TYPE R33/34/50

ROPAC COMPONENT SEALS

Installation, Operation & Maintenance Instructions

1. Foreword

This instruction manual contains standard, generic data and should be used with the seal family installation instructions. These instructions must be read and applied whenever work is done on the seal and must be kept available for future reference.

ATTENTION These instructions are for the installation and operation of a seal as used in rotating equipment. The instructions will help to avoid danger and increase reliability. The information required may change with other types of equipment or installation arrangements. This manual must be read in conjunction with the instruction manuals for both the pump and any ancillary equipment.

If the seal is to be used for an application other than that originally intended or outside the 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 or problems arise, contact your local John Crane representative or the original equipment manufacturer, as appropriate.

ATTENTION John Crane mechanical seals are precision products and must be handled appropriately. Take particular care to avoid damage to lapped sealing faces and to flexible sealing rings. Do not excessively compress the seal before or during installation.

2. Safety Instructions

The following designations are used in the installation instructions 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 information or instructions directed toward the prevention of damage to the seal or its surroundings.

Refers to mandatory instructions designed to prevent personal injury or extensive damage to the seal or its surroundings.

1. Installation, removal and maintenance of the seal must be carried out only by qualified personnel who have read and understood these installation instructions.
2. 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.
3. The seal must only be used in technically perfect condition, and must be operated within the recommended performance limits in accordance with its designated use and the instructions set out in these instructions.
4. If the pumped fluid is hazardous or toxic, appropriate precautions must be taken to ensure that any seal leakage is adequately contained. Further information on sealing hazardous or toxic fluids should be obtained from John Crane prior to seal installation.
5. Fluorocarbon components should never be burned or incinerated as the fumes and residues are highly toxic. If fluorocarbons are accidentally heated above 400°C/750°F, they can decompose. Protective gloves should be worn as hydrofluoric acid may be present.
6. PTFE components should never be burned or incinerated as the fumes are highly toxic.

3. Hazardous Environments

ATTENTION **Every working practice which compromises safety must be avoided.**

In the event of an operating problem the machine must be switched off immediately and made safe! Problems must be solved promptly.

Minor emissions will occur during normal seal operation. Depending on the duty, this emission can appear as a gas, a liquid or a solid. For emissions that are hazardous or toxic and a safe collection system is required.

Hot surfaces have to be protected against accidental contact.

In order to avoid unforeseen hazards do not make unauthorized 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 (also see Section 11). 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.

ATTENTION **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.**

Maintenance with steel tools must be avoided in the presence of substances classed as explosive group IIC according to EN 60079-0:2012+A11:2013.

If the machine is being used in a EN 60079-0:2012+A11:2013 Zone 21 or 22, regular cleaning of dust from exterior surfaces is required.

4. Declaration of Incorporation (2006/42/EC)

For each standard product supplied into the EU a Technical File is required and a Technical Record Sheet, 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 appointed representative.

5. 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:

1. Dry and dust-free
2. Ventilated at room temperature
3. Protected from direct effects of heat and ultraviolet light
4. 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 be replaced at these intervals. It is also recommended that the elastomer replacement be carried out by John Crane personnel.

⚠ **If used seal parts are to be shipped they must be cleaned and decontaminated before shipping. It is the responsibility of the machine user to ensure that any parts being shipped have appropriate safe-handling instructions externally attached to the package. Without this information there will be a refusal to handle the goods. If required a decontamination/transportation 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, before putting it back into operation the seal must be removed, cleaned and dried. 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 cartridge to John Crane for cleaning.

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

ATTENTION 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.

6. Seal Installation

Refer to the appropriate seal family installation instructions. Do not excessively compress the seal before or during installation.

7. Before Starting the Equipment

1. Check the machine at the coupling for proper alignment of the driver or motor.
2. Ensure that the gland plate nuts/bolts are securely tightened according to the pump manual instructions, and all screws are securely fastened.
3. Complete the assembly of the pump and turn the shaft (by hand if possible) to ensure free rotation.
4. Consult all available equipment operating instructions to check for correctness of all piping and connections, particularly regarding seal recirculation/flush, heating or cooling requirements, and services external to the seal.

ATTENTION This mechanical seal is designed to operate in a liquid, so the heat energy it creates is adequately removed. The following check should be carried out not only after seal installation, but also after any period of equipment inactivity.

5. Check that the seal chamber fluid lines are open and free of any obstruction, and ensure that the seal chamber is properly vented and filled with liquid — refer to the pump instruction manual.

ATTENTION 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 from the seal area and result in overheating and scoring or other damage to the sealing surfaces, causing excessive emissions and a reduced seal life.

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

ATTENTION **Seal installation should be handled only by qualified personnel. If questions arise, contact the local John Crane representative. 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 the company for information as to exclusive product warranty and limitations of liability.**

8. 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.

ATTENTION 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.

For a component seal (non-cartridge), remove the seal, adjust the impeller clearance then re-fit the seal at its correct working length.

8.1 Decommissioning the equipment

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 and which includes 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.

8.2 Removing the seal

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

1. Check the pump at the coupling for proper alignment of the driver or motor.

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

2. Ensure that the gland plate nuts/bolts are securely tightened according to the pump manual instructions, and all screws are securely fastened.

A mechanical seal must always be serviced after removal from the machine. In order to maximize reliability and minimize 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.**

8.3 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

9. Environmental Aspects

9.1 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 re-use of these high quality durable seals due to their ability to be refurbished and minimized transportation using world wide manufacturing and service centers .
- **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

9.2 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 & mating rings may be re-lapped and reused. Drive screws and springs are replaced. O-rings must be replaced. Please consult John Crane for assessment of seal condition and its potential reconditioning.

9.3 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 personal protective equipment (PPE) should be worn to prevent contact with any harmful residue that may be inside the seal.

9.4 Scrapped components

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

9.5 Special materials

Follow the local relevant guidelines for the environmentally friendly disposal of assembly lubricants, supplied fluids and scrapped components. Please refer to Section 2, Safety Instructions.

9.6 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.

10. 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.

11. 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 center (TDC). For vertical machines a piping connection above the seal faces is required.

12. Website

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

13. Fitting Lubricants

Elastomers and PTFE	Lubricant
General applications	Soft hand soap/water solution, glycerine (glycerol)
Food, pharmaceutical or similar	Consult machine manufacturer

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

Introduction

This document covers fitting of the mechanical seal to rotating machinery and should be kept for future reference. It should be used with any instruction manuals supplied with the rotating machinery and any ancillary equipment.

The mechanical seal contains precision lapped components which have been designed to minimize process fluid emissions when selected, fitted and used correctly.

⚠ **If the process fluid is toxic or hazardous, appropriate precautions must be taken to contain any emissions.**

⚠ **Never burn any of the rubber or plastic parts of the mechanical seal. Toxic fumes may be generated.**

ATTENTION The machinery operating conditions must not exceed the published operating limits of the mechanical seal.

ATTENTION Take care when handling the mechanical seal as it contains precision lapped parts.

NOTE Operating limits and all dimensions can be found at: **www.johncrane.com.**

The operating limits will depend on the materials used.

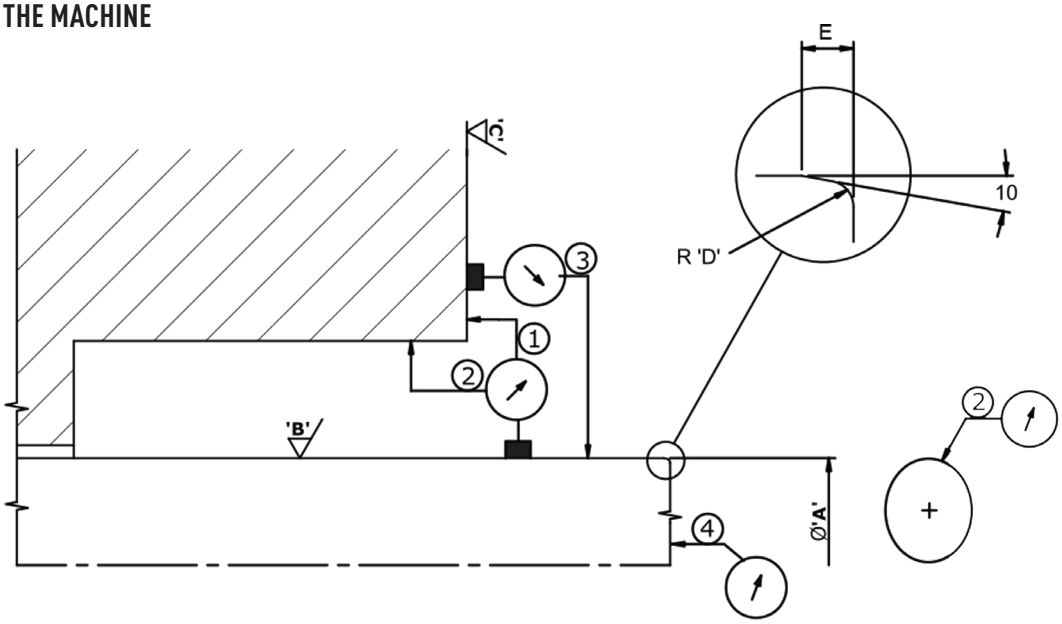
TYPE R33/34/50

ROPAC COMPONENT SEALS

Installation, Operation & Maintenance Instructions

FIGURE 1. CHECKING THE MACHINE

A – Seal size
B – 0.3-0.6 µm Ra
12-24 µinch Ra
C – 1.6-3.2 µm Ra
63-125 µinch Ra
D – 1.5 mm/0.060 inch
E – 3.0 mm/0.120 inch



1	2	3	4
Squareness of shaft to seal chamber face	**Concentricity seal chamber bore to shaft**	**Shaft runout**	**Shaft end play**
< 0.08 mm FIM, speed ≤ 1,800 RPM < 0.05 mm FIM, speed > 1,800 RPM < 0.003 inch FIM, speed ≤ 1,800 RPM < 0.002 inch FIM, speed >1,800 RPM	<0.006 inch FIM <0.15 mm FIM	< 0.08 mm FIM, speed ≤ 1,800 RPM < 0.05 mm FIM, speed > 1,800 RPM < 0.003 inch FIM, speed ≤ 1,800 RPM < 0.002 inch FIM, speed >1,800 RPM	<0.003 inch FIM <0.08 mm FIM

Operating Instructions

The Type R33 is a general duty unbalanced seal with an elastomer O-ring that incorporates a single wave spring design. For Ø10mm to 100mm, it complies to DIN 24960, NF E 29991 and ISO 3069 with the benefit of being shorter than L1K.

It is completed by a balanced variant Type 34 which is a higher duty seal.

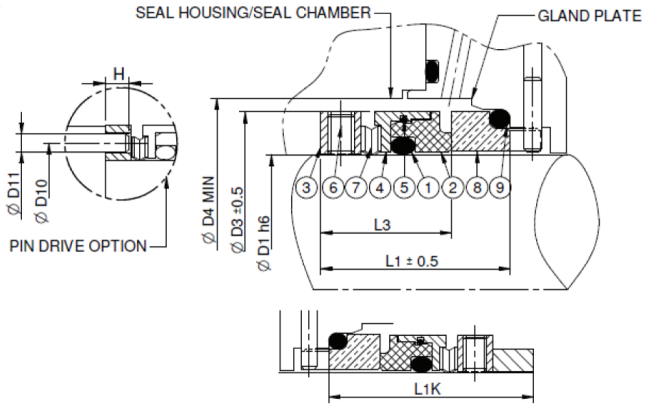
The Type 50 seal is a single, balanced seal designed to meet DIN24960 (L1K) specification, specially designed with the spring and drive mechanism outside of the product, decreasing clogging and permitting simple efficient cleaning.

These instructions apply to the seal as installed in rotary equipment and lubricated by the pumped fluid in accordance with the application information contained in John Crane Seal Selection Manual or other relevant approved John Crane seal selection literature or process. Typical operating limits can be found on the specification sheet from John Crane.

The selection of materials used in the construction of a seal should be made with regards to their temperature and chemical resistance/ compatibility with the liquid being pumped.

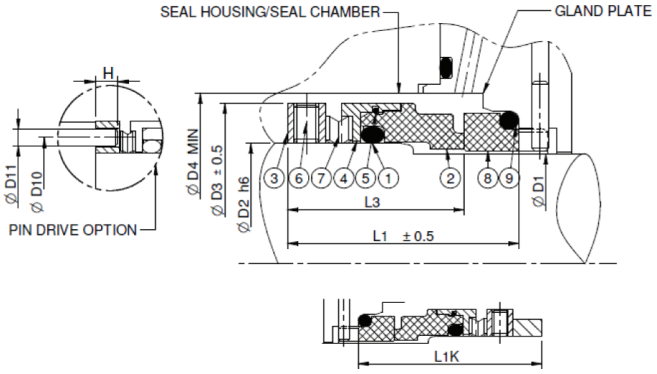
Typical Seal Cross Section and Seals Dimensions

FIGURE 2. Type R33



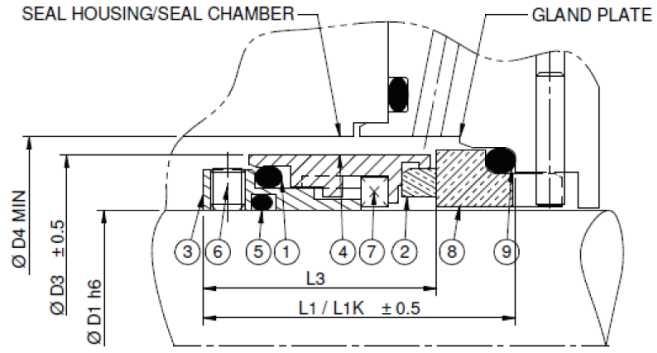
1 – O-ring
2 – Primary ring/face
3 – Retainer/drive collar
4 – Primary ring carrier
5 – Retaining clip
6 – Set screw
7 – Spring
8 – Mating ring/seat
9 – O-ring

FIGURE 3. Type 34



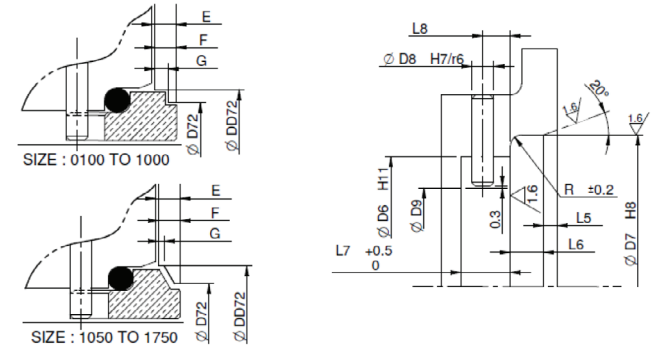
1 – O-ring
2 – Primary ring/face
3 – Retainer/drive collar
4 – Primary ring carrier
5 – Retaining clip
6 – Set screw
7 – Spring
8 – Mating ring/seat
9 – O-ring

FIGURE 4. Type 50



1 – O-ring
2 – Primary ring insert/insert
3 – Retainer/drive collar
4 – Primary ring carrier
5 – O-ring
6 – Set screw
7 – Spring
8 – Mating ring/seat
9 – O-ring

FIGURE 5. Standard mating ring housing



Setting the Seal

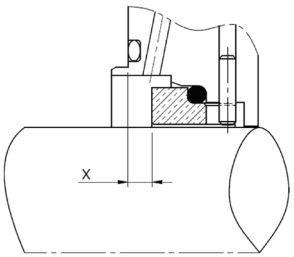
The seal must be installed to its correct working length L3, therefore it is essential that the back of the seal retainer is correctly positioned on the shaft. If the seal is to be pin driven by an adjustable ring or collar, it is the position of the ring or collar that must be verified. Setting procedure is described with respect to the shaft but is equally applicable to a fitted sleeve.

ATTENTION If L3 is over length, the seal will be under-compressed and will leak. If L3 is under length, the seal will be over-compressed and this will cause dry running and high wear of the seal faces.

Find the true seal position as follows:

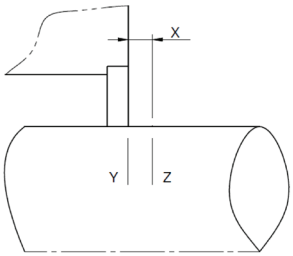
1. Refer to the appropriate seat/mating ring instruction manual to obtain dimension 'X' from the face of the gland plate to the seal mating surface (Figure 6).

FIGURE 6



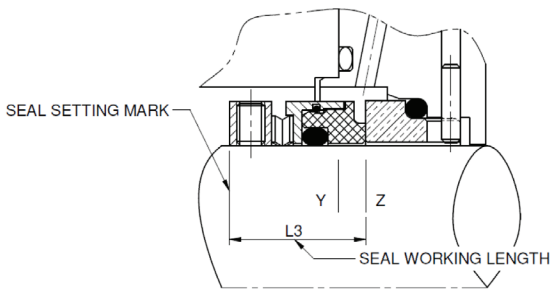
2. With the shaft in its working position, mark the surface at 'Y' in line with the seal housing end face and mark the shaft again at 'Z', the obtained distance away from the face position (Figure 7).

FIGURE 7



3. From the dimension tables, find the dimension L3 for the size of seal being fitted, and measure the distance back from position 'Z' (Figure 8). The new marked position is the point on the shaft where the back of the seal is to be located.

FIGURE 8



Installing the Seal

Before starting the installation, read the following instructions carefully, both to be aware of special information and because the fitting sequence may be different depending on the construction of the pump. These instructions assume fitting onto a plain shaft from the impeller end of a dismantled pump.

1. Remove the protective packaging from the seal; check for damage and wipe clean. Save package label for future reference.
2. Fit the seat/mating ring into the gland plate. Check that the gland plate O-ring or gasket is clean, undamaged, and in place, and then position the gland plate on the shaft, clear of the seal location avoid impact with shaft.

NOTE Use a suitable lubricant when fitting the seal.

3. Clean and sparingly lubricate the shaft.

NOTE As an alternative to the standard set screw drive, the seal may be driven by a pin set in a separate drive collar or abutment.

4. Pin-driven seals: Remove and discard all the set screw from the retainer. Fit the seal unit onto the shaft to abut the drive collar, positively engaging the drive pin.

   Set screw driven seals: Adjust the set screw until clear of the retainer bore. Fit the seal unit onto the shaft and accurately align the back of the retainer with the seal setting mark. Lightly tighten the set screws to hold the seal in position, then fully and evenly tighten the screw to the torque recommended table.

ATTENTION Accurate torque settings will avoid set screw damage and eliminate seal movement in operation.

5. Wipe the lapped surfaces of the seal and seat/mating ring perfectly clean and dry. Install the seal housing, then locate the gland plate squarely on the fixing studs and pull on the plate to compress the seal as necessary to fit the retaining nuts.
6. Recheck that the gland plate O-ring and gasket is in position, then tighten the nuts as advised by the pump instruction manual. Do not overtighten.

NOTE If the seal is visible after installation, a working length check can be made for Type R33 and Type 34. The setting is correct if the front of the drive collar is lined up with the line cut visible on the face retainer.

TABLE 1. Socket Set Screw Tightening Torque
(The torque values given below are for stainless steel cup point set screw)

Screw Size	Torque (lubricated) Nm/lbf·ft
M5	3.0/2.2
M6	4.0/3.0
M8	11.0/8.1
M10	16.0/11.8
M12	40.0/30.0

TYPE R33/34/50

ROPAC COMPONENT SEALS

Type R33 Dimensional Data (Sizes 0100 to 1000 comply with the standards EN 12756, DIN 24960 AND ISO 3069)

SEAL SIZE	D1	D3	D4	D6	D7	D8	D9	D10	D11	D72	DD72	E	F	G	H	L1	L1K	L3	L5	L6	L7	L8	L9	R
0100	10.0	20.0	22.0	17.0	21.0	3.0	10.5	15.0	2.5	19.3	21.0	3.0	2.5	1.5	6.5	28.0	32.5	19.5	1.5	4.0	8.5	5.0	3.75	1.0
0120	12.0	22.0	24.0	19.0	23.0	3.0	12.5	17.0	2.5	21.3	23.0	3.0	2.5	1.5	6.5	28.0	32.5	19.5	1.5	4.0	8.5	5.0	3.75	1.0
0140	14.0	24.0	26.0	21.0	25.0	3.0	14.5	19.0	2.5	23.3	25.0	3.0	2.5	1.5	6.5	28.0	35.0	19.5	1.5	4.0	8.5	5.0	3.75	1.0
0160	16.0	26.0	28.0	23.0	27.0	3.0	16.5	21.0	2.5	25.3	27.0	3.0	2.5	1.5	6.5	28.0	35.0	19.5	1.5	4.0	8.5	5.0	3.75	1.0
0180	18.0	29.0	34.0	27.0	33.0	3.0	18.5	23.5	2.5	29.6	33.0	3.0	2.5	1.5	6.5	30.5	37.5	20.5	2.0	5.0	9.0	5.0	3.75	1.5
0200	20.0	31.0	36.0	29.0	35.0	3.0	20.5	25.5	2.5	31.6	35.0	3.0	2.5	1.5	6.5	30.5	37.5	20.5	2.0	5.0	9.0	5.0	3.75	1.5
0220	22.0	33.0	38.0	31.0	37.0	3.0	22.5	27.5	2.5	33.6	37.0	3.0	2.5	1.5	6.5	30.5	37.5	20.5	2.0	5.0	9.0	5.0	3.75	1.5
0240	24.0	36.0	40.0	33.0	39.0	3.0	24.5	30.0	2.5	35.6	39.0	3.0	2.5	1.5	7.0	32.5	40.0	22.5	2.0	5.0	9.0	5.0	4.0	1.5
0250	25.0	39.0	41.0	34.0	40.0	3.0	25.8	32.0	4.0	36.6	40.0	3.0	2.5	1.5	7.0	33.5	40.0	23.5	2.0	5.0	9.0	5.0	4.0	1.5
0280	28.0	42.0	44.0	37.0	43.0	3.0	28.8	35.0	4.0	39.6	43.0	3.0	2.5	1.5	7.0	33.5	42.5	23.5	2.0	5.0	9.0	5.0	4.0	1.5
0300	30.0	44.0	46.0	39.0	45.0	3.0	30.8	37.0	4.0	41.5	45.0	3.0	2.5	1.5	7.0	34.5	42.5	24.5	2.0	5.0	9.0	5.0	4.0	1.5
0320	32.0	46.0	48.0	42.0	48.0	3.0	32.8	39.0	4.0	43.6	48.0	3.0	2.5	1.5	7.0	34.5	42.5	24.5	2.0	5.0	9.0	5.0	4.0	1.5
0330	33.0	47.0	49.0	42.0	48.0	3.0	33.8	40.0	4.0	44.6	48.0	3.0	2.5	1.5	7.0	34.5	42.5	24.5	2.0	5.0	9.0	5.0	4.0	1.5
0350	35.0	49.0	51.0	44.0	50.0	3.0	35.8	42.0	4.0	46.6	50.0	3.0	2.5	1.5	7.0	34.5	42.5	24.5	2.0	5.0	9.0	5.0	4.0	1.5
0380	38.0	53.0	58.0	49.0	56.0	4.0	38.8	45.5	4.0	52.1	56.0	3.0	2.5	1.0	7.0	38.0	45.0	27.0	2.0	6.0	9.0	5.0	4.0	1.5
0400	40.0	55.0	60.0	51.0	58.0	4.0	40.8	47.5	4.0	54.2	58.0	3.0	2.5	1.0	7.0	39.0	45.0	28.0	2.0	6.0	9.0	5.0	4.0	1.5
0430	43.0	58.0	63.0	54.0	61.0	4.0	43.8	50.5	4.0	57.2	61.0	3.0	2.5	1.0	7.0	39.0	45.0	28.0	2.0	6.0	9.0	5.0	4.0	1.5
0450	45.0	60.0	65.0	56.0	63.0	4.0	45.8	52.5	4.0	59.2	63.0	3.0	2.5	1.0	7.0	39.0	45.0	28.0	2.0	6.0	9.0	5.0	4.0	1.5
0480	48.0	63.0	68.0	59.0	66.0	4.0	48.8	55.5	4.0	62.2	66.0	3.0	2.5	1.0	7.0	39.0	45.0	28.0	2.0	6.0	9.0	5.0	4.0	1.5
0500	50.0	66.0	70.0	62.0	70.0	4.0	50.8	57.5	4.0	64.8	70.0	4.5	4.0	2.5	7.0	40.0	47.5	27.0	2.5	6.0	9.0	5.0	4.0	2.0
0530	53.0	69.0	73.0	65.0	73.0	4.0	53.8	60.5	4.0	67.7	73.0	4.5	4.0	2.5	7.0	40.0	47.5	27.0	2.5	6.0	9.0	5.0	4.0	2.0
0550	55.0	71.0	75.0	67.0	75.0	4.0	55.8	62.5	4.0	69.8	75.0	4.5	4.0	2.5	7.0	40.0	47.5	27.0	2.5	6.0	9.0	5.0	4.0	2.0
0580	58.0	77.0	83.0	70.0	78.0	4.0	58.8	67.5	5.0	72.8	78.0	4.5	4.0	2.5	8.0	42.0	52.5	29.0	2.5	6.0	9.0	5.0	4.5	2.0
0600	60.0	79.0	85.0	72.0	80.0	4.0	60.8	69.5	5.0	75.3	80.0	4.5	4.0	2.5	8.0	42.0	52.5	29.0	2.5	6.0	9.0	5.0	4.5	2.0
0630	63.0	82.0	88.0	75.0	83.0	4.0	63.8	72.5	5.0	78.3	83.0	4.5	4.0	2.5	8.0	45.0	52.5	32.0	2.5	6.0	9.0	5.0	4.5	2.0
0650	65.0	84.0	90.0	77.0	85.0	4.0	65.8	74.5	5.0	80.3	85.0	4.5	4.0	2.5	8.0	45.0	52.5	32.0	2.5	6.0	9.0	5.0	4.5	2.0
0680	68.0	87.0	93.0	81.0	90.0	4.0	68.8	77.5	5.0	83.3	90.0	4.0	3.5	2.0	8.0	47.0	52.5	33.5	2.5	7.0	9.0	5.0	4.5	2.0
0700	70.0	89.0	95.0	83.0	92.0	4.0	70.8	79.5	5.0	85.9	92.0	5.5	5.0	3.5	8.0	47.0	60.0	32.0	2.5	7.0	9.0	5.0	4.5	2.0
0750	75.0	94.0	104.0	88.0	97.0	4.0	75.8	84.5	5.0	90.9	97.0	5.5	5.0	3.5	8.0	47.0	60.0	32.0	2.5	7.0	9.0	5.0	4.5	2.0
0800	80.0	100.0	109.0	95.0	105.0	4.0	80.8	89.5	5.0	98.0	105.0	5.5	5.0	3.5	8.0	48.0	60.0	32.5	3.0	7.0	9.0	5.0	4.5	2.5
0850	85.0	105.0	114.0	100.0	110.0	4.0	85.8	94.5	5.0	103.0	110.0	5.5	5.0	3.5	8.0	48.0	60.0	32.5	3.0	7.0	9.0	5.0	4.5	2.5
0900	90.0	112.0	119.0	105.0	115.0	4.0	90.8	100.5	5.0	110.0	115.0	5.5	5.0	3.0	10.0	54.0	65.0	38.5	3.0	7.0	9.0	5.0	6.0	2.5
0950	95.0	117.0	124.0	110.0	120.0	4.0	95.8	105.5	5.0	115.0	120.0	5.5	5.0	3.0	10.0	54.0	65.0	38.5	3.0	7.0	9.0	5.0	6.0	2.5
1000	100.0	122.0	129.0	115.0	125.0	4.0	100.8	110.5	5.0	120.0	125.0	5.5	5.0	3.0	10.0	54.0	65.0	38.5	3.0	7.0	9.0	5.0	6.0	2.5

TYPE R33/34/50

ROPAC COMPONENT SEALS

Type R33 Dimensional Data

SEAL SIZE	D1	D3	D4	D6	D7	D8	D9	D10	D11	D72	DD72	E	F	G	H	L1	L1K	L3	L5	L6	L7	L8	L9	R
1050	105.0	127.0	134.0	122.0	131.0	5.0	105.8	115.5	5.0	125.0	131.0	7.0	6.5	1.7	10.0	64.0	–	42.0	3.0	9.0	10.0	6.0	6.0	2.5
1100	110.0	137.0	150.0	127.0	136.0	5.0	110.8	124.0	5.0	130.0	136.0	7.0	6.5	1.7	12.0	68.0	–	46.0	3.0	9.0	10.0	6.0	7.5	2.5
1150	115.0	142.0	155.0	132.0	141.0	5.0	115.8	129.0	5.0	135.0	141.0	7.0	6.5	1.7	12.0	68.0	–	46.0	3.0	9.0	10.0	6.0	7.5	2.5
1200	120.0	152.0	160.0	137.0	146.0	5.0	120.8	136.0	5.0	140.0	146.0	7.0	6.5	1.7	12.0	72.0	–	50.0	3.0	9.0	10.0	6.0	7.5	2.5
1250	125.0	157.0	165.0	142.0	151.0	5.0	125.8	141.0	5.0	145.0	151.0	7.0	6.5	1.7	12.0	72.0	–	50.0	3.0	9.0	10.0	6.0	7.5	2.5
1300	130.0	162.0	170.0	147.0	156.0	5.0	130.8	146.0	5.0	150.0	156.0	7.0	6.5	1.7	12.0	72.0	–	50.0	3.0	9.0	10.0	6.0	7.5	2.5
1350	135.0	167.0	175.0	157.0	166.0	8.0	135.8	151.0	5.0	160.0	166.0	8.5	8.0	3.2	12.0	82.0	–	57.0	3.0	9.0	13.0	7.0	7.5	2.5
1400	140.0	172.0	180.0	162.0	171.0	8.0	140.8	156.0	5.0	165.0	171.0	8.5	8.0	3.2	12.0	82.0	–	57.0	3.0	9.0	13.0	7.0	7.5	2.5
1450	145.0	177.0	185.0	167.0	176.0	8.0	145.8	161.0	5.0	170.0	176.0	8.5	8.0	3.2	12.0	82.0	–	57.0	3.0	9.0	13.0	7.0	7.5	2.5
1500	150.0	182.0	190.0	172.0	181.0	8.0	150.8	166.0	5.0	175.0	181.0	8.5	8.0	3.2	12.0	82.0	–	57.0	3.0	9.0	13.0	7.0	7.5	2.5
1550	155.0	187.0	200.0	177.0	186.0	8.0	155.8	171.0	5.0	180.0	186.0	8.5	8.0	3.2	12.0	82.0	–	57.0	3.0	9.0	13.0	7.0	7.5	2.5
1600	160.0	192.0	205.0	182.0	191.0	8.0	160.8	176.0	5.0	185.0	191.0	8.5	8.0	3.2	12.0	82.0	–	57.0	3.0	9.0	13.0	7.0	7.5	2.5
1650	165.0	202.0	215.0	192.0	201.0	8.0	165.8	183.5	8.0	195.0	201.0	11.5	11.0	4.0	15.0	93.0	–	65.0	3.0	10.0	14.0	7.0	9.0	2.5
1700	170.0	207.0	220.0	197.0	206.0	8.0	170.8	188.5	8.0	200.0	206.0	11.5	11.0	4.0	15.0	93.0	–	65.0	3.0	10.0	14.0	7.0	9.0	2.5
1750	175.0	212.0	225.0	202.0	211.0	8.0	175.8	193.5	8.0	205.0	211.0	11.5	11.0	4.0	15.0	93.0	–	65.0	3.0	10.0	14.0	7.0	9.0	2.5

TYPE R33/34/50

ROPAC COMPONENT SEALS

Installation, Operation & Maintenance Instructions

Type R34 Dimensional Data (Sizes 0100 to 1000 comply with the standards EN 12756, DIN 24960 AND ISO 3069)

SEAL SIZE	D1	D2	D3	D4	D6	D7	D8	D9	D10	D11	D72	DD72	E	F	G	H	L1	L1K	L2	L3	L5	L6	L7	L8	L9	R
0100	10.0	14.0	24.0	26.0	17.0	21.0	3.0	10.5	19.0	2.5	19.3	21.0	3.0	2.5	1.5	6.5	37.0	40.0	18.0	28.5	1.5	4.0	8.5	5.0	3.75	1.0
0120	12.0	16.0	26.0	28.0	19.0	23.0	3.0	12.5	21.0	2.5	21.3	23.0	3.0	2.5	1.5	6.5	37.0	40.0	18.0	28.5	1.5	4.0	8.5	5.0	3.75	1.0
0140	14.0	18.0	29.0	34.0	21.0	25.0	3.0	14.5	23.5	2.5	23.3	25.0	3.0	2.5	1.5	6.5	37.0	42.5	18.0	28.5	1.5	4.0	8.5	5.0	3.75	1.0
0160	16.0	20.0	31.0	36.0	23.0	27.0	3.0	16.5	25.5	2.5	25.3	27.0	3.0	2.5	1.5	6.5	37.0	42.5	18.0	28.5	1.5	4.0	8.5	5.0	3.75	1.0
0180	18.0	22.0	33.0	38.0	27.0	33.0	3.0	18.5	27.5	2.5	29.6	33.0	3.0	2.5	1.5	6.5	38.5	45.0	20.0	28.5	2.0	5.0	9.0	5.0	3.75	1.5
0200	20.0	24.0	36.0	40.0	29.0	35.0	3.0	20.5	30.0	2.5	31.6	35.0	3.0	2.5	1.5	7.0	41.5	45.0	20.0	31.5	2.0	5.0	9.0	5.0	4.0	1.5
0220	22.0	26.0	40.0	42.0	31.0	37.0	3.0	22.5	33.0	4.0	33.6	37.0	3.0	2.5	1.5	7.0	42.5	45.0	20.0	32.5	2.0	5.0	9.0	5.0	4.0	1.5
0240	24.0	28.0	42.0	44.0	33.0	39.0	3.0	24.5	35.0	4.0	35.6	39.0	3.0	2.5	1.5	7.0	42.5	47.5	20.0	32.5	2.0	5.0	9.0	5.0	4.0	1.5
0250	25.0	30.0	44.0	46.0	34.0	40.0	3.0	25.8	37.0	4.0	36.6	40.0	3.0	2.5	1.5	7.0	43.5	47.5	20.0	33.5	2.0	5.0	9.0	5.0	4.0	1.5
0280	28.0	33.0	47.0	49.0	37.0	43.0	3.0	28.8	40.0	4.0	39.6	43.0	3.0	2.5	1.5	7.0	43.5	50.0	20.0	33.5	2.0	5.0	9.0	5.0	4.0	1.5
0300	30.0	35.0	49.0	51.0	39.0	45.0	3.0	30.8	42.0	4.0	41.5	45.0	3.0	2.5	1.5	7.0	43.5	50.0	20.0	33.5	2.0	5.0	9.0	5.0	4.0	1.5
0330	33.0	38.0	53.0	58.0	42.0	48.0	3.0	33.8	45.5	4.0	44.6	48.0	3.0	2.5	1.5	7.0	44.5	50.0	20.0	34.5	2.0	5.0	9.0	5.0	4.0	1.5
0350	35.0	40.0	55.0	60.0	44.0	50.0	3.0	35.8	47.5	4.0	46.6	50.0	3.0	2.5	1.5	7.0	45.5	50.0	20.0	35.5	2.0	5.0	9.0	5.0	4.0	1.5
0380	38.0	43.0	58.0	63.0	49.0	56.0	4.0	38.8	50.5	4.0	52.1	56.0	3.0	2.5	1.0	7.0	49.0	52.5	23.0	38.0	2.0	6.0	9.0	5.0	4.0	1.5
0400	40.0	45.0	60.0	65.0	51.0	58.0	4.0	40.8	52.5	4.0	54.2	58.0	3.0	2.5	1.0	7.0	49.0	52.5	23.0	38.0	2.0	6.0	9.0	5.0	4.0	1.5
0430	43.0	48.0	63.0	68.0	54.0	61.0	4.0	43.8	55.5	4.0	57.2	61.0	3.0	2.5	1.0	7.0	49.0	52.5	23.0	38.0	2.0	6.0	9.0	5.0	4.0	1.5
0450	45.0	50.0	66.0	70.0	56.0	63.0	4.0	45.8	57.5	4.0	59.2	63.0	3.0	2.5	1.0	7.0	49.0	52.5	23.0	38.0	2.0	6.0	9.0	5.0	4.0	1.5
0480	48.0	53.0	69.0	73.0	59.0	66.0	4.0	48.8	60.5	4.0	62.2	66.0	3.0	2.5	1.0	7.0	49.0	52.5	23.0	38.0	2.0	6.0	9.0	5.0	4.0	1.5
0500	50.0	55.0	71.0	75.0	62.0	70.0	4.0	50.8	62.5	4.0	64.8	70.0	4.5	4.0	2.5	7.0	51.0	57.5	25.0	38.0	2.5	6.0	9.0	5.0	4.0	2.0
0530	53.0	58.0	77.0	83.0	65.0	73.0	4.0	53.8	67.5	5.0	67.7	73.0	4.5	4.0	2.5	8.0	52.0	57.5	25.0	39.0	2.5	6.0	9.0	5.0	4.5	2.0
0550	55.0	60.0	79.0	85.0	67.0	75.0	4.0	55.8	69.5	5.0	69.8	75.0	4.5	4.0	2.5	8.0	52.0	57.5	25.0	39.0	2.5	6.0	9.0	5.0	4.5	2.0
0580	58.0	63.0	82.0	88.0	70.0	78.0	4.0	58.8	72.5	5.0	72.8	78.0	4.5	4.0	2.5	8.0	55.0	62.5	25.0	42.0	2.5	6.0	9.0	5.0	4.5	2.0
0600	60.0	65.0	84.0	90.0	72.0	80.0	4.0	60.8	74.5	5.0	75.3	80.0	4.5	4.0	2.5	8.0	55.0	62.5	25.0	42.0	2.5	6.0	9.0	5.0	4.5	2.0
0630	63.0	68.0	87.0	93.0	75.0	83.0	4.0	63.8	77.5	5.0	78.3	83.0	4.5	4.0	2.5	8.0	55.0	62.5	25.0	42.0	2.5	6.0	9.0	5.0	4.5	2.0
0650	65.0	70.0	89.0	95.0	77.0	85.0	4.0	65.8	79.5	5.0	80.3	85.0	4.5	4.0	2.5	8.0	55.0	62.5	25.0	42.0	2.5	6.0	9.0	5.0	4.5	2.0
0700	70.0	75.0	94.0	104.0	83.0	92.0	4.0	70.8	84.5	5.0	85.9	92.0	5.5	5.0	3.5	8.0	58.0	70.0	28.0	43.0	2.5	7.0	9.0	5.0	4.5	2.0
0750	75.0	80.0	100.0	109.0	88.0	97.0	4.0	75.8	89.5	5.0	90.9	97.0	5.5	5.0	3.5	8.0	59.0	70.0	28.0	44.0	2.5	7.0	9.0	5.0	4.5	2.0
0800	80.0	85.0	105.0	114.0	95.0	105.0	4.0	80.8	94.5	5.0	98.0	105.0	5.5	5.0	3.5	8.0	59.0	70.0	28.0	43.5	3.0	7.0	9.0	5.0	4.5	2.5
0850	85.0	90.0	112.0	119.0	100.0	110.0	4.0	85.8	100.5	5.0	103.0	110.0	5.5	5.0	3.5	10.0	66.0	75.0	28.0	50.5	3.0	7.0	9.0	5.0	6.0	2.5
0900	90.0	95.0	117.0	124.0	105.0	115.0	4.0	90.8	105.5	5.0	110.0	115.0	5.5	5.0	3.0	10.0	66.0	75.0	28.0	50.5	3.0	7.0	9.0	5.0	6.0	2.5
0950	95.0	100.0	122.0	129.0	110.0	120.0	4.0	95.8	110.5	5.0	115.0	120.0	5.5	5.0	3.0	10.0	66.0	75.0	28.0	50.5	3.0	7.0	9.0	5.0	6.0	2.5
1000	100.0	105.0	127.0	135.0	115.0	125.0	4.0	100.8	115.5	5.0	120.0	125.0	5.5	5.0	3.0	10.0	66.0	75.0	28.0	50.5	3.0	7.0	9.0	5.0	6.0	2.5
0950	95.0	100.0	122.0	129.0	110.0	120.0	4.0	95.8	110.5	5.0	115.0	120.0	5.5	5.0	3.0	10.0	66.0	75.0	28.0	50.5	3.0	7.0	9.0	5.0	6.0	2.5
1000	100.0	105.0	127.0	135.0	115.0	125.0	4.0	100.8	115.5	5.0	120.0	125.0	5.5	5.0	3.0	10.0	66.0	75.0	28.0	50.5	3.0	7.0	9.0	5.0	6.0	2.5

TYPE R33/34/50

ROPAC COMPONENT SEALS

Type R34 Dimensional Data

SEAL SIZE	D1	D2	D3	D4	D6	D7	D8	D9	D10	D11	D72	DD72	E	F	G	H	L1	L1K	L2	L3	L5	L6	L7	L8	L9	R
1050	105.0	110.0	137.0	150.0	122.0	131.0	5.0	105.8	124.0	5.0	125.0	131.0	7.0	6.5	1.7	12.0	83.0	–	42.0	61.0	3.0	9.0	10.0	6.0	7.5	2.5
1100	110.0	115.0	142.0	155.0	127.0	136.0	5.0	110.8	129.0	5.0	130.0	136.0	7.0	6.5	1.7	12.0	83.0	–	42.0	61.0	3.0	9.0	10.0	6.0	7.5	2.5
1150	115.0	120.0	152.0	160.0	132.0	141.0	5.0	115.8	136.0	5.0	135.0	141.0	7.0	6.5	1.7	12.0	87.0	–	42.0	65.0	3.0	9.0	10.0	6.0	7.5	2.5
1200	120.0	125.0	157.0	165.0	137.0	146.0	5.0	120.8	141.0	5.0	140.0	146.0	7.0	6.5	1.7	12.0	87.0	–	42.0	65.0	3.0	9.0	10.0	6.0	7.5	2.5
1250	125.0	130.0	162.0	170.0	142.0	151.0	5.0	125.8	146.0	5.0	145.0	151.0	7.0	6.5	1.7	12.0	87.0	–	42.0	65.0	3.0	9.0	10.0	6.0	7.5	2.5
1300	130.0	135.0	167.0	175.0	147.0	156.0	5.0	130.8	151.0	5.0	150.0	156.0	7.0	6.5	1.7	12.0	92.0	–	42.0	70.0	3.0	9.0	10.0	6.0	7.5	2.5
1350	135.0	140.0	172.0	180.0	157.0	166.0	8.0	135.8	156.0	5.0	160.0	166.0	8.5	8.0	3.2	12.0	97.0	–	47.0	72.0	3.0	9.0	13.0	7.0	7.5	2.5
1400	140.0	145.0	177.0	185.0	162.0	171.0	8.0	140.8	161.0	5.0	165.0	171.0	8.5	8.0	3.2	12.0	97.0	–	47.0	72.0	3.0	9.0	13.0	7.0	7.5	2.5
1450	145.0	150.0	182.0	190.0	167.0	176.0	8.0	145.8	166.0	5.0	170.0	176.0	8.5	8.0	3.2	12.0	97.0	–	47.0	72.0	3.0	9.0	13.0	7.0	7.5	2.5
1500	150.0	155.0	187.0	200.0	172.0	181.0	8.0	150.8	171.0	5.0	175.0	181.0	8.5	8.0	3.2	12.0	97.0	–	47.0	72.0	3.0	9.0	13.0	7.0	7.5	2.5
1550	155.0	160.0	192.0	205.0	177.0	186.0	8.0	155.8	176.0	5.0	180.0	186.0	8.5	8.0	3.2	12.0	97.0	–	47.0	72.0	3.0	9.0	13.0	7.0	7.5	2.5
1600	160.0	165.0	202.0	215.0	182.0	191.0	8.0	160.8	183.5	8.0	185.0	191.0	8.5	8.0	3.2	15.0	103.0	–	47.0	78.0	3.0	9.0	13.0	7.0	9.0	2.5
1650	165.0	170.0	207.0	220.0	192.0	201.0	8.0	165.8	188.5	8.0	195.0	201.0	11.5	11.0	4.0	15.0	108.0	–	52.0	80.0	3.0	10.0	14.0	7.0	9.0	2.5
1700	170.0	175.0	212.0	225.0	197.0	206.0	8.0	170.8	193.5	8.0	200.0	206.0	11.5	11.0	4.0	15.0	108.0	–	52.0	80.0	3.0	10.0	14.0	7.0	9.0	2.5

TYPE R33/34/50

ROPAC COMPONENT SEALS

Installation, Operation & Maintenance Instructions

Type R50 Dimensional Data (Sizes 0140 to 1000 comply with the standards EN 12756, DIN 24960 AND ISO 3069)

Seal Size	D1	D3	D4	L1	L3	D6	D7	D8	D9	L5	L6	L7	R	D72	DD72	E	F	G
0140	14.0	26.0	27.0	35.0	26.5	21.0	25.0	3.0	14.5	1.5	4.0	8.5	1.0	23.3	25.0	3.0	2.5	1.5
0160	16.0	28.0	29.0	35.0	26.5	23.0	27.0	3.0	16.5	1.5	4.0	8.5	1.0	25.3	27.0	3.0	2.5	1.5
0180	18.0	32.0	34.0	37.5	27.5	27.0	33.0	3.0	18.5	2.0	5.0	9.0	1.5	29.6	33.0	3.0	2.5	1.5
0200	20.0	34.0	36.0	37.5	27.5	29.0	35.0	3.0	20.5	2.0	5.0	9.0	1.5	31.6	35.0	3.0	2.5	1.5
0220	22.0	36.0	38.0	37.5	27.5	31.0	37.0	3.0	22.5	2.0	5.0	9.0	1.5	33.6	37.0	3.0	2.5	1.5
0240	24.0	38.0	40.0	40.0	30.0	33.0	39.0	3.0	24.5	2.0	5.0	9.0	1.5	35.6	39.0	3.0	2.5	1.5
0250	25.0	39.0	41.0	40.0	30.0	34.0	40.0	3.0	25.8	2.0	5.0	9.0	1.5	36.6	40.0	3.0	2.5	1.5
0280	28.0	42.0	44.0	42.5	32.5	37.0	43.0	3.0	28.8	2.0	5.0	9.0	1.5	39.6	43.0	3.0	2.5	1.5
0300	30.0	44.0	46.0	42.5	32.5	39.0	45.0	3.0	30.8	2.0	5.0	9.0	1.5	41.5	45.0	3.0	2.5	1.5
0320	32.0	46.0	48.0	42.5	32.5	42.0	48.0	3.0	32.8	2.0	5.0	9.0	1.5	43.6	48.0	3.0	2.5	1.5
0330	33.0	47.0	49.0	42.5	32.5	42.0	48.0	3.0	33.8	2.0	5.0	9.0	1.5	44.6	48.0	3.0	2.5	1.5
0350	35.0	49.0	51.0	42.5	32.5	44.0	50.0	3.0	35.8	2.0	5.0	9.0	1.5	46.6	50.0	3.0	2.5	1.5
0380	38.0	54.0	58.0	45.0	34.0	49.0	56.0	4.0	38.8	2.0	6.0	9.0	1.5	52.1	56.0	3.0	2.5	1.0
0400	40.0	56.0	60.0	45.0	34.0	51.0	58.0	4.0	40.8	2.0	6.0	9.0	1.5	54.2	58.0	3.0	2.5	1.0
0430	43.0	59.0	63.0	45.0	34.0	54.0	61.0	4.0	43.8	2.0	6.0	9.0	1.5	57.2	61.0	3.0	2.5	1.0
0450	45.0	61.0	65.0	45.0	34.0	56.0	63.0	4.0	45.8	2.0	6.0	9.0	1.5	59.2	63.0	3.0	2.5	1.0
0480	48.0	64.0	68.0	45.0	34.0	59.0	66.0	4.0	48.8	2.0	6.0	9.0	1.5	62.2	66.0	3.0	2.5	1.0
0500	50.0	66.0	70.0	47.5	34.5	62.0	70.0	4.0	50.8	2.5	6.0	9.0	2.0	64.8	70.0	4.5	4.0	2.5
0530	53.0	69.0	73.0	47.5	34.5	65.0	73.0	4.0	53.8	2.5	6.0	9.0	2.0	67.7	73.0	4.5	4.0	2.5
0550	55.0	71.0	75.0	47.5	34.5	67.0	75.0	4.0	55.8	2.5	6.0	9.0	2.0	69.8	75.0	4.5	4.0	2.5
0580	58.0	78.0	83.0	52.5	39.5	70.0	78.0	4.0	58.8	2.5	6.0	9.0	2.0	72.8	78.0	4.5	4.0	2.5
0600	60.0	80.0	85.0	52.5	39.5	72.0	80.0	4.0	60.8	2.5	6.0	9.0	2.0	75.3	80.0	4.5	4.0	2.5
0630	63.0	83.0	88.0	52.5	39.5	75.0	83.0	4.0	63.8	2.5	6.0	9.0	2.0	78.3	83.0	4.5	4.0	2.5
0650	65.0	85.0	90.0	52.5	39.5	77.0	85.0	4.0	65.8	2.5	6.0	9.0	2.0	80.3	85.0	4.5	4.0	2.5
0680	68.0	88.0	93.0	52.5	39.0	81.0	90.0	4.0	68.8	2.5	7.0	9.0	2.0	83.3	90.0	4.0	3.5	2.0
0700	70.0	91.0	95.0	60.0	45.0	83.0	92.0	4.0	70.8	2.5	7.0	9.0	2.0	85.9	92.0	5.5	5.0	3.5
0750	75.0	99.0	104.0	60.0	45.0	88.0	97.0	4.0	75.8	2.5	7.0	9.0	2.0	90.9	97.0	5.5	5.0	3.5
0800	80.0	104.0	109.0	60.0	44.5	95.0	105.0	4.0	80.8	3.0	7.0	9.0	2.5	98.0	105.0	5.5	5.0	3.5
0850	85.0	109.0	114.0	60.0	44.5	100.0	110.0	4.0	85.8	3.0	7.0	9.0	2.5	103.0	110.0	5.5	5.0	3.5
0900	90.0	114.0	119.0	65.0	49.5	105.0	115.0	4.0	90.8	3.0	7.0	9.0	2.5	110.0	115.0	5.5	5.0	3.0
0950	95.0	119.0	124.0	65.0	49.5	110.0	120.0	4.0	95.8	3.0	7.0	9.0	2.5	115.0	120.0	5.5	5.0	3.0
1000	100.0	124.0	129.0	65.0	49.5	115.0	125.0	4.0	100.8	3.0	7.0	9.0	2.5	120.0	125.0	5.5	5.0	3.0

TYPE R33/34/50

ROPAC COMPONENT SEALS

Installation, Operation & Maintenance Instructions

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

Europe
United Kingdom
Tel: 44-1753-224000

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.

smiths
bringing technology to life

©2021 John Crane 12/21 **johncrane.com**