

Temperature Control Jacket Setup Guide

For Teledyne Isco Syringe Pumps

Overview

The optional temperature control jacket encircles the cylinder of a Teledyne Isco Syringe Pump, allowing liquid such as water or a water/ethylene glycol solution to circulate through the 1/4" upper and lower hose connectors, maintaining the temperature of the pumped fluid within the cylinder.

The jacket is recommended for applications such as:

- Liquid gases
- Low flows

The jacket is useful in SFC applications where cylinder cooling facilitates pump filling with supercritical fluids such as liquid CO₂. The jacket can also be used with a circulating temperature-controlled bath to keep the fluid inside the pump at a constant temperature. This can be critical when operating at very low flow rates (below 100 µl/min), where temperature fluctuation can cause flow variations.

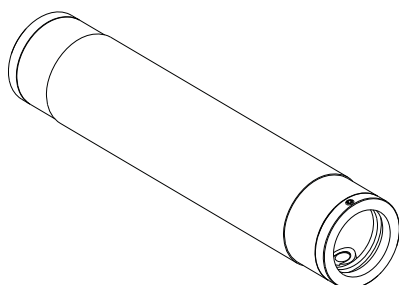


Figure 1: Temperature control jacket

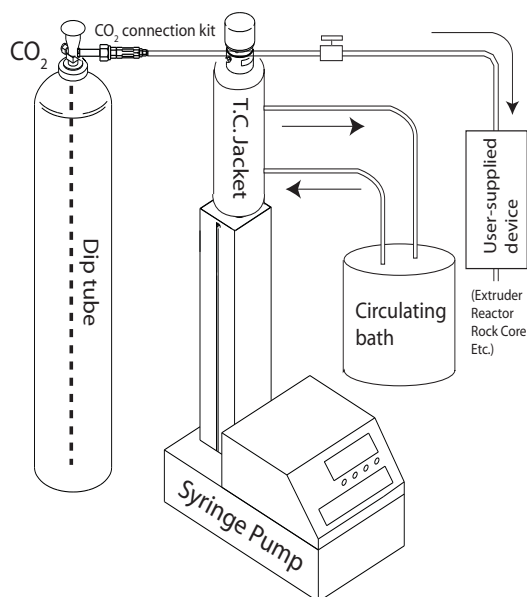


Figure 2: Jacket installed on pump with CO₂ dip tube tank and circulating bath

Pump systems are available from Teledyne Isco with the temperature control jacket already installed. Refer to Table 3 for part numbers.

Fluid Temperature and Volume

The fluid, circulation, and heating/cooling reservoir connected to the temperature control jacket are user-supplied. Water baths generally come with a built-in pump, and are available in a wide variety of temperature ranges and fluid capacities from many lab equipment suppliers, such as Cole Parmer or Thomas Scientific.

The model 1162 120V refrigerated circulating bath from Sensotec is an example of a bath for applications such as supercritical CO₂.

Temperature Ranges

The jacket itself is rated from -30 to 100 °C. However, bath temperatures are also determined by the type of seals used in the syringe pump.

- The standard pump seals are rated up to 70 °C.
- While the High Temperature pump seals are rated up to 200 °C, due to the jacket seal rating, **do not exceed 100 °C.**
- For pumps using virgin PTFE seals, contact the factory for assistance.

Volume

Fluid bath volume is determined by cylinder volume. To maximize temperature stability, a minimum of twice the cylinder volume should be used. Refer to Table 1 for recommended fluid volumes.

Table 1: Recommended Circulating Bath Volumes

Pump Model	Min. Volume (ml)
100DM, 100DX	205.86
500SP	400.00
260D	532.10
500D	1014.76
1000D	2030.00

Temperature Control Jacket Package

For existing systems, order the appropriate package for your pump model (refer to Table 4 for part numbers). Follow the procedure below for installation.

Removing the Pump Cylinder

Refer to Figure 3 for the following steps.

1. Empty the cylinder.

☑ Note

Be sure the piston is left fully extended.

2. Turn the pump's mains power switch OFF or disconnect the power cord.
3. Remove the pump front cover by loosening the four cover screws (two on each side of the pump).
4. Loosen the cylinder lock screw ($\frac{1}{4}$ "-20 set screw) on the front of the cylinder housing.
5. Disconnect the transducer cable from the pump and remove the inlet and outlet tubing.
6. Unscrew the cylinder from the mounting block.

☑ Note

It may be necessary to use a tubing strap wrench or Teledyne Isco wrench package to unscrew the cylinder without marring its outer surface.

7. Lift the cylinder off the piston and push rod.

Installing the Cooling Jacket

Refer to Figure 3 for the following steps.

1. Install the O-rings in the grooves of the cooling jacket.
2. Lubricate the O-rings with soapy water or a light oil to ease assembly of the cooling jacket onto the cylinder.
3. Slide the cooling jacket onto the cylinder using a twisting motion.

☑ Note

It is important that the cooling jacket be installed with the locking set screw away from the cylinder cap.

⚠ CAUTION

Be careful not to damage the O-rings when pushing them over the threads of the cylinder.

Reassembling the Pump

Refer to Figure 3 for the following steps.

1. Lower the cylinder/cooling jacket assembly over the piston and push rod assembly.

☑ Note

To avoid seal damage, ensure that the cylinder is aligned straight with the piston before lowering.

2. Screw the assembly into the cylinder housing until the cylinder is snug against the piston and no longer turns.
3. Unscrew the cylinder a minimum of $\frac{1}{2}$ a turn.
4. Line the inlet and outlet cylinder cap ports up as before. Turn the cooling jacket ports to the desired location and lock the cooling jacket to the cylinder by tightening the set screw.
5. Lock the cylinder by tightening the lock screw.
6. Replace the front cover and adjust both covers so they are flush with the cylinder housing.
7. Reinstall tubing.
8. Reconnect the pump pressure transducer cable.

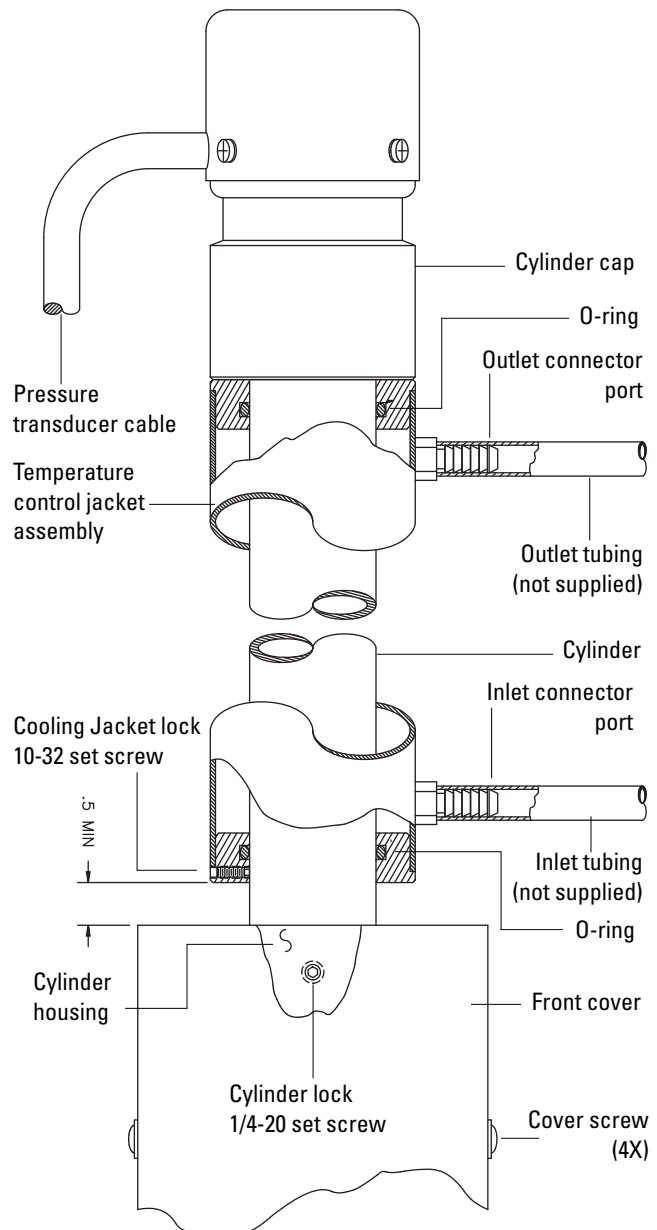






Figure 3: Temperature control jacket installation


Re-Zero the Pressure Transducer

Before re-zeroing, the pump should be set up and depressurized.

1. Be sure the pump is depressurized with port fittings installed.
2. Press ZERO PRESS (). The current pressure will appear on the third line of the display.
3. Select pump A (), pump B (), or pump C (), to zero the selected pump's pressure.

or,

If the pump is not depressurized, select DO NOT

() to exit the zero pressure operation.

Part Numbers

Table 2: Teledyne Isco Wrench Packages

Pump Model	Part Number
100DM/DX, 260D	68-1247-067
500D	60-1247-068
1000D	60-1247-093

Table 3: Pump Systems with Pre-Installed Jacket

Item Description	Part Number
100DM pump w/ controller & T. C. Jacket	67-1240-321
100DM pump only w/ T.C. Jacket	68-1240-029
100DX pump w/ controller & T. C. Jacket	67-1240-320
100DX pump only w/ T.C. Jacket	68-1240-043
260D pump w/ controller & T. C. Jacket	67-1240-301
260D pump only w/ T.C. Jacket	68-1240-028
500D pump w/ controller & T. C. Jacket	67-1240-311
500D pump only w/ T.C. Jacket	68-1240-030
1000D pump w/ controller & T. C. Jacket	67-1240-601
1000D pump only w/ T.C. Jacket	68-1240-601

Table 4: Packages and Parts Included

Item Description	Part Number
Temperature control jacket packages for:	
100DM, 100DX, 260D	68-1247-047
500D	68-1247-057
500SP	68-1247-115
1000D	60-5364-199
Temperature control jacket assembly:	
100DM, 100DX, 260D	60-1248-053
500D	60-1248-099
1000D	60-1248-183
Key $\frac{3}{32}$ " socket	490-0031-54
Inlet/outlet connector (2)	209-0161-00
Installation procedure	60-1242-183
O-ring (2):	
100DM, 100DX, 260D	202-2062-23
500D	202-2062-11
1000D	202-2062-35

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