START-UP

DANGER: To avoid the risk of burns, it is essential that a full flow of cooling water is present before opening the sample inlet valve. Always close the sample inlet valve before turning off the cooling water. Sample pipework becomes very hot under normal working conditions, and will cause burns if touched.

Follow this procedure for safe operation:

- ✓ Open the cooling water inlet valve and outlet valve (if installed) first, and ensure that a full flow can be seen at the cooling water outlet.
- ✓ Gradually open the sample inlet valve and regulate the flow to achieve a cooled sample at desired temperature.
- ✓ Allow the sample to run for a while before collection or adjust flow to analyze in continuous systems.
- ✓ When enough liquid has been collected close the sample inlet first, and then the cooling water inlet/outlet valves. In continuous analyzer systems ensure the temperature is within allowable range.
- ✓ After closing the sample inlet valve the sample OUT connection may drip in manual sampling systems for a few minutes while the coil drains.

MAINTENANCE

Remove scale by circulating an inhibited sulfamic acid cleaning solution through the cooling water side.
Replace used gaskets with new ones. After reassembly, pressurize shell and visually inspect for water leaks. Recommended bolts torque 80 Nm. Replace gaskets showing visible leaks. Keep spare shell gaskets on hand for this need

COOLERS SPARE PARTS	
Part #	Name
CL2O	Cover "O" Ring for SC-1 and SC-2
CL3O	Cover "O" Ring for SC-3 and SC-4

STANDARD WARRANTY

Manvia warrants products manufactured by it and supplied hereunder to be free from defects in workmanship and, to the extent materials are selected by Seller, to be free from defects in materials, in each case for a period as defined in the table below:

Model	Description	Warranty Period
SC – 1	Steam & Water Sampling Products and Systems	Twelve months from date of shipment
SC – 2	Steam & Water Sampling Products and Systems	Twelve months from date of shipment
SC – 3	Steam & Water Sampling Products and Systems	Twelve months from date of shipment
SC – 4	Steam & Water Sampling Products and Systems	Twelve months from date of shipment

manvia

MA-SC-SERr00

MANVIA SAMPLE COOLERS SC SERIE

INSTALLATION, OPERATION & MAINTENANCE MANUAL

⚠ CAUTION

CAUTION, indicates a hazardous situation which, if materialized, could result in material damage or a moderate injury.

⚠ DANGER

DANGER indicates a hazardous situation which, if materialized, could result in a serious injury and even in death.

SAFETY INFORMATION

Please pay attention to all Warnings and Cautions in this manual. Failure to do so could result in serious personal injury and/or equipment damage. It is mandatory to read the entire manual unpack, install or operate this product.

SC SERIE COOLERS SPECIFICATION

Model	Cooling Area	Tube Material Size Rating	Shell Material Rating	Weight	Optimal flow service (cm^3/min)	
					Single fase	Condensing heat transfer
SC-1	0.11 m^2 1.2 ft^2	316SS 1/4"ODx0.049" 245 bar @ 540 °C	304SS / 316SS 30 bar @ 200 °C	5 kg 11.02 lb	1,000	700
SC-2	0.22 m^2 2.4 ft^2	316SS 1/4"ODx0.049" 245 bar @ 540 °C	304SS / 316SS 30 bar @ 200 °C	7 kg 15.43 lb	1,800	1,100
SC-3	0.35 m^2 3.8 ft^2	316SS 3/8"ODx0.065" 215 bar @ 540 °C	304SS / 316SS 30 bar @ 200 °C	11 kg 24.25 lb	3,500	2,000
SC-4	0.44 m^2 4.8 ft^2	316SS 3/8"ODx0.065" 215 bar @ 540 °C	304SS / 316SS 30 bar @ 200 °C	12 kg 26.46 lb	5,000	2,000

PRODUCT DESCRIPTION

The MANVIA SC sample cooler series, is used to cool samples of boiler water or steam. The cooler consists of a stainless steel double coil, through which the sample flows, and a stainless steel shell, through which cooling water flows in the opposite direction. The end caps have pre-drilled mounting brackets. The SC sample cooler series is also available with clamping bracket for easy installation.

COIL PRESSURE/TEMPERATURE RATING TABLES

SC-1/SC-2	
Temperature °C	Allowable Pressure bar
38	318
93	318
149	318
204	308
260	286
316	270
371	261
427	254

SC-3/SC-4	
Temperature °C	Allowable Pressure bar
38	279
93	279
149	279
204	271
260	251
316	237
371	229
427	223

INSTALLATION

⚠ **CAUTION: The necessary protective equipment must be used in order to avoid knocks, cuts and entrapments during installation.**

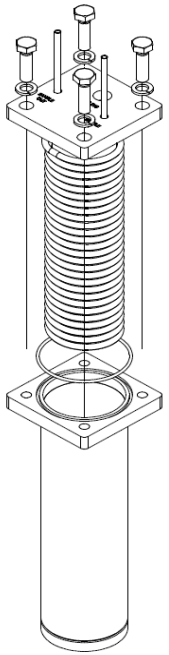
Follow this procedure for correct installation:

- ✓ It is advisable the use of corrosion resistant pipework suitable for the fluid being sampled in order to connect cooler to sampling stream.
- ✓ Keep the length of all tubing and pipes to a minimum.
- ✓ Cooling water must be clean and free of scale forming salts.
- ✓ The sample cooler must be mounted in vertical position, using a mounting bracket if required.
- ✓ For SC coolers with mounting bracket, install the mounting bracket in accordance with the assembly figure.
- ✓ Connect sample IN and OUT of the sample in the top of cooler by using ¼" OD or 3/8" OD connectors.
- ✓ Connect the cooling water IN. Should be piped to the bottom of the sample cooler in 3/4" nominal bore pipe via the cooling water inlet valve. A 3/4" or 1/2"NPT male elbow or straight fitting makes a suitable connector.
- ✓ Pipe the cooling water OUT. Should be piped from the top of the sample cooler to an open drain or return cooling water circuit . In order to avoid the possibilty of an air lock at the top of the sample cooler, do not allow the thread of the cooling water OUT fitting to protrude into the sample cooler body.

CONNECTION TYPE TABLES

CONNECTION DESCRIPTION	SC-1	SC-2	SC-3	SC-4
SAMPLE INLET	1/4" TUBE	1/4" TUBE	3/8" TUBE	3/8" TUBE
SAMPLE OUTLET	1/4" TUBE	1/4" TUBE	3/8" TUBE	3/8" TUBE
COOLING WATER INLET	3/4" NPTF	3/4" NPTF	3/4" NPTF	3/4" NPTF
COOLING WATER OUTLET	1/2" NPTF	1/2" NPTF	3/4" NPTF	3/4" NPTF

ASSEMBLY FIGURE



OPERATION BASIS

The cooling medium passes through the center shell around the coil. A hand regulating valve is used to throttle the sample medium flow through the tubing coil. Cooling water is passed through the shell of the unit in opposite direction to the sample medium in order to ensure optimum efficiency. The energy of the sample medium is transferred as heat to the flowing cooling water, resulting in a drop in the sample temperature.

When steam is the sample medium, the cooling water will first absorb the steam's latent heat, condensing it back to water. Further, heat transfer as condensate passes through the coil will reduce its sensible heat/ temperature prior to discharge.