



AIR-COOLED  
WATER CHILLER

**WSAT-2** 2.230-2.260-2.280-2.300  
2.360-2.400-2.440-3.450-3.540-  
3.580-3.620-3.660-4.720

## MAINTENANCE

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MEASURE OF THE INSULATION OF THE COMPRESSOR WINDINGS' RESISTOR

### 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			
Structure control			X	
Power cable control		X		
Water system control		X		
Heat exchanger control		X		

### STRUCTURE

While checking the condition of the parts forming the structure, pay particular attention to the components that are subject to oxidation process. Treat these points with paints designed to eliminate or reduce this problem.

Make sure that the unit's casing panels are mounted firmly in place. Poor mounting can cause abnormal vibrations and noise.

### ELECTRICAL SYSTEM

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 board.

### WATER SYSTEM

Carefully inspect the water circuit for any signs of leaks. Call only authorised service centres if any maintenance operation is required.

### HEAT EXCHANGER COIL

**ATTENTION:** In order to avoid little cuts due to fortuitous contact with the aluminium fins, please wear suitable gloves before performing the following operations

It is essential that the coil offers the maximum heat exchange efficiency. It is therefore important to ensure that its surface is always free from any dirt or dust which could have accumulated due to the action of the fans.

- Brush off any paper, leaves or other matter that may have accumulated on the coil surface.

- Clean the aluminium surface of the coil using a jet of compressed air, taking care to ensure the air is always directed parallel to the coil fins in order to avoid damaging them.

- Check that the aluminium fins are not damaged or bent. If you do find any damage of this kind, "comb" the coil using the special tool for this purpose to return them to their initial positions, ensuring the coil operates with optimal air flow.

### PROPELLER FANS

- Check the fan is mounted correctly on its mounting supports and that all the related fittings are in good condition.

- Check that the fan's mounting supports are mounted correctly on the structure of the unit and that all the related fittings are in good condition.

- Check that the fan is not out of balance, which would be indicated by any strange noise or abnormal vibration.

## SUPPLEMENTARY MAINTENANCE

The maintenance operations listed in this section must be performed by authorised service centres or qualified authorised personnel. The following table shows the routine controls to carry out 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			
Verify the electrical tension	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 gate valves		X		
Check the calibration of the safety devices and their effectiveness			X	
Check the condenser state				X

## COMPRESSOR PERIODICAL VERIFICATION

N°	TYPE OF VERIFICATION	FREQUENCY
1	Measure of the resistance of the electric motor isolation	Annual
2	Oil check	7.500 ore o 4 Years
3	Satellite rotors check	20.000 ore o 4 Years
4	Suction filter check	20.000 ore o 4 Years

As regarding the points 2-3 and 4 the service centre will be provided with the suitable documentation.

## IMPORTANT

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

### ELECTRICAL SYSTEM

After the first period of start up of the unit and on every seasonal stop/start up, control carefully the tightening of the screws of the electrical connections. As a matter of fact, they tend to loosen because of the warming/cooling of the electric cables.

### SIGHT GLASS

The colour of the sight glass indicates the drying degree in the installation. It is extremely important to control it after any maintenance operation. During these operation the indicator can turn to yellow, because moisture has possibly entered the installation. Anyhow, before changing the filter drier cartridge, the unit must operate for about 3 hours with the purpose of stabilizing the installation.

In order to ascertain if there is moisture in the installation, keep in mind the following:

Colour **GREEN (BLUE)** means **DRY**  
 Colour **YELLOW (PINK)** means **MOISTURE**

### THERMOSTATIC VALVE

There is one thermostatic valve for each refrigerant circuit. It controls the liquid refrigerant flow rate to the evaporator. These valves are calibrated in the factory so to have a superheating value between 4°C and 7°C. Only if it is necessary to control the superheating, remove the cap at the bottom of the valve in order to have access to the adjust screw (one complete clockwise turn implies a rise in the superheating of 0,5°C). Wait some time before proceeding to another adjustment in order to let the installation to stabilize.

### FILTER DRIER

The filter drier keeps the circuit dry and clean. A filter with replaceable cartridge is installed. The sight glass indicates the necessity to substitute the cartridge (see above). Install only brand new sealed cartridges. Remove the seal only immediately before the replacement of the cartridge.



**WARNING: Before carrying out the following steps, make sure that the electrical panel is NOT under tension. (For this reason open the mains isolator switch by turning the handle to its OPEN position.)**



**WARNING: The steps 2 and 3 which follow are referred to different units and are mutually exclusive. The instructions reported there must be followed in accordance with the unit actually purchased..**

However, before substituting the cartridge, it is fundamental to switch off the unit and check that a complete pump-down cycle has been done correctly. Once the cartridge has been substituted, produce the vacuum from the valve placed on the filter's flange, open the valves and start-up the compressor again.

Types of cartridge

Unit	Circuit 1	Circuit 2	Circuit 3	Circuit 4	Type of cartridge
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
4.720	2	2	2	2	S48

#### SOLENOID VALVE

There is one solenoid valve in each circuit. It is closed when the compressor is stopped, for the intervention of the control thermostat, and for the tripping of any cut-outs, with the exception of the LP switch.

#### CONTROL OF THE OIL LEVEL

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

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

#### OIL HEATER

Every compressor is supplied with a crankcase 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 and pump pressure drop. As a consequence, the oil flow would be reduced. The electric heater will switch on any time the unit stops. The electric heater of the crankcase can be substituted without discharging the oil.

## WARNING

IF THE UNIT IS LEFT UNUSED FOR A PROLONGED TIME, THE OPERATIONS LISTED BELOW MUST BE CARRIED OUT

- Close the manual valves on the liquid line.
- Once the pump-down has been carried out, shut down the water pump.
- Disconnect the electrical supply.
- Close the compressor suction and discharge valves and the discharge valve on the liquid line.
- Label all the open switches notifying not to operate before having opened the compressor suction and discharge valves.
- **Drain all the water from the evaporator and from the chilled water piping if the unit is left unused in the winter time and left exposed to temperatures below zero (in case the unit is not protected by antifreeze solutions like glycol).**