



# SAMPLE COOLER INSTRUCTION SHEET MODELS SC-316, SC-600

## INSTALLATION

- The sample cooler is provided with 1/4" NPT connections for sample fluid and 3/8" NPT connections for cooling water.
- WARNING:** Use 3/8" fitting for cooling water only. Never connect hot or high pressure samples to the 3/8" fitting as injury or equipment damage can result.
- The sample cooler should be installed in the vertical position. The directions of flow are indicated on the permanently attached metal tag on the coil shell.
- Proper installation requires valves on sample inlet and cooling water inlet for hot water service. An additional valve must be installed on the sample outlet for all vapor or steam services to obtain required operating pressures in the coil.
- Proper installation in the superheated steam service also requires pre cooling the sample to 750°F, the maximum design operating temperature of the Neptune Sample Cooler. Pre cooling can be accomplished by installing a pipe between the main steam header and the sample cooler to radiate excess heat. The length of the pipe is determined by the chart on the reverse side.

## OPERATING CONDITIONS

- The cooling water should have a constant temperature and flow at a constant uninterrupted rate. In order to prevent the formation of mineral deposits in the shell, softened water is recommended; otherwise, periodic acid cleaning will be necessary.

## OPERATION

- To start up, open the cooling water valve "A" to normalize the temperature of the cooler prior to starting the sample flow. With valve "C" closed, open valve "B". Open valve "C" until desired sample temperature is achieved. Sample temperature will be dependent upon the temperature of the cooling water and the amount of sample produced. If sufficient quality of sample cannot be produced at the desired temperature, a larger cooler or two coolers in series may be required.

### To Place in Service:

- Open valve "A"
- Open valve "B"

### To Take Out of Service:

- Close valve "B"
- Close valve "A"

**REMEMBER:** Cooling water on before sample on. Sample off before cooling water off.

**WARNING:** Operating cooler without cooling water can result in damage to the cooler or injury to operator.

## PERFORMANCE

Assuming a coolant inlet of approximately 55°F (12°C) and exit of approximately 120°F (50°C) and a sample exit of approximately 110°F (43°C), the cooler will provide performance approximately per the ranges described below.

### **HOT WATER SAMPLES:**

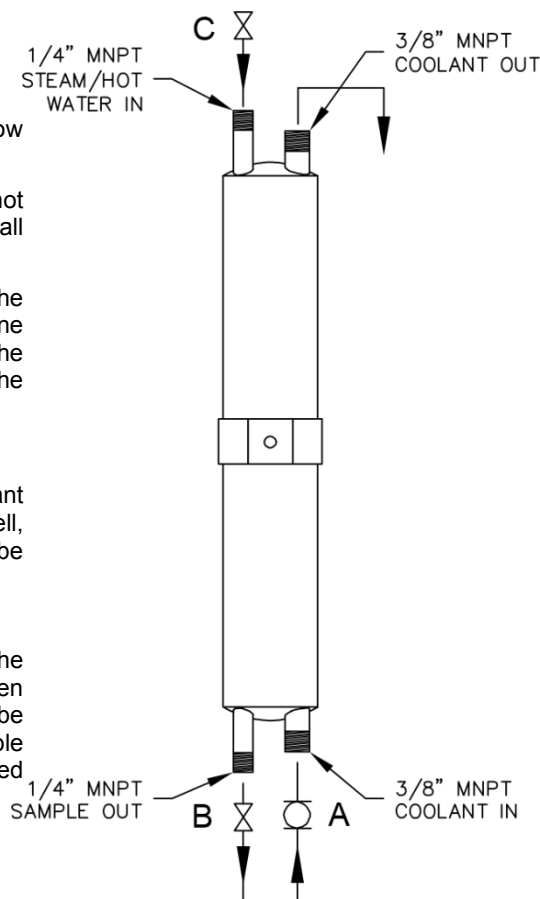
- At 250°F (120°C), approximately 1500 CC/Min of sample will be produced using 1 gallon per minute of coolant.
- At 700°F (370°C), approximately 950 CC/Min of sample will be produced using 2.5 gallons per minute of coolant.

**SATURATED STEAM VAPOR:** The sample inlet and exit valves can be used to create various operating pressures in the cooler for producing samples from saturated steam vapor.

- At 175 psia operating pressure, 640 CC/Min of sample can be produced using approximately 3.0 gallons per minute of coolant.
- At 25 psia operating pressure, 300 CC/Min of sample can be produced using approximately 1.5 gallons per minute of coolant.

**SUPER HEATED STEAM:** Max. sample inlet temperature of 750°F (400°C).

- 1,000 psia cooler operating pressure produces 640 CC/Min of sample at 3.5 gallons per minute of coolant flow.
- 20 psia cooler operating pressure produces 315 CC/Min of sample at 1.75 gallons per minute of coolant flow.



## **SEE OTHER SIDE FOR MODEL SC-100**

PSG  
22069 Van Buren Street  
Grand Terrace, CA 92313 USA

P: +1 (215) 699-8700 F: +1 (215) 699-0370  
neptune1.com



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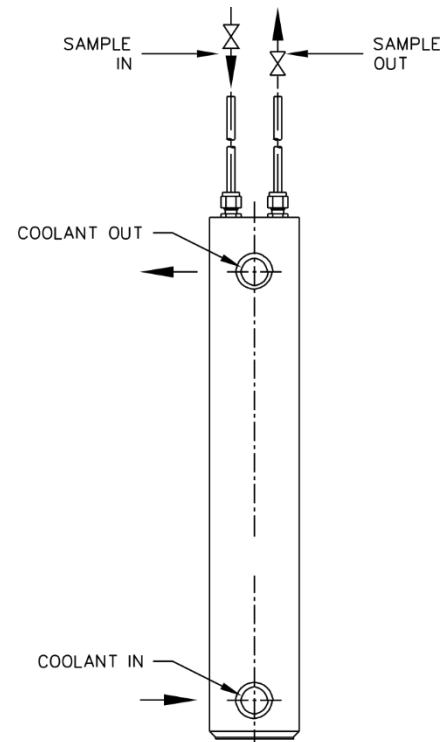


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# SAMPLE COOLER INSTRUCTION SHEET MODELS SC-100

## INSTALLATION

- The sample cooler is provided with 1/4" NPT tubing tails for use with tubing connectors for sample fluid and 1/2" NPT connections to the shell for cooling water.
- The sample cooler should be installed in the vertical position with tubing tails upward.
- The directions of flow are indicated in the tag affixed to the cooler shell in the diagram at right.
- Proper installation requires valves on sample inlet and cooling water inlet for hot water service. An additional valve must be installed on the sample outlet for all vapor or steam services to obtain required operating pressures in the coil.
- Proper installation in the superheated steam service also requires pre cooling the sample to 600°F, the maximum design operating temperature of the Neptune Sample Cooler. Pre cooling can be accomplished by installing a pipe between the main steam header and the sample cooler to radiate excess heat. Determine the length of the pipe to pre cool the sample to 750°F from the chart below. Use 1.5 times this length to cool to 600°F.



## OPERATING CONDITIONS

- The cooling water should have a constant temperature and flow at a steady rate.
- In order to prevent the formation of mineral deposits in the shell, softened cooling water is recommended; otherwise, periodic acid cleaning will be necessary.

## OPERATION

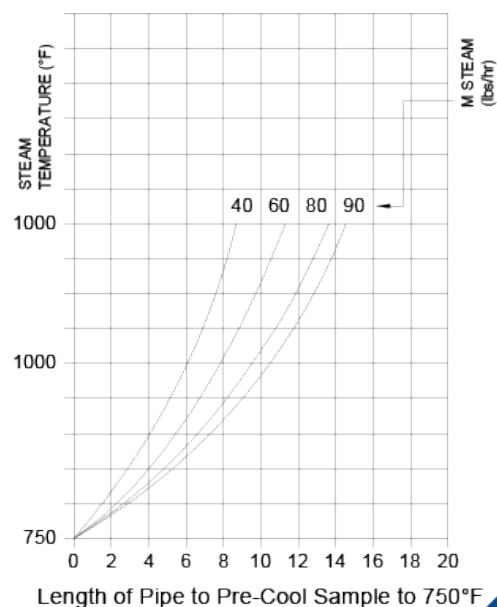
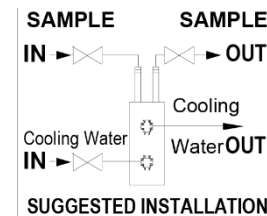
- See section titled "Operation" on the reverse side.

## MANUAL CLEANING

- Remove the unit from service.
- Remove the snap ring in the top of the sample cooler.
- Pull the tube bundle out of the shell for access to the coil.
- Replacement O-Ring Part Number 105532.

**NOTE:** Information on coolant supply at different conditions are given under "Performance" on the Other Side

**SEE OTHER SIDE FOR MODELS SC-316 AND SC-600**



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