thrust Ring
8	Snap Ring
9	Cup Point Grubscrew

Ref.	Description
10	Retaining Sleeve
11	Outboard Mating Ring
12	Outboard Mating Ring O-Ring
13	Outboard Primary Ring
14	Outboard Primary Ring O-Ring
15	Inner Gland Plate ASM
16	Inner Gland Plate O-Ring
17	Liner ASM
18	Liner ASM O-Ring

Ref.	Description
19	Sleeve
20	Sleeve O-Ring
21	Cap Head Screw
22	Drive Collar
23	Cap Head Screws
24	Spacer
25	Cup Point Grubscrew

DOUBLE SEAL CARTRIDGE

Installation, Operation & Maintenance Instructions

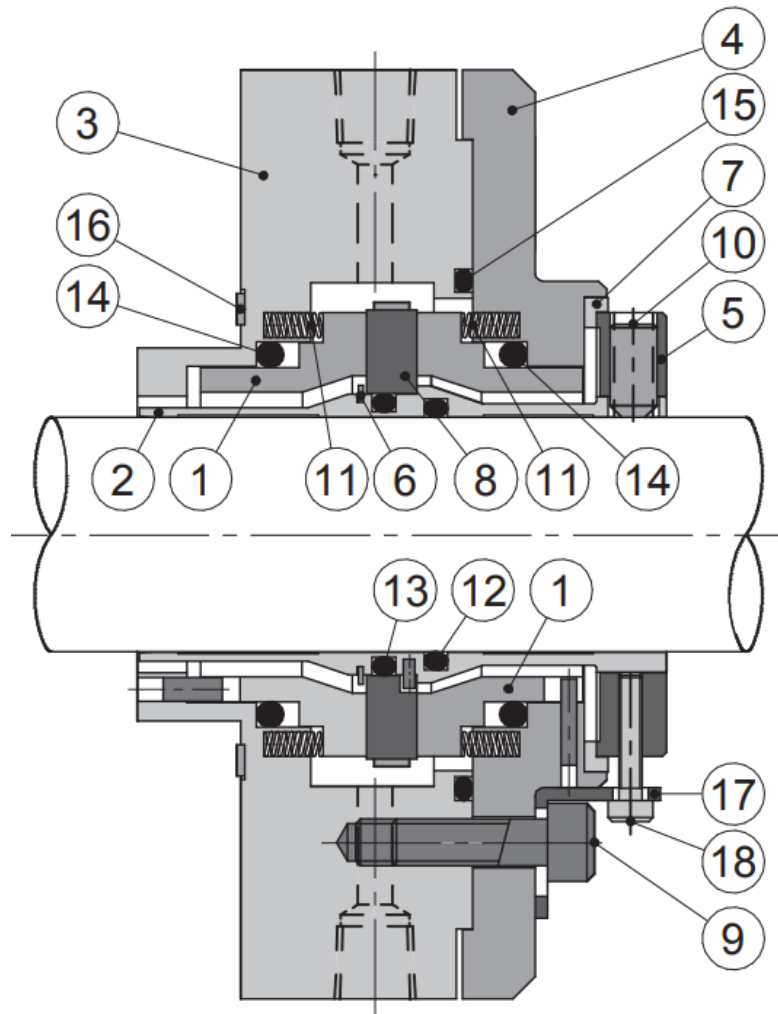


Figure 7. Typical T2800E Seal Cross Section

Ref.	Description
1	Primary Ring
2	Sleeve
3	Inner Gland Plate
4	Outer Gland Plate
5	Drive Collar
6	Retaining Ring
7	Setting Ring
8	Branded Mating Ring
9	Cap Head Screws

Ref.	Description
10	Set Screws
11	Springs
12	Sleeve O-Ring
13	Mating Ring O-Ring
14	Primary Ring O-Ring
15	Inner Gland Plate O-Ring
16	Gasket
17	Transit Clips
18	Cap Head Screws

DOUBLE SEAL CARTRIDGE

Installation, Operation & Maintenance Instructions

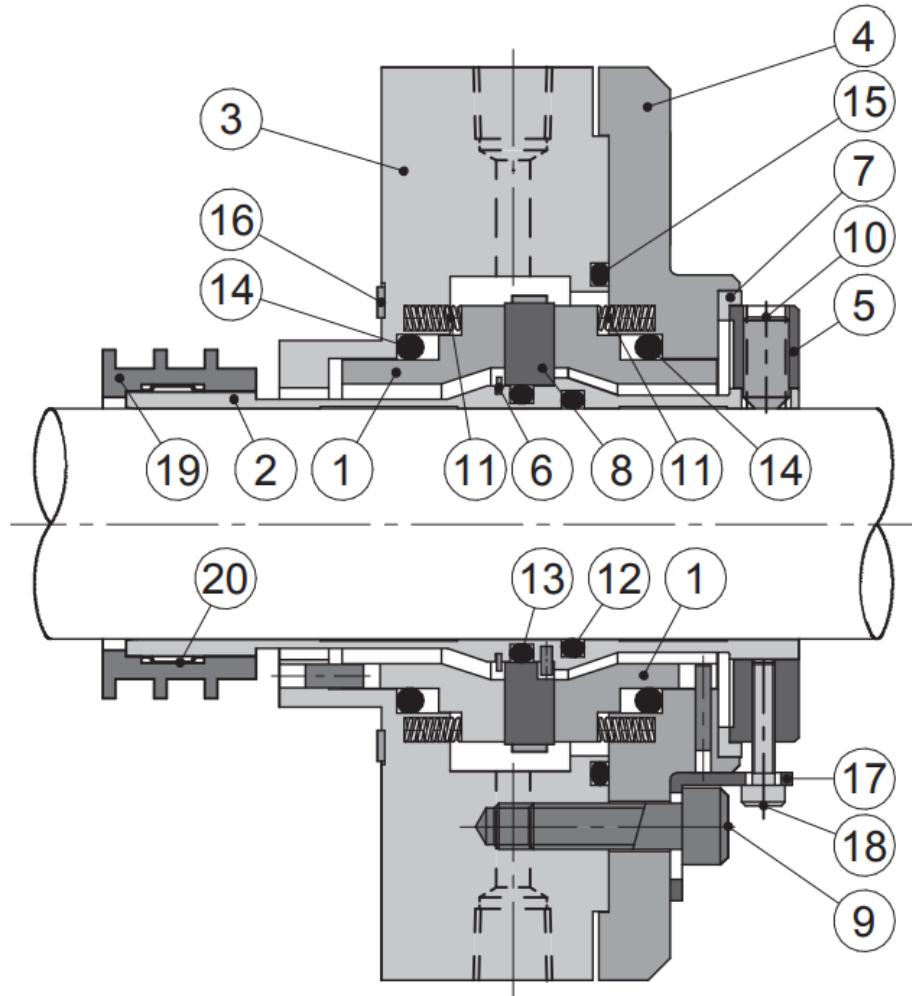


Figure 8. Typical T2800EX Seal Cross Section

Ref.	Description	Ref.	Description
1	Primary Ring	11	Springs
2	Sleeve	12	Sleeve O-Ring
3	Inner Gland Plate	13	Mating Ring O-Ring
4	Outer Gland Plate	14	Primary Ring O-Ring
5	Drive Collar	15	Inner Gland Plate O-Ring
6	Retaining Ring	16	Gasket
7	Setting Ring	17	Transit Clips
8	Branded Mating Ring	18	Cap Head Screws
9	Cap Head Screws	19	Expeller
10	Set Screws	20	Tolerance Strip

DOUBLE SEAL CARTRIDGE

Installation, Operation & Maintenance Instructions

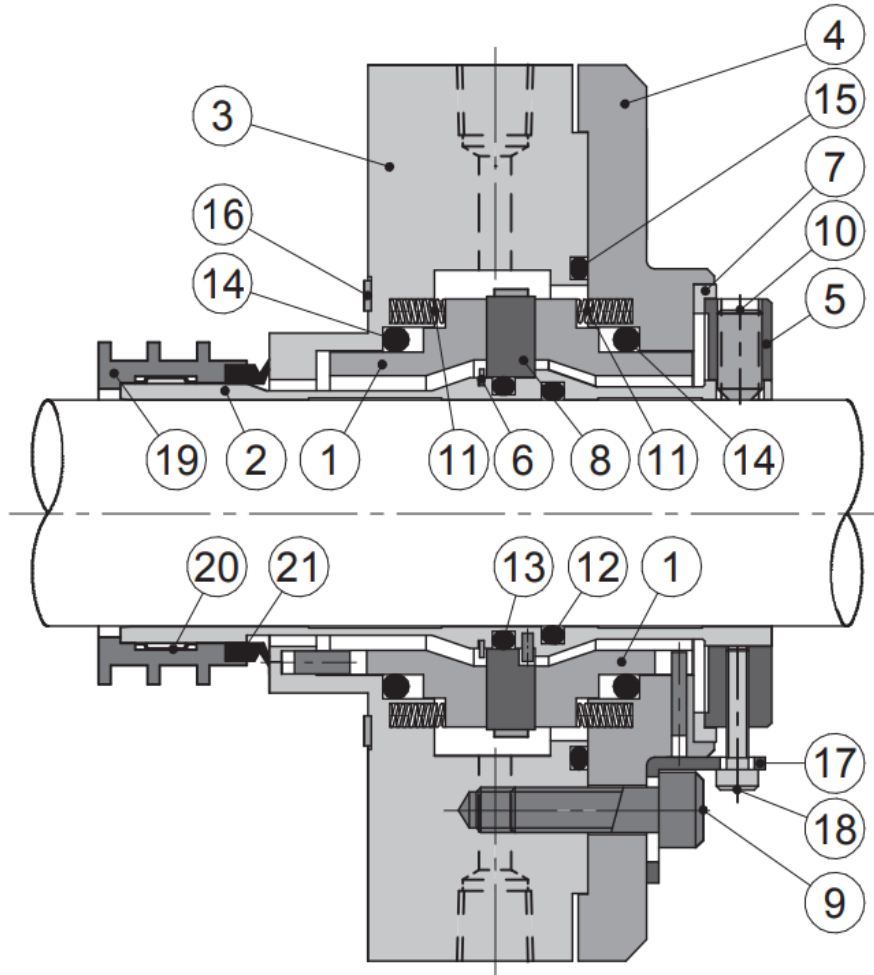


Figure 9. Typical T2800EC Seal Cross Section

Ref.	Description
1	Primary Ring
2	Sleeve
3	Inner Gland Plate
4	Outer Gland Plate
5	Drive Collar
6	Retaining Ring
7	Setting Ring
8	Branded Mating Ring
9	Cap Head Screws
10	Set Screws
11	Springs

Ref.	Description
12	Sleeve O-Ring
13	Mating Ring O-Ring
14	Primary Ring O-Ring
15	Inner Gland Plate O-Ring
16	Gasket
17	Transit Clips
18	Cap Head Screws
19	Expeller
20	Tolerance Strip
21	V-Ring

DOUBLE SEAL CARTRIDGE

Installation, Operation & Maintenance Instructions

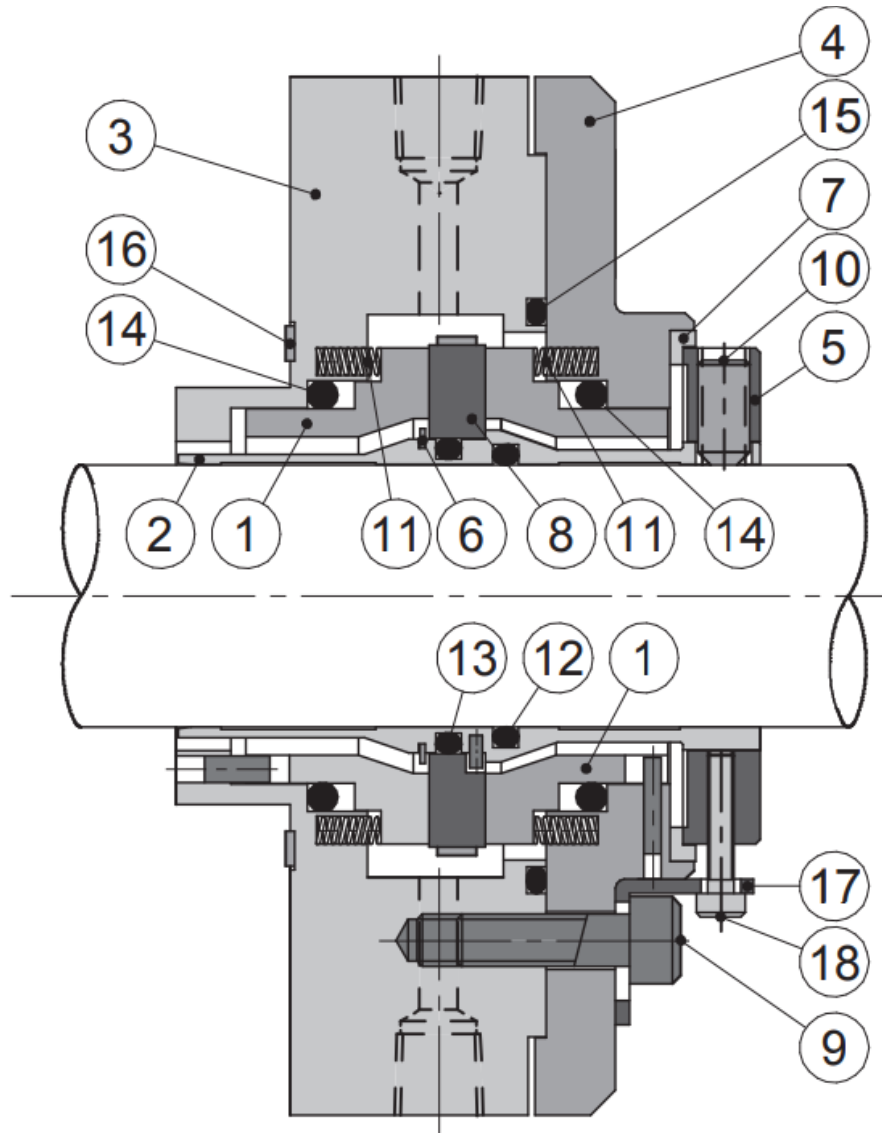


Figure 10. Typical T2800EH Seal Cross Section

Ref.	Description
1	Primary Ring
2	Sleeve
3	Inner Gland Plate
4	Outer Gland Plate
5	Drive Collar
6	Retaining Ring
7	Setting Ring
8	Branded Mating Ring
9	Cap Head Screws

Ref.	Description
10	Set Screws
11	Springs
12	Sleeve O-Ring
13	Mating Ring O-Ring
14	Primary Ring O-Ring
15	Inner Gland Plate O-Ring
16	Gasket
17	Transit Clips
18	Cap Head Screws

DOUBLE SEAL CARTRIDGE

Installation, Operation & Maintenance Instructions

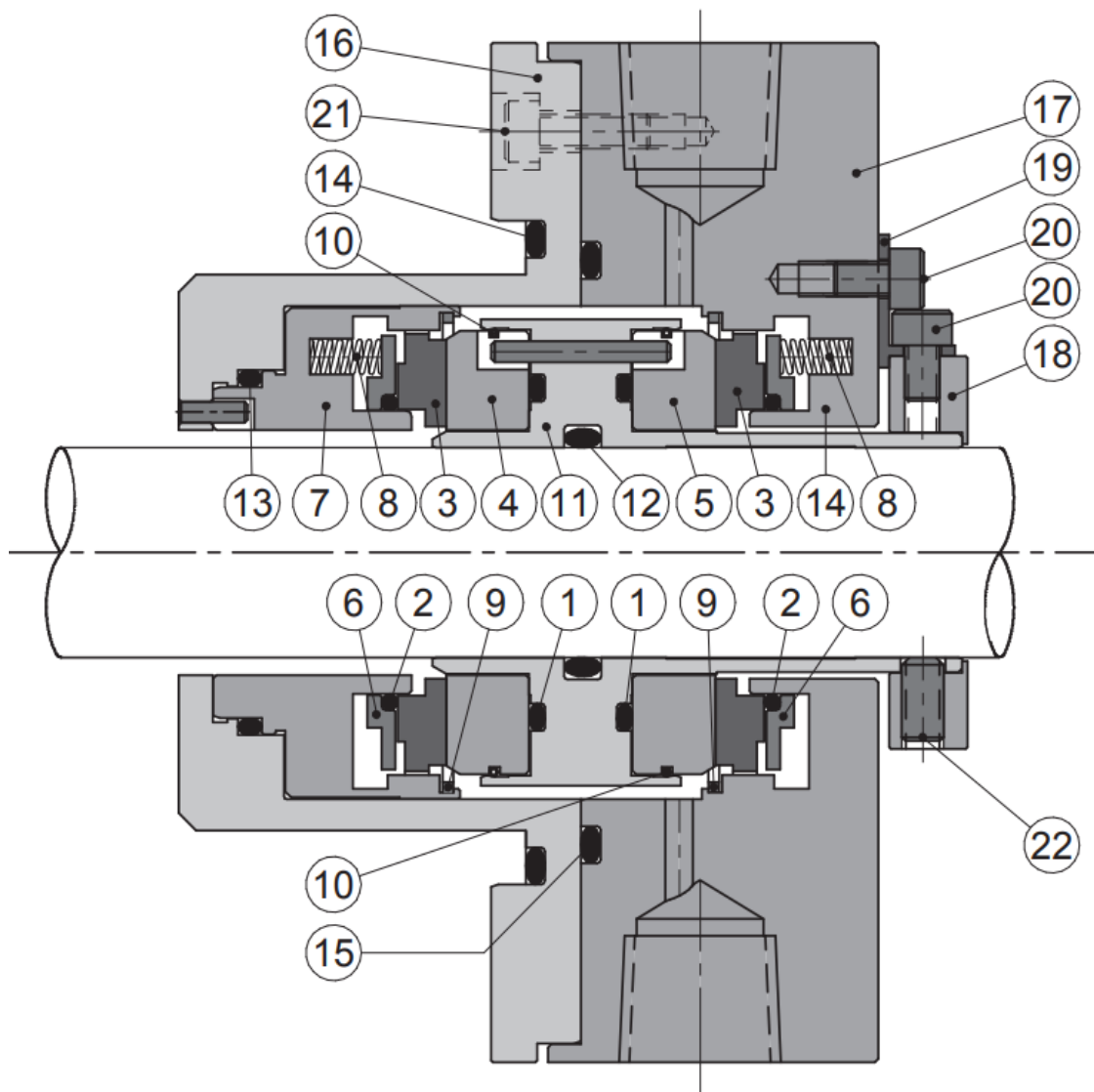


Figure 11. Typical T2800XA Seal Cross Section

Ref.	Description
1	O-Ring
2	O-Ring
3	Primary Ring
4	Inner Mating Ring
5	Outer Mating Ring
6	Thrust Ring
7	Retainer
8	Springs
9	Snap Ring
10	Canted Spring
11	Mating Ring Carrier Assembly

Ref.	Description
12	O-Ring
13	O-Ring
14	O-Ring
15	O-Ring
16	Inner Gland Plate
17	Outer Gland Plate
18	Drive Collar
19	Spacer
20	Cap Head Screw
21	Cap Head Screw
22	Cup Point Set Screw

DOUBLE SEAL CARTRIDGE

Installation, Operation & Maintenance Instructions

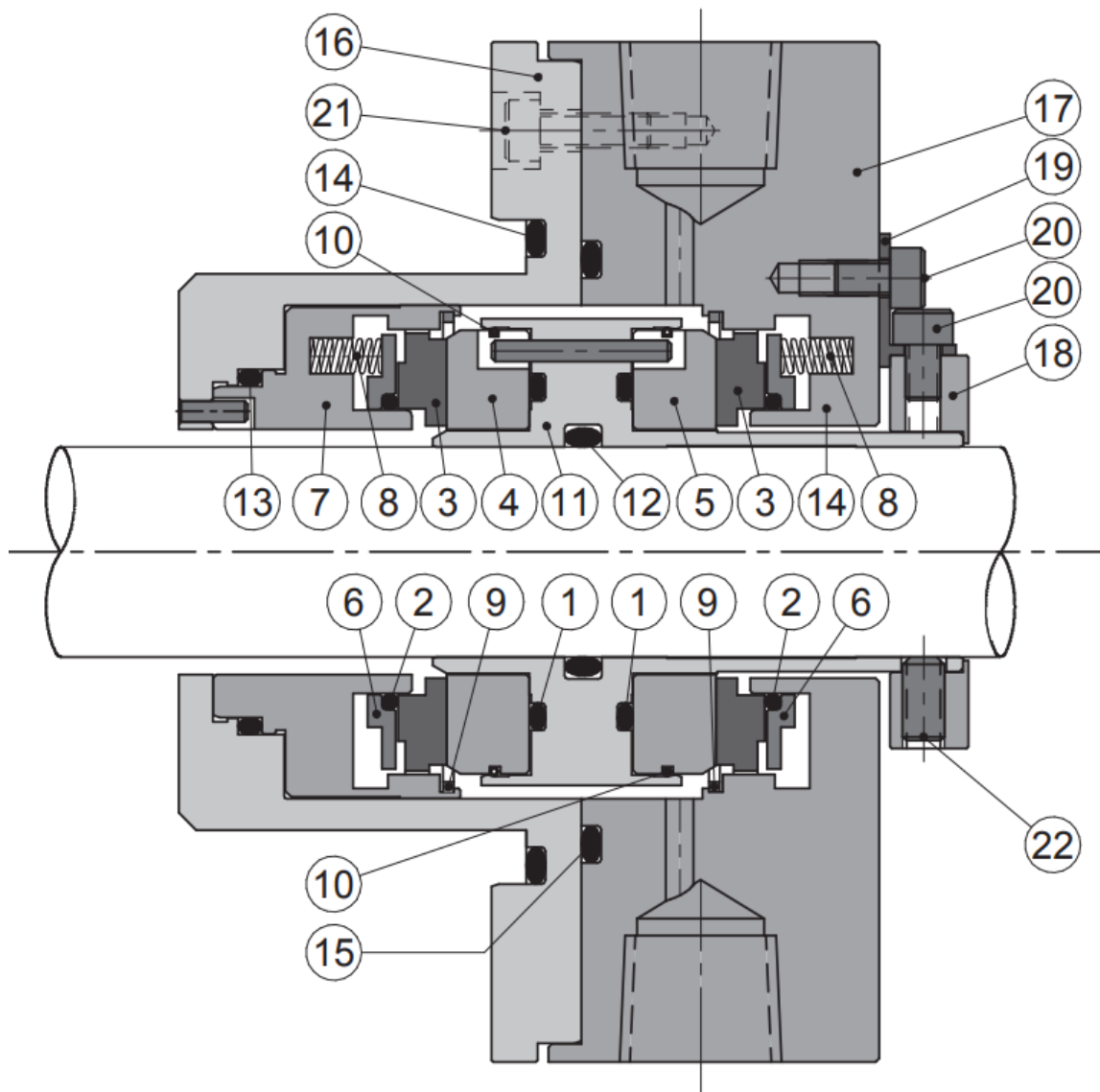


Figure 12. Typical T2800XP Seal Cross Section

Ref.	Description
1	O-Ring
2	O-Ring
3	Primary Ring
4	Inner Mating Ring
5	Outer Mating Ring
6	Thrust Ring
7	Retainer
8	Springs
9	Snap Ring
10	Canted Spring
11	Mating Ring Carrier Assembly

Ref.	Description
12	O-Ring
13	O-Ring
14	O-Ring
15	O-Ring
16	Inner Gland Plate
17	Outer Gland Plate
18	Drive Collar
19	Spacer
20	Cap Head Screw
21	Cap Head Screw
22	Cup Point Set Screw

DOUBLE SEAL CARTRIDGE

Installation, Operation & Maintenance Instructions

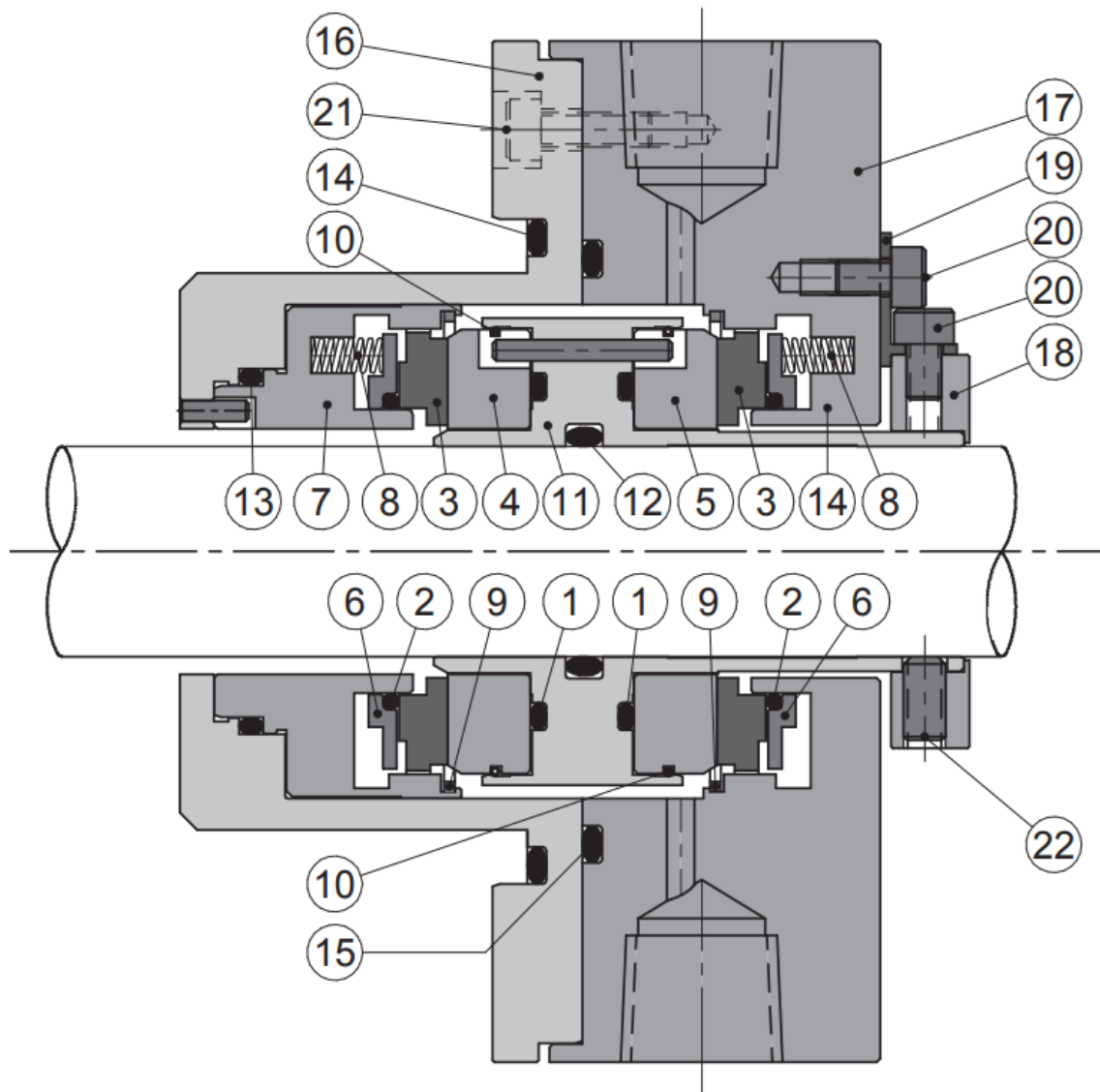


Figure 13. Typical T2800XS Seal Cross Section

Ref.	Description
1	O-Ring
2	O-Ring
3	Primary Ring
4	Inner Mating Ring
5	Outer Mating Ring
6	Thrust Ring
7	Retainer
8	Springs
9	Snap Ring
10	Canted Spring
11	Mating Ring Carrier Assembly

Ref.	Description
12	O-Ring
13	O-Ring
14	O-Ring
15	O-Ring
16	Inner Gland Plate
17	Outer Gland Plate
18	Drive Collar
19	Spacer
20	Cap Head Screw
21	Cap Head Screw
22	Cup Point Set Screw

DOUBLE SEAL CARTRIDGE

Installation, Operation & Maintenance Instructions

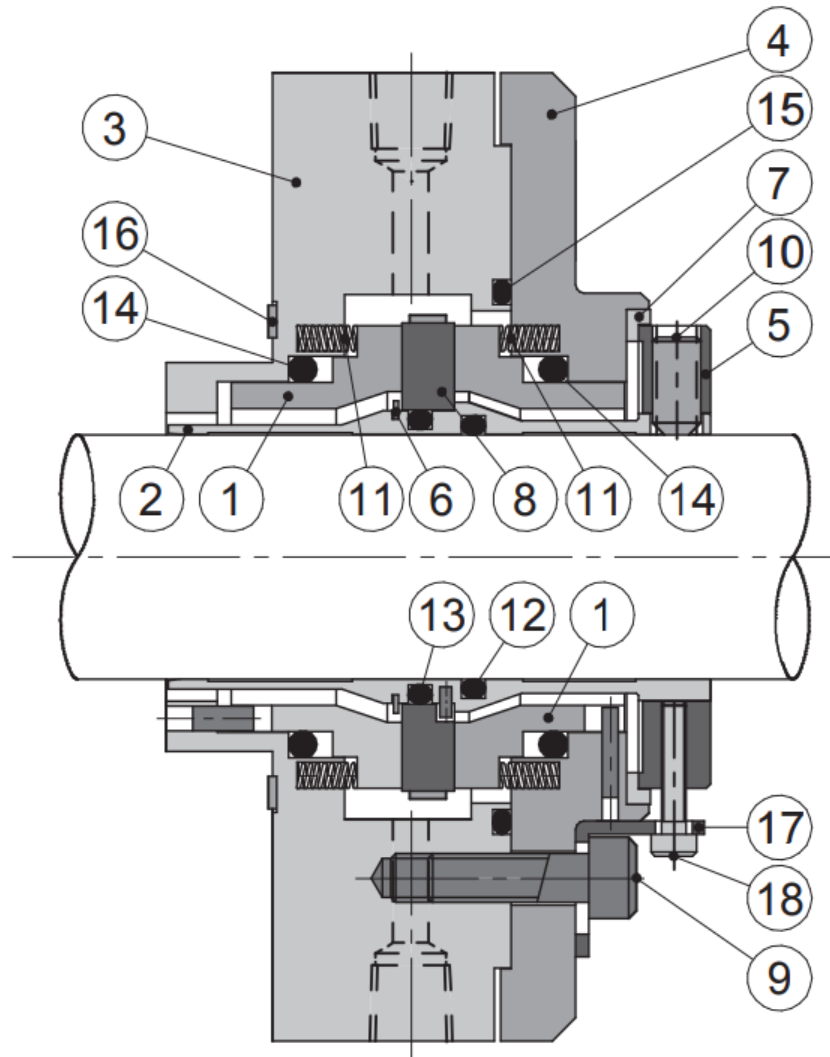


Figure 14. Typical T2874 Seal Cross Section

Ref.	Description
1	Inner Mating Ring
2	O-Ring
3	Inner Primary Ring
4	O-Ring
5	Disc
6	O-Ring
7	Inner Spring
8	Retainer
9	Outer Mating Ring
10	O-Ring
11	Outer Primary Ring
12	O-Ring
13	Disc
14	Outer Spring
15	Retaining Ring

Ref.	Description
16	Mating Ring Adaptor
17	O-Ring
18	Snap Ring
19	Inner Gland Plate
20	O-Ring
21	Outer Gland Plate
22	O-Ring
23	Cap Head Screw
24	Sleeve
25	O-Ring
26	Spacer
27	Cap Head Screws
28	Drive Collar
29	Cup Point Set Screw
30	O-Ring

DOUBLE SEAL CARTRIDGE

Installation, Operation & Maintenance Instructions

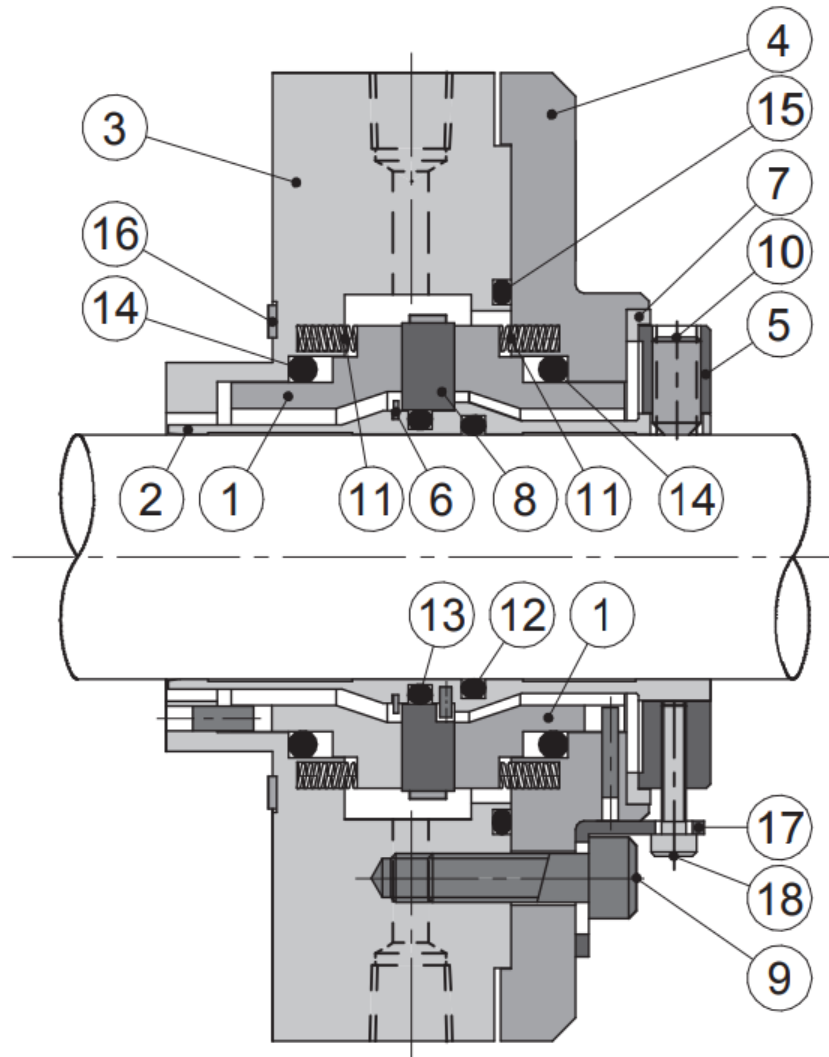


Figure 15. Typical T2874XP Seal Cross Section

Ref.	Description
1	Inner Mating Ring
2	O-Ring
3	Inner Primary Ring
4	O-Ring
5	Disc
6	O-Ring
7	Inner Spring
8	Retainer
9	Outer Mating Ring
10	O-Ring
11	Outer Primary Ring
12	O-Ring
13	Disc
14	Outer Spring
15	Retaining Ring

Ref.	Description
16	Mating Ring Adaptor
17	O-Ring
18	Snap Ring
19	Inner Gland Plate
20	O-Ring
21	Outer Gland Plate
22	O-Ring
23	Cap Head Screw
24	Sleeve
25	O-Ring
26	Spacer
27	Cap Head Screws
28	Drive Collar
29	Cup Point Set Screw
30	O-Ring

Typical arrangement and dimensional data

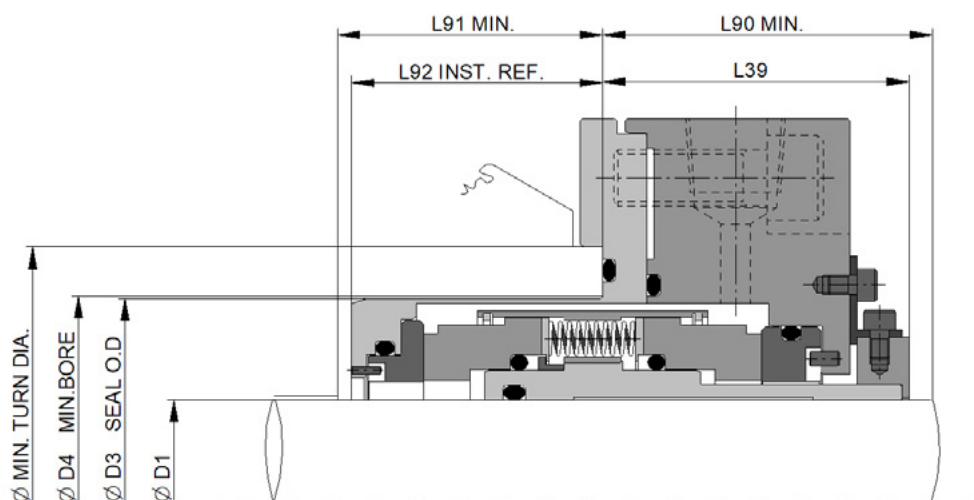


Figure 16.
T2800 Dimensional
Data

NOTE: The size range of the type 2800 are currently only in imperial sizes.

TABLE 6. T2800 DIMENSIONAL DATA (DIMENSIONS IN MM)

T2800 dimensions in mm										
Seal size	Size code	ØD1	ØD3 seal O.D.	ØD4 min. Bore	ØD26	L39	L90	L91	L92	Min turn dia
1.125	0285	28.58	66.65	66.68	114.3	57.15	60.32	53.94	52.37	79.37
1.375	0349	34.93	72.9	73.03	127	52.37	55.54	52.37	50.8	85.72
1.375	0349	34.93	72.14	73.03	136.52	52.37	55.54	52.37	50.8	91.36
1.750	0444	44.45	88.01	88.9	165.1	65.86	69.03	55.54	53.98	110.23
1.875	0476	47.63	91.95	92.08	149.22	81.74	81.71	55.98	54.41	104.77
2.125	0539	53.98	97.79	98.43	180.97	65.07	68.24	54.71	53.14	119.65
2.500	0635	63.5	113.41	114.3	200.02	52.37	55.54	66.24	64.67	138.55
2.625	0666	66.68	117.07	117.48	177.8	52.35	55.54	66.24	64.67	130.17
2.750	0698	69.85	119.84	120.65	200.02	63.09	66.26	63.47	61.9	138.55

TABLE 7. T2800 DIMENSIONAL DATA (DIMENSIONS IN INCHES)

T2800 dimensions in inches										
Seal size	Size code	ØD1	ØD3 seal O.D.	ØD4 min. Bore	ØD26	L39	L90	L91	L92	Min turn dia
1.125	0285	1.125	2.624	2.625	4.500	2.250	2.375	2.124	2.062	3.125
1.375	0349	1.375	2.870	2.875	5.000	2.062	2.187	2.062	2.000	3.375
1.375	0349	1.375	2.840	2.875	5.375	2.062	2.187	2.062	2.000	3.597
1.750	0444	1.750	3.465	3.500	6.500	2.593	2.718	2.187	2.125	4.340
1.875	0476	1.875	3.620	3.625	5.875	3.218	3.217	2.204	2.142	4.125
2.125	0539	2.125	3.850	3.875	7.125	2.562	2.687	2.154	2.092	4.711
2.500	0635	2.500	4.465	4.500	7.875	2.062	2.187	2.608	2.546	5.455
2.625	0666	2.625	4.609	4.625	7.000	2.061	2.187	2.608	2.546	5.125
2.750	0698	2.750	4.718	4.750	7.875	2.484	2.609	2.499	2.437	5.455

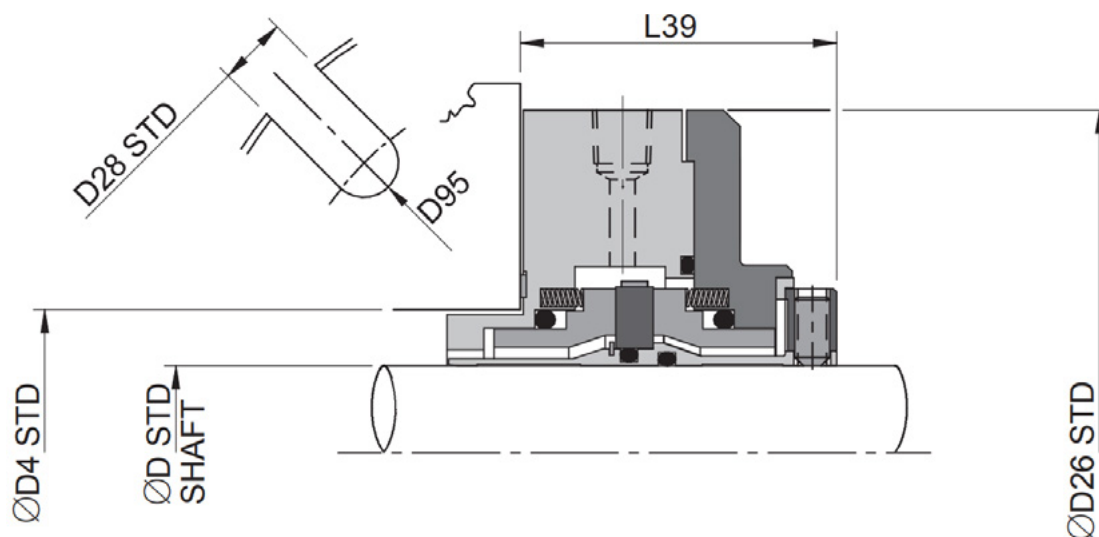


Figure 17. T2800E and T2800EH Dimensional Data

TABLE 8. T2800E AND T2800EH – METRIC SIZES DIMENSIONAL DATA (DIMENSION IN MM)

T2800E & T2800EH dimensions in mm - metric							
Seal size	Size code	ØD	ØD4	ØD26	ØD28	ØD95	L39
25	0250	25	41	114	12	64.7	55
28	0280	28	44	117	12	67.7	55
30	0300	30	46	119	12	69.7	55
33	0330	33	49	122	14	72.7	55
35	0350	35	51	124	14	74.7	55
38	0380	38	58	135	14	79.7	57
40	0400	40	60	137	14	81.7	57
43	0430	43	63	140	14	84.7	57
45	0450	45	65	142	14	86.7	57
50	0500	50	70	147	18	91.7	57
53	0530	53	73	150	18	94.7	57
55	0550	55	75	152	18	96.7	57
60	0600	60	85	157	18	102	57
65	0650	65	90	180	18	107	59
80	0800	80	109	195	18	122	59
100	1000	100	129	215	22	142	59



TYPE 2800, 2800E, 2800EC, 2800EH, 2800EX, 2800XA, 2800XP, 2800XS, 2874 & 2874XP

DOUBLE SEAL CARTRIDGE

Installation, Operation & Maintenance Instructions

TABLE 9. T2800E AND T2800EH – METRIC SIZES DIMENSIONAL DATA (DIMENSION IN INCHES)

T2800E & T2800EH dimensions in inches - metric							
Seal size	Size code	ØD	ØD4	ØD26	ØD28	ØD95	L39
25	0250	0.984	1.614	4.488	0.472	2.547	2.165
28	0280	1.102	1.732	4.606	0.472	2.665	2.165
30	0300	1.181	1.811	4.685	0.472	2.744	2.165
33	0330	1.299	1.929	4.803	0.551	2.862	2.165
35	0350	1.378	2.008	4.882	0.551	2.941	2.165
38	0380	1.496	2.283	5.315	0.551	3.138	2.244
40	0400	1.575	2.362	5.394	0.551	3.217	2.244
43	0430	1.693	2.480	5.512	0.551	3.335	2.244
45	0450	1.772	2.559	5.591	0.551	3.413	2.244
50	0500	1.969	2.756	5.787	0.709	3.610	2.244
53	0530	2.087	2.874	5.906	0.709	3.728	2.244
55	0550	2.165	2.953	5.984	0.709	3.807	2.244
60	0600	2.362	3.346	6.181	0.709	4.016	2.244
65	0650	2.559	3.543	7.087	0.709	4.213	2.323
80	0800	3.150	4.291	7.677	0.709	4.803	2.323
100	1000	3.937	5.079	8.465	0.866	5.591	2.323

TABLE 10. T2800E AND T2800EH – IMPERIAL SIZES DIMENSIONAL DATA (DIMENSION IN MM)

T2800E & T2800EH dimensions in mm - imperial							
Seal size	Size code	ØD	ØD4	ØD26	ØD28	ØD95	L39
0.875	0222	22.23	38.10	95.2	11.1	58.3	51.5
1.000	0254	25.40	41.30	95.2	11.1	61.5	51.5
1.125	0285	28.58	44.50	108.0	11.1	62.7	51.5
1.250	0317	31.75	50.80	108.0	11.1	67.8	51.5
1.375	0349	34.93	54.00	107.8	11.1	71	51.5
1.500	0381	38.10	57.20	123.8	11.1	79.8	57
1.625	0412	41.28	60.30	114.3	11.1	83	57
1.750	0444	44.45	63.50	139.7	14.3	86.1	57
1.875	0476	47.63	66.70	139.7	14.3	84.7	57
2.000	0508	50.80	69.90	120.7	14.3	87.9	57
2.125	0539	53.98	73.00	152.5	17.5	95.7	57
2.250	0571	57.15	79.40	165.1	17.5	98.8	57
2.375	0603	60.33	82.60	158.7	17.5	102	57
2.500	0635	63.50	85.70	165.1	17.5	105.2	59
2.625	0666	66.68	92.10	165.1	17.5	108.4	59
2.750	0698	69.85	95.30	177.8	17.5	111.5	59
3.000	0762	76.20	101.60	177.8	17.5	117.9	59
3.500	0889	88.90	114.30	184.2	20.6	130.6	59
4.000	1016	101.60	127.00	184.2	20.6	143.3	59



TYPE 2800, 2800E, 2800EC, 2800EH, 2800EX, 2800XA, 2800XP, 2800XS, 2874 & 2874XP

DOUBLE SEAL CARTRIDGE

Installation, Operation & Maintenance Instructions

TABLE 11. T2800E AND T2800EH – IMPERIAL SIZES DIMENSIONAL DATA (DIMENSION IN INCHES)

T2800E & T2800EH dimensions in inches - imperial							
Seal size	Size code	ØD	ØD4	ØD26	ØD28	ØD95	L39
0.875	0222	0.875	1.500	3.748	0.437	2.295	2.028
1.000	0254	1.000	1.626	3.748	0.437	2.421	2.028
1.125	0285	1.125	1.752	4.252	0.437	2.469	2.028
1.250	0317	1.250	2.000	4.252	0.437	2.669	2.028
1.375	0349	1.375	2.126	4.244	0.437	2.795	2.028
1.500	0381	1.500	2.252	4.874	0.437	3.142	2.244
1.625	0412	1.625	2.374	4.500	0.437	3.268	2.244
1.750	0444	1.750	2.500	5.500	0.563	3.390	2.244
1.875	0476	1.875	2.626	5.500	0.563	3.335	2.244
2.000	0508	2.000	2.752	4.752	0.563	3.461	2.244
2.125	0539	2.125	2.874	6.004	0.689	3.768	2.244
2.250	0571	2.250	3.126	6.500	0.689	3.890	2.244
2.375	0603	2.375	3.252	6.248	0.689	4.016	2.244
2.500	0635	2.500	3.374	6.500	0.689	4.142	2.323
2.625	0666	2.625	3.626	6.500	0.689	4.268	2.323
2.750	0698	2.750	3.752	7.000	0.689	4.390	2.323
3.000	0762	3.000	4.000	7.000	0.689	4.642	2.323
3.500	0889	3.500	4.500	7.252	0.811	5.142	2.323
4.000	1016	4.000	5.000	7.252	0.811	5.642	2.323

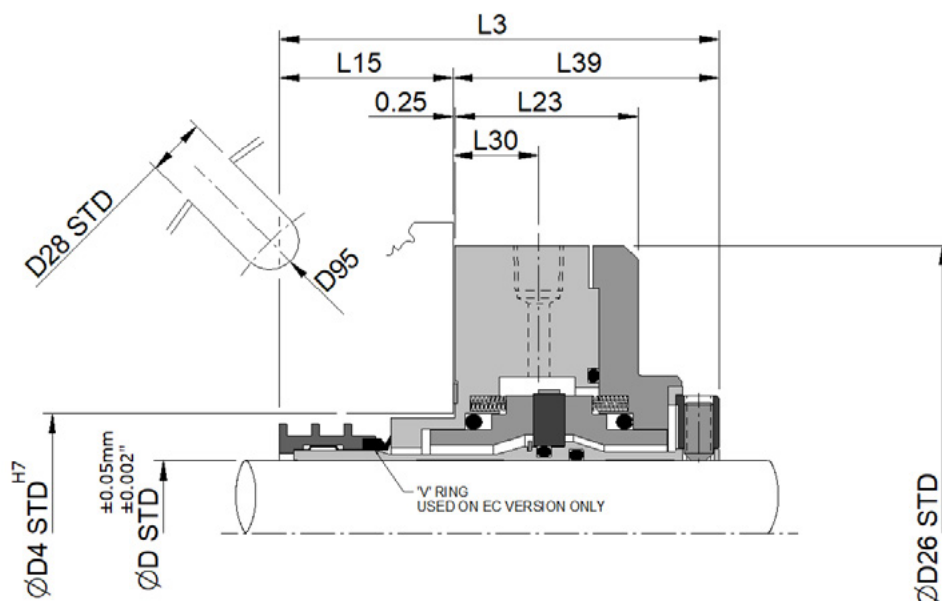


Figure 18. T2800EC and T2800EX

TABLE 12. T2800EC AND T2800EX – METRIC SIZES DIMENSIONAL DATA (DIMENSION IN MM)

T2800EC & T2800EX dimensions in mm - metric															
Seal Size	Size Code	$\varnothing D$		$\varnothing D4$		$\varnothing D26$		D28		D95	L3	L15	L23	L30	L39
		Min	Std	Std	Max	Min	Max	Min	Max						
25	0250	20	25	41	54.7	99	114	10	12	64.7	90.8	36.3	37.5	15.7	54.5
28	0280	25	28	44	57.7	102	117	10	12	67.7	90.8	36.3	37.5	15.7	54.5
30	0300	28	30	46	59.7	104	119	10	12	69.7	90.8	36.3	37.5	15.7	54.5
33	0330	30	33	49	62.7	107	122	10	14	72.7	90.8	36.3	37.5	15.7	54.5
35	0350	33	35	51	64.7	109	124	10	14	74.7	90.8	36.3	37.5	15.7	54.5
38	0380	35	38	58	69.7	118	135	10	14	79.7	92.4	36	39.8	18	56.4
40	0400	38	40	60	71.7	120	137	10	14	81.7	92.4	36	39.8	18	56.4
43	0430	40	43	63	74.7	123	140	10	14	84.7	92.4	36	39.8	18	56.4
45	0450	43	45	65	76.7	125	142	10	14	86.7	92.4	36	39.8	18	56.4
50	0500	45	50	70	81.7	130	147	14	18	91.7	92.4	36	41.8	18	56.4
53	0530	50	53	73	84.7	133	150	14	18	94.7	92.4	36	41.8	18	56.4
55	0550	53	55	75	86.7	135	152	14	18	96.7	92.4	36	41.8	18	56.4
60	0600	55	60	85	91.7	140	157	14	18	101.7	92.4	36	41.8	18	56.4
65	0650	60	65	90	96.7	145	180	14	18	106.7	94.4	36	43.8	20	58.4
80	0800	65	80	109	111.7	160	195	14	18	121.7	94.4	36	43.8	20	58.4
100	1000	80	100	129	131.7	180	215	18	22	141.7	95.4	37	43.8	20	58.4



TYPE 2800, 2800E, 2800EC, 2800EH, 2800EX, 2800XA, 2800XP, 2800XS, 2874 & 2874XP

DOUBLE SEAL CARTRIDGE

Installation, Operation & Maintenance Instructions

TABLE 13. T2800EC AND T2800EX – METRIC SIZES DIMENSIONAL DATA (DIMENSION IN INCHES)

T2800EC & T2800EX dimensions in inches - metric															
Seal Size	Size Code	ØD		ØD4		ØD26		D28		D95	L3	L15	L23	L30	L39
		Min	Std	Std	Max	Min	Max	Min	Max						
25	0250	0.787	0.984	1.614	2.154	3.898	4.488	0.394	0.472	2.547	3.575	1.429	1.476	0.618	2.146
28	0280	0.984	1.102	1.732	2.272	4.016	4.606	0.394	0.472	2.665	3.575	1.429	1.476	0.618	2.146
30	0300	1.102	1.181	1.811	2.350	4.094	4.685	0.394	0.472	2.744	3.575	1.429	1.476	0.618	2.146
33	0330	1.181	1.299	1.929	2.469	4.213	4.803	0.394	0.551	2.862	3.575	1.429	1.476	0.618	2.146
35	0350	1.299	1.378	2.008	2.547	4.291	4.882	0.394	0.551	2.941	3.575	1.429	1.476	0.618	2.146
38	0380	1.378	1.496	2.283	2.744	4.646	5.315	0.394	0.551	3.138	3.638	1.417	1.567	0.709	2.220
40	0400	1.496	1.575	2.362	2.823	4.724	5.394	0.394	0.551	3.217	3.638	1.417	1.567	0.709	2.220
43	0430	1.575	1.693	2.480	2.941	4.843	5.512	0.394	0.551	3.335	3.638	1.417	1.567	0.709	2.220
45	0450	1.693	1.772	2.559	3.020	4.921	5.591	0.394	0.551	3.413	3.638	1.417	1.567	0.709	2.220
50	0500	1.772	1.969	2.756	3.217	5.118	5.787	0.551	0.709	3.610	3.638	1.417	1.646	0.709	2.220
53	0530	1.969	2.087	2.874	3.335	5.236	5.906	0.551	0.709	3.728	3.638	1.417	1.646	0.709	2.220
55	0550	2.087	2.165	2.953	3.413	5.315	5.984	0.551	0.709	3.807	3.638	1.417	1.646	0.709	2.220
60	0600	2.165	2.362	3.346	3.610	5.512	6.181	0.551	0.709	4.004	3.638	1.417	1.646	0.709	2.220
65	0650	2.362	2.559	3.543	3.807	5.709	7.087	0.551	0.709	4.201	3.717	1.417	0.172	0.787	2.299
80	0800	2.559	3.150	4.291	4.398	6.299	7.677	0.551	0.709	4.791	3.717	1.417	1.724	0.787	2.299
100	1000	3.150	3.937	5.079	5.185	7.087	8.465	0.709	0.866	5.579	3.756	1.457	1.724	0.787	2.299



TYPE 2800, 2800E, 2800EC, 2800EH, 2800EX, 2800XA, 2800XP, 2800XS, 2874 & 2874XP

DOUBLE SEAL CARTRIDGE

Installation, Operation & Maintenance Instructions

TABLE 14. T2800EC AND T2800EX – IMPERIAL SIZES DIMENSIONAL DATA (DIMENSION IN MM)

T2800EC & T2800EX dimensions in mm - imperial

Seal Size	Size Code	ØD		ØD4		ØD26		D28		D95	L3	L15	L23	L30	L39
		Min	Std	Std	Max	Min	Max	Min	Max						
7/8"	0222	19.05	22.23	38.1	48.3	93.1	95.2	7.93	11.1	58.3	87.7	36.6	35.5	13.7	51.5
1"	0254	22.23	25.4	41.28	51.4	-	95.2	7.93	11.1	61.5	87.7	36.6	35.5	13.7	51.5
1 1/8"	0285	25.4	28.58	44.45	52.7	98.5	108	7.93	11.1	62.7	87.7	36.6	35.5	13.7	51.5
1 1/4"	0317	28.58	31.75	50.8	57.8	102.7	108	7.93	11.1	67.8	87.7	36.6	35.5	13.7	51.5
1 3/8"	0349	31.75	34.93	53.98	61	105.8	107.8	7.93	11.1	71	87.7	36.6	35.5	13.7	51.5
1 1/2"	0381	34.93	38.1	57.15	69.8	114	123.8	7.93	11.1	79.8	92.4	36	39.8	18	57
1 5/8"	0412	38.1	41.28	60.33	73	-	114.3	7.93	11.1	83	92.4	36	39.8	18	57
1 3/4"	0444	41.28	44.45	63.5	76.1	120.4	139.7	11.1	14.27	86.1	92.4	36	39.8	18	57
1 7/8"	0476	44.45	47.63	66.68	74.7	120.5	139.7	11.1	14.27	84.7	92.4	36	39.8	18	57
2"	0508	47.63	50.8	69.85	77.9	-	120.7	11.1	14.27	87.9	92.4	36	39.8	18	57
2 1/8"	0539	50.8	53.98	73.03	85.7	129.9	152.5	14.27	17.45	95.7	92.4	36	39.8	18	57
2 1/4"	0571	53.98	57.15	79.38	88.8	133.1	165.1	14.27	17.45	98.8	92.4	36	39.8	18	57
2 3/8"	0603	57.15	60.33	82.55	92	136.2	158.7	14.27	17.45	102	92.4	36	39.8	18	57
2 1/2"	0635	60.33	63.5	85.73	95.2	139.4	165.1	14.27	17.45	105.2	94.4	36	43.8	20	59
2 5/8"	0666	63.5	66.68	92.08	98.4	142.6	165.1	14.27	17.45	108.4	94.4	36	43.8	20	59
2 3/4"	0698	66.68	69.85	95.25	101.5	145.8	177.8	14.27	17.45	111.5	94.4	36	43.8	20	59
3"	0762	69.85	76.2	101.6	107.9	152.1	177.8	14.27	17.45	117.9	94.4	36	43.8	20	59
3 1/2"	0889	76.2	88.9	114.3	120.6	164.8	184.2	14.27	20.62	130.6	94.4	36	43.8	20	59
4"	1016	88.9	101.6	127	133.3	177.5	184.2	14.27	20.62	143.3	95.4	37	43.8	20	59



TYPE 2800, 2800E, 2800EC, 2800EH, 2800EX, 2800XA, 2800XP, 2800XS, 2874 & 2874XP

DOUBLE SEAL CARTRIDGE

Installation, Operation & Maintenance Instructions

TABLE 15. T2800EC AND T2800EX – IMPERIAL SIZES DIMENSIONAL DATA (DIMENSION IN INCHES)

T2800EC & T2800EX dimensions in inches - imperial															
Seal Size	Size Code	ØD		ØD4		ØD26		D28		D95	L3	L15	L23	L30	L39
		Min	Std	Std	Max	Min	Max	Min	Max						
7/8"	0222	0.750	0.875	1.500	1.902	3.665	3.748	0.312	0.437	2.295	3.453	1.441	1.398	0.539	2.028
1"	0254	0.875	1.000	1.625	2.024	-	3.748	0.312	0.437	2.421	3.453	1.441	1.398	0.539	2.028
1 1/8"	0285	1.000	1.125	1.750	2.075	3.878	4.252	0.312	0.437	2.469	3.453	1.441	1.398	0.539	2.028
1 1/4"	0317	1.125	1.250	2.000	2.276	4.043	4.252	0.312	0.437	2.669	3.453	1.441	1.398	0.539	2.028
1 3/8"	0349	1.250	1.375	2.125	2.402	4.165	4.244	0.312	0.437	2.795	3.453	1.441	1.398	0.539	2.028
1 1/2"	0381	1.375	1.500	2.250	2.748	4.488	4.874	0.312	0.437	3.142	3.638	1.417	1.567	0.709	2.244
1 5/8"	0412	1.500	1.625	2.375	2.874	-	4.500	0.312	0.437	3.268	3.638	1.417	1.567	0.709	2.244
1 3/4"	0444	1.625	1.750	2.500	2.996	4.740	5.500	0.437	0.562	3.390	3.638	1.417	1.567	0.709	2.244
1 7/8"	0476	1.750	1.875	2.625	2.941	4.744	5.500	0.437	0.562	3.335	3.638	1.417	1.567	0.709	2.244
2"	0508	1.875	2.000	2.750	3.067	-	4.752	0.437	0.562	3.461	3.638	1.417	1.567	0.709	2.244
2 1/8"	0539	2.000	2.125	2.875	3.374	5.114	6.004	0.562	0.687	3.768	3.638	1.417	1.567	0.709	2.244
2 1/4"	0571	2.125	2.250	3.125	3.496	5.240	6.500	0.562	0.687	3.890	3.638	1.417	1.567	0.709	2.244
2 3/8"	0603	2.250	2.375	3.250	3.622	5.362	6.248	0.562	0.687	4.016	3.638	1.417	1.567	0.709	2.244
2 1/2"	0635	2.375	2.500	3.375	3.748	5.488	6.500	0.562	0.687	4.142	3.717	1.417	1.724	0.787	2.323
2 5/8"	0666	2.500	2.625	3.625	3.874	5.614	6.500	0.562	0.687	4.268	3.717	1.417	1.724	0.787	2.323
2 3/4"	0698	2.625	2.750	3.750	3.996	5.740	7.000	0.562	0.687	4.390	3.717	1.417	1.724	0.787	2.323
3"	0762	2.750	3.000	4.000	4.248	5.988	7.000	0.562	0.687	4.642	3.717	1.417	1.724	0.787	2.323
3 1/2"	0889	3.000	3.500	4.500	4.748	6.488	7.252	0.562	0.812	5.142	3.717	1.417	1.724	0.787	2.323
4"	1016	3.500	4.000	5.000	5.248	6.988	7.252	0.562	0.812	5.642	3.756	1.457	1.724	0.787	2.323

TYPE 2800, 2800E, 2800EC, 2800EH, 2800EX, 2800XA, 2800XP, 2800XS, 2874 & 2874XP

DOUBLE SEAL CARTRIDGE

Installation, Operation & Maintenance Instructions

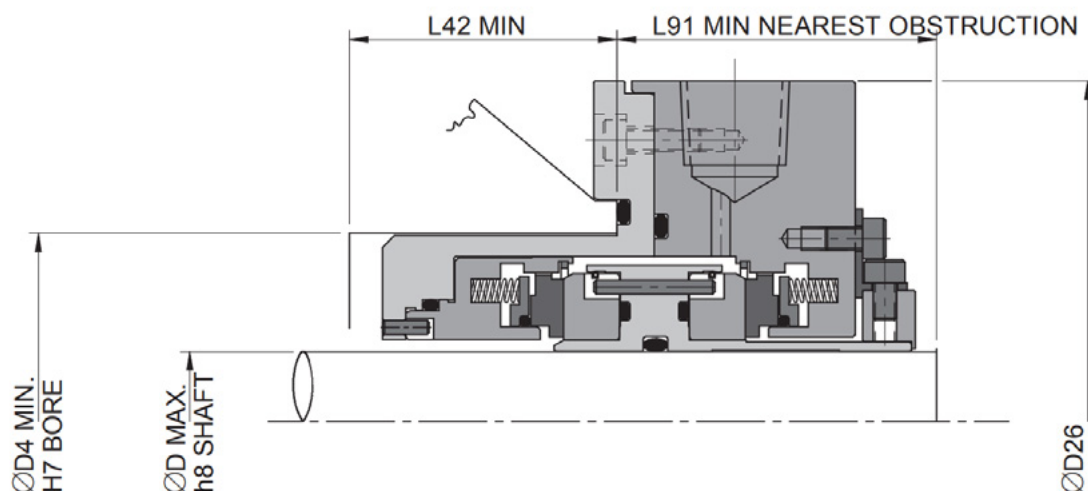


Figure 19. T2800XA, T2800XP, T2800XS Dimensional Data

TABLE 16. T2800XA, T2800XP AND TS2800XS – METRIC SIZES DIMENSIONAL DATA (DIMENSION IN MM)

T2800XA, T2800XP and TS2800XS dimensions in mm - metric						
Seal Size	Size Code	ØD	ØD4	ØD26	ØL42	ØL91 (Min)
30	0300	30	80.00	140.00	55.00	100.00
38	0380	38	76.20	139.70	55.12	60.63
40	0400	40	90.00	147.00	60.00	100.00
43	0430	43	88.90	165.10	52.82	69.33
48	0480	48	92.08	149.24	40.19	82.50
50	0500	50	100.00	166.00	55.00	110.00
53	0530	53	98.42	180.98	55.82	67.33
60	0600	60	120.00	185.00	60.00	110.00
70	0700	70	130.00	196.00	65.00	110.00
80	0800	80	140.00	206.00	70.00	110.00
90	0900	90	160.00	240.00	65.00	120.00
100	1000	100	170.00	248.00	70.00	120.00
110	1100	110	180.00	256.00	75.00	120.00

NOTE The size range of the type 2800XA, XP and XS are currently only in metric sizes.



TYPE 2800, 2800E, 2800EC, 2800EH, 2800EX, 2800XA, 2800XP, 2800XS, 2874 & 2874XP

DOUBLE SEAL CARTRIDGE

Installation, Operation & Maintenance Instructions

TABLE 17. T2800XP, T2800XP AND TS2800XS – METRIC SIZES DIMENSIONAL DATA (DIMENSION IN INCHES)

T2800XA, T2800XP and TS2800XS dimensions in inches - metric						
Seal Size	Size Code	ØD	ØD4	ØD26	ØL42	ØL91 (Min)
30	0300	1.181	3.150	5.512	2.165	3.937
38	0380	1.496	3.000	5.500	2.170	2.387
40	0400	1.575	3.543	5.787	2.362	3.937
43	0430	1.693	3.500	6.500	2.080	2.730
48	0480	1.890	3.625	5.876	1.582	3.248
50	0500	1.969	3.937	6.535	2.165	4.331
53	0530	2.087	3.875	7.125	2.198	2.651
60	0600	2.362	4.724	7.283	2.362	4.331
70	0700	2.756	5.118	7.717	2.559	4.331
80	0800	3.150	5.512	8.110	2.756	4.331
90	0900	3.543	6.299	9.449	2.559	4.724
100	1000	3.937	6.693	9.764	2.756	4.724
110	1100	4.331	7.087	10.079	2.953	4.724

NOTE The size range of the type 2800XA, XP and XS are currently only in metric sizes.

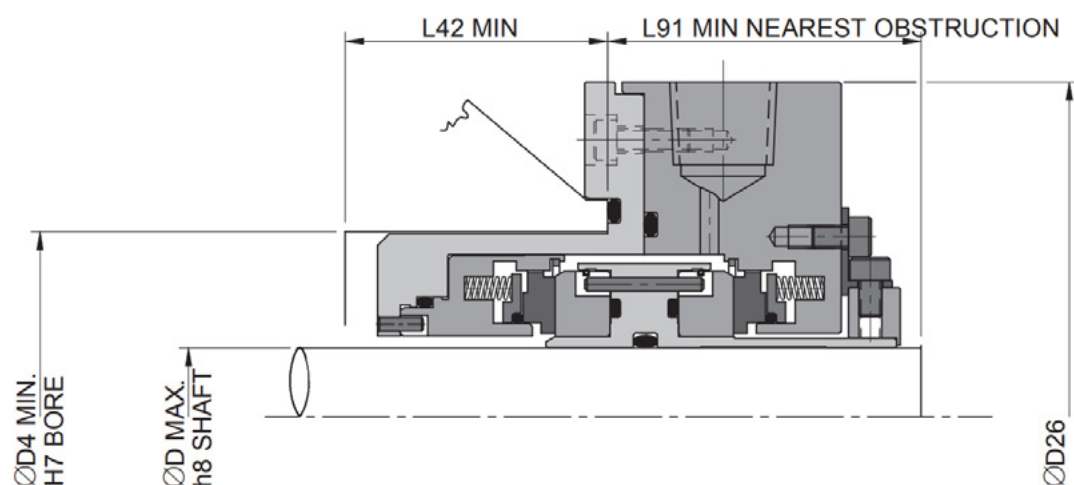


Figure 20. T2874 and T2874XP Dimensional Data

**TABLE 18. T2874 & T2874XP
– METRIC SIZES DIMENSIONAL DATA (DIMENSION IN MM)**

T2874 & T2874XP dimensions in mm - imperial					
Seal Size	ØD1	ØD3 (Min)	ØD4	L3	ØL4
1.375*	34.93	73.03	136.53	55.55	52.37
1.375**	34.93	73.03	127.00	55.55	52.37
1.500	38.1	85.73	152.40	82.55	50.80
1.750	44.45	88.90	165.10	71.42	53.98
1.875	47.63	92.08	149.23	81.74	47.63
2.000	50.8	100.00	168.28	94.62	49.20
2.125	53.98	98.43	180.98	68.25	54.76
2.250	57.15	104.65	209.55	88.90	44.45
2.500	63.5	114.30	200.03	55.55	65.07
2.625	66.68	117.48	177.80	55.55	66.24
2.750	69.85	120.65	200.03	66.27	63.50
3.000	76.2	127.00	215.90	76.96	74.60
3.250	82.55	127.00	203.20	76.20	80.16
3.375	85.73	149.23	241.3	91.67	64.67
3.500	88.9	152.40	228.6	103.96	49.2
4.000	101.6	165.10	254	84.96	70.03

**TABLE 1. T2874 & T2874XP
– METRIC SIZES DIMENSIONAL DATA (DIMENSION IN INCHES)**

T2874 & T2874XP dimensions in inches - imperial					
Seal Size	ØD1	ØD3 (Min)	ØD4	L3	ØL4
1.375*	34.93	2.875	5.375	2.187	2.062
1.375**	34.93	2.875	5.000	2.187	2.062
1.500	38.10	3.375	6.000	3.250	2.000
1.750	44.45	3.500	6.500	2.812	2.125
1.875	47.63	3.625	5.875	3.218	1.875
2.000	50.80	3.937	6.625	3.725	1.937
2.125	53.98	3.875	7.125	2.687	2.156
2.250	57.15	4.120	8.250	3.500	1.750
2.500	63.50	4.500	7.875	2.187	2.562
2.625	66.68	4.625	7.000	2.187	2.608
2.750	69.85	4.750	7.875	2.609	2.500
3.000	76.20	5.000	8.500	3.030	2.937
3.250	82.55	5.000	8.000	3.000	3.156
3.375	85.73	5.875	9.500	3.609	2.546
3.500	88.90	6.000	9.000	4.093	1.937
4.000	101.60	6.500	10.000	3.345	2.757

NOTE

The size range of the type 2874 and 2874XP are currently only in metric sizes.

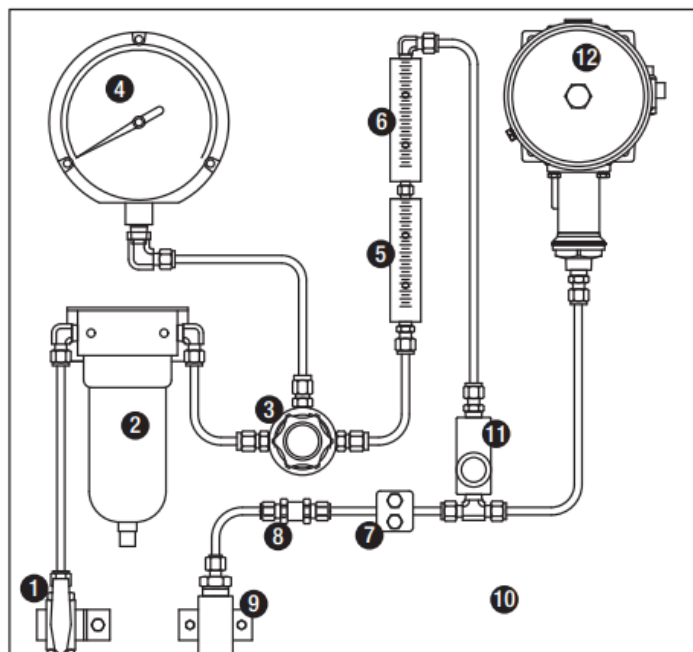


TYPE 2800, 2800E, 2800EC, 2800EH, 2800EX, 2800XA, 2800XP, 2800XS, 2874 & 2874XP

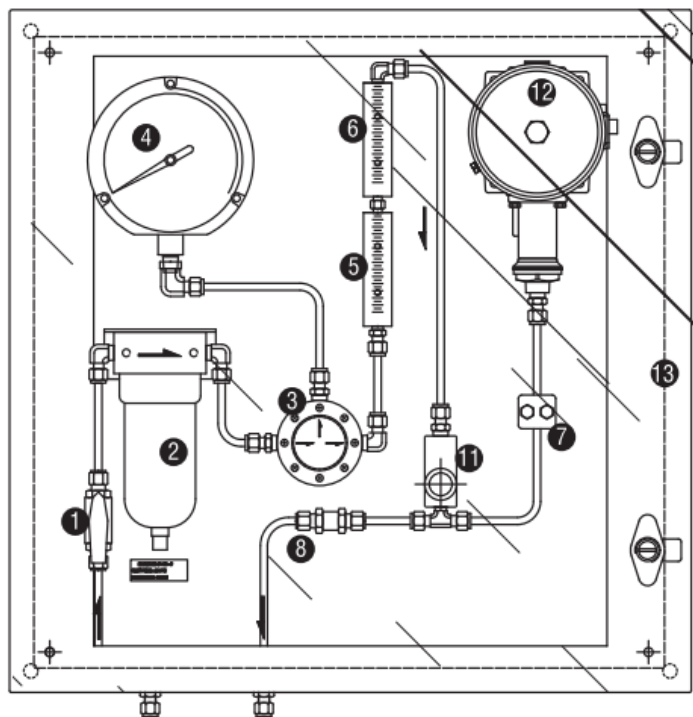
DOUBLE SEAL CARTRIDGE

Installation, Operation & Maintenance Instructions

Barrier gas supply systems



Barrier
Supply



Standard Components

- 1 – Isolating Ball Valve
- 2 – Coalescing Filter
- 3 – Pressure Regulator
- 4 – Pressure Gauge
- 5 – Flow Meter (Low Range)
- 6 – Flow Meter (High Range)
- 7 – Tubing Clamp
- 8 – Check Valve
- 9 – Coupling (To Seal Piping)
- 10 – Back Panel

Options

- 11 – Flow Switch
- 12 – Pressure Switch
- 13 – Enclosure

- Isolast™ and Kalrez® for the Check Valve Seat Material
- Stand
- Enclosures are also available in a NEMA 4X Enclosure (as shown)
- Gas Amplifier/Booster Systems
- Pressure Tracking Regulators

Available from John Crane in both standard tamper proof enclosure and panel mounted designs.

Further application information is available from John Crane.

Gas Flow Schematic

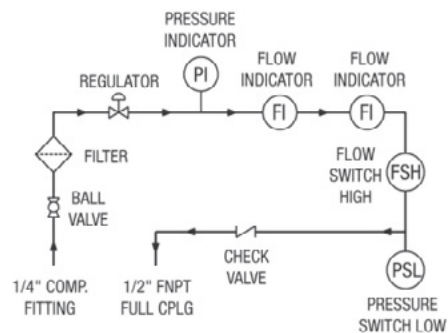


Figure 20. Control Panel Unit



TYPE 2800, 2800E, 2800EC, 2800EH, 2800EX, 2800XA, 2800XP, 2800XS, 2874 & 2874XP

DOUBLE SEAL CARTRIDGE

Installation, Operation & Maintenance Instructions

The seal requires a clean barrier gas supply at 30 psig/2 bar above seal chamber process pressure. This barrier gas pressure must never drop below the seal chamber pressure.

If shop air is to be used, or if the gas source is not clean and dry, a moisture trap and a 10-micron filter must be included in the line.

A gas control panel is recommended for optimal system performance and control, and John Crane can supply either a lowpressure enclosed unit (0 to 10 bar/145 psi), or panel-mounted systems (0 to 25 bar/363 psi) for low to higher pressures see system diagrams (page 30). Modified and custom panels are available.

These systems can be specified to serve the following functions:

- Barrier source regulation
- Barrier consumption measurement
- Detection of barrier pressure drop
- Maintenance of gas integrity
- Process containment on primary seal failure

PIPING CONNECTIONS

The gland plate is provided with two pipework connections, both tapped 1/4 in. NPT: if another size or thread form is

required, a suitable adapter must be fitted.

One connection is for the barrier gas supply and is fitted with a plastic plug; the second connection is sealed with a metal plug and is for use only as a drain to check for the presence of liquid in the unlikely event of an inboard seal failure.

ATTENTION The inlet connection plastic plug is a temporary fitting for storage and transit only and must not be used for any other purpose. The metal drain plug must not be removed before or during seal operation as barrier gas pressure will be lost.

For further information contact your local John Crane representative.



North America
United States of America
Tel: 1-847-967-2400

Europe
United Kingdom
Tel: 44-1753-224002

Latin America
Brazil
Tel: 55-11-3371-2500

Middle East & Africa
United Arab Emirates
Tel: 971-481-27800

Asia Pacific
Singapore
Tel: 65-6518-1800

If the products featured will be used in a potentially dangerous and/or hazardous process, your John Crane representative should be consulted prior to their selection and use. In the interest of continuous development, John Crane Companies reserve the right to alter designs and specifications without prior notice. It is dangerous to smoke while handling products made from PTFE. Old and new PTFE products must not be incinerated. ISO 9001 and ISO14001 Certified, details available on request.