



Series 80-SC

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Introduction and Safety

Introduction

Purpose of this manual

The purpose of this manual is to provide necessary information for:

- Installation
- Operation
- Maintenance



CAUTION:

Read this manual carefully before installing and using the product. Improper use of the product can cause personal injury and damage to property, and may void the warranty.

NOTICE:

Save this manual for future reference, and keep it readily available at the location of the unit.

Requesting other information

Special versions can be supplied with supplementary instruction leaflets. See the sales contract for any modifications or special version characteristics. For instructions, situations, or events that are not considered in this manual or in the sales documents, please contact the nearest Xylem representative.

Always specify the exact product type and identification code when requesting technical information or spare parts.

Safety



WARNING:

- The operator must be aware of safety precautions to prevent physical injury.
 - Any pressure-containing device can explode, rupture, or discharge its contents if it is over-pressurized. Take all necessary measures to avoid over-pressurization.
 - Operating, installing, or maintaining the unit in any way that is not covered in this manual could cause death, serious personal injury, or damage to the equipment. This includes any modification to the equipment or use of parts not provided by Xylem. If there is a question regarding the intended use of the equipment, please contact a Xylem representative before proceeding.
 - Do not change the service application without the approval of an authorized Xylem representative.
-



CAUTION:

You must observe the instructions contained in this manual. Failure to do so could result in physical injury, damage, or delays.




Safety terminology and symbols

About safety messages

It is extremely important that you read, understand, and follow the safety messages and regulations carefully before handling the product. They are published to help prevent these hazards:

- Personal accidents and health problems
- Damage to the product
- Product malfunction

Hazard levels

Hazard level	Indication
 DANGER:	A hazardous situation which, if not avoided, will result in death or serious injury
 WARNING:	A hazardous situation which, if not avoided, could result in death or serious injury
 CAUTION:	A hazardous situation which, if not avoided, could result in minor or moderate injury
NOTICE:	<ul style="list-style-type: none"> • A potential situation which, if not avoided, could result in undesirable conditions • A practice not related to personal injury

Hazard categories

Hazard categories can either fall under hazard levels or let specific symbols replace the ordinary hazard level symbols.

Electrical hazards are indicated by the following specific symbol:



Electrical Hazard:

These are examples of other categories that can occur. They fall under the ordinary hazard levels and may use complementing symbols:

- Crush hazard
- Cutting hazard
- Arc flash hazard

Safety instruction decals



WARNING:

The maximum working pressure of the pump is listed on the nameplate. Do not exceed this pressure. Failure to follow these instructions can result in serious personal injury, death, and/or property damage.

Alert symbol



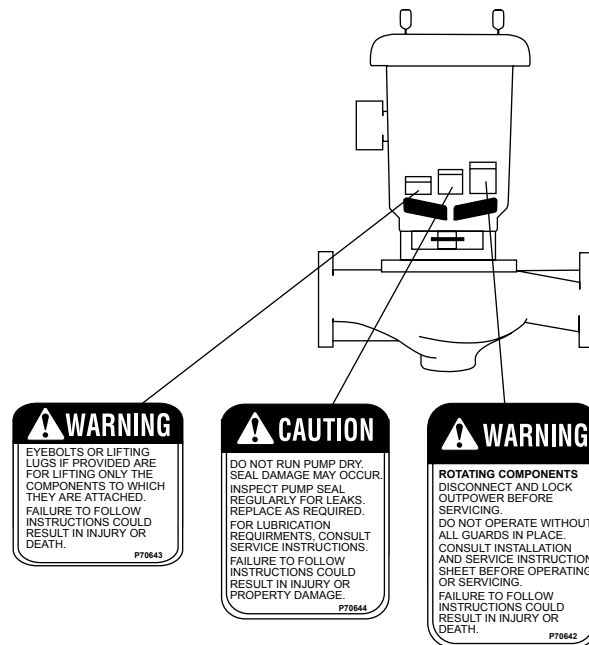
This safety alert symbol is used in manuals and on the safety instruction decals on the pump to draw attention to safety-related instructions.

When used, the safety alert symbol means that failure to follow the instructions may result in a safety hazard.

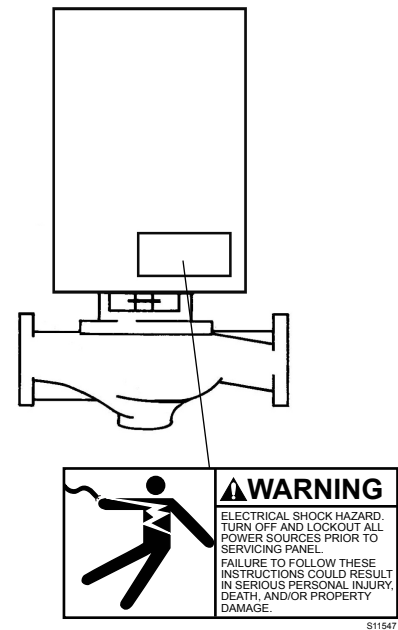
Decals

Make sure your pump has these safety instruction decals and that they are located as this figure shows. If the decals are missing or illegible, contact your local sales and service representative for a replacement.

All series 80-SC Pumps



Series 80-SC with optional ITSC



Make sure that all safety instruction decals are always clearly visible and readable.

User safety

General safety rules

These safety rules apply:

- Always keep the work area clean.
- Pay attention to the risks presented by gas and vapors in the work area.
- Avoid all electrical dangers. Pay attention to the risks of electric shock or arc flash hazards.
- Always bear in mind the risk of drowning, electrical accidents, and burn injuries.

Safety equipment

Use safety equipment according to the company regulations. Use this safety equipment within the work area:

- Hard hat
- Safety goggles, preferably with side shields
- Protective shoes
- Protective gloves
- Gas mask
- Hearing protection
- First-aid kit
- Safety devices

NOTICE:

Never operate a unit unless safety devices are installed. Also see specific information about safety devices in other chapters of this manual.

Electrical connections

Electrical connections must be made by certified electricians in compliance with all international, national, state, and local regulations. For more information about requirements, see sections dealing specifically with electrical connections.

Precautions before work

Observe these safety precautions before you work with the product or are in connection with the product:

- Provide a suitable barrier around the work area, for example, a guard rail.
- Make sure that all safety guards are in place and secure.
- Make sure that you have a clear path of retreat.
- Make sure that the product cannot roll or fall over and injure people or damage property.
- Make sure that the lifting equipment is in good condition.
- Use a lifting harness, a safety line, and a breathing device as required.
- Allow all system and pump components to cool before you handle them.
- Make sure that the product has been thoroughly cleaned.
- Disconnect and lock out power before you service the pump.
- Check the explosion risk before you weld or use electric hand tools.

Wash the skin and eyes

Follow these procedures for chemicals or hazardous fluids that have come into contact with your eyes or your skin:

Condition	Action
Chemicals or hazardous fluids in eyes	<ol style="list-style-type: none"> 1. Hold your eyelids apart forcibly with your fingers. 2. Rinse the eyes with eyewash or running water for at least 15 minutes. 3. Seek medical attention.
Chemicals or hazardous fluids on skin	<ol style="list-style-type: none"> 1. Remove contaminated clothing. 2. Wash the skin with soap and water for at least 1 minute. 3. Seek medical attention, if necessary.

Environmental safety

The work area

Always keep the station clean.

Waste and emissions regulations

Observe these safety regulations regarding waste and emissions:

- Appropriately dispose of all waste.
- Handle and dispose of the processed liquid in compliance with applicable environmental regulations.
- Clean up all spills in accordance with safety and environmental procedures.
- Report all environmental emissions to the appropriate authorities.



WARNING:

Radiation Hazard. Do NOT send the product to Xylem if it has been exposed to any nuclear radiation.

Electrical installation

For electrical installation recycling requirements, consult your local electric utility.

Recycling guidelines

Always follow local laws and regulations regarding recycling.

Product warranty

Coverage

Xylem undertakes to remedy defects in products from Xylem under these conditions:

- The faults are due to defects in design, materials, or workmanship.
- The faults are reported to an local sales and service representative within the warranty period.
- The product is used only under the conditions described in this manual.
- The monitoring equipment incorporated in the product is correctly connected and in use.
- All service and repair work is done by Xylem authorized personnel.
- Genuine Xylem parts are used.
- Only Ex-approved spare parts and accessories authorized by an EX-approved Xylem representative are used in Ex-approved products.

Limitations

The warranty does not cover defects caused by these situations:

- Deficient maintenance
- Improper installation
- Modifications or changes to the product and installation made without consulting an Xylem authorized representative
- Incorrectly executed repair work
- Normal wear and tear

Xylem assumes no liability for these situations:

- Bodily injuries
- Material damages
- Economic losses

Warranty claim

Xylem products are high-quality products with expected reliable operation and long life. However, should the need arise for a warranty claim, then contact your local sales and service representative.

Transportation and Storage

Inspect the delivery

Inspect the package

1. Inspect the package for damaged or missing items upon delivery.
2. Note any damaged or missing items on the receipt and freight bill.
3. File a claim with the shipping company if anything is out of order.
If the product has been picked up at a distributor, make a claim directly to the distributor.

Inspect the unit

1. Remove packing materials from the product.
Dispose of all packing materials in accordance with local regulations.
2. Inspect the product to determine if any parts have been damaged or are missing.
3. If applicable, unfasten the product by removing any screws, bolts, or straps.
For your personal safety, be careful when you handle nails and straps.
4. Contact the local sales representative if there is any issue.

Pump lifting

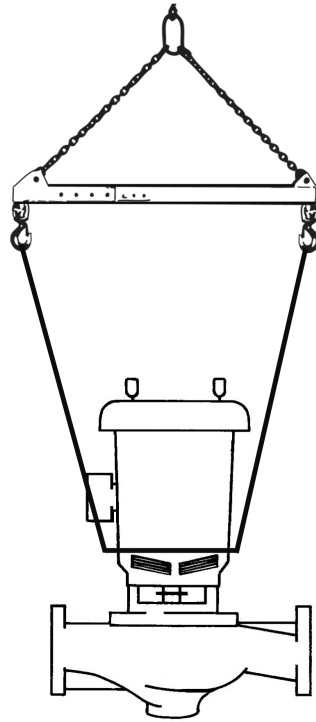


WARNING:

- Assembled units and their components are heavy. Failure to properly lift and support this equipment can result in serious physical injury and/or equipment damage. Lift equipment only at the specifically identified lifting points. Lifting devices such as eyebolts, slings, and spreaders must be rated, selected, and used for the entire load being lifted.
- Crush hazard. The unit and the components can be heavy. Use proper lifting methods and wear steel-toed shoes at all times.

In order to lift the entire pump, use slings placed around the unit as shown.

Series 80-SC



Series 80-SC with optional ITSC

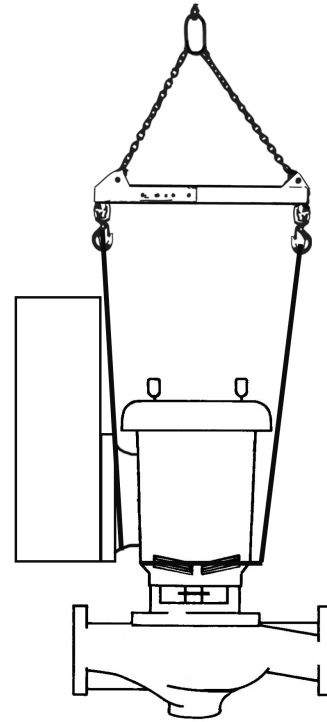


Figure 1: Proper lifting method

Long-term storage

If the unit is stored for more than 6 months, these requirements apply:

- Store in a covered and dry location.
- Store the unit free from heat, dirt, and vibrations.
- Rotate the shaft by hand several times at least every three months.

Treat bearing and machined surfaces so that they are well preserved. Refer to the drive unit and coupling manufacturers for their long-term storage procedures.

For questions about possible long-term storage treatment services, please contact your local sales and service representative.

Product Description

General description

The pump is a split coupled pump. These features make the pump easy to install, operate, and service:

- High efficiency
- Rugged bronze-fitted construction
- Vertical in-line mounting

Mechanical seal options

The pump has two options for the mechanical seal.

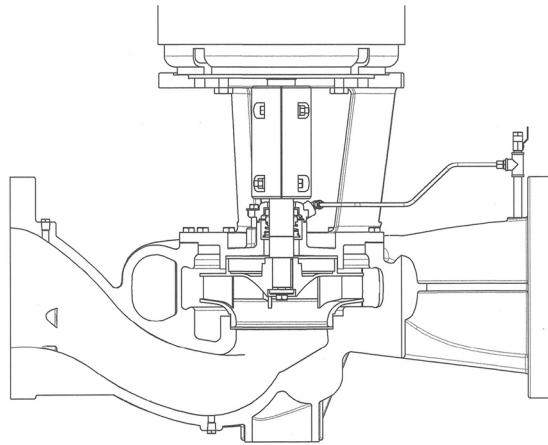


Figure 2: Inside mechanical seal

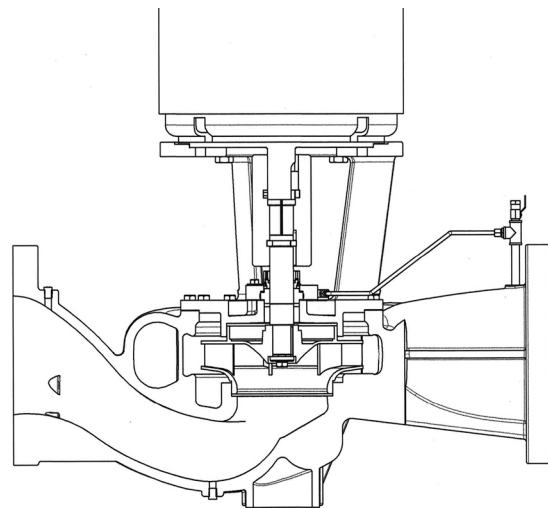


Figure 3: Outside mechanical seal

Intended applications



WARNING:

California Proposition 65 warning! This product contains chemicals known to the state of California to cause cancer and birth defects or other reproductive harm.

NOTICE:

- This product is not intended for potable water applications.
- This product is non-submersible. For indoor use only.
- This product has not been investigated, nor is it intended for, use in swimming pools and marine areas.

The pump is intended for use with these pumped fluids:

- Unheated domestic and fresh water
- Boiler feed water
- Condensate
- Hydronic cooling or heating
- Benign liquids
- Pressure boosting
- General liquid transfer

Rotation

Pump rotation is clockwise when viewed from the back of the motor. An arrow is also located on the pump to show the direction of rotation.

Operational specifications

Mechanical seal specifications

This table describes the specifications of the seals.

Seal type	Parameter	Value
BUNA-carbon-ceramic	pH range limits	pH 7-9
	Liquid temperature limits	-20°F to 225°F (-29°C to 107°C)
EPR-carbon-ceramic	pH range limits	pH 7-9
	Liquid temperature limits	-20°F to 250°F (-29°C to 121°C) ³
	Maximum pressure	175 psig
EPR-carbon-tungsten-carbide	pH range limits	pH 7-11
	Liquid temperature limits	-20°F to 250°F (-29°C to 121°C) ³
	Maximum pressure	250 psig

Table notes

1. An external flush is required on low pressure systems that contain a high concentration of abrasives.
2. For operating temperatures above 250°F, a cooled flush is required and is recommended for temperatures above 225°F for optimum seal life. On closed systems, cooling is accomplished by inserting a small heat exchanger in the flush line to cool the seal flushing fluid.
3. Flush-line filters and sediment separators are available on request.

Installation

Preinstallation

Precautions



WARNING:

- When installing in a potentially explosive environment, make sure that the motor is properly certified.
 - You must earth (ground) all electrical equipment. This applies to the pump equipment, the driver, and any monitoring equipment. Test the earth (ground) lead to verify that it is connected correctly.
 - Motors without built-in protection must be provided with contactors and thermal overload protection for single-phase motors, or starters with heaters for three-phase motors. (See the nameplate on the drive unit to select properly-sized overloads.)
-

NOTICE:

Supervision by an authorized Xylem representative is recommended to ensure proper installation. Failure to do so may result in equipment damage or decreased performance.

Evaluate the installation in order to determine that the Net Positive Suction Head Available (NPSH_A) meets or exceeds the Net Positive Suction Head Required (NPSH_R), as stated by the pump performance curve.

Pump mounting guidelines

Series 80-SC pumps can only be mounted with the motor shaft vertical (motor shaft down).

The optional Integrated Technologic with Sensorless Control (ITSC) can be oriented to different positions relative to the pump nozzles. This can be easily changed during pump installation by removing the motor mounting capscrews, raising the motor assembly slightly, 0.015 to 0.030" (if needed), and rotating the motor assembly around the pump centerline. Raising the motor assembly more than 0.030" could damage the mechanical seal. Replace the motor capscrews when the preferred position is determined.


CAUTION:

The pump and motor assembly must be properly supported during this procedure to prevent the pump unit or motor assembly from falling. Failure to properly support the pump and motor assembly could result in personal injury and or property damage.

Pump location guidelines



WARNING:

Assembled units and their components are heavy. Failure to properly lift and support this equipment can result in serious physical injury and/or equipment damage. Lift equipment only at the specifically identified lifting points. Lifting devices such as eyebolts, slings, and spreaders must be rated, selected, and used for the entire load being lifted.

Guideline	Explanation/comment
Keep the pump as close to the liquid source as practically possible. If the pump is not on a closed system, locate the pump so that the fewest number of bends or elbows in the suction pipe are needed.	This minimizes the friction loss and keeps the suction piping as short as possible.

Guideline	Explanation/comment
Make sure that the space around the pump is sufficient.	This facilitates ventilation, inspection, maintenance, and service.
If you require lifting equipment such as a hoist or tackle, make sure that there is enough space above the pump. For pumps with the optional ITSC installed, be careful not to damage the ITSC during lifting. Do not wrap the sling around the ITSC.	This makes it easier to properly use the lifting equipment and safely remove and relocate the components to a safe location.
Protect the unit from weather and water damage due to rain, flooding, and freezing temperatures.	This is applicable if nothing else is specified.
Do not install and operate the equipment in closed systems unless the system is constructed with properly-sized safety devices and control devices.	Acceptable devices: <ul style="list-style-type: none"> • Pressure relief valves • Expansion tanks • Pressure controls • Temperature controls • Flow controls If the system does not include these devices, consult the engineer or architect in charge before you operate the pump.
Take into consideration the occurrence of unwanted noise and vibration.	The best pump location for noise and vibration absorption is on a concrete floor with subsoil underneath.
If the pump location is overhead, undertake special precautions to reduce possible noise transmission.	Consider a consultation with a noise specialist.
When possible, locate the pump below the fluid level.	This facilitates priming, ensures a steady flow of liquid, and provides a positive suction head on the pump.

Piping checklist



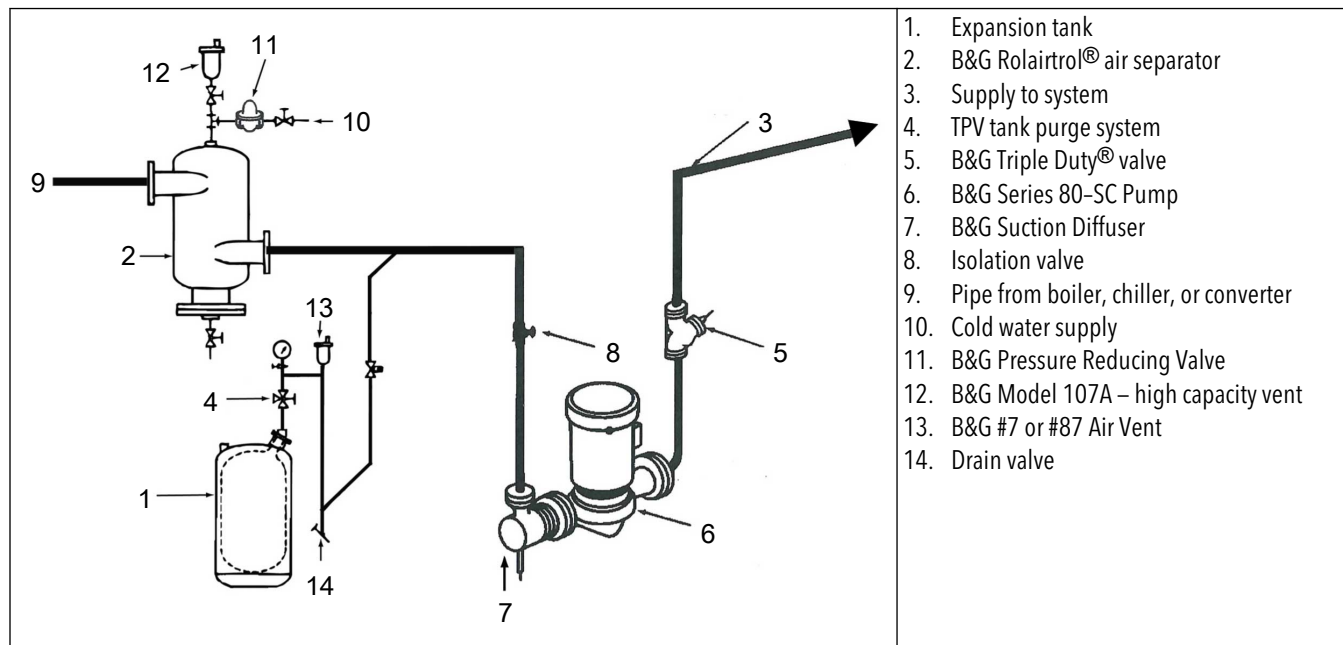
WARNING:

- The heating of water and other fluids causes volumetric expansion. The associated forces can cause the failure of system components and the release of high-temperature fluids. In order to prevent this, install properly sized and located compression tanks and pressure-relief valves. Failure to follow these instructions can result in serious personal injury or death, or property damage.
- Avoid serious personal injury and property damage. Make sure that the flange bolts are adequately torqued.
- Never force piping to make a connection with a pump.

Check	Explanation/comment	Checked
Check that a section of straight pipe, with a length that is five times its diameter, is installed between the suction side of the pump and the first elbow, or that a B&G Suction Diffuser is installed.	This reduces suction turbulence by straightening the flow of liquid before it enters the pump.	
Check that the suction and discharge pipes are supported independently by use of pipe hangers near the pump .	This eliminates pipe strain on the pump .	
Check that there is a strong, rigid support for the suction and discharge lines.	As a rule, ordinary wire or band hangers are not adequate to maintain proper alignment.	
For pumps with flanges, check that the bolt holes in the pump flanges match the bolt holes in the pipe flanges.	–	

Check	Explanation/comment	Checked
For pumps mounted in vertical piping with the motor in the horizontal position, check that adequate support is provided.	This prevents strain on the pump parts and piping. Do not mount the pump with the motor vertically downward. Do not use motor lift rings to suspend the pump.	
Check that the suction or discharge lines are not forced into position.	Coupling and bearing wear will result if suction or discharge lines are forced into position. The code for Pressure Piping (A.S.A.B. 31.1) lists many types of supports available for various applications.	
Check that fittings for absorbing expansion are installed in the system when considerable temperature changes are expected.	This helps to avoid strain on the pump.	
Check that you have a foot valve of equal or greater area than the pump suction piping when you use in an open system with a suction lift.	Prevent clogging by using a strainer at the suction inlet next to the foot valve. Make sure that the strainer has an area three times that of the suction pipe with a mesh hole diameter of no less than 0.25 in. (0.64 cm).	
Check that flexible piping is used on both the suction and discharge sides of the pump when you use an isolation base.	–	
Check that a B&G Triple Duty® valve is installed in the discharge line.	This valve serves as a check valve that protects the pump from water hammer, and serves as an isolation valve for servicing and for throttling.	
Check that the pipeline has isolation valves around the pump and has a drain valve in the suction pipe.	–	

Typical installation



Check that the control and safety devices have these characteristics:

- Properly sized for their purpose
- Placed correctly in the system before putting the system into operation

Commissioning, Startup, Operation, and Shutdown

Preparation for startup



WARNING:

- Failure to follow these precautions before you start the unit will lead to serious personal injury and equipment failure.
 - Do not operate the pump below the minimum rated flows or with the suction or discharge valves closed. These conditions can create an explosive hazard due to vaporization of pumped fluid and can quickly lead to pump failure and physical injury.
 - If the pump, motor, or piping operate at extremely high or low temperatures, then guarding or insulation is required. Failure to follow these instructions can result in serious personal injury or death, and property damage.
 - Always disconnect and lock out power to the driver before you perform any installation or maintenance tasks. Failure to disconnect and lock out driver power will result in serious physical injury.
 - Operating the pump in reverse rotation can result in the contact of metal parts, heat generation, and breach of containment.
-

NOTICE:

- Verify the driver settings before you start any pump.
 - Make sure that the warm-up rate does not exceed 2.5°F (1.4°C) per minute.
-

You must follow these precautions before you start the pump:

- Flush and clear the system thoroughly to remove dirt or debris in the pipe system in order to prevent premature failure at initial startup.
- Bring variable-speed drivers to the rated speed as quickly as possible.
- Run a new or rebuilt pump at a speed that provides enough flow to flush and cool the close-running surfaces of the stuffing-box bushing.
- If temperatures of the pumped fluid will exceed 200°F (93°C), then warm up the pump prior to operation. Circulate a small amount of fluid through the pump until the casing temperature is within 100°F (38°C) of the fluid temperature.

At initial startup, do not adjust the variable-speed drivers or check for speed governor or over-speed trip settings while the variable-speed driver is coupled to the pump. If the settings have not been verified, then uncouple the unit and refer to instructions supplied by the driver manufacturer.

Check the rotation



WARNING:

- Operating the pump in reverse rotation can result in the contact of metal parts, heat generation, and breach of containment.
 - Always disconnect and lock out power to the driver before you perform any installation or maintenance tasks. Failure to disconnect and lock out driver power will result in serious physical injury.
-

1. Unlock power to the driver.
2. Make sure that everyone is clear, and then jog the driver long enough to determine that the direction of rotation corresponds to the arrow on the pump.
3. Lock out power to the driver.

Prime the pump



CAUTION:

Do not run the pump dry.

Make sure that the pump body is full of liquid before startup. If the system does not automatically fill the pump body with liquid, then you must manually prime the pump.

1. Loosen the vent plugs on the pump body.
2. While venting the air from the pump body, rotate the pump shaft a few times by hand.
3. After all air has been purged from the pump, close the vent plugs.

Start the pump



CAUTION:

- Observe the pump for vibration levels, bearing temperature, and excessive noise. If normal levels are exceeded, shut down the pump and resolve the issue.
-

If your Series 80-SC pump is equipped with the optional ITSC, refer to the ITSC IOM for proper setup and running requirements.

Before you start the pump, you must perform these tasks:

- Open the suction valve.
 - Open any recirculation or cooling lines.
1. Fully close or partially open the discharge valve, depending on system conditions.
 2. Start the driver.
 3. Slowly open the discharge valve until the pump reaches the desired flow.
 4. Immediately check the pressure gauge to ensure that the pump quickly reaches the correct discharge pressure.
 5. If the pump fails to reach the correct pressure, perform these steps:
 - a) Stop the driver.
 - b) Prime the pump again.
 - c) Restart the driver.
 6. Monitor the pump while it is operating:
 - a) Check the pump for bearing temperature, excessive vibration, and noise.
 - b) If the pump exceeds normal levels, then shut down the pump immediately and correct the problem.
 7. Repeat steps 5 and 6 until the pump runs properly.

Pump operation precautions

General considerations



CAUTION:

- Vary the capacity with the regulating valve in the discharge line. Never throttle the flow from the suction side since this can result in decreased performance, unexpected heat generation, and equipment damage.
 - Do not overload the driver. Driver overload can result in unexpected heat generation and equipment damage. The driver can overload in these circumstances:
 - The specific gravity of the pumped fluid is greater than expected.
 - The pumped fluid exceeds the rated flow rate.
 - Make sure to operate the pump at or near the rated conditions. Failure to do so can result in pump damage from cavitation or recirculation.
-

Operation at reduced capacity



WARNING:

Never operate any pumping system with a blocked suction and discharge. Operation, even for a brief period under these conditions, can cause confined pumped fluid to overheat, which results in a violent explosion. You must take all necessary measures to avoid this condition.



CAUTION:

Avoid excessive vibration levels. Excessive vibration levels can damage the bearings, stuffing box or seal chamber, and the mechanical seal, which can result in decreased performance.

NOTICE:

- Avoid increased radial load. Failure to do so can cause stress on the shaft and bearings.
 - Avoid heat build-up. Failure to do so can cause rotating parts to score or seize.
 - Avoid cavitation. Failure to do so can cause damage to the internal surfaces of the pump.
-

Operation under freezing conditions

NOTICE:

Do not expose an idle pump to freezing conditions. Drain all liquid that is inside the pump and the flush lines. Failure to do so can cause liquid to freeze and damage the pump.

Shut down the pump

1. Slowly close the discharge valve.
2. Shut down and lock the driver to prevent accidental rotation.

Maintenance

Lubrication

The pump motor has been lubricated at the factory. Keep the motor properly lubricated in accordance with the motor manufacturer's instructions.

Disassembly

Disassembly precautions

This manual clearly identifies accepted methods for disassembling units. These methods must be adhered to.



WARNING:

- Make sure that the pump is isolated from the system and that pressure is relieved before you disassemble the pump, remove plugs, open vent or drain valves, or disconnect the piping.
- Always disconnect and lock out power to the driver before you perform any installation or maintenance tasks. Failure to disconnect and lock out driver power will result in serious physical injury.
- Crush hazard. The unit and the components can be heavy. Use proper lifting methods and wear steel-toed shoes at all times.

NOTICE:

Make sure that all replacement parts are available before you disassemble the pump for overhaul.

Drain the pump



CAUTION:

- Allow all system and pump components to cool before you handle them to prevent physical injury.

-
1. Close the isolation valves on the suction and discharge sides of the pump.
You must drain the system if no valves are installed.
 2. Open the drain valve.
Do not proceed until liquid stops coming out of the drain valve. If liquid continues to flow from the drain valve, the isolation valves are not sealing properly and you must repair them before you proceed.
 3. Leave the drain valve open and remove the drain plug located on the bottom of the pump housing.
Do not reinstall the plug or close the drain valve until the reassembly is complete.
 4. Drain the liquid from the piping and flush the pump if it is necessary.
 5. Disconnect all auxiliary piping and tubing.

Reassembly

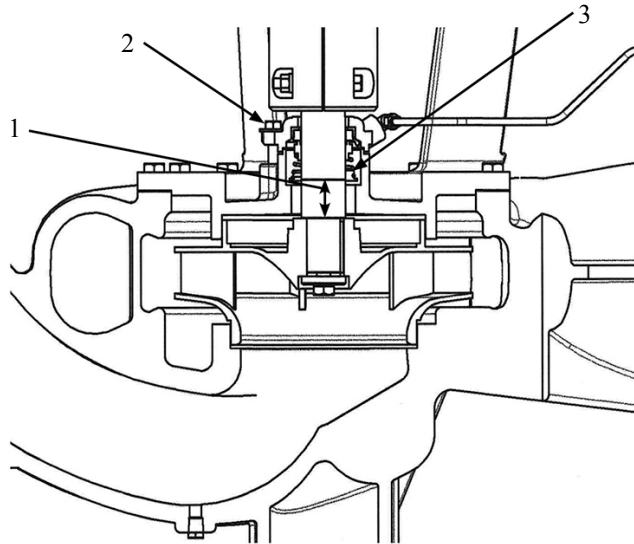
Seal setting

If the pump is fully disassembled and the shaft or bearing are replaced, it may be necessary to reset the seal.

Set the inside seal

Unitized inside seal

The position of the unitized seal is set with a snap ring placed on the pump shaft. The snap ring is positioned on the shaft by a machined groove and no adjustment is possible. The unitized seal sets directly up to the snap ring.



1. Seal distance
2. Seal cap bolts
3. Seal spring retainer with two setscrews

Multi-part inside seal

1. To set the multi-part inside seal position, set the bottom edge of the spring retainer the following distance from the shaft shoulder:
 - 1 1/4" seal, set the distance to 1.125".
 - 1 5/8" seal, set the distance to 1.414".
2. Tighten the seal spring retainer set screws to 20 in-lb torque to ensure the spring retainer will hold in position.
3. Lubricate the seal with P80 and slide into place over the shaft.
4. Install the seal cap.

Make sure to tighten the four bolts evenly to avoid misalignment and seal seat damage.

Set the outside seal

1. Leave the seal holding clips in the seal.
2. Lubricate the seal with P80 and slide over the shaft.
3. Tighten the seal gland bolts evenly.
4. Install the coupling to properly position the pump shaft.
5. Ensure the seal is tight against the seat.
6. Tighten the seal set screws onto the shaft.
7. Remove seal holding clips. The seal is now set.

Keep the seal holding clips in case the seal has to be removed in the future.

Motor collar ring setting



CAUTION:

The motor collar ring must be set on the motor shaft at the correct position and set screws torqued to the proper value.

The motor collar ring must be set on the motor shaft at a specified distance for both TC motors and IEC motors to insure the pump impeller is in the proper position during pump operation. The distance to set the collar (DC) is measured from the motor mounting surface to the surface of the collar ring closest to the motor.

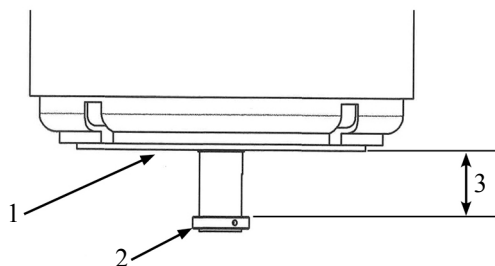


Figure 4: Motor collar ring setting for TC motor

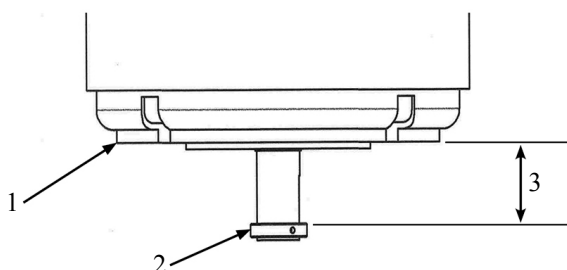


Figure 5: Motor collar ring setting for IEC motor

1. Motor mounting surface
2. Collar ring
3. DC

The collar ring is held in position on the motor shaft with set screws. These set screws must be tightened to the proper torque to ensure that the collar does not slip as a result of pump rotor weight and pump hydraulic thrust.

Place a small amount of Loctite 222MS on each setscrew before installing them into the motor collar.

Table 1: Collar setting distance

This table describes the collar setting distance, set screw size, and set screw torque for TC and IEC motors.

Motor frame size	Distance Collar (DC) in (mm)	Set screw size	Set screw torque in-lbs
182TC – 184TC	2.121 (53.87)	#8-32UNC	20
213TC – 215TC	2.597 (65.96)	#10-32UNF	36
254TC – 256TC	3.227 (81.97)	#10-32UNF	36
284TC – 286TC	3.735 (94.87)	.25-28UNF	87
324TSC – 365TSC	2.855 (72.52)	.25-28UNF	87

Motor frame size	Distance Collar (DC) in (mm)	Set screw size	Set screw torque in-lbs
D80 IEC	1.076 (27.33)	#8-32UNC	20
D90 IEC	1.470 (37.34)	#8-32UNC	20
D100 – D112 IEC	1.863 (47.32)	#8-32UNC	20
D132 IEC	2.627 (66.73)	#10-32UNF	36
D160 IEC	3.686 (93.62)	.25-28UNF	87
D180 IEC	3.686 (93.62)	.25-28UNF	87
D200 IEC	3.686 (93.62)	.25-28UNF	87
D225 IEC	4.762 (120.95)	.313-24UNF	165
D250 IEC	4.762 (120.95)	.313-24UNF	165
324TC-326TC	4.375 (111.13)	.25-28UNF	87
364TC-365TC	4.875 (123.83)	.313-24UNF	165
404TC-405TC	6.25 (158.75)	.313-24UNF	165
444TC-445TC	7.50 (190.5)	.313-24UNF	165
447TC-449TC	7.50 (190.5)	.313-24UNF	165

Assemble the coupler

1. Ensure that the coupler halves are clean and burr free. Use sand paper to remove any burrs and sharp edges within the keyways, collar ring groove, and set screw collar groove. Rings and keys must slide within their grooves without interference.
2. Install the collar rings in the coupling as matched pairs, with the letter pointing toward the pump impeller.
The halves of the collar rings are matched and must only be used together. The collar ring has a letter on each half identifying the set. The letters must match.
The pump coupling uses keys, collar rings, which are split collars, and set screw collars, which are full rings with set screws, to maintain the motor and pump shaft position. The pump shaft always has one collar ring. The TC and IEC motors have a set screw collar set on the motor shaft. An HP type motor uses a split collar ring that fits into the motor shaft groove.
3. Install the motor set screw collar first for TC or IEC motor types.
4. The impeller weight and seal spring force causes the shaft to move downward; therefore, half the coupler should be assembled into the pump shaft with collar. Then the pump shaft must be pulled up and the motor collar ring or motor set screw collar inserted into the coupling.
5. Install the keys and the other half of the collar ring or rings.
6. Install the second half of the coupler.
7. Insert the coupler hex head bolts and place a lock washer and nut on each bolt.
The bolt heads on opposite sides of the coupling should face in different directions.

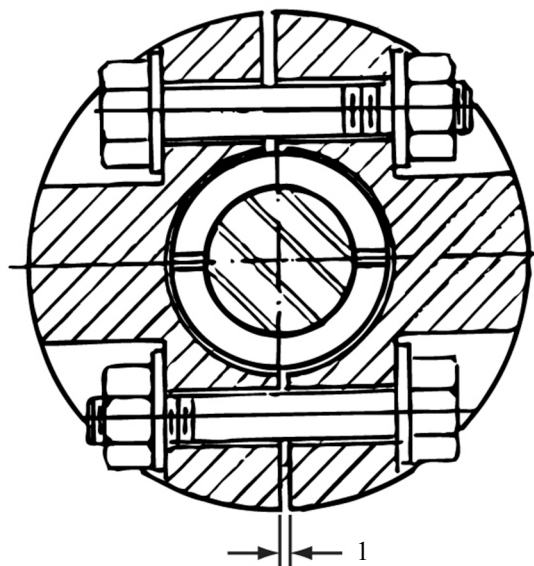


Figure 6: Coupling

1. Gap

Note: Couplings use either four, six, or eight bolts depending on the motor size.

8. Tighten the bolts evenly to avoid misalignment.
9. Rotate the shaft by hand and make sure the gap on both sides of the coupler is approximately equal.

If the gap is not equal, loosen the bolts and repeat the tighten step.
10. Make sure that the gap from the top to the bottom of the coupling is equal.
11. Slowly rotate the shaft by hand and check to see if any rubs occur.
 - If no rubs occur, prime and start the pump for two minutes and determine if the pump runs smooth and vibration free.
 - If problems occur, check installation of the coupling and repeat as necessary.

Replace the seal

The inside and outside seal can be replaced without removing the motor.

1. Remove the coupling guard.
2. Remove the flush line from the seal cap.
3. If an outside seal, put seal clips in the seal and then loosen the set screws that hold the seal on the shaft.
4. Remove the coupler halves. Tape the collar rings together in pairs as assembled previously.

The shaft drops down when the coupling is removed.
5. If an outside seal, remove the seal.
6. Remove the seal cap or seal gland through the space between shafts.
 - a) Remove the seal seat from the seal cap or gland.
 - b) If an inside seal, remove the seal using a pair of screwdrivers, to pry out the seal.
7. Clean the seal box, seal cap, or gland and shaft.



CAUTION:




Avoid touching the carbon face and ceramic face of the seal and getting it dirty.

8. Place the seal seat in the seal cap or gland. Use P80 with an inside seal.

9. Refer to [Set the outside seal](#) (page 18) for seal installation instructions.
10. If an inside seal, lubricate the inside of the seal with P80.
 - a) Slide the seal and spring over the shaft to the proper position.
 - b) Install the seal cap and the four bolts.
 - c) Tighten the four seal cap bolts evenly to avoid misalignment.
11. Install the coupling to the pump shaft. Tighten the bolts evenly.
12. Reinstall the flush line.
13. Reinstall the coupling guard.

Screw torque values

Capscrew torque in ft-lb (Nm)

Capscrew type	Head marking	Capscrew diameter (in inches)								
		1/4	5/16	3/8	7/16	1/2	5/8	3/4	7/8	1
SAE grade 2		6 (8)	13 (18)	25 (34)	38 (52)	60 (81)	120 (163)	190 (258)	210 (285)	300 (407)
Brass and stainless steel	or 	4 (5)	10 (14)	17 (23)	27 (37)	42 (57)	83 (113)	130 (176)	200 (271)	300 (407)
SAE grade 5		10 (14)	20 (27)	35 (47)	60 (81)	90 (122)	180 (244)	325 (440)	525 (712)	800 (1085)

Dealer servicing

If trouble occurs that cannot be rectified, contact your local sales and service representative and be prepared to provide this information:

1. Complete nameplate data of pump and motor
2. Suction and discharge pipe pressure gauge readings
3. Ampere draw of the motor
4. A sketch of the pump hook-up and piping

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- 1) The tissue in plants that brings water upward from the roots
- 2) A leading global water technology company

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