



WATER-COOLED
WATER CHILLERS
WITH SCREW
COMPRESSORS

WSH-2

2.200-2.230-2.260-2.280-

2.300-2.360-2.400-2.440-

WATER-WATER
HEAT PUMPS
WITH SCREW
COMPRESSORS

WSHH-2

3.450-3.540-3.580-3.620-3.660

MAINTENANCE

CONTENTS:

ROUTINE MAINTENANCE

SPECIAL MAINTENANCE

MEASURING THE RESISTANCE OF THE COMPRESSOR WINDING INSULATION

ROUTINE MAINTENANCE

This section is intended for the end user and contains information that is extremely important to ensure the unit has a long, trouble free service life. The operations that need to be carried out do not require any special technical knowledge, involving the following simple checks on the components of the unit.

The following table shows the routine controls to carry out and the frequency of these checks.

Description	Weekly	Monthly	Six-monthly	Annual
Reading and recording of the suction pressure	X			
Reading and recording of the discharge pressure	X			
Structural check			X	
Power cable check		X		
Water system check		X		
Heat exchanger check		X		

STRUCTURE

When checking the condition of the parts forming the structure, pay particular attention to the components that are subject to oxidation.

Treat these points with paints designed to eliminate or reduce this phenomenon.

ELECTRICAL PARTS

Make sure there are no cuts, cracks or other signs of deterioration indicating a possible loss of insulating capacity in the power cable that connects the unit to the distribution panel.

WATER SYSTEM - EVAPORATOR AND CONDENSER

Visually check that there are no leaks in the water circuit. Contact an authorised service centre if maintenance is required.

If no frost protection systems are installed, and the temperature of the unit may fall below 0°C, the evaporator and condenser should be emptied before shutting down the unit at the end of the season.

- On the evaporator, the discharge cock is located in the lower part of the head, opposite the thermostat.

- On the condenser, remove the hexagonal screw at the front of the condenser head.

SPECIAL MAINTENANCE

The maintenance operations listed in this section must be performed by authorised service centres or qualified authorised personnel.

The following table shows the recommended operations and the frequency of these checks.

The readings must be carried out with the unit working at full capacity.

Description	Weekly	Monthly	Six-monthly	Annual
Read the suction pressure	X			
Read the discharge pressure	X			
Check the power supply voltage	X			
Read the current intensity	X			
Check the tightening of the electrical connections		X		
Check the refrigerant charge through the sight glass		X		
Check the suction and superheating temperature.		X		
Check the shut off valves		X		
Check the calibration of the safety devices and their effectiveness			X	
Check the condition of the condenser				X
Check the condition of the evaporator				X

PERIODICAL INSPECTION OF THE COMPRESSOR

N°	TYPE OF CHECK	FREQUENCY
1	Measure the resistance of the insulation of the electric motor	Annual
2	Oil check	7.500 hours o 4 years
4	Inspect the intake filter	20.000 hours o 4 years

For the checks in points 2-4, the service centre will have suitable documentation.

IMPORTANT

MAKE SURE THE UNIT IS NOT CONNECTED TO THE POWER SUPPLY BEFORE STARTING ANY MAINTENANCE OR CLEANING OPERATIONS.

ELECTRICAL PARTS

After the first period of operation of the unit and on every seasonal stop/start up, carefully check the tightening of the screws of the electrical connections. These tend to loosen because of the heating/cooling of the electric cables.

LIQUID SIGHT GLASS AND MOISTURE INDICATOR

The colour of the moisture indicator indicates the level of moisture in the installation. It is extremely important to check it after any maintenance operation. During these operations, the indicator may turn yellow, because moisture has possibly entered the installation. In any case, before changing the dehydrator filter cartridge, the unit must operate for about 3 hours so as to allow the system to reach equilibrium.

To ascertain if there is moisture in the installation, keep in mind the following:

COLOUR GREEN (BLUE)	DRY
COLOUR YELLOW (ROSE)	MOIST

THERMOSTATIC VALVE

There is one thermostatic valve for each refrigerant circuit. These control the flow-rate of liquid refrigerant to the evaporator. The valves are calibrated in the factory to ensure a superheating value of between 4°C and 7°C.

Only if the superheating needs to be checked, remove the cap at the bottom of the valve so as to access the adjustment screw (one complete clockwise turn involves an increase in superheating of around 0.5°C). Wait for the system to stabilise before making further adjustments.

DEHYDRATOR FILTER

This filter keeps the circuit dry and clean. A filter with replaceable cartridge is installed. The sight glass and the temperature difference upstream and downstream of the filter indicate the need to replace the cartridge (see above). Install only brand-new sealed cartridges. Remove the seal only immediately before replacing the cartridge.



WARNING: Before carrying out the following steps, make sure that the electrical panel is NOT powered (open the mains isolator switch).



WARNING: The second and third steps that follow refer to different units and are mutually exclusive. Follow the instructions referring to the unit actually purchased (size and configuration) and ignore the others.

When replacing the cartridge, switch the unit off and check that a complete pump-down cycle has been performed correctly. Once the pressure value on the low pressure side has been checked using a pressure gauge, the cartridges can be replaced.
Empty through the flange on the filter, reopen the cocks and re-start the compressor.

SOLENOID VALVE

There is one solenoid valve in each circuit. It is closed when the compressor is stopped, due to the activation of the control thermostat and the tripping of any cut-out devices

COMPRESSOR OIL LEVEL

The oil level must be carefully checked on first start-up, and for sometime afterwards.

When the compressor is operating, the oil level must reach the half of the sight glass on the compressor casing.

OIL HEATER

Every compressor is supplied with an electric heater in order to prevent the mixing of refrigerant with the oil in the crankcase when the system is not operating. The excessive quantity of refrigerant in the crankcase dilutes the oil, causing excessive scum. As a consequence, the oil flow would be reduced. The electric heater switches on whenever the unit stops. The electric crankcase heater can be replaced without draining the oil.

Type of cartridge to be used

Size	Circuit 1	Circuit 2	Cartridge type	Size
2.200	2	2	-	S48
2.230	2	2	-	S48
2.260	2	2	-	S48
2.280	2	2	-	S48
2.300	2	2	-	S48
2.360	2	2	-	S48
2.400	2	4	-	S48
2.440	4	4	-	S48
3.450	2	2	2	S48
3.540	2	2	2	S48
3.580	2	2	4	S48
3.620	2	4	4	S48
3.660	4	4	4	S48

WARNING

IF THE UNIT IS NOT OPERATED FOR AN EXTENDED TIME, THE OPERATIONS LISTED BELOW MUST BE CARRIED OUT

- Close the manual valves on the liquid line.
- Once the pump-down has been performed, shut down the chilled water pump.
- Disconnect the electrical power supply.
- Label all the open switches, warning against operation before having completed the procedure.
- Drain all the water from the evaporator and the chilled water piping if the unit is left unused in winter and exposed to temperatures below zero
- **Drain all the water from the condenser if the unit is left unused in winter and exposed to temperatures below zero** (unless antifreeze solutions are used).