



WLA Compact

Translation of original instructions
Air cooled water chiller

230/1/50, 230/1/60
400/3/50, 460/3/60

Index i04

Revision 10.2021

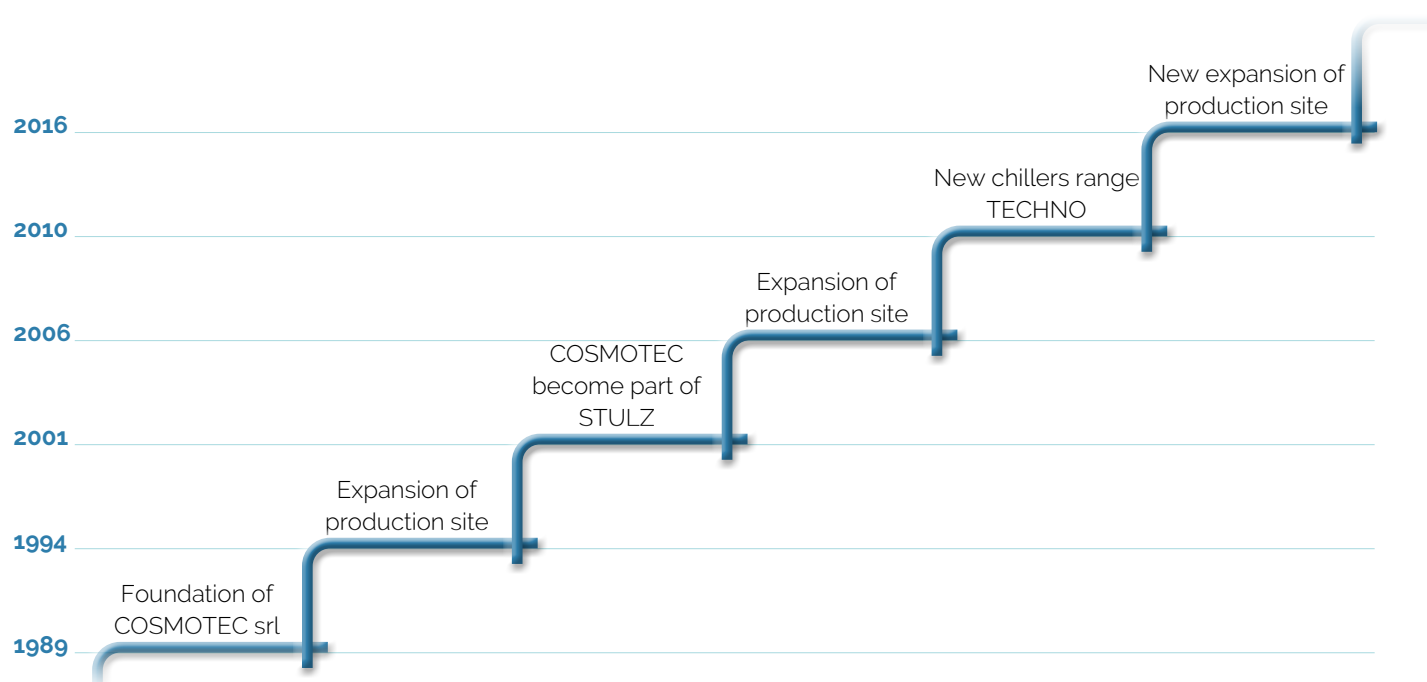
COSMOTEC HISTORY

Cosmotec was founded in 1989. In 2001, Cosmotec joined Stulz GmbH, which has its headquarters in Hamburg. In 2004, Cosmotec SpA changed its name to Stulz SpA. Stulz SpA immediately became a major producer of air conditioning and cooling in the industrial and ICT markets. Innovation, flexibility and respect for the environment are the primary quality factors behind the ISO9001 certification.

The most important corporate goals are a range of tailor-made solutions, high stock levels, a resulting high delivery capacity and a service tailored to customer needs.

A high degree of customer satisfaction is due to the fast order processing and a delivery capability within a few days.

COSMOTEC S.p.A.
via Torricelli, 3
37067 Valeggio Sul Mincio
Verona - Italy



WLA Compact – High quality liquid chiller made in Italy

Dear Customer,

Thank you for purchasing a Cosmotec chiller.

It is the result of many years of research and design studies, as well as a fine matching of materials and technologies to obtain a high quality chiller.

The CE mark guarantees that the Cosmotec products fulfill the requirements of the European Machinery Directive for safety.

The level of quality is permanently checked at every phase, from design to production and makes Cosmotec products synonymous of SAFETY, QUALITY and RELIABILITY.

For any questions or requests concerning products by Stulz SpA, please contact our **Aftersales** at:

telephone 0039 045 6331615

fax 0039 045 6331635

email aftersales@Stulz.it

Or visit our website for more information about our products and services:

www.cosmotec.it

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Soggetto a modifiche senza preavviso

1. Introduction

1.1. Introduction

These operating instructions contain basic information which is to be complied with for installation, operation and maintenance. They must therefore be read and complied with by the fitter and the responsible trained staff/operators before assembly and commissioning.

All procedures detailed in the manual, including tasks for installation, commissioning and maintenance must only be performed by suitable trained and qualified personnel. They must be permanently available at the place where the system is used.

The manufacturer will not be liable for any injury or damage caused by incorrect installation, commissioning, operation or maintenance resulting from a failure to follow the procedures and instructions detailed in the manual.

INFORMATION

An informative document on the REACH Regulation is available. Please view it on web site <https://www.cosmotec.it/certificazioni>.

1.2. Warranty

The warranty is limited to free replacement and shipping of any faulty part, or sub-assembly which has failed due to poor quality or manufacturing errors. All claims must be supported by evidence that the failure has occurred within the warranty period, and that the chiller has been operated within the designed parameters specified.

All warranty claims must specify the model and serial number of the chiller. This information is printed on the name plate, fitted on the door from the electrical cabinet.

The warranty will be invalid in case of any modification on the chiller which is not written approved from Cosmotec.

To claim any warranty purpose the following conditions need to be satisfied:

The initial startup of the chiller has to be carried out by trained personnel authorized from Cosmotec.

Only Cosmotec approved spare parts and liquids are allowed to be used.

All scheduled maintenance operations described in this manual must be performed accordingly by trained and qualified personnel.

Not fulfilling at least one these conditions will automatically void the warranty.





1.3. Annex

The following annexes are an integral part of this manual.

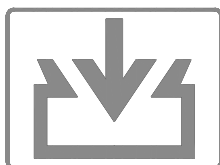
- Manual part 2: consisting of water-refrigeration diagram, electrical diagram, and CE declaration of conformity;
- Electronic control manual (user version);
- Accessory manuals (if presents).

2. Safety

2.1. Symbols used in the manual

| | |
|--|---|
|  DANGER | Risk of death or injury to the operator |
|  WARNING | Risk of damage to the unit |
|  INFORMATION | Important information, use note |
|  ESD CAUTION | Risk of damage to electronic components |

2.2. Labels



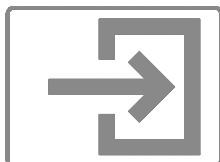
Tank filling

Position: close to the filling valves of the storage tank (where available).



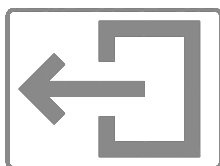
Tank discharge

Position: close to the draining valves of the evaporators and storage tank (where available).



Chiller hydraulic circuit inlet (chiller water return)

Position: close to the hydraulic circuit inlet connection.



Chiller hydraulic circuit outlet (chiller water supply)

Position: close to the hydraulic circuit outlet connection.



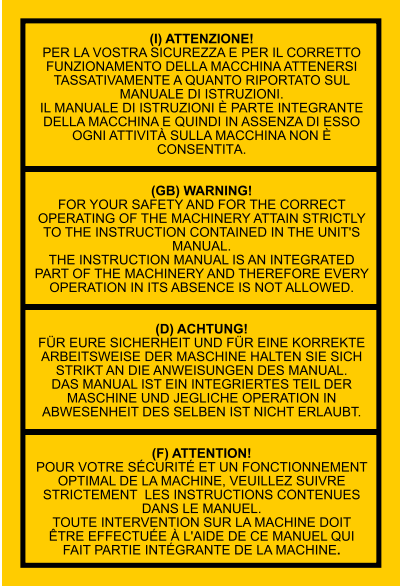
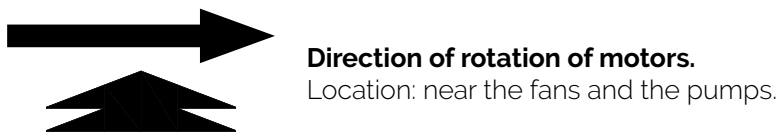
Hot components

Position: close to condenser inlet/outlet pipes (under the protection guard) and on the compressor support. With antifreeze option, they can be found close to the heaters around the evaporator, at the pump volute, steel hydraulic pipes and in the storage tank.





High voltage

Position: close to electric components and in the electrical panel.



Label recalling the instruction manual.
Location: on the side of the powerboard.

| | | | |
|---|--|---|---|
|  Via E. Torricelli, 3 37067 Valeggio sul Mincio (VR) I Phone 0039 (0)45 6331600 Fax 0039 (0)45 6331635 | |  |  0035 |
| REFRIGERATORE DI LIQUIDO - LIQUID COOLER - KUHLANLAGE - REFROIDISSEUR DE LIQUIDE | | | |
| MODELLO - MODEL - TYP - MODELE | | WLA13B1A061A080 7035 | |
| SERIE - SERIES - SERIE - SERIE | | N°0000458674 | |
| ORDINE - ORDER - ORDER - COMMANDER | | 2130006329 | |
| DATA - DATE - DATUM - DATE | | -- /-- /---- | |
| Tensione nominale - Rated voltage - Nennspannung - Tension nominale | | 400-460V/3/50-60 Hz | |
| Avviamento/marcia - Starting/run current - Anlaufstrom/Nennstrom - Démarrage/marche | | --- / --- A | |
| Resa nom. - Cooling cap. - Kälteleistung - Puissance nominale | | ---- kW (W15L32) | |
| Potenza Assorbita - Input power - Leistungsaufnahme - Puissance absorbée | | ---- kW (W15L32) | |
| Carica gas - Filling capacity - Fullmenge - Charge de gaz | | --- kg | |
| Refrigerante tipo - Refrigerant type - Kaltemittel - Refrigerant type Peso - Weight - Gewicht - Poids | | R134a --- kg | |
| TSS (Max temp. Di stoccaggio - Max Storage temp. - Max Lagertemperatur - Temp. Max d'emmagasinage) | | 45 °C | |
| TS MAX (Refrigerante - Refrigerant - Kaltemittel - Refrigerant) | | 85 °C | |
| TS MIN (Refrigerante - Refrigerant - Kaltemittel - Refrigerant) | | -10 °C | |
| PS HP (Max pressione ammissibile HP - Max allowable pressure HP - Max zulässiger Druck HP - Pression maximum admise HP) | | --- bar | |
| PS LP (Max pressione ammissibile LP - Max allowable pressure LP - Max zulässiger Druck LP - Pression maximum admise LP) | | --- bar | |
| CAT PED | | I | |
| Modulo valutazione - Evaluation Module - Bewertungsverfahren - Procédure d'évaluation | | A1 | |
| Contiene gas fluorurati ad effetto serra disciplinati dal protocollo di Kyoto - Device containing HFC fluids causing greenhouse effect regulated by Kyoto protocol - Das Gerät erhält wie vom Kyoto-Protokoll geregelte Fluorkohlenwasserstoffe Treibhausgasen - Dispositif contenant fluides HFC à effet de serre disciplinés par le protocole de Kyoto | | | |
| MADE IN ITALY | | | |

The chiller is identified by the nameplate shown on the side. The identification nameplate also shows the serial number of the unit, it is important to know the label as it is essential to get assistance or any information concerning the unit described in this manual.
Location: under the power board.

2.3. Safety instructions

INFORMATION

This cooling unit contains fluorinated greenhouse gas covered by the Kyoto protocol.

In these Cosmotec chillers the refrigerant R134A is used. Refrigerants are volatile or highly volatile fluorinated hydrocarbons which are liquefied under pressure. They are incombustible and not hazardous to health when used as intended.

DANGER

- Works have to be carried out by competent staff only.
- Observance of the regulations for accident prevention.
- Stay out of danger when lifting and setting off the unit.
- Secure the unit to avoid the risk of overturning.
- Safety devices may not be bypassed.
- Respect the corresponding EN- and IEC standards for the electrical connection of the unit and observe the conditions of the power supply companies.
- Switch off the voltage from the unit when working on it.
- The unit must be earthed.

WARNING

- The unit may only be used to cool water according to the Cosmotec specification.
- Observe the national regulations of the country where the unit will be installed.
- The refrigerant circuit contains refrigerant and refrigerating plant oil, observe professional disposal for maintenance and when setting the unit out of service.
- Cooling water additives have an acidic effect on skin and eyes, wear safety glasses and safety gloves.
- Observe personal protective equipment when working on the refrigerant circuit.

INFORMATION

- Respect material compatibility in the whole hydraulic circuit.
- The male triangular wrench is to be placed in a visible location in the immediate vicinity of the unit.

2.4. Handling refrigerants

According to EN 378, refrigerants are divided in groups in respect of health and safety.

- Adherence to the regulations by law and guide-lines.
- Execution only by competent staff.
- Responsibility for correct disposal of refrigerant and system parts is incumbent on the operator.
- Refrigerants have a narcotic effect when inhaled in high concentrations.
- The room is to be evacuated immediately if high concentrations of refrigerant suddenly occur. The room may only be entered again after adequate ventilation.
- If unavoidable work is required in the presence of a high concentration of refrigerant, breathing apparatus must be worn. This does not mean simple filter masks. Comply with breathing protection data sheet.
- Safety glasses and safety gloves are to be worn.
- Do not eat, drink or smoke at work.
- Liquid refrigerant must not get onto the skin (risk of burns).
- Only use in well ventilated areas.
- Do not inhale refrigerant vapours.

- Warn against intentional misuse.
- It is absolutely essential to comply with the first aid measures if accidents occur.
- Refrigerants containing FCs contribute to the global warming and with this to climate changes. The FCs must therefore be disposed of in accordance with the regulations, i.e. only by companies specially qualified and licensed as recognised disposal companies for refrigerants.

2.5. Safety and environmental requirement

The following requirements relate to the operation of refrigerating plants within the European Community.

- The used components must correspond to the pressure equipment guide-line 2014/68/EC and EN 378 part 1-4.
- Independent of the design, the equipment and inspection before the delivery, also the operator of such plants has duties according to EN 378 and national regulations.
- This concerns the installation, the operation and the repeated inspection:
- Installation: according to EN 378
- Operation: Determination of emergency measures (accidents, malfunctions)
Creation of an abbreviated instruction and notification (template page)
 1. A unit protocol must be kept.
 2. To be stored in the proximity of the unit
 3. Access for competent staff in case of repairs and repeated inspection must be ensured.
- Repeated inspection: according to EN 378. The operator is responsible for the execution.

The operator must ensure that all maintenance, inspection and assembly work is carried out by authorised and qualified specialist staff who have made an in-depth study of the operating instructions. It is absolutely essential to comply with the procedure for shutting down the system described in the operating instructions. Before maintenance work, the unit must be switched off at the main switch and a warning sign displayed to prevent unintentional switching-on.

First aid measures

- If health problems occur during or after handling fluorinated hydrocarbons, a doctor is to be consulted immediately.
- The doctor is to be informed that the work involved the use of fluorinated hydrocarbons.
- In the case of acute effects, the casualty is to be brought into the fresh air as quickly as possible.
- Splashes of fluorinated hydrocarbons in the eyes can be blown out or fanned out by an assistant. Then rinse with water.

Independent conversion and manufacture of replacement parts

The system may only be converted or modified after consultation with Cosmotec. Original replacement parts and replacement parts/accessories authorised by Cosmotec are an aid to safety.

Unacceptable operating methods

The operating safety of the system is only guaranteed when it is used as intended. The limit values stipulated in the technical data must not be exceeded under any circumstances.

3. Residual risk

During transport and installation

| Area | Danger | Risk | Preventative measures |
|----------------|--|-------------------------------------|--|
| Under the unit | Defective lifting system of the unit, which causes its fall. | Contusions, trauma. | Keep away from the danger area while handling the unit. |
| Near the unit | Accidental shock with damage to the refrigerant circuit and leak of high pressure refrigerant. | Bruises, formation of acid vapours. | Keep away from the danger area while handling the unit. Wear PPE. |
| Near the unit | Unstable or unsuitable unit support that causes its overturn. | Contusions, trauma. | Make sure the unit support is adequate to its weight, is stable and levelled. Wear PPE. |
| Electrical box | Connection cables under voltage. | Electroshock | Make sure to disconnect the power supply from the distribution panel. Remain electrically insulated from the ground. Wear PPE. |

During start-up and operation

| Area | Danger | Risk | Preventative measures |
|---|---|--|---|
| Near the unit | Suction and following expulsion of objects, dust, and substances from the fans in the installation site. | Contusions, trauma. | Clean the installation area. Wear PPE. |
| In contact with the unit | Non-compliant electrical connection and missing earth connection. | Electroshock. | Remain electrically insulated from the ground. Wear PPE. |
| Near water pipes | Closed shut-off valves; leaks from the hydraulic pipes. Consequent leaking of water and additives. | Irritation of skin and eyes due to contact with ethylene glycol. Irritation of the skin and breathing system due to glycol vapours. Electrocutation, slipping. | Open the shut-off valves of the hydraulic circuit. Wear PPE. |
| Near water pipes | Condensate formation in the presence of the dew point with leaks of the not insulated pipes. | Electroshock, slipping. | Wear PPE. |
| Near the unit | With unit ON: Losses in the refrigerant circuit; defective safety valve and high pressure switch; fire; shut-off valves in the refrigerant circuit closed after maintenance; defect on the gas charge line. Consequent explosive breakage of the refrigerant circuit. | Bruises, formation of acid vapours with open flames.. | Wear PPE. In case of fire, wear fire-fighting masks. |
| Near the unit (Electrical box, supply cables) | Short-circuit; incorrect sizing of the cables or of the main switch. | Electroshock, fire, formation of acid vapours. | Check the fixing of the terminal cables; select the power supply cables and main switch. Wear PPE. In case of fire, wear fire-fighting masks. |
| Near the unit | Noise emission. | Injury of the hearing system. | Wear PPE. |

During maintenance

| Area | Danger | Risk | Preventative measures |
|---|--|--|--|
| Near the unit | Losses in the refrigerant circuit; defective safety valve and high pressure switch; fire; defect on the gas charge line. Consequent explosive breakage of the refrigerant circuit. | Bruises, formation of acid vapours with open flames. | Wear PPE. In case of fire, wear fire-fighting masks. |
| Components of the unit: compressor, delivery pipes, condenser | Contact with hot surfaces. | Bruises. | Avoid the contact. Wear PPE. |
| Condenser | Contact with sharp surfaces (fins). | Cuts, abrasions. | Wear PPE. |

| Area | Danger | Risk | Preventative measures |
|----------------|---|--------------|---|
| Electrical box | Live power supply line even if the switch on board the unit is OFF. | Electroshock | Make sure to disconnect the power supply from the distribution panel. Make sure that the main switch is not reactivated during maintenance. |

During dismantling

| Area | Danger | Risk | Preventative measures |
|------------------|---|--|---|
| Near the unit | Losses in the refrigerant circuit; defective refrigerant recovery system. Consequent explosive breakage of the refrigerant circuit. | Bruises, formation of acid vapours with open flames.. | Wear PPE. |
| Near the unit | Oil leaks during recovery. | Oil contact wit skin or eyes | Wear PPE. |
| Near water pipes | Unscrewing the water pipes still under pressure. | Irritation of skin and eyes due to contact with ethylene glycol.. Electroshock. Slipping | De-pressurise the hydraulic circuit before disconnection. Wear PPE. |
| Electrical box | Live power supply line even if the switch on board the unit is OFF. | Electroshock. | Make sure to disconnect the power supply from the distribution panel. Make sure that the main switch is not reactivated during maintenance. |

3.1. Refrigerant safety data

| Refrigerant safety data | | |
|---|---|---|
| 1. Identification of the substance/ preparation | Identification of the preparation | STAR COLD 134a |
| | Recommended uses | Refrigerant |
| 2. Composition / information on the ingredients | Tetrafluoroethane (C ₂ H ₂ F ₄) | N° CAS: 811-97-2 N° CE: 212-377-0 Concentration: 100% |
| 3. Identification of the hazards | Possible Hazards | Not dangerous according to Directive 1999/45/EC. Consequences on the environment: not readily biodegradable. Physical and chemical hazards: thermal decomposition in toxic and corrosive products. |
| 4. Fire-fighting measures | Inhalation | Move the victim to a non-contaminated area wearing breathing equipment. Keep the patient warm and at rest. Call a doctor. Apply artificial respiration if breathing has stopped. |
| | Contact with skin | In case of frostbite, spray with water for at least 15 minutes. Apply a sterile gauze. And obtain medical assistance. |
| | Contact with eyes | Immediately wash the eyes with water for at least 15 minutes. |
| | Ingestion | Ingestion is not considered a potential route of exposure. |
| | Protection for first-aiders | Wear suitable respiratory equipment in case of interventions in saturated atmosphere. |
| | Notes for the doctor | Do not administer catecholamines (due to the cardiac effects of the product) |
| 5. Fire-fighting measures | Suitable extinguishing medium | Adopt extinguishing measures in fire area. |
| | Special risks from the substance or mixture | The product is not flammable in ambient pressure and temperature. Any mixtures, under pressure with air, can be flammable. At high temperature: There is thermal decomposition into toxic and corrosive products as hydrofluoric acid and carbon oxides. |
| | Advice for fire-fighters | Cool containers/tanks with spraying water. Provide a rapid container evacuation system. In case of fire nearby, keep away containers exposed to fire. In case of fire, wear a self-contained breathing apparatus and a complete protection suit against chemical agents. |
| 6. Accidental release measures | Individual measures | Try to stop the leakage. Evacuate the area. Ensure suitable ventilation. Use the respiratory equipment to access the involved area unless atmosphere is proved to be unbreathable. Avoid accessing sewers, basements, or any place where its accumulation could be dangerous. |
| | Environmental precautions. | Try to stop the leakage. |
| | Methods and materials for containment and recovery | Ventilate the area. |

| | | |
|---|---|--|
| 7. Handling and storage | Precaution for safe handling | Storage and handling dispositions applied for the following products: under pressure gas and liquefied gas. Provide adequate ventilation and extraction near equipment. Provide showers, eye fountains. Provide nearby points of water delivery. Well ventilate cisterns and tanks, before intervening inside. Prohibit sources of ignition and the contact with hot surfaces. DON'T SMOKE. Avoid the contact with skin, eyes and inhalation of vapours. Don't drink and don't eat during use. Clean hand after manipulation. Remove contaminating clothing and protective clothing before entering food catering areas. |
| | Condition for secure storage, including any incompatibilities | Keep in a fresh and well ventilated place. Keep away from free flames, hot surfaces and ignition sources. Don't smoke. Protect full containers from heat sources to avoid over pressures. Protect from lights. Avoid direct lights. |
| | Storage temperature | <45°C |
| | Incompatible products | Alkaline hydroxides. Alkaline earth metals. Strong oxidizing agents. Finely divided metals. |
| | Packaging material | Recommended: Ordinary steel, stainless steel. To avoid: alloy containing more than 2% magnesium. Plastic materials. |
| | Storage conditions | Keep in a fresh, dry and well ventilated place. The temperature cannot be higher than 50°C. Maintain the valves well closed. |
| | Suitable packaging | Storage in original cylinder. Protect from contaminations. |
| 8. Exposure/ personal protection checks | Exposition | Norflurane = 13936 mg/m ³ in case of inhalation for workers. Norflurane = 2476 mg/m ³ in case of inhalation for consumers. |
| | General protection measures | Ensure an adequate air change and/or aspiration in working environments |
| | Protection for respiratory tracts | In case of not enough ventilation, use a suitable air breathing apparatus. |
| | Hand protections | Leather glove |
| | Eyes/face protection | Protection glasses with side-shields |
| | Skin/body protection | Wear protection suit (cotton) that covers legs and arms. |
| | Ambient | Should not be released into the environment. |
| 9. Physical and chemical properties | Aspect | Physical state (20°C): gaseous; Physical state: liquefied gas; Colour: without colour |
| | Odour | Slightly similar to air |
| | Fusion interval / point | -108 °C |
| | Boiling interval / point | -26 °C |
| | Flammability (solids,gas) | Non-flammable substance. Vapour pressure: 0.574 MPa a 20 °C. Vapour density: 4.24 kg/m ³ Density: 1.206 kg/m ³ a 25°C, 1.102 kg/m ³ a 50°C, 996 kg/m ³ Relative density (Water): 1.21 a 20°C, 1.1 a 50°C |
| | Solubility in water | 1 g/l a 25 °C |
| | Auto-ignition temperature | 743 °C a 1 bar |
| | Decomposition temperature | >370 °C |
| 10. Stability and reactivity | Other information | Henry constant: 155E+03 PA.m ³ /mol. Molecular weight: 102 g/mol Critical pressure: 4.07 MPa. Critical temperature: 101 °C |
| | Chemical stability and reactivity | Stable at ambient temperature. The product, in presence of air, can create a flammable mix, under certain conditions of temperature and pressure. |
| | Conditions to be avoided | Keep far from eat sources and other causes of fire. Avoid the contact with flames and incandescent metallic surfaces. |
| | Incompatible materials | Alkaline hydroxides. Alkaline earth metals. Strong oxidizing agents. Finely divided metals. |
| | Thermal decomposition | Decomposition temperature: > 370 °C |
| 11. Toxicological information | Hazardous decomposition products | At high temperature there is the thermal decomposition into toxic and harmful products: Gaseous hydrogen fluoride and carbon oxides. |
| | Inhalation | Reduced harm for inhalation. As the others volatile aliphatic halogenated compounds, trough vapours accumulation and/or inhalation of huge quantities, the substance can cause: loss of consciousness and heart disease, aggravated by stress and lack of oxygen: mortal risk. |
| | Local effects | Possible frostbite for liquefied gas sketches on skin and eyes. |
| | Respiratory or skin sensitization | No genotoxic effects. |
| | Carcinogenicity | No carcinogenic or mutagen effects in animal experiments. |
| | Toxicity for reproduction | No toxicity to reproduction. No toxic effects for developing foetus, at no toxic concentration for mothers. |
| 11. Toxicological information | Specific target organ toxicity | Studies of long inhalation on animals didn't highlighted any chronic toxic effect. |

WLA COMPACT - TRANSLATION OF ORIGINAL INSTRUCTIONS

| | | |
|--------------------------------|-------------------------------|---|
| 12. Ecological information | Acute toxicity | Low harmful for fishes. Low harmful for alga. |
| | Persistence and degradability | Not readily biodegradable |
| | Potential for bioaccumulation | Considered to be not bioaccumulative |
| 13. Considerations on disposal | Waste disposal methods | Elimination of the product, recycle or incinerate. According to local and national Norms. |
| 14. Transport information | UN number | 3159 |
| | Suitable shipment name | LIQUIFIED GAS N.O.S. (Tetrafluoroetano) |
| | Transport danger class | 2 (ADR) - 2 (ADN) - 2.2 (IATA_Cargo) - 2.2 (IATA - Passenger) - 2.2 (IMDG) |
| | ImS code | F-C, S-V |

4. Moving and storage

4.1. Receipt

To ensure product quality and reliability, all the chillers are checked and tested before delivery.

The standard packaging consists of:

- Bubble wrap around the sides and roof of the unit;
- Some plastic air bag strips around the unit.
- Specific pallet for transporting the chiller

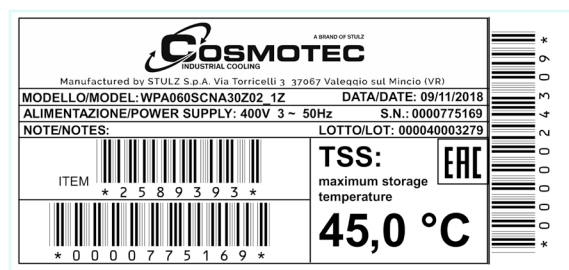
WARNING

Standard packaging is not suitable for sea or air freight

The packaging is equipped with an adhesive providing the following information:

- COSMOTEC logo
- COSMOTEC production order number
- Unit code
- Unit serial number
- TSS: maximum storage temperature

Other labels of this type can be positioned on the packaging to identify the accessories included in the unit packaging.



Upon reception of the goods, immediately inspect the unit.

- Make sure that the goods have been transported in the correct position. Write any unsuitable shipment on the transport document.
- Check the presence of all the items indicated in the transport document and also check the integrity of the conditioner upon reception.
- Make sure that there are no external damage and, if any, write them on the transport document in the presence of the carrier.

Hidden damage, to be verified after having removed the packaging, must be signalled to the carrier within the times and methods indicated in the transport document.

With goods delivered ex-works, the carrier is liable for any damage caused during transport.

If the goods are not delivered ex-works, in case of damage, follow the instructions indicated on the transport document.

This product must not be returned without prior authorisation of COSMOTEC. Contact you local COSMOTEC partner in case assistance service is required.

INFORMATION

- Due to the pre-filled refrigerant, the unit is marked as transport of dangerous goods.
- The refrigerant is non-toxic and non-flammable.
- For special shipping indication, please contact the corresponding sales department.
- Special transport regulations must be checked country specifically.

4.2. Handling

! WARNING

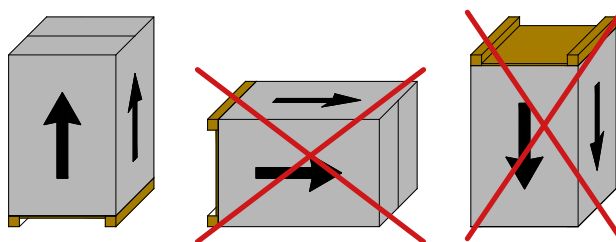
The chiller must be lifted safely, without inclining it or resting it on its sides, with suitable equipment.

The capacity of the mean must be suitable for the weight of the chiller to be lifted.

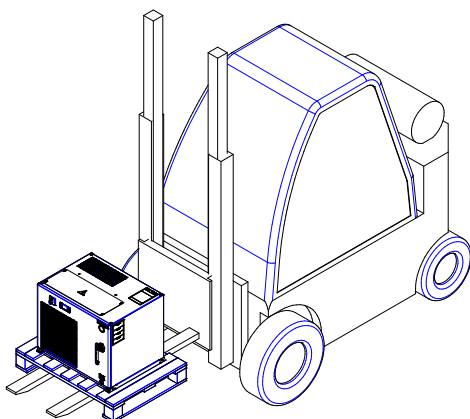
The load must be balanced to prevent overturning.

Do not perform sudden and/or violent manoeuvres.

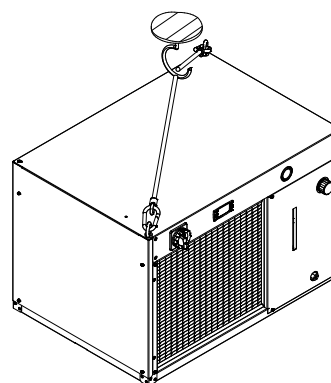
Do not overlap other objects on the chiller.



Handling with forklift truck:
- Chiller on pallet



Handling with eyebolts



4.3. Removing of the packaging

Once the chiller is placed on the ground, remove the packaging without damaging the unit

The packaging must be disposed of in compliance with Regulation in the place of disposal. For more information see chapter "11. Decommissioning and disposal of the unit".

4.4. Storage

If you put the unit into intermediate storage before the installation, the following measures have to be carried out:

- Make sure that the hydraulic connections are provided with closing caps supplied in series with the unit;
- Do not expose the unit to direct sunlight;
- Store the unit in its original packaging.

The chiller are packaging with standard packaging (unless different agreements). The packaging:

- It doesn't protect the chiller from rain and adverse weather conditions;
- It's not suitable for sea freight;
- It's not suitable for air freight.

The ambient conditions for storage are shown in paragraph 6.1.

5. Description

5.1. Coding

The type code represents the variant of your chiller unit and can be found on the nameplate located on the inner side of the electric cabinet. You can decode the type code by the following table.

i INFORMATION

Please be aware that not every combination of these values is possible.

1'digit ●

2'digit ●

3'digit ●

4'digit ●

5'digit ●

6'digit ●

7'digit ●

8'digit ●

9'digit ●

10'digit ●

11'digit ●

12'digit ●

13'digit ●

14'digit ●

W

L

A

0

2

A

0

A

0

0

0

A

0

8

Liquid Chiller

Cooling Capacity

02

1.4 kW

08

3.2 kW

03

1.6 kW

10

4.1 kW

05

2.5 kW

13

5.1 kW

Pump configuration

A

Exchanger

B

Exchanger + Standard pressure pump P3

C

Exchanger + Medium pressure pump P5

Hydraulic configuration

0

Standard - without tank

1

Tank

Hydraulic option with tank

A

No option

B

Electrical level stop pump

C

Under-beam

D

Pre-heating in the pump + Electrical level stop pump

E

Under-beam + Electrical level stop pump

F

Under-beam + Pre-heating in the pump + Electrical level stop pump

Regulation of condensing pressure

0

Standard

1

On-Off system for low ambient T version -5°C

2

Modulating system for low ambient T version -10°C

3

Modulating system + Hot gas bypass for LASER version

Power supply

00

230/1/50 (only for WLA10-13)

20

230/1/50-60

61

400/3/50- 460/3/60 (only for WLA05-08-10-13)

Electrical options

A

Standard

B

Multi-pole connector (Power + alarm signal)

C

Differential control with external probe

D

Multi-pole connector (Power + alarm signal) + Differential control with external probe

Frame

0

Standard

1

Stainless steel

Refrigerant

8

R134a

5.2. Intended and unintended use

Intended use

The chiller is designed to cool liquids in an industrial environment, protected from heat sources, according to limits and indications of technical label.

The unit is designed to be used in room with supervised and/or authorized access category (see tab. 4 EN 378-1:2016). Consequently, on informed personnel can stay near the unit; it's considered that, in case of fire, the personal is aware of the intrinsic risk of the unit.

The operation safety of the system is guaranteed as long as it complies with its intended use. The storage and operation limit values indicated on the data plate and stated in paragraph 6.1 must never be exceeded.

COSMOTEC is not liable for damage caused by improper use. The operator is fully responsible for this risk.

Unintended use

The use of the chiller must always comply with the standards in force and instructions provided in this manual.

Moreover, its use is prohibited in the event it is installed:

- Incorrectly;
- On mobile parts or on oscillating, inclined (not levelled) supports or on supports that transmit vibrations;
- In areas with high heat radiation;
- In areas with strong magnetic fields;
- In areas with open flames;
- In areas featuring explosive atmospheres;
- In the presence of flammable products;
- In areas with risk of explosion;
- In areas with saline atmosphere;
- In areas with aggressive atmospheres;
- In areas excessively dusty;
- In the presence of materials that may obstruct the air circuit after being deposited or suctioned by the chiller.

Moreover, its use is prohibited after any modification or transformation applied but not approved by COSMOTEC, including the use of non-original spare parts.

5.3. Layout of the components, principle and mode operation

Only chiller

The chillers described in this manual consist of:

- Hermetic refrigerant circuit, filled with R134a refrigerant. The refrigerant circuit includes a rotary vane compressor, condenser, an electronic thermostatic valve, and stainless steel evaporator as brazed plate heat exchanger;
- Hydraulic circuit;
- Condensation module consisting of a condenser and a fan.

The chiller is controlled from the Dixell XW07K electronic regulator (designed and produced according to COSMOTEC specification) and from a main switch placed on the side of the electronic regulator on the chiller front panel. The electrical panel, with protection rate IP40, can be accessed from the upper part of the unit and contains all the electrical control components of the chiller already wired. The holes for the passage of power supply cables are located on the rear side of the unit and are provided with cable gland sheaths.

The compressor is fixed to the base and it is found in the left rear side of the chiller (accessible by removing the left side panel).

The condenser, with intake fan integrated, is located in the left side of the chiller and it can be accessed from the left panel and from the front side, prior removal of the specific panels.

The evaporator as brazed plate heat exchanger is placed at the centre of the unit and it can be

accessed by removing the front panel.
The condenser cooling air is suctioned from the front side and discharged on the rear by means of the specific grid in the closing panels.
The inlet and outlet water fittings are located on the rear right, whereas additional hydronic components (circulation pump and storage tank) are found on the chiller right side.

5.4. Components of the refrigerant circuit

The compressor compresses the refrigerant gas, bring it to higher temperature and pressure. Through the condenser, the hot gas is cooled and liquefied, releasing hot to the external air. Pushed through the electronic expansion thermostatic valve, the liquid refrigerant lose pressure and its prepares for the evaporation. This takes place in the evaporator, where the refrigerant absorbs the heat of the warm water or of the mixture to the treated, which is therefore cooled.

5.4.1 Compressor

According to the cooling capacity, compressor type changes: see below the table with relation between size and compressor type. The compressor has thermal protection from overload.

| Size | Compressor |
|-------|--------------------|
| WLA02 | Alternative piston |
| WLA03 | Alternative piston |
| WLA05 | Rotary vane |
| WLA08 | Rotary vane |
| WLA10 | Scroll |
| WLA13 | Scroll |

5.4.2 Condenser


The condenser is copper-aluminium type, with copper pipes and aluminium fins. The chiller cannot be use in environments with aggressive atmosphere.
On request there is the possibility to have the exchanger with cataphoresis treatment, tested to resist with salt mist > 1000h. Other particular treatments for aggressive environments can be evaluated on request.

5.4.3 Fan

Installed in the rear side of the condenser, it's non-ductable suction type. The fan, with metallic blades, it has metallic protection grid.

5.4.4 Evaporator

Plate condensers are used, made in stainless steel AISI 316 and brazed AISI 304.

 **WARNING**

The liquid to be cooled must be conform to the prescriptions reported in paragraph 6.1.

5.4.5 Expansion valve

It's mechanical type, based on pressure and temperature in base exiting from the evaporator (compressor suction), adapts the refrigerant capacity to the evaporator. The adjustments for the correct working are made by the manufacturer and cannot be altered afterwards.

5.5. Safety components of the refrigerant circuit

5.5.1 High pressure switch

A high pressure switch is installed on the refrigerant circuit and it triggers when the pressure inside the refrigerant circuit exceeds 25 barg. The circuit compressor is deactivated and an alarm signal appears on the electronic controller display. The alarm conditions stops when the pressure drops below 17 barg.

5.6. Protection components of the refrigerant circuit

5.6.1 Refrigerant filter

A chiller filter is located in the liquid line of each refrigerant circuit. This filter holds the humidity particles in the chiller.

5.6.2 Evaporator antifreeze protection device

The antifreeze protection device prevents the evaporator from freezing. An evaporator outlet probe placed on the water circuit measures the temperature of the cooled liquid. If this reaches values equal to or lower than the alarm threshold, the control disables the cooling mode.

5.7. Components of the hydraulic circuit

5.7.1 Chiller

The standard hydraulic circuit includes an evaporator, two water probes, one on the inlet and the other one on the outlet of the heat exchanger, a pressure gauge, a non-pressurised storage tank, a pump and a protection flow switch.

The refrigerated water pipes are made of polyurethane and are equipped with quick coupling connections. The chiller can be supplied in the following versions:

- Evaporator + Tank + centrifugal pump with standard prevalence.
- Evaporator + centrifugal pump with standard prevalence.
- Only evaporator, standard version.

Moreover, the following options are available and can be installed inside the chiller:

- Medium head centrifugal pumps.
- Non-ferrous crankcase and anti-freeze heater

5.7.2 Low temperature fluid up to -5°C

Optional. For more information, please refer to paragraph 12.2.

5.8. Air circuit

The air circuit is composed by the condenser, the fan and the air filter.

5.8.1 Fan

The units have an axial fan, aspirant, with black metallic blades. The motor has mono-phase power supply, with insulation class F. Motor protection degree is IP44. The fan has internal thermal protection for overload.

The fan is always on when compressor is switch on.

Through some options, for chiller management at low ambient temperatures, there is the possibility to have the following fan speed regulations:

- On-off, to reach ambient temperature up to -5°C.
- Speed modulation, with phase cut module. Apply to reach ambient temperature up to -10°C.

5.8.2 Condenser

Consisting of copper pipes and aluminium fins to maximise the thermal exchange yield between the overheated gas and the environment.

It is positioned in the left front side of the chiller. A washable polyurethane filter can be installed as accessory to protect the condenser.

5.8.3 Air filter

The installation of the air filter at condenser entry, made of:

- n°1 polypropylene honeycomb air filter, black coloured, with frame and nets in galvanised welded sheet
- n°2 brackets for the interlock fixing of the filter to the condenser
- small parts for a correct installation

The filter is washable with blowing of compressed air.

For the cleaning, when chiller is off, proceed as follows:

1. Remove the interlocked frontal panel of the chiller
2. Unlatch the filter from its supporting brackets.
3. Clean the filter, blowing air in opposite direction of chiller flow. Don't clean the filter with cleaners or water jets. Verify the integrity of the filter and substitute if necessary.
4. Reposition the chiller and verify it's stable.
5. Reposition the frontal panel of the chiller.

5.9. Protection and control electric components

5.9.1 Main disconnection switch

A main disconnection switch is installed on the front panel next to the electronic generator. This is a safety device that allows the chiller to be disconnected from the power supply immediately.

5.9.2 Motor protection devices

Circuit breakers are installed on the power supply lines of the single electric utilities to protect against short-circuits and over-currents

The ignition is adjusted by the manufacturer and it must never be modified.

5.9.3 Phase cut module to adjust the fan speed.

As an option, a phase cut out module can be supplied to adjust fan speed. The regulator, of electromechanical type, regulates through pressure direct lecture, on compressor supply pipe.

5.9.4 Electronic control

The electronic control consists of a XW07K microprocessor board and a CX40 keyboard to control the devices of the chiller (compressor, fan, adjustment and safety devices, etc.). The operation software and the file with the parameters are written in EEPROM so that they remain in the memory even in case of power failure.



The keyboard with 3-digit display is placed on the front side of the chiller. It allows you to display and set all the operating parameters of the chiller. Password-protected menus limit the access to the user's parameters.

The microprocessor board is installed inside the electrical panel. All the components of the chiller are electrically connected to the microprocessor board.








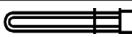













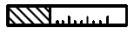






The electronic controller is equipped with a door for the sequencing with another regulator, to reduce or optimise the chiller operation.

Moreover, it is possible to connect the electronic controller to supervision and monitoring systems via TTL output.

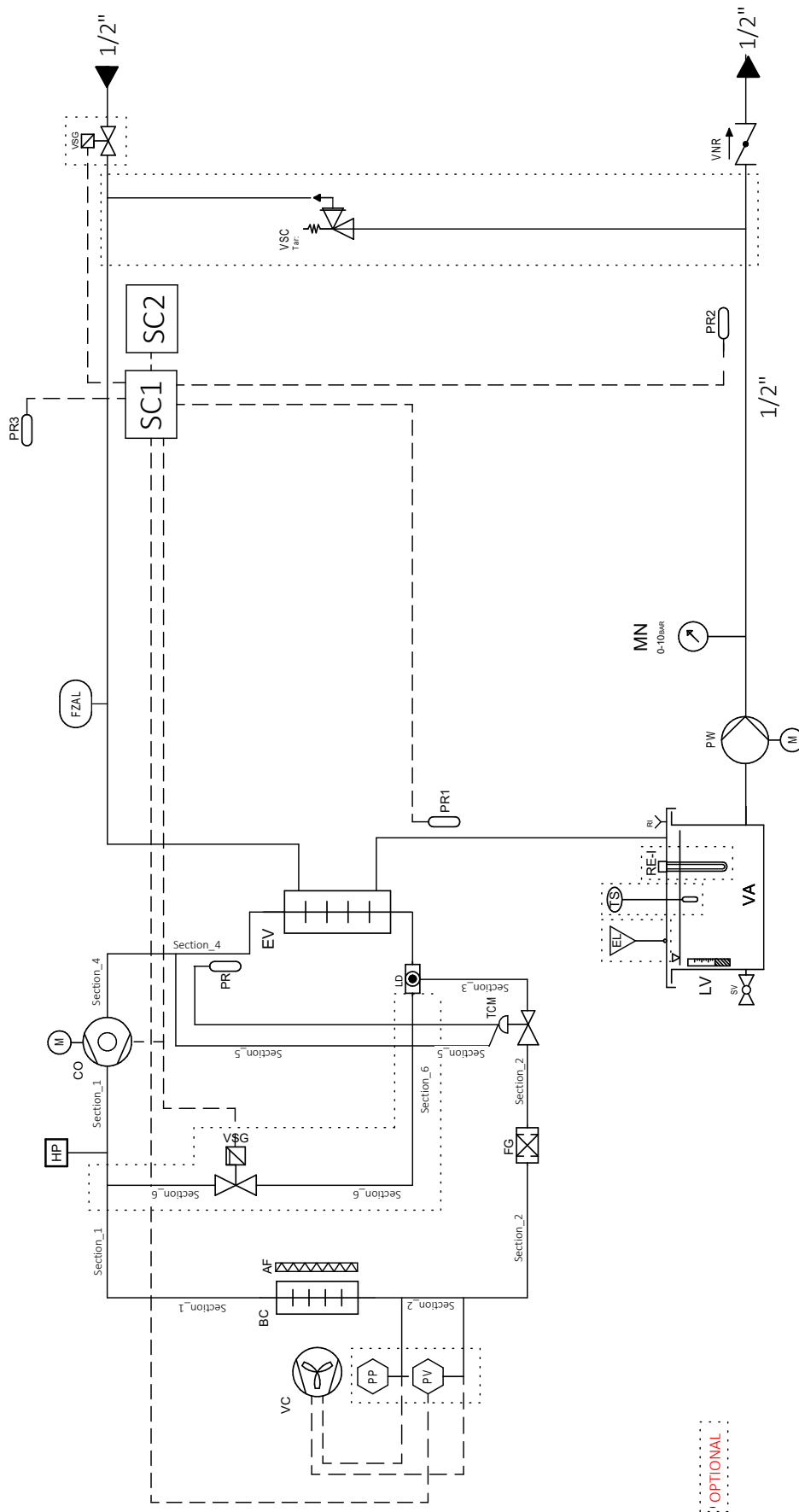
As optional, the power and signal connector (male + female) can be installed on the rear side of the chiller in correspondence of the corrugated sheaths.

5.10. Hydro-cooling circuits

5.10.1 Legend

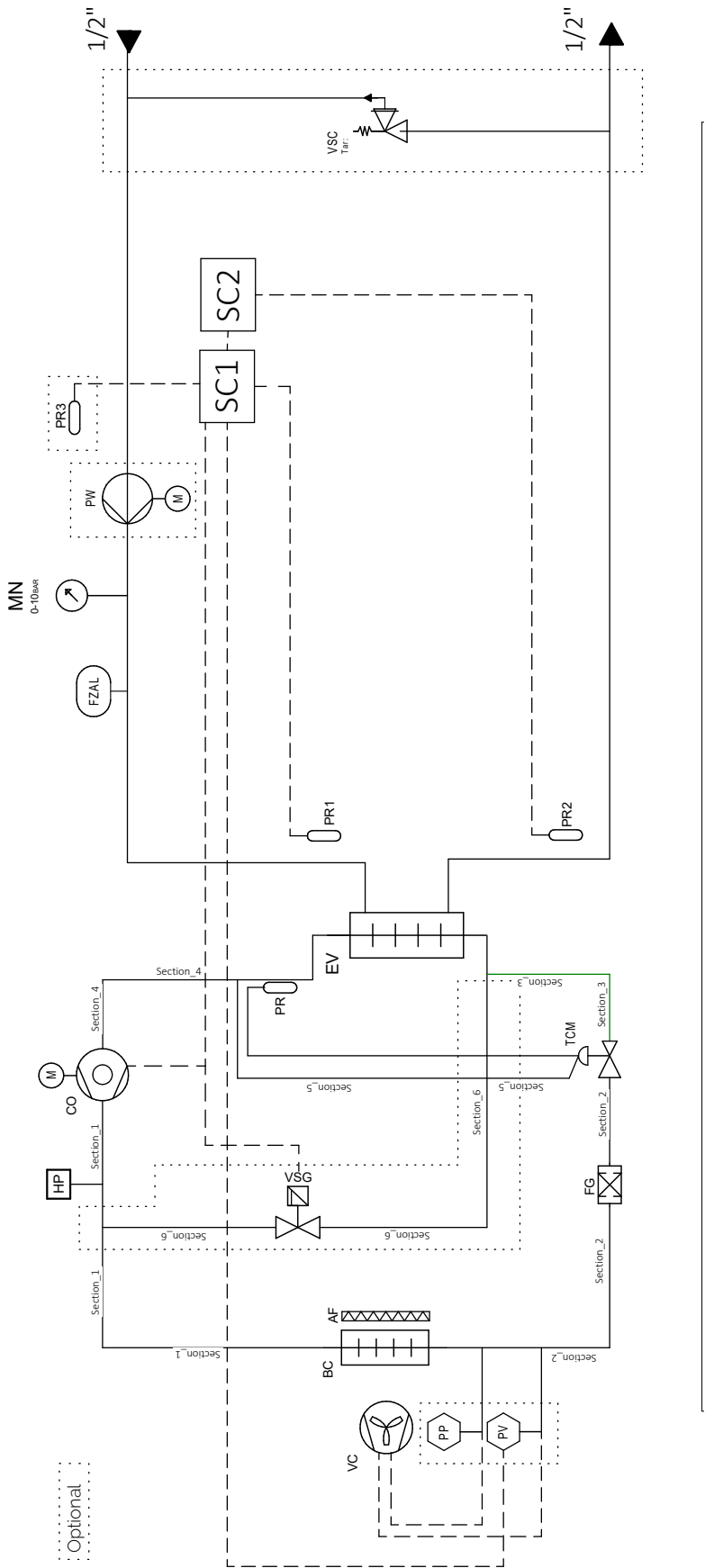
| Nomenc. | Symbol | Meaning | Nomenc. | Symbol | Meaning |
|-------------|---|--------------------------------|-------------|--|--------------------------------------|
| |  | Refrigerant line | PR |  | Probe |
| |  | Direction flow | PV |  | Check of fan speed |
| AF |  | Air filter | PW |  | Water pump |
| BC |  | Condenser | RE-I |  | Resistance |
| CO |  | Compressor | RI |  | Filling cap |
| EL |  | Electrical level | SC |  | SC1 = SEC.Blue board SC2 = Keypad |
| EV |  | Evaporator | SV |  | Tank discharge |
| FG |  | Refrigerant filter | TCM |  | Mechanical thermostatic valve |
| FZAL |  | Flow switch | TS |  | Limit thermostat |
| HP |  | High pressure switch | VA | | Tank |
| LD |  | Gas injector | VC |  | Condenser fan |
| LV |  | Visual level | VNR |  | Non-return valve |
| M |  | Motor | VSC |  | Safety valve with spring reload |
| MN |  | Manometer | VSG |  | Valve gas vent |
| PP |  | Partialization pressure switch | | | |

Complete hydro-cooling circuit diagram



| ø_Pipe | | | | | | |
|------------------|----------------|-------------|------------------|--------------|-------------------|-----------------|
| | Discharge line | Liquid line | Expansion device | Suction line | Equalization pipe | Hot gas by pass |
| WLA 02/03 | ø 8 | ø 6 | ø 8 | ø 10 | ø 6 | ø 8 |
| WLA 05/08 | ø 10 | ø 6 | ø 8 | ø 12 | ø 6 | ø 8 |
| WLA 10/13 | ø 12 | ø 8 | ø 10 | ø 14 | ø 6 | ø 8 |

Complete hydro-cooling circuit diagram without tank



| ø_Pipe | | | | | |
|-----------|----------------|-------------|------------------|--------------|-------------------|
| | Discharge line | Liquid line | Expansion device | Suction line | Equalization pipe |
| WLA 02/03 | ø 8 | ø 6 | ø 8 | ø 10 | ø 6 |
| WLA 05/08 | ø 10 | ø 6 | ø 8 | ø 12 | ø 6 |
| WLA 10/13 | ø 12 | ø 8 | ø 10 | ø 14 | ø 6 |

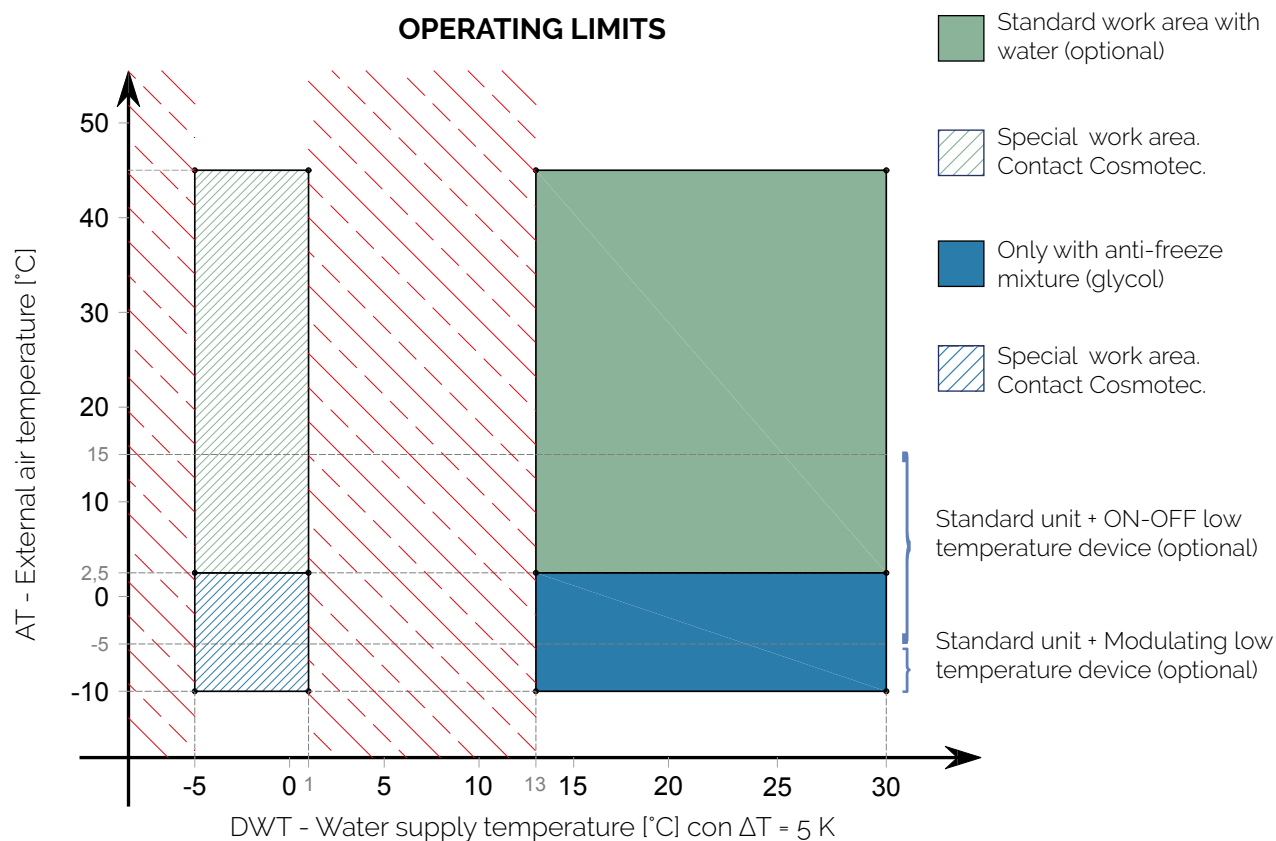
6. Technical data

6.1. Application limits

The COSMOTEC WLA Compact chillers have been designed to store and operate within the limits described in this paragraph.

The warranty becomes void and null immediately if these limits are not complied with.

Contact the manufacturer if the temperature of the fluid to be cooled is required to be outside the defined limits.



| Pure water values at 50Hz | WLA02 | WLA03 | WLA05 | WLA08 | WLA10 | WLA13 |
|---------------------------|-------|-------|-------|-------|-------|-------|
| Water flow [l/min] | 4 | 4,6 | 7,2 | 9,3 | 11,8 | 14,5 |
| Load loss [kPa] | 12 | 15,3 | 10,5 | 16,4 | 25,0 | 36,3 |

i INFORMATION

The maximum and minimum flow rate values have been calculated considering a temperature difference between evaporator inlet and outlet equal to 5°C. The operation of the heat exchanger is guaranteed if these limits are respected.

Power supply: 230/1/50

Voltage: 230 V ± 5% ⁽¹⁾

Frequency: 50 Hz ± 1%

Power supply: 230/1/60

Voltage: 230 V ± 5% ⁽¹⁾

Frequency: 60 Hz ± 1%

Power supply: 400/3/50

Voltage: 400 V ± 5% ⁽¹⁾

Frequency: 50 Hz ± 1%

Power supply: 460/3/60


Voltage: 460 V ± 5% ⁽¹⁾

Frequency: 60 Hz ± 1%

Storage limit temperature: min -10°C / max + 60°C

6.2. Features of primary fluid


In this unit its possible to use tap water which respects the values reported in the table below. We recommend the use of premixed fluid COSMOTEC No frost N25 / N39 or COSMOTEC No frost L38. Alternatively its possible to use Clariant Antifrogen N or Clariant Antifrogen L, respecting the concentrations recommended in the data sheet of the product.

 INFORMATION


Check the manual Part II* for any changes..

Using other mixtures could invalidate the chiller warranty..


| Features | | Minimum value | Maximum value |
|--|-------|---------------|---------------|
| pH ^(*) | | 7,0 | 8,0 |
| Total hardness ^(*) | °F | 13 | 35 |
| Conductivity ^(*) | µS/cm | 200 | 350 |
| Alkalinity (HCO3) ^(*) | mg/L | 200 | 300 |
| (*) Considering water at temperature +20°C | | | |

 WARNING

For water coming out from the unit with temperature equal to or less than +5°C and in environments where the temperature is below 0°C, using water/glycol mixtures


 INFORMATION

The mixture with glycol modifies the performance of the unit.

 WARNING

The chiller cannot be used out of limits specified in the technical nameplate.

6.2.1 Glycol correction factors

 INFORMATION

In the case of addition of glycol in the fluid to be cooled, the technical data contained in this paragraph shall be adjusted according to the coefficients shown in the following table.

| Features | | Percentage of ethylene glycol | | Percentage of propylene glycol |
|--|---|-------------------------------|-------|--------------------------------|
| | | 20% | 30% | 30% |
| Freezing temperature | [°C] | -8,9 | -15,6 | -12,2 |
| Cooling capacity | Correction factors on the technical data sheets | 0,990 | 0,984 | 0,974 |
| Power absorbed | | 0,997 | 0,996 | 0,993 |
| Flow of fluid to be cooled | | 1,033 | 1,068 | 1,017 |
| Pressure drop on the fluid to be cooled side | | 1,16 | 1,30 | 1,23 |

6.3. Technical data

1. Nominal conditions

| Model | Base |
|---|------------|
| Temperature of the fluid to be cooled at the evaporator inlet [°C] | 20 |
| Temperature of the fluid to be cooled at the evaporator outlet [°C] | 15 |
| External air temperature to the condenser [°C] | 32 |
| Fluid to be cooled (composition referred to the weight) | Water 100% |

2. Sound pressure level is measured according to Normative EN-ISO 9614 and declared at the following conditions:

- In free field;
- With the unit on reflecting base;
- With unit working in nominal conditions.

i INFORMATION

In the sound pressure level declared is considered the contribution of standard circulation pump.

3. Inrush current = Compressor inrush current + max working current of the fan + max current of working pump

Notes on technical data:

⁽¹⁾ Values referred to:

- Return fluid temperature: 20°C
- Supply fluid temperature: 15°C
- External air temperature: 32°C

⁽²⁾ Sound pressure level (non-binding datum) obtained by sound power level, according to Normative EN ISO 3744 and declared at the following conditions: at 1 m distance from the unit, in free field, with the unit on a reflecting base, with the unit working in nominal conditions and at full load, for standard unit (no options).

⁽³⁾ Inrush current= Inrush current Compressor + max working current of the fan + max current of working pump

⁽⁴⁾ standard circuit without accessories. Fluid: pure water

⁽⁵⁾ weight tolerance $\pm 10\%$

Standard technical data sheet. Verify on **MANUAL PART 2** possible modifications

| | | WLA02 | | WLA03 | |
|--|--------|--------------------|----------|--------------------|----------|
| Cooling capacity ⁽¹⁾ | W | 1412 | | 1605 | |
| Sound pressure level at 1 m ^{(1) (2)} | dB(A) | 64,1 | | 64,1 | |
| Refrigerant | | R134a | | R134a | |
| N° of refrigerant circuits | | 1 | | 1 | |
| Nominal power supply | V/-/Hz | 230-1-50 | 230-1-60 | 230-1-50 | 230-1-60 |
| Max power absorbed with standard pump | W | 1294 | 1454 | 1304 | 1584 |
| Max current absorbed with standard pump | A | 8,39 | 8,58 | 8,51 | 8,85 |
| Inrush current con Standard pump ⁽³⁾ | A | 23,31 | 24,00 | 23,31 | 24,00 |
| Transport weight (no tank, no pump, no accessories) ⁽⁵⁾ | kg | 43,5 | | 43,5 | |
| Transport weight (Tank, P3 pump, no accessories) ⁽⁵⁾ | kg | 54,3 | | 54,3 | |
| Operating weight (Tank, P3 pump, no accessories) ⁽⁵⁾ | kg | 62,3 | | 62,3 | |
| Height | mm | 477 | | 477 | |
| Width | mm | 601 | | 601 | |
| Depth | mm | 517 | | 517 | |
| Compressor | | | | | |
| N° | | 1 | | 1 | |
| Compressor type | | Alternative piston | | Alternative piston | |
| Max power absorbed | kW | 0,75 | 0,71 | 0,76 | 0,84 |
| Max current absorbed | A | 4,39 | 3,87 | 4,50 | 4,13 |
| Inrush current | A | 19,7 | 19,7 | 19,7 | 19,7 |
| Axial fan | | | | | |
| N° | | 1 | | 1 | |
| Fan diameter | mm | 250 | | 250 | |
| Freeblowing air flow | m³/h | 1820 | 1970 | 1820 | 1970 |
| Power absorbed | W | 134 | 164 | 134 | 164 |
| Current absorbed | A | 0,71 | 0,80 | 0,71 | 0,80 |
| Evaporator | | | | | |
| Flow rate of the fluid to be cooled ⁽¹⁾ | l/min | 4,0 | | 4,6 | |
| Load loss from the side of the fluid to be cooled ⁽¹⁾ | kPa | 12,0 | | 15,3 | |
| Flow rate of the fluid to be cooled min/max (3 ÷ 7K) | l/min | 3,0 ÷ 7,2 | | 3,0 ÷ 8,2 | |
| Flow rate of the fluid to be cooled @60Hz | l/min | 4,5 | | 5,2 | |
| Accumulation tank | | | | | |
| Tank capacity | l | 8 | | 8 | |
| Standard pump | | | | | |
| Max power absorbed | W | 410 | 580 | 410 | 580 |
| Max current absorbed | A | 1,90 | 2,50 | 1,90 | 2,50 |
| Max pressure head | kPa | 260 | 350 | 260 | 350 |
| Medium / High prevalence pump | | | | | |
| Max power absorbed | W | 920 | 1300 | 920 | 1300 |
| Max current absorbed | A | 5,00 | 6,00 | 5,00 | 6,00 |
| Max pressure head | kPa | 420 | 600 | 420 | 600 |

| | | WLA05 | | | |
|--|--------|-------------|----------|-------------|----------|
| Cooling capacity ⁽¹⁾ | W | 2504 | | | |
| Sound pressure level at 1 m ^{(1) (2)} | dB(A) | 61,9 | | | |
| Refrigerant | R134a | | | | |
| N° of refrigerant circuits | 1 | | | | |
| Nominal power supply | V/-/Hz | 230-1-50 | 230-1-60 | 400-3-50 | 460-3-60 |
| Max power absorbed with standard pump | W | 1844 | 2424 | 1804 | 2374 |
| Max current absorbed with standard pump | A | 10,72 | 12,92 | 8,62 | 9,77 |
| Inrush current con Standard pump ⁽³⁾ | A | 28,71 | 28,80 | 18,7 | 20,8 |
| Transport weight (no tank, no pump, no accessories) ⁽⁵⁾ | kg | 58,5 | | 58,5 | |
| Transport weight (Tank, P3 pump, no accessories) ⁽⁵⁾ | kg | 75,4 | | 75,4 | |
| Operating weight (Tank, P3 pump, no accessories) ⁽⁵⁾ | kg | 95,4 | | 95,4 | |
| Height | mm | 527 | | 527 | |
| Width | mm | 801 | | 801 | |
| Depth | mm | 632 | | 632 | |
| Compressor | | | | | |
| N° | | 1 | | 1 | |
| Compressor type | | rotary vane | | rotary vane | |
| Max power absorbed | kW | 0,79 | 0,96 | 0,75 | 0,91 |
| Max current absorbed | A | 3,50 | 4,50 | 1,50 | 1,50 |
| Inrush current | A | 22,0 | 21,0 | 12,0 | 13,0 |
| Axial fan | | | | | |
| N° | | 1 | | 1 | |
| Fan diameter | mm | 250 | | 250 | |
| Freeblowing air flow | m³/h | 1820 | 1970 | 1820 | 1970 |
| Power absorbed | W | 134 | 164 | 134 | 164 |
| Current absorbed | A | 0,71 | 0,80 | 0,71 | 0,80 |
| Evaporator | | | | | |
| Flow rate of the fluid to be cooled ⁽¹⁾ | L/min | 7,2 | | 7,2 | |
| Load loss from the side of the fluid to be cooled ⁽¹⁾ | kPa | 10,5 | | 10,5 | |
| Flow rate of the fluid to be cooled min/max (3 ÷ 7K) | L/min | 4,8 ÷ 13,0 | | 4,8 ÷ 13,0 | |
| Flow rate of the fluid to be cooled @60Hz | L/min | 8,0 | | 8,0 | |
| Accumulation tank | | | | | |
| Tank capacity | l | 20 | | | |
| Standard pump | | | | | |
| Max power absorbed | W | 920 | 1300 | 920 | 1300 |
| Max current absorbed | A | 5,00 | 6,00 | 5,00 | 6,00 |
| Max pressure head | kPa | 420 | 600 | 420 | 600 |
| Medium / High prevalence pump | | | | | |
| Max power absorbed | W | 920 | 1300 | 920 | 1300 |
| Max current absorbed | A | 5,00 | 6,00 | 5,00 | 6,00 |
| Max pressure head | kPa | 660 | 860 | 660 | 860 |

Standard technical data sheet. Verify on **MANUAL PART 2** possible modifications

Standard technical data sheet. Verify on **MANUAL PART 2** possible modifications

| | | WLAo8 | | | |
|--|--------|-------------|----------|-------------|----------|
| Cooling capacity ⁽¹⁾ | W | 3242 | | | |
| Sound pressure level at 1 m ^{(1) (2)} | dB(A) | 61,9 | | | |
| Refrigerant | R134a | | | | |
| N° of refrigerant circuits | 1 | | | | |
| Nominal power supply | V/-/Hz | 230-1-50 | 230-1-60 | 400-3-50 | 460-3-60 |
| Max power absorbed with standard pump | W | 2064 | 2704 | 2074 | 2734 |
| Max current absorbed with standard pump | A | 11,77 | 13,97 | 9,67 | 10,71 |
| Inrush current con Standard pump ⁽³⁾ | A | 36,71 | 37,80 | 26,71 | 25,80 |
| Transport weight (no tank, no pump, no accessories) ⁽⁵⁾ | kg | 58,5 | | 58,5 | |
| Transport weight (Tank, P3 pump, no accessories) ⁽⁵⁾ | kg | 75,4 | | 75,4 | |
| Operating weight (Tank, P3 pump, no accessories) ⁽⁵⁾ | kg | 95,4 | | 95,4 | |
| Height | mm | 527 | | 527 | |
| Width | mm | 801 | | 801 | |
| Depth | mm | 632 | | 632 | |
| Compressor | | | | | |
| N° | | 1 | | 1 | |
| Compressor type | | rotary vane | | rotary vane | |
| Max power absorbed | kW | 1,01 | 1,24 | 1,02 | 1,27 |
| Max current absorbed | A | 4,50 | 5,50 | 2,50 | 2,40 |
| Inrush current | A | 30,0 | 30,0 | 20,0 | 18,0 |
| Axial fan | | | | | |
| N° | | 1 | | 1 | |
| Fan diameter | mm | 250 | | 250 | |
| Freeblowing air flow | m³/h | 1820 | 1970 | 1820 | 1970 |
| Power absorbed | W | 134 | 164 | 134 | 164 |
| Current absorbed | A | 0,71 | 0,80 | 0,71 | 0,80 |
| Evaporator | | | | | |
| Flow rate of the fluid to be cooled ⁽¹⁾ | L/min | 9,3 | | 9,3 | |
| Load loss from the side of the fluid to be cooled ⁽¹⁾ | kPa | 16,4 | | 16,4 | |
| Flow rate of the fluid to be cooled min/max (3 ÷ 7K) | L/min | 6,2 ÷ 16,5 | | 6,2 ÷ 16,5 | |
| Flow rate of the fluid to be cooled @60Hz | L/min | 10,4 | | 10,4 | |
| Accumulation tank | | | | | |
| Tank capacity | l | 20 | | | |
| Standard pump | | | | | |
| Max power absorbed | W | 920 | 1300 | 920 | 1300 |
| Max current absorbed | A | 5,00 | 6,00 | 5,00 | 6,00 |
| Max pressure head | kPa | 420 | 600 | 420 | 600 |
| Medium / High prevalence pump | | | | | |
| Max power absorbed | W | 920 | 1300 | 920 | 1300 |
| Max current absorbed | A | 5,00 | 6,00 | 5,00 | 6,00 |
| Max pressure head | kPa | 660 | 860 | 660 | 860 |

| | | WLA10 | | |
|--|--------|------------|----------|----------|
| Cooling capacity ⁽¹⁾ | W | 4120 | | |
| Sound pressure level at 1 m ^{(1) (2)} | dB(A) | 71.8 | | |
| Refrigerant | R134a | | | |
| N° of refrigerant circuits | 1 | | | |
| Nominal power supply | V/-/Hz | 230-1-50 | 400-3-50 | 460-3-60 |
| Max power absorbed with standard pump | W | 3160 | 3320 | 4172 |
| Max current absorbed with standard pump | A | 17,18 | 12,55 | 13,86 |
| Inrush current con Standard pump ⁽³⁾ | A | 54.75 | 31.75 | 33.00 |
| Transport weight (no tank, no pump, no accessories) ⁽⁵⁾ | kg | 70 | | |
| Transport weight (Tank, P3 pump, no accessories) ⁽⁵⁾ | kg | 86.9 | | |
| Operating weight (Tank, P3 pump, no accessories) ⁽⁵⁾ | kg | 96.9 | | |
| Height | mm | 527 | | |
| Width | mm | 801 | | |
| Depth | mm | 632 | | |
| Compressor | | | | |
| N° | 1 | | | |
| Compressor type | scroll | | | |
| Max power absorbed | kW | 1.94 | 2.1 | 2.51 |
| Max current absorbed | A | 8,61 | 4,20 | 4,20 |
| Inrush current | A | 47,0 | 24,0 | 24,0 |
| Axial fan | | | | |
| N° | 1 | | | |
| Fan diameter | mm | 300 | | |
| Freeblowing air flow | m³/h | 3415 | 3415 | 3745 |
| Power absorbed | W | 300 | 300 | 362 |
| Current absorbed | A | 1.75 | 1.75 | 2,00 |
| Evaporator | | | | |
| Flow rate of the fluid to be cooled ⁽¹⁾ | l/min | 11,8 | | |
| Load loss from the side of the fluid to be cooled ⁽¹⁾ | kPa | 25 | | |
| Flow rate of the fluid to be cooled min/max (3 ÷ 7K) | l/min | 8,0 ÷ 21,5 | | |
| Flow rate of the fluid to be cooled @60Hz | l/min | 13,2 | | |
| Accumulation tank | | | | |
| Tank capacity | l | 20 | | |
| Standard pump | | | | |
| Max power absorbed | W | 920 | 920 | 1300 |
| Max current absorbed | A | 5,00 | 5,00 | 6,00 |
| Max pressure head | kPa | 420 | 420 | 600 |
| Medium / High prevalence pump | | | | |
| Max power absorbed | W | 920 | 920 | 1300 |
| Max current absorbed | A | 5,00 | 5,00 | 6,00 |
| Max pressure head | kPa | 660 | 660 | 860 |

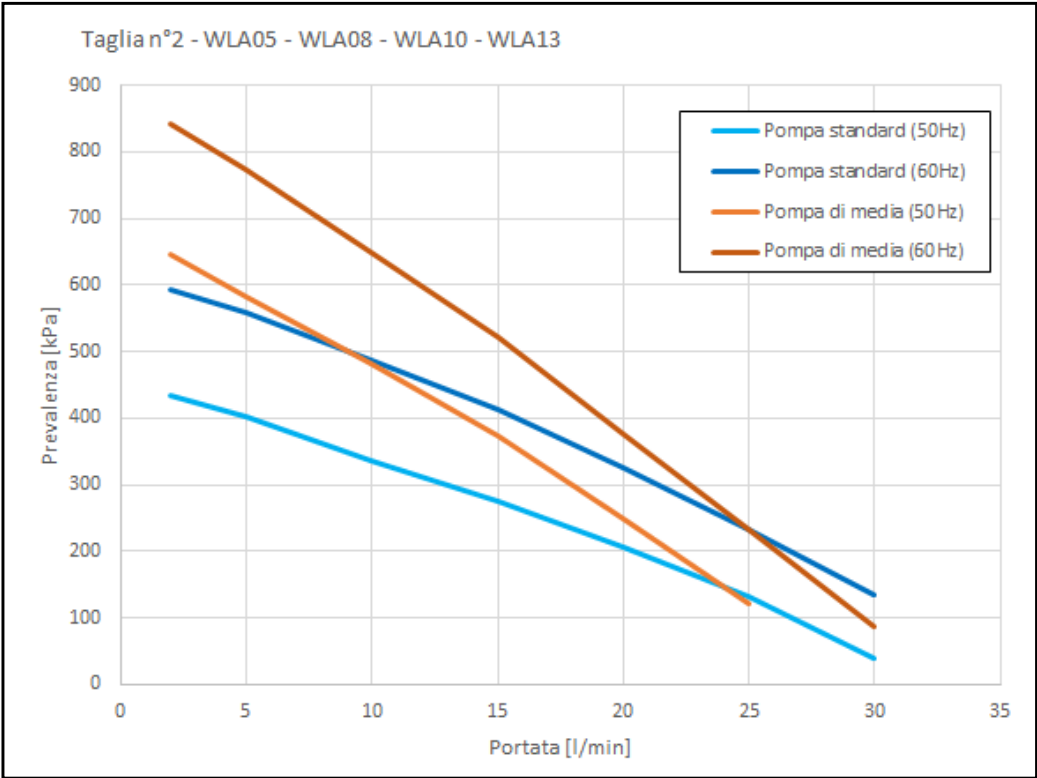
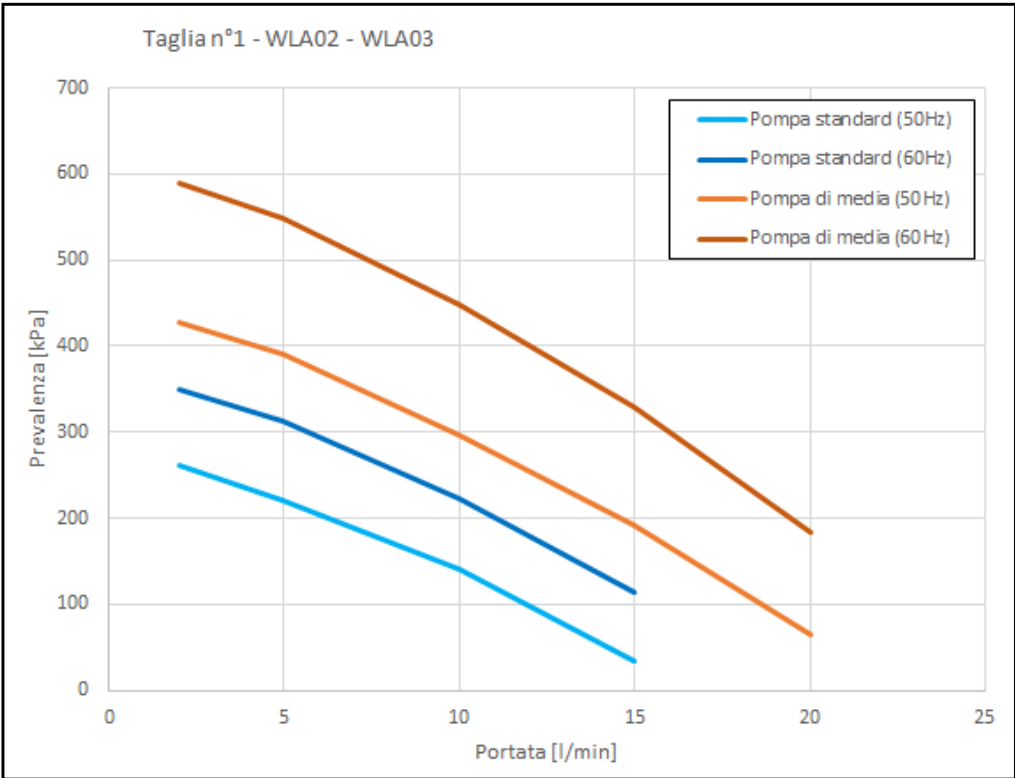
Standard technical data sheet. Verify on **MANUAL PART 2** possible modifications

Standard technical data sheet. Verify on **MANUAL PART 2** possible modifications

| | | WLA13 | | |
|--|--------|------------|----------|----------|
| Cooling capacity ⁽¹⁾ | W | 5050 | | |
| Sound pressure level at 1 m ^{(1) (2)} | dB(A) | 71.8 | | |
| Refrigerant | | R134a | | |
| N° of refrigerant circuits | | 1 | | |
| Nominal power supply | V/-/Hz | 230-1-50 | 400-3-50 | 460-3-60 |
| Max power absorbed with standard pump | W | 3760 | 3790 | 4742 |
| Max current absorbed with standard pump | A | 20,72 | 13.49 | 14,81 |
| Inrush current con Standard pump ⁽³⁾ | A | 68,75 | 39.75 | 41,00 |
| Transport weight (no tank, no pump, no accessories) ⁽⁵⁾ | kg | 75.5 | | |
| Transport weight (Tank, P3 pump, no accessories) ⁽⁵⁾ | kg | 92.4 | | |
| Operating weight (Tank, P3 pump, no accessories) ⁽⁵⁾ | kg | 112.4 | | |
| Height | mm | 527 | | |
| Width | mm | 801 | | |
| Depth | mm | 632 | | |
| Compressor | | | | |
| N° | | 1 | | |
| Compressor type | | scroll | | |
| Max power absorbed | kW | 2,54 | 2,57 | 3,08 |
| Max current absorbed | A | 11,98 | 5,10 | 5,10 |
| Inrush current | A | 61,0 | 32,0 | 32,0 |
| Axial fan | | | | |
| N° | | 1 | | |
| Fan diameter | mm | 300 | | |
| Freeblowing air flow | m³/h | 3415 | 3415 | 3745 |
| Power absorbed | W | 300 | 300 | 362 |
| Current absorbed | A | 1,75 | 1,75 | 2,00 |
| Evaporator | | | | |
| Flow rate of the fluid to be cooled ⁽¹⁾ | L/min | 14,5 | | |
| Load loss from the side of the fluid to be cooled ⁽¹⁾ | kPa | 36,3 | | |
| Flow rate of the fluid to be cooled min/max (3 ÷ 7K) | L/min | 9,8 ÷ 27,8 | | |
| Flow rate of the fluid to be cooled @60Hz | L/min | 16,2 | | |
| Accumulation tank | | | | |
| Tank capacity | l | 20 | | |
| Standard pump | | | | |
| Max power absorbed | W | 920 | 920 | 1300 |
| Max current absorbed | A | 5,00 | 5,00 | 6,00 |
| Max pressure head | kPa | 420 | 420 | 600 |
| Medium / High prevalence pump | | | | |
| Max power absorbed | W | 920 | 920 | 1300 |
| Max current absorbed | A | 5,00 | 5,00 | 6,00 |
| Max pressure head | kPa | 660 | 660 | 860 |

6.4. Available pressure

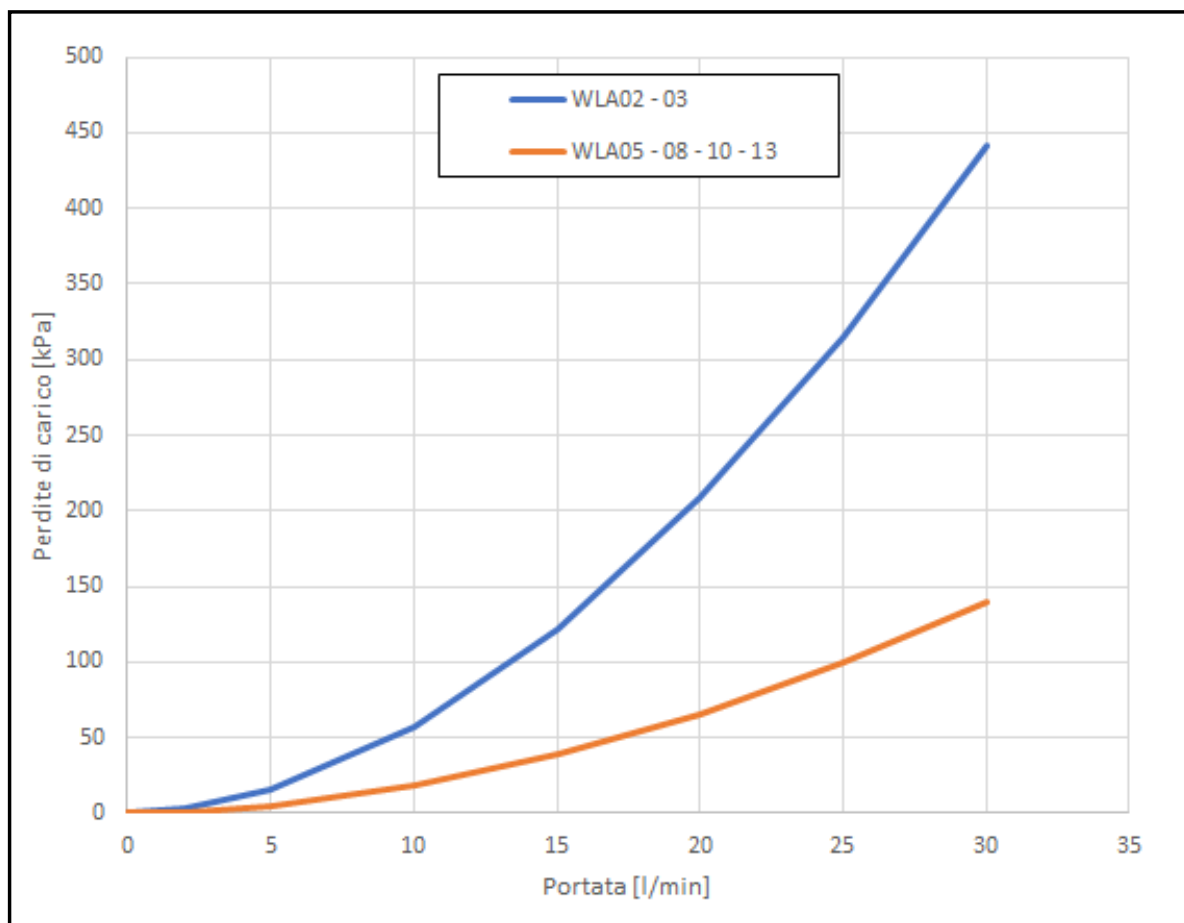
6.4.1 Available pressure standard pumps



Verify on **MANUAL PART 2** possible modifications

6.5. Pressure losses

6.5.1 Evaporator pressure losses



Verify on **MANUAL PART 2** possible modifications

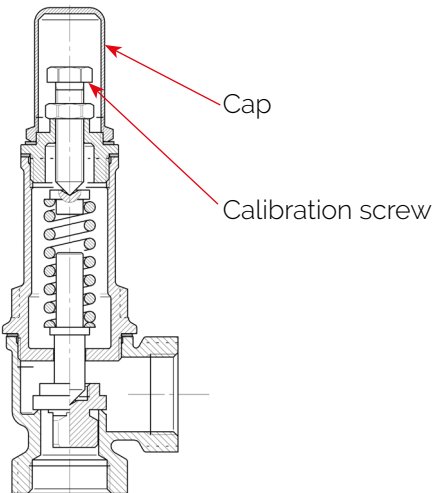
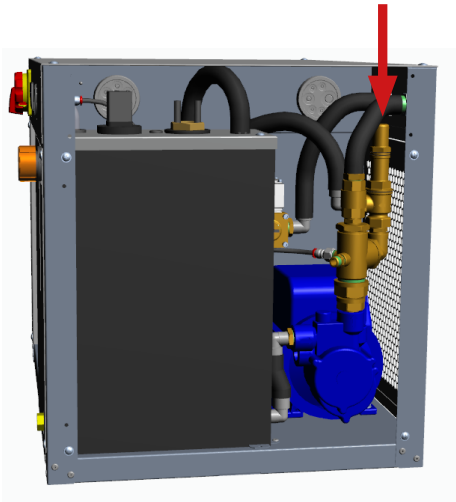
6.6. Calibration of automatic bypass

The automatic by-pass (BPA) is located on the right side of the chiller, and is accessible by removing the right panel.

The factory setting of the by-pass is for operation with pumps 50 Hz.

i INFORMATION

For the correct operation with a power supply frequency of 60 Hz it is necessary to change the calibration of the automatic by-pass according to the following table.



To calibrate the bypass:

- Remove the right side panel of the chiller
- Close the valves on the external flow pipe
- Activate the pump and on the pressure gauge display the working point
- Remove the top cap of the valve by-pass
- With chiller operating and the pump turned on, act on the calibration screw until bringing the pump within the range of correct operation
- Replace the top cap
- Open the taps on the external flow pipe.

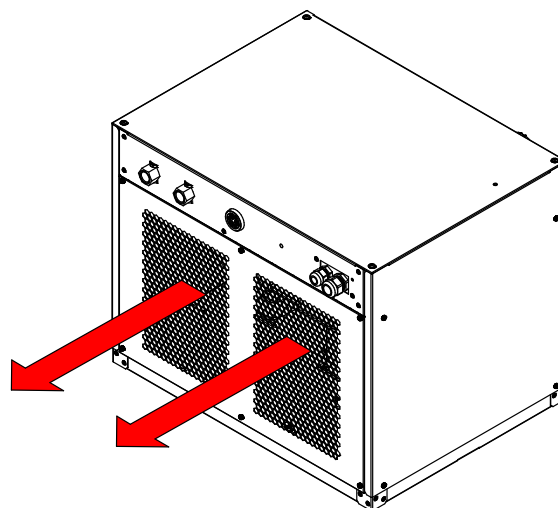
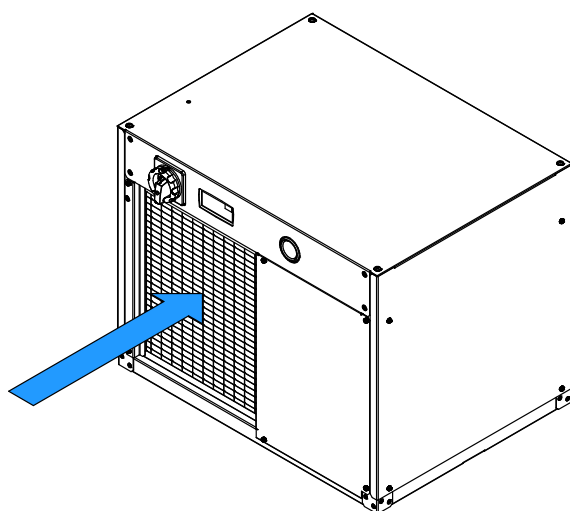
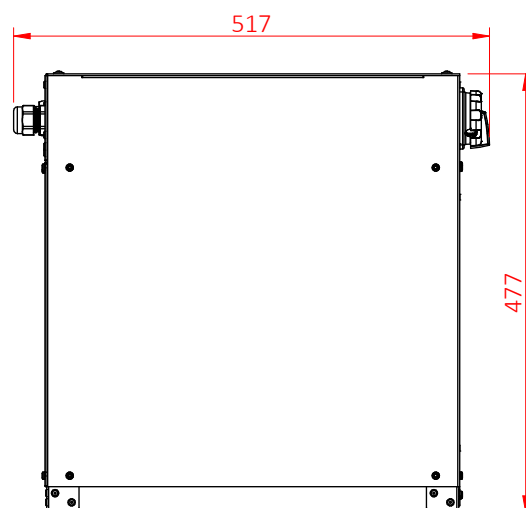
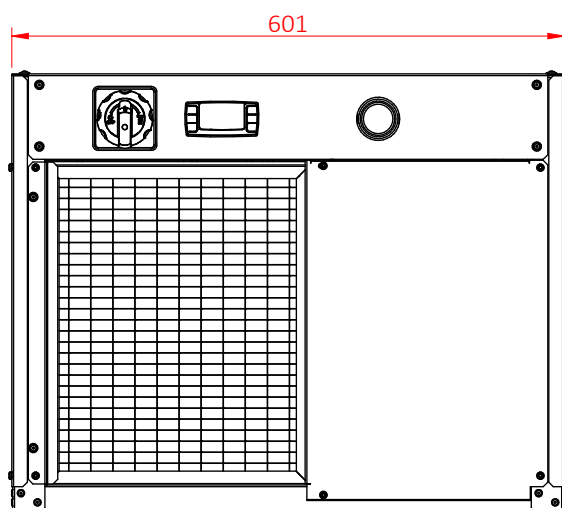
Below the setting values of the automatic by-pass recommended by the manufacturer:

| | WLA02 | | WLA03 | | WLA05 | |
|----------------------------|-------|-------|-------|-------|-------|-------|
| | 50 Hz | 60 Hz | 50 Hz | 60 Hz | 50 Hz | 60 Hz |
| Standard pump [bar] | 2,6 | 3,3 | 2,5 | 3,2 | 3,7 | 4,8 |
| Medium pressure pump [bar] | 4,2 | 5,8 | 4,1 | 5,8 | 5,0 | 6,8 |

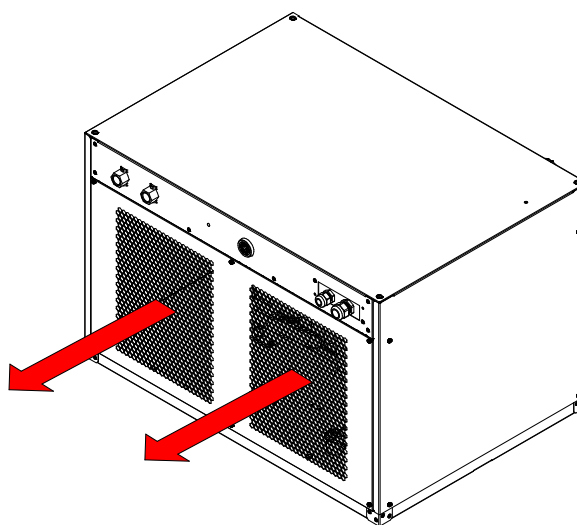
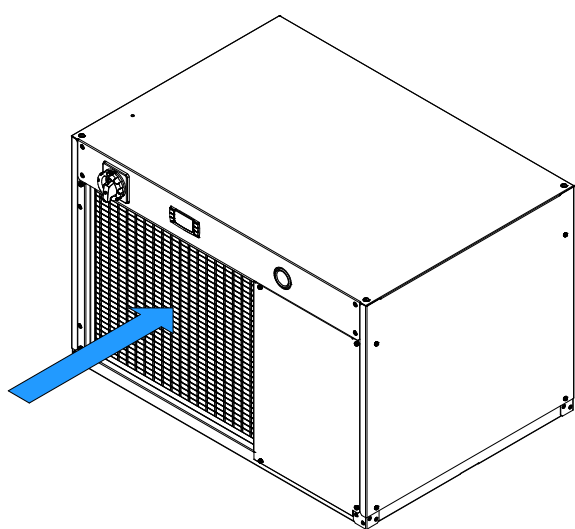
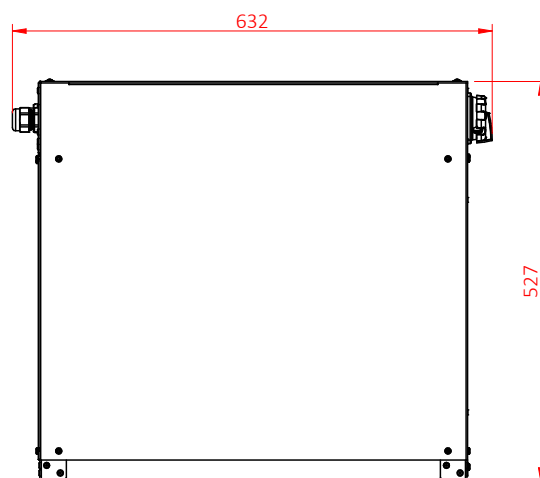
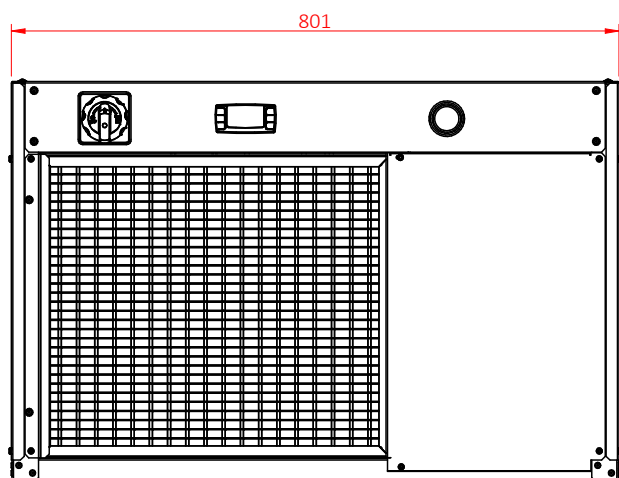
| | WLA08 | | WLA10 | | WLA13 | |
|----------------------------|-------|-------|-------|-------|-------|-------|
| | 50 Hz | 60 Hz | 50 Hz | 60 Hz | 50 Hz | 60 Hz |
| Standard pump [bar] | 3,7 | 4,8 | 3,5 | 4,5 | 3,5 | 4,5 |
| Medium pressure pump [bar] | 5,0 | 6,8 | 4,5 | 6,0 | 4,5 | 6,0 |

6.7. Dimensional drawings

WLA 02 - 03



WLA 05 - 08 - 10 - 13



7. Installation

To install the air conditioner, comply with the Directives indicated at the beginning of chapter "Safety".

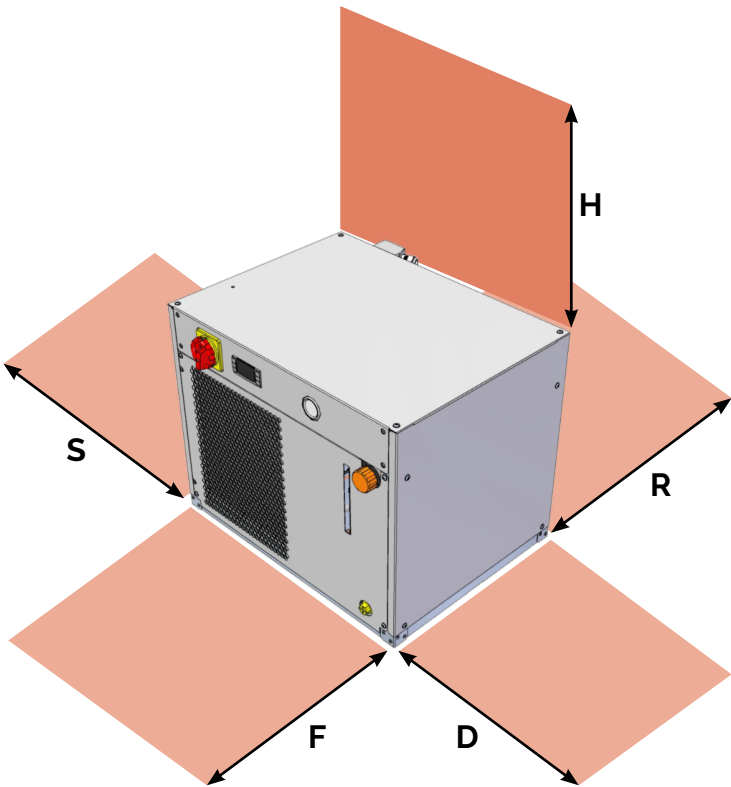
7.1. Positioning

Pay attention to the following factors to identify the chiller installation site.

- The unit should not be positioned downstream heat sources or dirt, in relation to the wind direction. Particles of grease and dust in the air would deposit on the condenser fins, reducing the heat transmission efficiency.
- Sites subject to heavy snow or sand accumulation, as well as flooding, are not suitable for installation. To prevent snow or sand accumulation, you can install protection devices provided that they do not obstruct free maintenance spaces.
- Moreover, make sure that the site does not favour air short-circuits between discharge and condenser recovery.
- If the unit is installed on the ground, the soil must not be soft or crumbly.
- According to the drawings shown in paragraph other chillers. 6.7, check the compliance with the free spaces for maintenance and air circulation, by means of the condenser, suction, and expulsion. Moreover, check the minimum distance from obstacles or

The support surface must be perfectly horizontal and capable to withstand the weight of the chiller during operation (data indicated in the technical sheets, paragraph 6.3 safely. The dimensions of the support base must be larger compared to the plan dimensions of the chiller.

7.1.1 Minimum distance from obstacles or other chillers



| | WLA 02-03 | WLA 05-08-10-13 |
|---|-----------|-----------------|
| S | 200 | 300 |
| F | 500 | 500 |
| D | 300 | 300 |
| R | 500 | 500 |
| H | 250 | 250 |

7.2. Hydraulic connections

The minimum equipment required for the external hydraulic circuit are:

- Pipes with diameter equal to the diameter of the circuit connections, indicated in the hydraulic diagrams in paragraph 5.10.
- Two shut-off valves to isolate the chiller from the system in correspondence of the inlet and outlet hydraulic connections.
- System draining valves in its lowest points.
- Flexible couplings to join the chiller external hydraulic circuit.
- A filter on the chiller inlet return pipe, with metal mesh of $50 \div 80 \mu\text{m}$.
- Suitable insulation on the pipes to prevent condensation and reduce thermal on the circuit.

WARNING

Before connecting the chiller to the utility, make sure that the pipes used do not contain dirt or processing residues; if in doubt, perform one or more washing cycles.

The position of the hydraulic connections is shown in the dimensional drawings in paragraph 6.7. Remove the protective plugs from the connections and connect the pipes of the external hydraulic circuit complying with the inlet and outlet direction of the chiller. The inlet and outlet of the hydraulic circuit are marked with the labels shown on paragraph 2.2.

7.3. Electrical connections

DANGER

Before performing any operation on electrical parts, make sure that there is no voltage. Make sure that the earthing system of the unit is efficient.

- Make sure that the power supply matches with that indicated in the data plate of the chiller (voltage, phase number, frequency) and that the values are not out of the range indicated in paragraph 6.1.
- Moreover, the phase-to-phase unbalance rate should never exceed 2%. The phase-to-phase unbalance rate is determined by measuring the voltage differences between phases. The average value of the voltage differences should never exceed 8 V.
- Select the power cables according to the total inrush current of the unit, which is indicated in the technical sheets in paragraph 6.3.
- A disconnection switch with protection having the same tripping curve of the main disconnection switch on board the unit must be installed on the distribution panel upstream the power cables (refer to the electrical diagram attached to the documentation). The tripping value of this disconnection switch must be selected according to the length of the power supply lines and to the Standards in force in the country of installation.
- Identify the holes for the passage of power and signal cables placed on the rear of the unit.
- Set the main disconnection switch to position 0. After this operation, you will be able to open the covering panels of the electrical compartment to complete the connections.
- Connect the power cable, suitably sized, to the electrical panel, following the electrical diagram supplied together with the unit documentation.
- Connect the earth cable to the PE clamp on the chiller electrical panel.
- Some digital outputs of the electronic control are available to signal alarms and unit status. The assignment of the outputs to the various alarms and status can be configured. The factory configuration is shown in the connection diagram, which is part of the unit electrical diagram. Upon request, connect these signals according to the indications.
- Connect the external ON-OFF control, or other external devices (if provided), according to the electrical diagram.

WARNING

To use the chiller with 460V/3/60Hz three-phase power supply, modify the electrical connection of the winding secondary transformer. See the electrical diagram shown in "MANUAL PART II" for the modifications to be applied.

As default setting, the digital inputs for any customer's device (e.g. remote ON-OFF control) are disabled. If installed, inform the person in charge of commissioning about the necessity to enable the corresponding digital inputs.

7.3.1 Check the sequence of the phases

INFORMATION

This function is available only for chillers with three-phase power supply (400/3/50 or 460/3/60) and rotary compressor (WLA05 - 08 - 10 - 13)

Once you have closed the protection panels of the electric compartment, close the main disconnecting switch by setting it to position I. If the sequence of the power supply phases is incorrect, a phase is missing or voltage is too low, the compressor doesn't start.

The display doesn't show any alarm.

If within 30 seconds the compressors don't start, check the sequence of the phases.

Check the phase voltage on all the power supply phases. If this is correct, the phase sequence must be modified. Therefore, switch the connection of two phases of the power supply on the unit terminals.

Once this operation is complete, make sure that the display shows the unit in OFF status and open the main switch.

7.4. Commissioning preliminary operations

The operations to be performed before commissioning must be carried out by the installers according to their field of expertise. The commissioning preliminary operations must be performed maximum two days before commissioning.

Check correct installation

Make sure that the unit has been installed as described in chapter "7. Installation".

- Make sure that the hydraulic connections are correct and comply with the indications of the circuit inlet and outlet positioned near the chiller connectors.
- Make sure that the refrigerant does not leak.
- With the main disconnection switch open (position 0), access the electrical panel by opening the covering panels.
- Make sure that the power supply and earthing cables are connected firmly to the respective terminals.
- Make sure that the power supply voltage falls within the values allowed for the unit and stated in paragraph 6.3.
- Close the protection panels of the electrical panel and take the main disconnection switch of the unit to I.

Low temperature operation

As indicated in paragraph 6.1, for chiller water supply temperatures lower than 10°C and external air temperatures lower than 2.5°C, it is necessary to add an antifreeze liquid (ethylene glycol) to the water to be cooled.

The percentage of antifreeze liquid must be established according to the project values for the unit outlet water minimum temperature and for the external air minimum temperature, in compliance

with the provisions supplied by the manufacturer of the antifreeze liquid.

! WARNING

In any case, the water supply and external temperature and minimum values must be complied with, as well as the maximum percentage of glycol. These values are stated in paragraph 6.2.

The corrective coefficients of the technical data according to the percentage of glycol used are indicated in paragraph 6.2.1.

Filling the hydraulic circuit

With machine powered, but in OFF mode, fill the circuit completely with the filling cap. You can use the point indicated with RI in the chiller hydraulic diagram as filling point (see "Hydro-cooling circuits"). For the symbols, refer to "Symbols used in the manual".

! WARNING

Before starting the chiller, check the complete priming of the pump. To access the pump, remove the chiller right panel

! DANGER

Do not run the pump without water to prevent damage.

! WARNING

The requirements of the liquid to be cooled are described in paragraph 6.1. Do not contaminate the filling liquid with liquids or additives other than those indicated. Do not mix products and/or additives of different brands.

To fill the pump correctly:

- Bleed the air from the pump body (where provided). With the unit off, open the specific cap on the top of the pump body and bleed the air.
- Before starting the pump, make sure that the impeller rotates freely. If not, use a screwdriver on the slot placed on the pump shaft on the fan side to rotate the impeller in both directions until it is released.
- The pump must never run dry to prevent the mechanical and hydraulic seal from permanent damage.
- The pump must not run with the supply inlet closed to prevent the pumped liquid and motor from the risk of overheating.
- To prime the pump correctly during start-up, fill the pump body, the tank intake pipe, and the supply pipe with water. Otherwise, performance will be poor and damage may occur on the hydraulic part.

! WARNING

Once the circuit is filled, the antifreeze function is essential. Therefore, make sure that the circulation pump is powered with disconnection switch in position ON. Moreover, make sure that the consent signal from the chiller is correctly connected to the pump. Also make sure that the pump valve is open.

8. Commissioning

Only support centres authorised by the manufacturer are allowed to commission the unit. For information and quotations, contact the manufacturer technical support service (see "Contacts" at the end of this paragraph). The preliminary checks described in paragraph 7.4 are not included in the commissioning operations.

8.1. Start up

⚠ DANGER

The chiller comes already adjusted and calibrated.
The adjustments that can be modified during the start up phase are the user level access parameters.

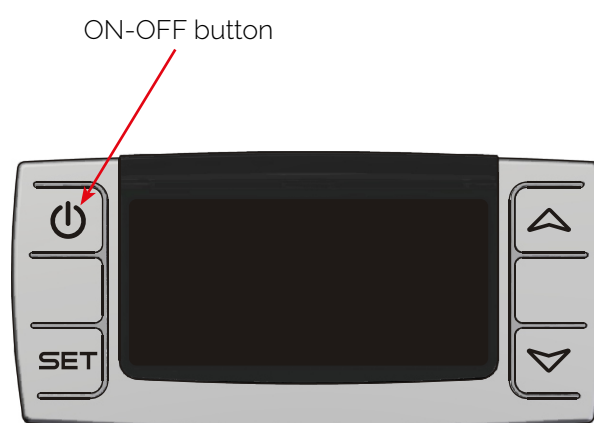
i INFORMATION

The instructions to modify the user level access parameters are found in the electronic controller manual, in the user version, together with the product documentation.

- In the event antifreeze has been added in the water circuit, the water supply temperature can drop below the limit value set by the manufacturer. Therefore, reset some parameters of the electronic controller: minimum cooling set point limit, low temperature alarm threshold, and antifreeze function. Moreover, re-calibrate the alarm threshold on the electronic controller.
- Select the water temperature value required. As default setting, the electronic controller adjusts the supply temperature (chiller outlet)
- As default setting, the digital inputs for any customer's device (e.g. remote ON-OFF control) are disabled. If there were installed, in order to do their activity correctly, enable the respective digital inputs.
- Press ON-OFF to change the unit status from OFF to ON.

i INFORMATION

If an external consent signal is provided, the electronic controller sets the unit in standby, until the consent signal is not provided.



8.2. Checks to be performed after start up

- Make sure no alarms are displayed.
- Make sure that the fan runs correctly and guarantees correct air flow to the condenser without recirculation.
- Make sure that the power supply voltage remains within the limits allowed when the unit is running.
- Make sure that the water temperature is close to the value set on the electronic controller.
- After 30 minutes of compressor operation, check the presence of leaks and proceed refilling R134a refrigerant, according to the instructions provided at paragraph 9.3.
- Make sure that the current consumed by the electrical components (compressor, fan, and pumps) falls within the maximum values indicated in the technical sheets.
- Make sure that the tank liquid level is beyond the "min" limit but not beyond the "max" limit indicated on the level indicator.
- Make sure that the work pressure detected on the pressure gauge matches with the characteristic curve of the pump installed at the power supply frequency ("6.5. Pressure losses"). If required, adjust it in order to take the pressure back to the pump operation field.
- In the presence of reduced load loss of the unit external hydraulic circuit, install a shutter on the supply pipe to take the pressure within the pump operation field. Lock the shutter until the required value is reached.

8.3. Deactivation

Deactivation for maintenance

To switch the unit off:

- Press ON-OFF on the display to stop the chiller.
- Once the chiller is OFF, disconnect the power supply from the unit setting the main disconnection switch to 0 (OFF).

DANGER

The ON-OFF button on the display keyboard is not a safety device to disconnect the power supply before start up or maintenance operations.

Emergency Plan

Disconnect the power supply from the unit using the main disconnection switch (0-OFF).

Stopping the system

In case of long periods of non-use during winter, we recommend checking the minimum ambient temperature that can be reached. If this is lower than the freezing point of the liquid introduced in the hydraulic circuit, discharge and drain the circuit completely.

9. Maintenance

9.1. Warnings

For maintenance operations, comply with the general safety rules described in paragraph 2.3. These operations can be carried out only by qualified personnel, as specified in paragraph 1.1. Remember that routine and special maintenance operations must be carried out by support centres authorised by the manufacturer.

DANGER

RISK OF EXPLOSION: avoid open flames close to refrigerant pipes when the refrigerant circuit is under pressure, regardless of the operation described in this chapter.

Before performing any operation, disconnect the chiller using the main switch. To increase safety, padlock the main disconnection switch of the chiller to O (OFF) (when possible) or expose a warning sign, such as "DO NOT RESTORE POWER SUPPLY". When the main switch is closed in position I, the components are powered anyway, even if the unit is set to OFF.

Pay attention to high temperatures of the compressor head and supply pipe (that connects the compressor to the condenser), even with machine at standstill.

Pay attention to the finned heat exchanger, as the aluminium fins are particularly sharp.

In the event some checks are performed while the unit is running (current, pressure, temperature measurements), restore the power supply via the main switch only after having closed or reinstalled all the protection panels. Once measurements are complete, immediately restore the power supply.

At the end of the operations, close or reinstall the protection panels.

Use only original spare parts to replace the unit components.

9.2. Routine maintenance

WARNING

Periodically check the chiller and its operation.

DANGER

Very little routine maintenance is necessary to keep the unit in reliable operating order and protect its moving parts. This maintenance, however, must be performed at the prescribed maintenance intervals. Failure to perform due maintenance both decreases the intended life and efficiency of the unit and also invalidates guarantee coverage. If the unit works in particularly dirty environment, like an ambient with conductive dust, it's necessary to increase maintenance frequency. Product intended life time is variable and dependent on the application (eg. On/Off cycling due to load variability, annual working hours, cleaning of exchange fluids, operating temperatures, etc.).

| Interval | Operation |
|----------------|---|
| Every month | Air circuit: cleaning of the whole module Hydraulic circuit: cleaning the filter on chiller water return (if present) Hydraulic circuit: check the level of the fluid to be cooled and eventually refill Hydraulic circuit: check the presence of air and eventual vent Hydraulic circuit: check and repair eventual losses and piping insulation Electrical components: search for abnormal absorptions Mechanical components: verify the absence of unusual noises and vibrations |
| Every 4 months | Air circuit: verify the fixing, working and balancing of the fan Hydraulic circuit: verify flow switch efficiency (if present) Hydraulic circuit: verify evaporator cleaning, water side Electric circuit: verify the tightening of all the terminals in the electrical box and in the compressor Electric circuit: verify the cleaning and the integrity of contactors Electric circuit: verify the connection of pressure switches |
| Every 6 months | Refrigerant circuit: leakages checking |
| Every year | Refrigerant circuit: check the high pressure safety switch |

9.2.1 Air circuit

Exchanger

The heat exchangers can be exposed to external agents (mechanical and chemical stress) and to air pollution. Dirty particles may deposit on the fins and reduce the heat transmission power, besides increasing air flow resistance. As a consequence, the fan increases its current consumption. The heat exchanger can be cleaned with pressurised air (maximum 2 bar) blown in the opposite direction compared to normal air flow.

WARNING

Do not bend the fins during this operation not to reduce the efficiency of the heat exchanger and increase the air side load losses.

Air filter

The air filter is in polypropylene with metallic net, so it can be cleaned blowing pressured air, once it was removed from its seat. Filter removal must be done using a tool, because the filter is also a protection from the contact with cutting surfaces (condenser fins).

Fan

Make sure that the fan is secured to the chiller structure and make sure that the protection grid is also secured correctly.

Check the presence of anomalies on the consumed current, which may mean excessive obstruction of the condenser or problems on the fan electric motor. Replace the fan in the event problems are detected on the fan electric motor. The automatic control (optional) provides fan variable speed.

9.2.2 Refrigerant circuit

INFORMATION

See paragraph "9.3. Extraordinary maintenance" to replace parts, recharge or perform operations on the refrigerant circuit. to replace parts, recharge or perform operations on the refrigerant circuit.

Lubricant oil

The compressor contains an amount of oil, which must not be renewed under normal operating conditions, and it lasts for the entire life span of the unit. However, as the oil has a hygroscopic reaction, it is possible that it has absorbed air humidity, which comes into contact with the oil after leaks in the refrigerant circuit, replacement of components, or faults of the dehydrator filter. The interaction between oil and water forms an acid that may cause corrosive processes inside the

compressor. In these situations, the lubricant oil must be fully replaced.

Check the presence of leaks

It is mandatory to check the presence of refrigerant leaks according to European Standard 517/2014 (F-gas). Qualified companies and personnel (according to Reg. 303/2008) provide regular seal checks (according to Reg. 1516/2007 and Reg. 1497/2007) and store registration of the maintenance activities in a specific register containing the various checks performed.

High pressure safety pressure switch

The pressure switch is a safety device; therefore, check its operation regularly. Simulate an increase in pressure to perform this verification. If the pressure switch is triggered at a pressure higher than 25 bar, it must be replaced immediately with a new one with the same intervention point.

9.2.3 Hydraulic circuit

Water filter on chiller return

If available, check its cleanliness and wash it with water, if required.

Hydraulic circuit seal

Check the presence of leaks and the seal of the fittings

Liquid to be cooled

Top up if the level of liquid is low. Switch the unit off and follow the instructions provided in paragraph 7.4.

WARNING

The added liquid must have the same quality and glycol composition of that poured in the circuit.

If required, the hydraulic circuit of the evaporator must be cleaned chemically (Extraordinary maintenance).

Flow switch

Check the intervention by simulating the lack of flow rate in the hydraulic circuit.

9.2.4 Electric circuit

Check the presence of motor current consumption anomalies.

9.2.5 Mechanical components

Clean inside the unit with a vacuum cleaner. Clean the pipes to facilitate the identification of leaks. Check the presence of loose hardware that cause noise and vibrations.

9.3. Extraordinary maintenance

For information and quotations, contact the manufacturer technical support service.

Special maintenance operations include:

- Repair or replacement of any unit component activated with electric motor; any intervention on the refrigerant circuit that requires the charge to be restored, e.g. repair or replacement of components,
- Such as dehydrator filter, thermostatic valve, evaporator, condenser, and compressor..

9.3.1 Refrigerant refill

Every time a leak is detected or the refrigerant circuit must be opened to replace a components, refill the refrigerant circuit.

Perform the following operations if a leak is detected or if the circuit must be opened to replace a component.

1. Collect the refrigerant in a collection device with pressure lower than 1 bar-a.
2. Connect a vacuum pump via pressure gauge to the high and low pressure side.
3. Remove the refrigerant from the vacuum pump (not from the compressor!) up to about 0 bar-a.
4. Dispose of the refrigerant according to national standards.
5. Fill the circuit with nitrogen at 1 bar-a.
6. Repair the leak.
7. Eliminate the humidity from the circuit with at least 3 filling and nitrogen extractions. When required, replace the dehydrator filter.
8. Once the circuit is closed, make sure to create the vacuum with a specific pump for a sufficient period of time. On this purpose, check that the absolute pressure has reached at least 0.1 bar-a with the pressure gauge. Make sure that upon switching the vacuum pump off, this pressure does not increase (its increase may indicate that the welding has not been made correctly)
9. Refill with R134a liquid using the compressor intake connection. The amount of refrigerant to be refilled is equal to that indicated on the chiller data plate.

WARNING

To prevent the compressor from suctioning great amounts of liquid, we recommend opening the chiller cylinder valve for 10 s, close it and wait 1 minute before opening it again.

9.3.2 Compressor oil top up

For replacement or top up operations, use the top up inlet on the compressor, which consists of a Schrader valve.

WARNING

The type of oil to be used must have equal characteristics to those indicated on the compressor data plate or contact the Service.

10. Troubleshooting

Refer to the general safety rules indicated in paragraph 2.3. All the operations described in this chapter must be performed only by qualified personnel according to that specified in paragraph 1.1.

| Problem | Possible cause | Recommended intervention |
|--|--|--|
| 1. The chiller fails to start | No external consents | Check the presence of external consents. |
| | Incorrect external consent connection | Check the external consent connections |
| | The anti-circulation timer is on | Wait 5 minutes |
| 2. The compressor fails to start | Defective compressor | Use the testers to check the winding phases if they are in short circuit and the correct impedance. Repair/replace the motor. |
| | The power circuit is open. | Check the power circuit |
| | The compressor protection device is open | Check the compressor work conditions |
| 3. Compressor repeated start ups and stops | Defective compressor | Check and/or replace it |
| | Minimum pressure switch intervention | See point 5 |
| | Defective compressor remote switch | Check and/or replace it |
| | Incorrect thermostat configuration | Check and restore the original configuration, see point 7 |
| 4. High pressure switch intervention | No refrigerant | Check and/or replace it |
| | Defective pressure switch | Clean the filters and/or condenser |
| | Clogged air filter and/or condenser | See point 6 |
| | Failed fan(s) | Make sure that the liquid indicator indicates the presence of humidity in the system or of bubbles in the liquid indicator during normal operation. Replace the gas filter. |
| | Clogged refrigerant filter | Remove the refrigerant in excess. If the condensation pressure is too high and if there are no additional anomalies in the system, pay attention because zeotropic blends, as R407c, allow you to discharge the circuit partially. |
| | Excessive refrigerant gas charge | Check and/or replace it |
| 5. Minimum pressure switch intervention | Defective pressure switch | See point 7 |
| | No refrigerant gas | Check and open the valves completely |
| | Valves closed partially on liquid line | Check and/or replace it, see point 4 |
| | Clogged refrigerant filter | Check if the machine does not cool down and if the low pressure side has a too low pressure. Replace it if required |
| | Blocked thermostatic valve | Check if fluid circulates in the evaporator. |
| | No thermal load | Add liquid |
| | Insufficient tank liquid level | Check and/or replace it |
| 6. The fan fails to start | Defective fan remote switch | Check the fan motor insulation |
| | Fan circuit breaker intervention | Check and/or replace it, see point 2 |
| | Defective fan motor | Pressurise the circuit at 10 bar. Identify the leak with a leak detector. |
| 7. No refrigerant | Leak from the refrigerant circuit | Fill, repair, make the vacuum and refill. |
| 8. Frost thermostat | Blocked thermostatic valve | Check and/or replace it |
| | No refrigerant gas | See point 7 |

| Problem | Possible cause | Recommended intervention |
|---|---|---|
| 9. The chiller runs continuously | No refrigerant gas | See point 7 |
| | Incorrect thermostat configuration | Check and restore the original configuration |
| | Excessive thermal load | Reduce thermal load |
| 10. The chiller runs but does not cool down | No refrigerant gas | See point 7 |
| | Presence of humidity in the refrigerant circuit | Discharge, dry the circuit, replace the filter, make vacuum and recharge. |
| | Open hot gas bypass valve | Check and/or replace it |
| 11. The chiller produces anomalous noise | Noisy compressor | Scroll compressor with incorrect rotation. Check the correspondence between the motor winding connection and the electrical diagram on the motor. Invert the phases in order to comply with the correct rotation. |
| | Noisy thermostatic valve | Check and/or replace it |
| | Vibrations coming from the pipes | Check and/or bracket the pipes |
| | Noisy body | Check the fixing of the hardware |

11. Decommissioning and disposal of the unit

The decommissioning of the chillers must be carried out by experienced and qualified personnel.

⚠ DANGER

This unit contains refrigerant and a small quantity of lubricant (ester) inside its compressor. These substances are dangerous for the environment and must not be dispersed in it. Refrigerants containing fluorocarbons contribute to global warming and consequently to climate changes. They must be disposed of in accordance with disposal standards or they must be delivered to firms qualified as specialized waste disposal firms.

⚠ WARNING

Cut off power supply. Switch off power conducting cables to the unit and secure them against being switched on again. Disconnect the A/C unit from the de-energized network.

Move the unit as described in paragraph "Moving and storage", with a lifting device of suitable capacity. The following are the instructions for proper disposal of the unit during the various phases of its life. For further clarification or additional information, please contact info@stulz.it.

i INFORMATION

To ensure proper and safe disposal activities, operator must equip themselves with the necessary PPE including: anti-cut gloves, oil resistant gloves, heat resistant gloves, safety footwear, safety eyewear against liquid and gas splashes. The context in which the unit is located may require the use of additional PPE, thus it is mandatory to inquire with the relevant staff of the area before starting operation.

Once the materials have been separated as shown below, they should be assigned EWC codes and then sent for disposal in accordance with the national legislation. Disposal related to the unit purchased occurs in three stages:

1. Disposal of packaging

- The packaging of the unit must be disposed of ensuring separation of the following materials:
- Paper and Cardboard
 - Wood Packing–Packing materials are not chemically treated unless they are declared to be “fumigate”
 - Plastic pallets- high- density polyethylene HDPE
 - Plastic Film– polyethylene PE
 - Polystyrene –expanded polystyrene EPS 6

2. Disposal of substances during maintenance operations

During the life cycle of the unit, if it becomes necessary to drain the cooling system, the refrigerant must be recovered. This operation must be performed by qualified personnel in accordance with EC Regulation 517/2014. The types of gases used are shown in the following table.
If the compressor oil needs to be replaced, it must be disposed of according to the instructions below.
The air filters should be disposed of depending on the substances they contain from the environment in which the units operate
The gas filters must be disposed of as contaminated materials from the oils of the type shown below

3. Disposal at the end of life of the unit

- The unit must be disposed of ensuring separation of the following materials:
- Refrigerant - The refrigerant must therefore be recovered before dismantling the unit. The types of refrigerants used are the following:

| Code | CASnumber |
|--------|-------------------------------|
| R-407C | 75-10-5 / 354-33-6 / 811-97-2 |
| R-134a | 811-97-2 |

- Metals
- Copper pipes– may contain traces of oil
- Insulation and sound-absorbing materials
- Electric and electronic components- (pumps, fans, oil-free compressors, electronic circuit boards, servomotors, electrical heating resistances, electrical panel components)
- Cables and wiring
- Oil content within the compressors–is polyester based (POE). Refer to the label on the compressor
- Plastic Parts - Plastic parts that are important in terms of weight are the following:

| Identified Substance | CAS Number |
|--|-------------|
| acrylonitrile butadiene styrene terpolymer | 9003-56-9 |
| polystyrene homopolymer | 9003-53-6 |
| polycarbonatefrom bisphenol A | 103598-77-2 |

12. Options

Are defined as 'Options' those components that must be installed directly by the manufacturer. These are:

- Multi-pole connector.
- Device for low ambient temperature up to -5°C.
- Device for low ambient temperature up to -10°C.
- Temperature tracking with differential thermostat.
- Tank electric level with pump stop function.
- 50/60 Hz medium pressure pump.
- Pre-heating resistance.
- Under-beam kit
- Stainless steel carpentry + Condenser with Cataphoresis treatment.

| Description | Chiller set up | | | |
|---|----------------|------|-------------|-------|
| | Only exchanger | Pump | Pump + Tank | Laser |
| Multi-pole connector | ○ | ○ | ○ | ○ |
| Device for low ambient temperature up to -5°C | ○ | ○ | ○ | ✗ |
| Device for low ambient temperature up to -10°C | ○ | ○ | ○ | ✓ |
| Temperature tracking with differential thermostat | ○ | ○ | ○ | ✗ |
| Tank electric level with pump stop function | ✗ | ✗ | ○ | ○ |
| 50/60 Hz medium pressure pump | ✗ | ○ | ○ | ○ |
| Pre-heating resistance | ✗ | ✗ | ○ | ○ |
| Under-beam kit | ✗ | ✗ | ○ | ○ |
| Stainless steel carpentry + Treated condenser | ○ | ○ | ○ | ○ |

✓ standard ○ optional ✗ not available

12.1. Multi-pole connector

It's made of 1 male connector installed on the rear part of the chiller and of 1 female connector to be installed on the customer's utility. They allow the rapid connection of the power supply (400V/3/50Hz, 400V/3/50Hz e 460V/3/60Hz) and of the signals (generic alarm, stop chiller, remote on/off, etc...) to the chiller.

The male connector pins are directly wired by the manufacturer. The specific indication of the connection is indicated in chiller electric diagram, attached to the Manual, Part II, specific for every chiller.

The installation of multi-pole connector increase the dimension of the chiller in-depth (see measure H of the table below).

| | | Fixed connector | Mobile connector |
|------------------------------|-----|---|--------------------------|
| | | Power supply and signals | Power supply and signals |
| Type | | Female | Male |
| Protection rate (IP) | | IP 65 | |
| Casing material | | Die-cast aluminium | |
| Input | | 2, cable gland PG21 | 1, cable gland PG21 |
| Size | | 4 | 4 |
| Dimensions (LxPxH) | mm | 115,7x55,5x74 | 73x43x72 |
| Closing system | | Low transversal hook | |
| Total pole number | N° | 10 | 10 |
| Number of power supply poles | N° | 4 | 4 |
| Number of signal poles | N° | 6 | 6 |
| Rated voltage | V | 500 | |
| Rated current | A | 16 | |
| Pole material | | Copper alloy, passivated silver coating | |
| Insulation material group | | IIIa | |
| Cable connection section | mm² | 2,5 | |
| Type of M3 screw | | Screw connection M3 | |
| Operating temperature | °C | -40 ÷ + 125 | |

The code includes the components required to install the male connector on chiller rear side.

WARNING

Put the main switch in OFF position before proceeding with connector release.

12.2. Device for low ambient temperature up to -5°C

Installation of a differential pressure switch for the control of the condenser fan in On-Off mode. The kit allow the expansion of chiller working ambient temperature limit from +2,5°C up to -5°C ambient temperature (with water added with proper amount of glycol).

12.3. Device for low ambient temperature up to -10°C

Installation of a differential pressure switch for the control of the modulation condenser fan. It's installed as standard in models with precision $\pm 1K$, WLAxxxxx3xxxxx.

The kit allows the expansion of chiller working ambient temperature limit from $+2,5^{\circ}C$ until $-10^{\circ}C$ ambient temperature (with water added with proper amount of glycol).

12.4. Temperature tracking with differential thermostat

Installation of an external probe, electrically connected to the electronic control of the chiller. It allows the chase of the temperature read by the external probe, imposing a minimum and maximum temperature limit. When these limits will be reached, the chiller will not change the temperature until the joining of the temperature chase range.

Standard parameters on the electronic control related to temperature chase:

| Parameter | Standard value | Description | Adjustment range |
|-----------|----------------|---|-------------------------|
| CMt | 0 | Checking mode: Absolute (0) / T° External (1) | 0 ÷ 1 |
| LFi | 25 | Lower operation limit | $-40^{\circ}C \div LFs$ |
| LFs | 45 | Upper operation limit | $LFi \div +40^{\circ}C$ |

12.5. Tank electric level with pump stop function

Installation of an electric level switch in the tank with intervention at 1/3 of tank capacity.

The intervention of the electric level act as safety device, interrupting the working of the pump and of the pre-heating resistance in the tank, to avoid damages of the chillers.

An alarm appears on chiller display. Tank filling automatically reset the level switch.

12.6. 50/60 Hz medium pressure pump

Pump installation with higher pressure. For the performances, see the graphs in paragraph "6.3. Technical data"

12.7. Pre-heating resistance

Installation of an armoured heating element immersed in the tank.

The option requires the installation of the "electrical level" to interrupt the functioning with lack of water.

| | |
|--------------|-----------------------|
| Power supply | 230 V / ~1 / 50-60 Hz |
| Power | 300 W |
| Material | AISI 321 |
| Attack | G 1" 1/4 |

12.8. Under-beam kit

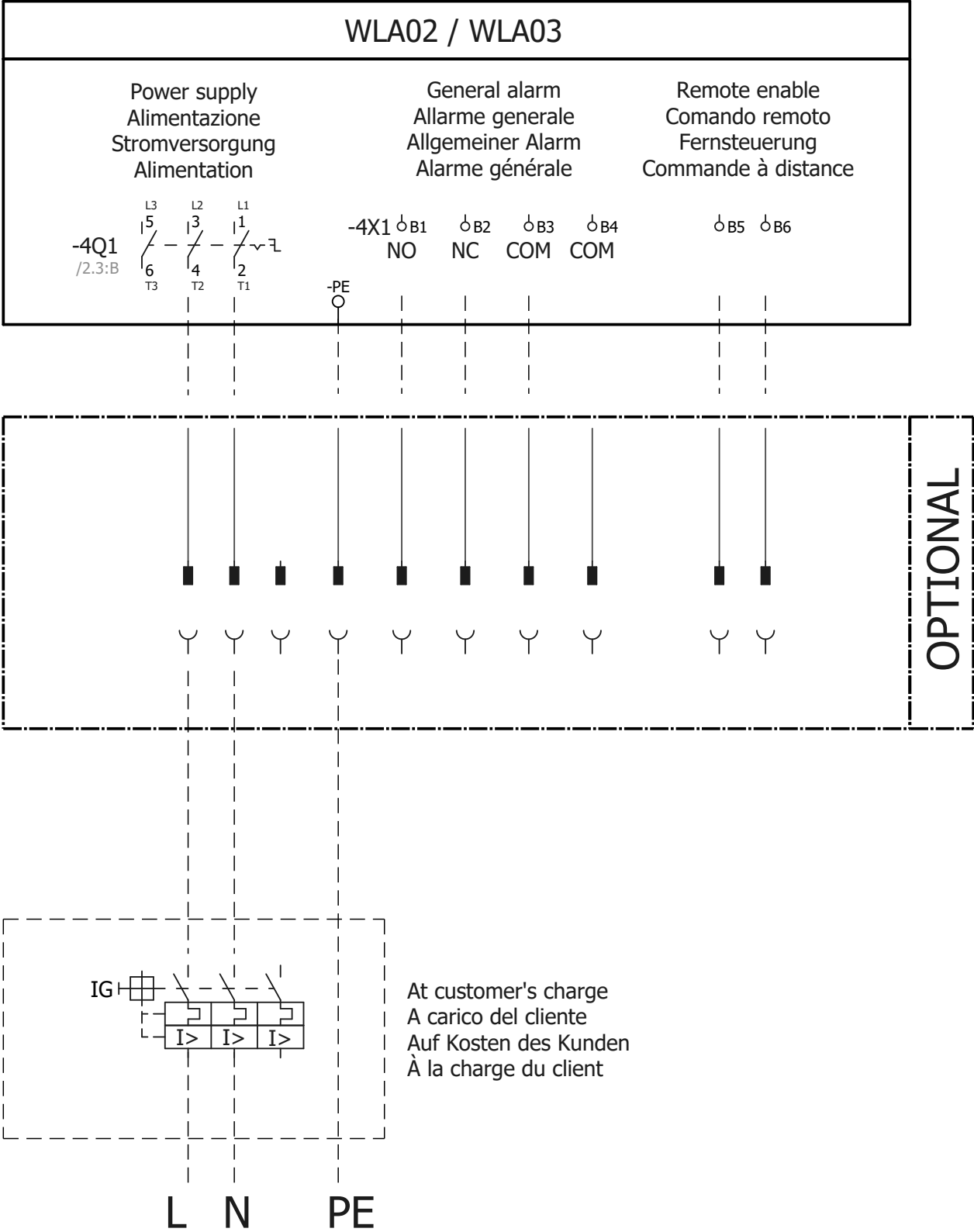
Installation of an electro-valve on hydraulic return in the tank.

It allows the installation of the chiller with free water level tank under application level, avoiding the overflowing of the tank when the pump is stopped.

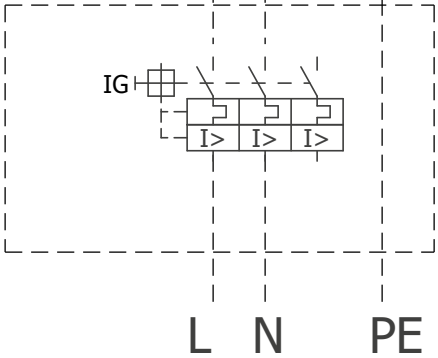
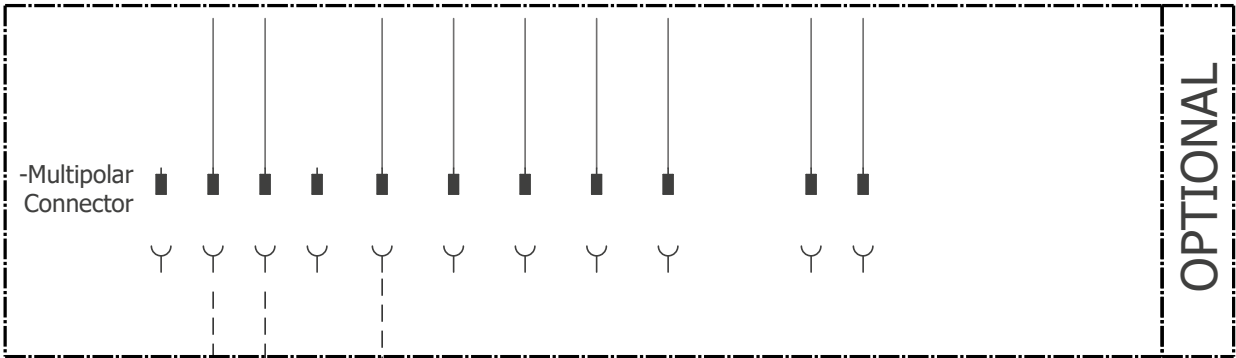
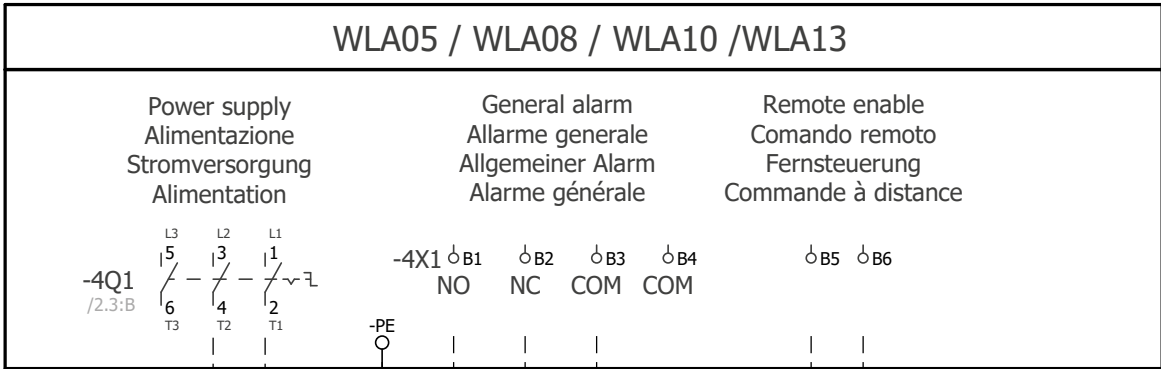
| | |
|--------------|----------------------|
| Power supply | 230V / ~1 / 50-60 Hz |
| Material | Brass |
| Attack | G 1/2" |

13. Connection diagrams

Single phase unit size 1



Single phase unit size 2



At customer's charge
A carico del cliente
Auf Kosten des Kunden
À la charge du client

Main power 1ph/n/pe
Alimentazione 1ph/n/pe
Netz 1~/n/pe

Three phase unit size 2

