
CHILLER START UP PROCEDURE FORM DOC. N° 061103
(DOC.N°071103 BELOW TO BE RETURN TO AERMEC)

1. Preliminary Operation

WARNING: The following operation must be done without the power supply (unit with the main switch in the OFF position).

WARNING: Before the following operations, disconnect the unit from the power supply. The main switch must be in the OFF position. Please check with a voltmeter on each phase in order to be sure of the absence of voltage. Apply a label to the unit if required by the safety procedure of the country.

- 1.1. **Cables Section:** Check the section of the power supply cables and verify that they are correct (insulation and size) for the nominal current of the unit (check the rating in the Aermec Technical Manual section electrical data.).
- 1.2. **Ground connection (Earthing):** Check the connection to the ground and test it. (see the Aermec Technical Manual).
- 1.3. **Cable tightness / good electrical contact:** Check the cable termination tightness and good electrical contact of all the cables. Tighten all the bolts and screws of the terminals.
- 1.4. **Voltage sequence check.** In some units it is installed the automatic check. If the automatic check is not installed please check carefully the correct sequence of the three phases. High noise of the compressors means that the sequence is wrong.

The following operation must be done with the power supply connected. The unit must not be switched ON until check 1.4 has been made.

- 1.5. **Nominal Voltage:** Check the nominal voltage of the unit 230V or 400V or 500V. Verify with the voltmeter that the nominal voltage corresponds to the voltage at the terminals. **WARNING:** If the voltage measured does not correspond you must stop the start up operation. The Voltage should be **400V ±10% per phase (or 230V ±10% per phase if the unit has been ordered with nominal voltage 230V, or 500V ±10% per phase if the unit has been ordered with nominal voltage 500V)**. The difference across the phases should not be more than 3%. If the voltage difference is above the 3% limit **DO NOT START THE UNIT** and call the technical service.
- 1.6. **Switch the main switch ON:** Place the main switch in the ON position with the unit control in the off position.
- 1.7. **Display activation:** The display of the unit will be activated a few seconds after the main switch has been turned to the ON position.
- 1.8. **Connection:** Check that the connections done on the unit are in accordance with the Aermec Technical Manual supplied with the unit.
- 1.9. **Compressor heater:** Check the correct functioning of the crank case heater of each compressor. Check the increase of the temperature of the oil. The heater must be activated

at least 12 hours before the start up of the compressor. The temperature of the oil should be at least 10-15°C more than the ambient temperature.

2. Hydraulic Circuit

- 2.1. **Hydraulic connections:** Check all the hydraulic connections and verify their correctness.
- 2.2. **Filter:** Check a mechanical filter is installed at the entry of the evaporator. (compulsory accessory; if the mechanical filter is not installed any warranty is immediately voided by Aermec).
- 2.3. **Hydraulic circuit:** The hydraulic circuit must be filled with water (glycol if necessary) and it should have the right pressure. Vent all the air in the circuit.
- 2.4. **Valves:** Verify that all the valves in the hydraulic circuit are open.
- 2.5. **Pump/s:** Check and verify the functioning of the water pump. It must be in operation. Verify that there is enough water flow to close the contact of the flow switch.
- 2.6. **Water flow:** Check and verify the water flow by measuring the pressure difference between water in and water out of the evaporator. In order to calculate the water flow please refer to the pressure drop of the evaporator and use the table / chart in the Aermec technical manual to determine the water flow.
- 2.7. **Flow Switch:** Check and verify the correct functioning of the flow switch. Closing the water valve of the hydraulic circuit slowly, you should cause an Alarm that will be shown on the unit display. Once this check has been done please open the valve again and reset the alarm.
- 2.8. **Cleaning:** The hydraulic circuit of the plant must be vented (several times) in order to eliminate all the air and dirty particles that are present in the circuit. The mechanical filter must be cleaned until all the dirty particles are completely removed.
- 2.9. **Glycol:** In case of usage with glycol, check that the percentage of glycol is correct.

3. Start UP

- 3.1. **Start up the unit:** Once all the above checks have been done it is possible to start up the unit pressing the ON button.
- 3.2. **Set Points:** Check all the set points of the unit and verify that they are within the operating limits of the unit. Reset any possible alarms. After some minutes the unit will start.
- 3.3. **Phase rotation:** Check the phase rotation. If the rotation is not correct disconnect the main switch from the power supply and change over two phases of the incoming triple main supply to reverse motor rotation. Do not alter the internal wiring of the unit otherwise the warranty will terminate with immediate effect.
- 3.4. **Input current:** Check the fans and compressor input current and verify it with the technical data.

4. Refrigerant Circuit

- 4.1. **Leaks:** Check and verify that there are no refrigerant leaks by using a leak detector. In particular you must check all the pressure plugs (manometers, transducers, pressure switches); The vibration during transport could have caused plugs to loosen.

- 4.2. **Oil Level:** Check and verify that after a few hours of operation of the unit, the oil level of the compressor is correct.
- 4.3. **Refrigerant circuit:** Check and verify after a few hours of operation of the unit, that there are no vapour bubbles at the sight glass. If there are a lot of bubbles you must charge refrigerant or adjust the thermostatic valve. If there are a few bubbles the unit could operate but after the approval of the Aermec technical service, nevertheless the presence of bubbles for a short period is possible.
- 4.4. **Superheat:** Check and verify that the refrigerant superheat is between 4 and 8°C. This operation to be done comparing the temperature measured with a contact thermometer located on the compressor suction, with the temperature shown in the manometer (if not present on the unit you need to install one for the check) set on the suction side (the saturated temperature corresponding to the suction pressure). The difference between the two values gives the superheat value).
- 4.5. **Subcooling:** Check and verify that the refrigerant subcooling is between 4 and 6°C. This operation can be done comparing the temperature measured with a contact thermometer located on the outlet pipe of condenser, with the temperature shown in the manometer (if not present on the unit you need to install one for the check) set on the outlet of the condenser (saturated temperature corresponding to the condenser outlet pressure). The difference between the two values gives the subcooling value).
- 4.6. **Discharge Temperature:** Check the Discharge Temperature of the compressor. If the subcooling and the superheat values are correct the temperature measured at the discharge line of the compressor must be 30 to 40°C above the condensing temperature.

5. Safety and control devices

- 5.1. **General:** The unit is set and tested in the factory before delivery. It is, however, advisable to check all these devices after a reasonable period of working time. All maintenance and service operations must be carried out by qualified persons. Incorrect setting values of the safety devices could cause serious damage of the unit.
- 5.2. **High pressure switch:** Check and verify that the high pressure switch is working. This device must stop the unit, generating the appropriate Alarm, once the discharge pressure exceeds the setting value. In order to check the correct operation, stop the condenser air flow (in cooling mode) and verify with the manometer the pressure that the unit stops. **WARNING:** in case the value measured exceeds the setting value given by Aermec STOP THE COMPRESSOR IMMEDIATELY, and verify the reasons. The reset of this device is manual and it can be reactivated once the pressure value drops by the differential value. In order to check the setting and the differential value refer to the Aermec technical manual.
- 5.3. **Low pressure switch:** Check and verify that the low pressure switch is working. This device stops the unit, generating the appropriate Alarm, once the suction pressure drops below the set value. In order to check the correct operation, after about 5 minutes with the compressor in operation, close the liquid line slowly (in cooling mode) and verify with the manometer the pressure when the unit stops. The reset of this device is manual and it can be reactivated once the pressure value drops by the differential value. In order to check the setting and the differential value refer to the Aermec technical manual.
- 5.4. **Antifreeze system:** Check the antifreeze system. The antifreeze control is managed by the electronic control board with the water outlet sensor in order to prevent the water freezing if the water flow temperature is too low. To check the correct operation of this control, increase the set point gradually in the electronic board parameters until the value is equal to

If the above operation is not strictly carried out and if the form (last three pages) is not returned to Aermec within 30 days from the start up, Aermec will not accept any warranty claim.



AERMEC S.P.A.
37040 Bevilacqua (VR) – Italia – Via Roma, 44
C.C.I.A.A. 83945 – Registro Imprese Verona 4524
Capitale Sociale € 6.000.000 int. Versato
Codice Fiscale / Partita IVA 00234050235

Phone. (+39) 0442633111
Fax (+39) 044293566 / 0442 93577
www.aermec.com

the water out temperature constantly measured with a high quality contact thermometer, and verify that the unit stops. The appropriate Alarm will appear on the unit display. After this check RESET THE ANTIFREEZE ORIGINAL VALUE.

If the above operation is not strictly carried out and if the form (last three pages) is not returned to Aermec within 30 days from the start up, Aermec will not accept any warranty claim.

CONTROL TABLE (Pag.2 and 3):

| DESCRIPTION | DATE | TIME | CONTROL YES / NO | SIGNATURE |
|---|------|------|---------------------|-----------|
| 1. Preliminary Operation | | | | |
| 1.1. Cables Section: | | | | |
| 1.2. Ground connection: | | | | |
| 1.3. Cables tightness / good electrical contact | | | | |
| 1.4. Nominal Voltage: | | | | |
| 1.5. Switch main switch ON: | | | | |
| 1.6. Display activation: | | | | |
| 1.7. Connection: | | | | |
| 1.8. Compressor heater: | | | | |
| 2. Hydraulic Circuit | | | | |
| 2.1. Hydraulic connections: | | | | |
| 2.2. Filter: | | | | |
| 2.3. Hydraulic circuit: | | | | |
| 2.4. Valves: | | | | |
| 2.5. Pump/s: | | | | |
| 2.6. Water flow: | | | | |
| 2.7. Flow Switch: | | | | |
| 2.8. Cleaning: | | | | |
| 2.9. Glycol: | | | | |
| 3. Start UP | | | | |
| 3.1. Start up the unit: | | | | |

If the above operation is not strictly carried out and if the form (last three pages) is not returned to Aermec within 30 days from the start up, Aermec will not accept any warranty claim.

| | | | | |
|--------------------------------------|--|--|--|--|
| 3.2. Set Points: | | | | |
| 3.3. Phase rotation: | | | | |
| 3.4. Input current: | | | | |
| 4. Refrigerant Circuit | | | | |
| 4.1. Leaks: | | | | |
| 4.2. Oil Level: | | | | |
| 4.3. Refrigerant circuit: | | | | |
| 4.4. Superheat: | | | | |
| 4.5. Subcooling: | | | | |
| 4.6. Discharge Temperature: | | | | |
| 5. Safety and control devices | | | | |
| 5.1. General: | | | | |
| 5.2. High pressure switch: | | | | |
| 5.3. Low pressure switch: | | | | |
| 5.4. Antifreeze system: | | | | |

If the above operation is not strictly carried out and if the form (last three pages) is not returned to Aermec within 30 days from the start up, Aermec will not accept any warranty claim.