installation, operating and maintenance manual

datatech

6÷170 kW

Precision air conditioners
for technological environments

BLUE BOX
AIR WITH CARE

> DATATECH /EDA
Air cooled air-conditioner

> DATATECH /EDW
Water cooled air-conditioner

> DATATECH /EDA DC
Dual-Cooling mode air cooled air-conditioner

> DATATECH /EDW DC
Dual-Cooling mode water cooled air-conditioner

> DATATECH /EDW FC
Free-Cooling mode water cooled air-conditioner

> DATATECH /CW
Water cooled air-conditioner

> DATATECH /DW
Air-conditioner with double chilled water coil

index

DATATECH

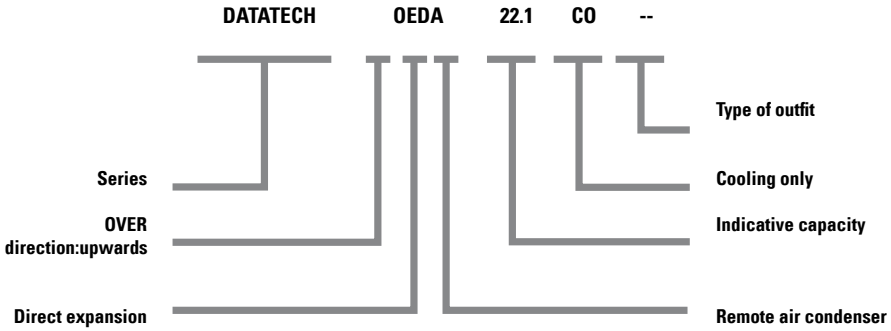
For the design features, available models and technical data refer to the TECHNICAL BOOK.

CONFIGURATION

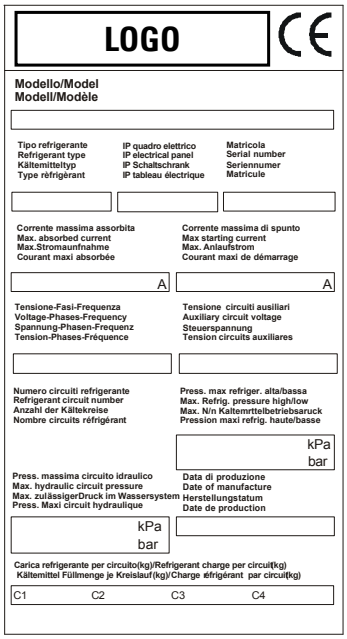
DATATECH	0	ED	A	22.1	CO	--
1	2	3	4	5	6	7

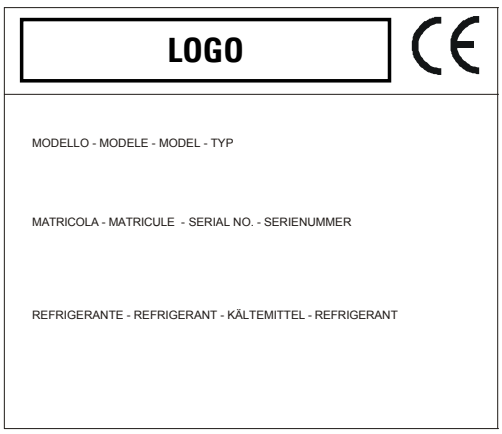
1. **Series**
2. **Air direction**
   O = OVER upwards
   U = UNDER downwards
3. **Unit type**
   DE = expansion
   CW = cooled water
   DW= double chilled water coil
4. **Condenser type**
   A = remote air
   W = incorporated water
5. **Indicative capacity and number of cooling circuits**
6. **Version**
   CO = cooling
   CH= cooling + heating
   HH = cooling + heating + humidification
7. **Outfit**
   DC = Dual Cooling
   FC = Free Cooling

EXAMPLE OF UNIT NOMENCLATURE



The labels on the machine display the model, serial number, features, supply voltage, etc (the following images are just an example).





1. FIELD OF APPLICATION

Datatech units are designed for air temperature and humidity control, for "close control" applications and technologies in general.
The units must be used within the operating limits specified in the TECHNICAL BOOK.

1.1 INTRODUCTION

- When installing or servicing the conditioner, it is necessary to strictly follow the rules described in this manual, to conform to all the instructions detailed on the unit labels and take all necessary precautions.

- Installing and servicing operations can be hazardous due to refrigerant circuit pressures and electrical components.

Any work on the unit must be carried out by trained people only.

Caution: Before repairing or servicing the unit, ensure that the electrical supply is disconnected.

The warranty will lapse if the instructions described in this manual are not observed and if any modifications are made to the unit without prior, written authorisation of the manufacturer.

2. INSPECTION, TRANSPORT, SITE HANDLING

2.1 INSPECTION

After receiving the unit, immediately check its integrity. The unit will have left the factory in perfect condition.Therefore on receiving the unit any damage must be verbally described to the carrier and recorded on the Delivery Note before it is signed by both parties.
The manufacturer or their Dealer must be informed as soon as possible of the extent of the damage.
The Client must draw up a report including written and photographic documentation concerning any relevant damages.

2.2 UNPACKING

When unpacking the unit pay attention not to damage the unit. Packaging consists of different materials: wood, paper, nylon etc. It is recommended to separate the materials and deliver it for disposal or possible recycling to a proper gathering centre in order to reduce their environmental impact.
The unit must not be left outside, neither before nor after removing its packaging.

2.3 LIFTING AND TRANSPORTING

All due precautions must be taken to avoid sudden or violent movements when unloading and positioning the unit.
Transportation on the premises must be carried out with care, keeping the unit in its vertical position and without applying pressure on its components.The unit must be lifted with a forklift truck, by inserting the fork in the pallet on which the unit stands (see figure 1).

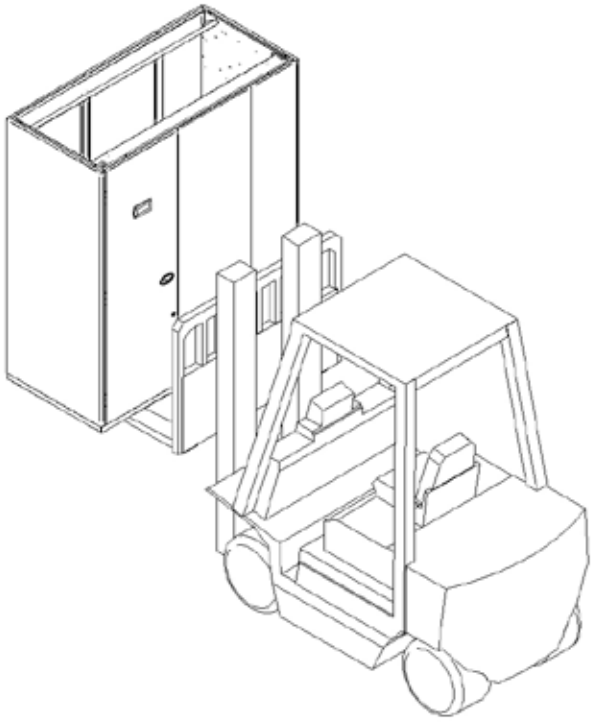


Figure 1

Caution: ensure that the method of lifting does not allow the unit to slip from chains and slings and does not allow the unit to turn over or slide from lifting devices.

All lifting devices must be selected by someone with the required knowledge and be fully responsible for the use thereof.

The machine is balanced. In any case keep the forks low. If the unit is not balanced apply ballast. Any protruding parts should not be supported by hands.

Do not walk beneath or in the proximity of the load. Transportation must be by specialised personnel (truck operators), wearing the necessary individual protection equipment (overalls, safety shoes, protective gloves, helmets, goggles). The manufacturer will not accept any responsibility in case of possible accidents due to the non-observance of these warnings.

Caution: it is recommended that you do not remove the unit from the pallet until in the final position

3. LIMITATIONS ON USE

The unit should not be used in the following circumstances:
– in an explosive atmosphere;
– in an inflammable atmosphere;
– in excessively dusty environments;
– by untrained personnel;
– in any manner contrary to the rules in force.
– with incorrect installation;
– with defective power supply;
– without total or partial observance of instructions;
– with lack of maintenance and/or use of non original spare parts;
– with modifications or other changes unauthorized by the manufacturer;
– within a location that is not clear of debris or other objects;
– within a location that is inadequately cleared, – with anomalous vibrations in the location area.

4. SAFETY PRECAUTIONS

The machine has been designed in compliance with the standards and directives specified in the statement of conformity attached to the documentation. For more specific information please refer to the documentation in the attachment.

4.1 DELIMITATION OF DANGER ZONE

Only authorised operators must have access to the unit.
– The dangerous area located in the unit can be accessed by entering inside the machine. It is strictly forbidden for unqualified personnel to have access inside the machine and without having the power supply disconnected beforehand.

4.2 SAFETY RULES

All units have been designed to ensure the maximum level of safety. To avoid possible situations of risk adhere to the following rules at all times:

- Any operation on the unit must be carried out by trained personnel only. Before working on the unit, ensure that the designated personnel are conversant with the documentation supplied.
- Always ensure there is a copy of the documentation in the immediate vicinity of the unit.
- The operations indicated in this manual must be integrated with the procedures specified in the instruction manuals of the other systems or devices assembled in the unit. The manuals contain all the necessary information to safely control all devices and possible operating modes.
- Use the appropriate safety equipment (gloves, helmet, safety goggles, safety footwear, etc.) for any maintenance or control operation on the unit.
- Avoid loose garments, dangling accessories such as ties, chains, watches which could be entangled in moving parts of the machine.
- Always use tools and equipment that are in excellent condition.
- The compressor compartment contains various high temperature components. Adopt the maximum caution when working in the vicinity of the compressors and avoid touching any parts of the unit without appropriate protection.
- Do not operate in the discharge area of the relief valves.
- The user of this plant must consult the manuals of installation and use of the component systems, attached to the manual herein.
- The machine is equipped with warning and alert signs in order to prevent any potential risks.
- It is forbidden to remove the warning signs.

It is forbidden to:
- remove or make ineffective the guards provided to protect the safety of the people;
- tamper with/or modify, even partially, the machine safety devices.
- In case of alarm signals, and the consequent intervention of safety devices, the operator must contact qualified maintenance technicians. A possible accident could cause serious injuries or death.
- All safety devices must be verified according to the instructions in the attached manuals. Verification and checks must be performed by authorised personnel, appointed by employer through a written document. A copy of the check results must be left in close proximity to the machine. A possible accident could cause serious injuries or death.

The manufacturer assumes no liability for damage to people, pets or matters arising from the reuse of machine parts for operations or installations other than those intended to. It is forbidden to carry out unauthorised interventions / replacement of one or more parts of the machine.

The use of accessories, tools or components different from those recommended by the Manufacturer exonerates the Manufacturer from any civil or penal responsibility.
Machine decommissioning and demolition must be carried out only by properly trained and equipped personnel.

SAFETY DATA SHEET - REFRIGERANT R410A

1. IDENTIFICATION OF THE SUBSTANCE OR/ PREPARATION	1.1	Identification of preparation	SUVA* 410A Refrigerant
		ASHRAE Refrigerant number designation	R410A

2.COMPOSITION / CAS INFORMATION ON INGREDIENTS	Chemical composition	% by mass	–	CAS RN	–	CE No
	Difluoromethane (R32)	50	–	75-10-5		200-839-4
	Pentafluoroethane (R125)	50		354-33-6		206-557-8

3.HAZARDSIDENTIFICATION	3.1	Most important hazards	The vapours are heavier than the air and may cause chocking due to reduction of the oxygen available for breathing.
	3.2	Specific hazards	Contact with rapidly evaporating liquid may cause frost-bite. May cause cardiac arrhythmia.

4.FIRST-AIDMEASURES	4.1	Eyes	Rinse immediately with plenty of water for at least 15 minutes and call a physician.
		Skin	Rinse immediately with plenty of water. Remove immediately all contaminated clothing.
		Inhalation	Move to fresh air. Oxygen or artificial respiration if needed. Do not give adrenaline or similar drugs.
		General advice	Do not give anything to unconscious people.

5.FIRE-FIGHTINGMEASURES	5.1	Suitable extinguishing agents	Any.
	5.2	Specific hazards	Increase of pressure.
	5.3	Specific methods	Cool containers/tanks with water spray.

6.ACCIDENTALRELEASE MEASURES	6.1	Personal precautions	Evacuate personnel to safe areas. Provide adequate ventilation. Use personal protective equipment.
	6.2	Environmental precautions	Evaporates.
	6.3	Methods for cleaning up	Evaporates.

7.HANDLINGANDSTORAGE	7.1	Handling	Technical Measures/Precautions: ensure sufficient air exchange and / or exhaust in work environments. Recommendations on the safe use: Use only in well-ventilated areas. Do not inhale the gas.
	7.2	Storage	Storage precautions: Close carefully and keep container in well ventilated place. Incompatible Materials: explosive, flammable materials, organic peroxide.Packing materials: Store in the original containers.

8. EXPOSURE /PERSONAL PROTECTION	8.1	Control parameters	Difluoromethane: Exposure limits recommended by DuPont: AEL(8-h e 12-h TWA) = 1000 ml/m3; DuPont (1999).
	8.2	Respiratory protection	For rescue and maintenance of tanks wear suitable autonomous respiratory equipment. The vapours are heavier than the air and may cause chocking due to reduction of the oxygen available for breathing.
		Hand protection	Rubber gloves.
		Eye protection	Safety glasses.
		Hygiene measure	Do not smoke.

SAFETY DATA SHEET - REFRIGERANT R410A

9.STABILITYANDREAC-TIVITY	9.1	Stability	No decomposition if used according to specifications.
	9.2	Conditions to avoid	Product non-flammable when in contact with air under normal temperature and pressure conditions. When pressurised with air or oxygen the mixture may become flammable. Some mixtures of HCFC or HFC and chlorine can become flammable or reactive under certain conditions.
	9.3	Materials to avoid	Alkaline metals, alkaline earth metals, finely divided metallic salts, Al, Zn, Be, etc in powder.
	9.4	Hazardous decompo-sition products	Halogen acids, traces of carbonyl halides.

10. TOXICOLOGICAL INFORMATION	10.1	Acute toxicity	Difluoromethane: LC 50/inhalation/4hours/lab. rat = >760 ml/lPentafluor-oethane (R125): LC50/ inhalation/1 hour/lab. rat = >3480 mg/l
	10.2	Local effects	High atmospheric concentrations above TLV value may lead to anaesthetic effects. High concentration of prod-ucts in decomposition can lead to respiratory insuffi-ciency (pulmonary oedema).
	10.3	Long term toxicity	No cancerigenic, teratogenic or mutagenic effects re-sulted from studies on experimental animals.
	10.4	Specific effects	Contact with rapidly evaporating liquid may cause frost-bite. May cause cardiac arrhythmia.

11.ECOLOGICALINFOR-MATION	11.1	Ecotoxicity	Pentafluoroethane (R125): Global warming factor of halo carbides; HGWP; (R-11 = 1) = 0,84 Ozone depleting potential; ODP; (R-11 = 1) = 0

12. DISPOSAL CONSIDERATIONS	12.1	Waste from discarded /unused products	May be reused after reconditioning.
	12.2	Contaminated con-tainers	Empty pressure vessels should be returned to supplier.

13.TRANSPORT INFORMATION	UN number	3163
	ADR/RID	3163 Liquified gas, n.o.s. (Difluoromethane, Pentafluoroethane), 2, ADR.

4.3 INSTALLATION IN AREAS WITH EXPLOSIVE ATMOSPHERES

The unit and its relative accessories are not suited for installation in potentially explosive atmospheres. Contact the manufacturer for further adjustments / solutions.

4.4 SAFETY DEVICES

The unit uses technical means to protect people from dangers that cannot be reasonably eliminated or limited when the unit is designed. It is forbidden:
– to remove or to make ineffective the protections designed for the safety of people;
– tamper with/or modify, even partially, the safety devices installed on the unit

4.5 LIGHTING

Must ensure working conditions without risks due to zones in shadow (as for instance during maintenance operations).

4.6 QUALIFICATION OF PERSONNEL - OBLIGATIONS

The user must know and apply the requirements regarding safety in the workplace, in accordance with the directives of the country of use.The knowledge and the understanding of the manual are a necessary tool for the reduction of risks and for the safety and health of operators.The operator must have an adequate degree of knowledge to carry out the various activities during the life span of the machine.

The operator must be trained to manage possible anomalies, disfunctions or situations which are dangerous for him or for others, and must comply with the following prescriptions:
– stop the machine immediatelly pushing the emergency push button/s.
– do not perform operations that are beyond your duty and technical knowledge;
– Immediately inform the person in charge and avoid any unauthorised actions.

4.7 VARIOUS INSTRUCTIONS

In the use of the unit use the protection devices decreed by law, whether integrated in the unit or by human activity.
Machine Technical Booklet is kept by manufacturer.
The manufacturer takes no responsibility for possible injuries to persons, domestic animals or damage due to lack of compliance with the safety rules and recommendations contained in the supplied documentation.This manual has to be completed with information contained in other documents. Consult these documents whenever necessary.

5. POSITIONING

Read the following points carefully when choosing the most suitable site for the unit and its connections:

– dimensions and setting of hydraulic pipelines ;
– location of the electrical power supply;
– accessibility for maintenance and repair work;
– solidity of the supporting structure;
– ventilation of the remot condenser (if supplied): consult the relative documentation;
– position of the remote condenser and its exposure to solar radiation: the condenser coil must not be exposed to direct sunlight, if at all possible;
– direction of prevailing wind: try to locate the condenser unit in an area where wind cannot cause air to circulate around the coil;
– floor type: if possible, avoid positioning the condenser unit on dark coloured floors (e.g. tarred sur faces) which can cause overheating during operation;
– possible sound reverberation.

All the models in the DATATECH series have been designed and built to be installed indoors; it is therefore strictly forbidden to position and store the units outside, even if sheltered from inclement weather.

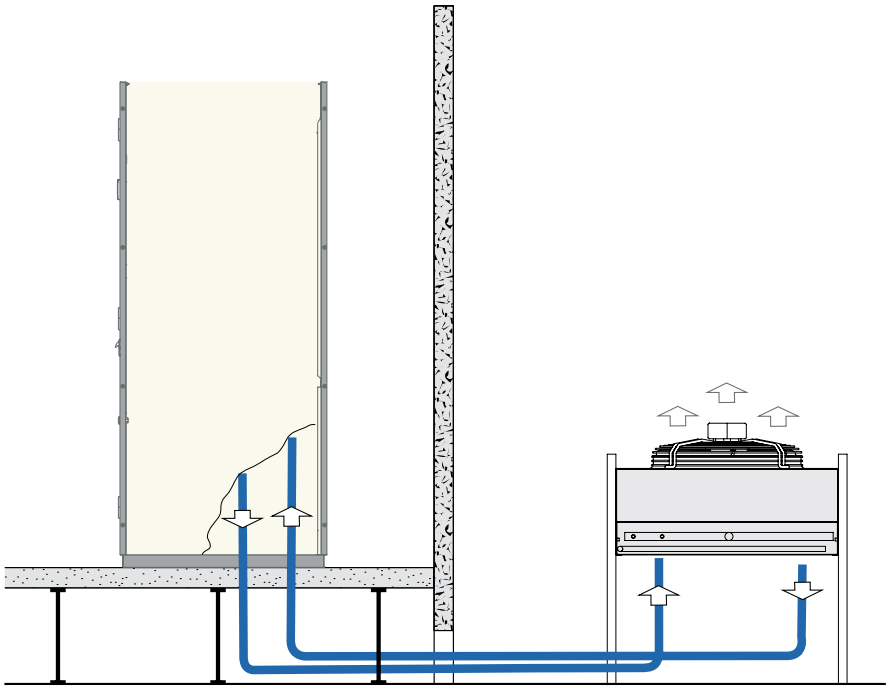


Figure 2

6. INSTALLATION

6.1 CLEARANCE AREAS

Datatech units only require clearance at the front for opening the panels and switchboard and for routine maintenance. In particular, all cooling, hydraulic and electrical connections need to be made at the base of the unit. Should there not be a raised floor, install a base to carry out the connections.
Refer to the dimensional drawings for details on the attachments diameters.The fresh air intake device requires, by necessity, clearance at its sides for connecting the sleeve and removing the relative filter. Should more than one unit be installed in the same area, all measures must be taken to optimize air distribution and avoid its recirculation.Given the high specific air flow, suitable space must be provided if units are to be installed in areas with constant human presence.

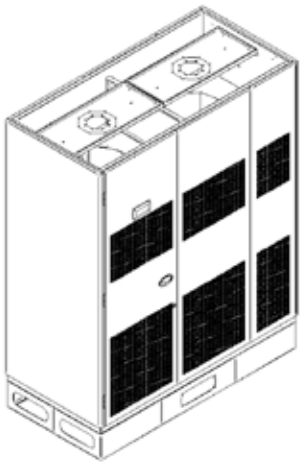


Figure 3

For upflow units, in case a connection to a ductwork or air discharge plenum is not foreseen, place a suitable safety protection on the air discharge side of the unit itself.

6.2 Base frame (UNDER versions)

Units with downward air flow require suitable supporting systems as they are normally installed in rooms with raised floors. A base frame with adjustable feet supports is supplied on request and, if required, with an air convevor.

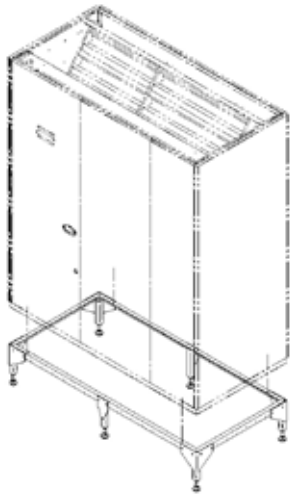


Figure 4

Attach the unit to the base frame by inserting screws in their relative holes.

6.3 CONNECTION TO THE REMOTE CONDENSER

The air condensing units require that cooling circuit to be connected to the remote condensers. The cooling circuits, fitted with interception valves, are pressurized at the factory with anhydrous nitrogen at a pressure of 12 bar.

6.3.1 Connecting the pipes

Use rigid or annealed copper pipes of a diameter suited to the cooling potential and distances to be covered. The table 1specifies recommended diameters for lengths of up to 30 metres.Contact the manufacturer with regard to longer distances. Pipes should be as short and linear as possible.Follow these basic rules:

- Bends should preferably be at a broad angle and as few as possible.
- Provide a slight inclination to the downflow line (1% downward) in horizontal sections to facilitate the transport of oil
- Fit siphons every 6 metres on upward tracts of the gas supply pipe leading to the condenser
- Keep the gas supply lines separate from the fluid return line, if not insulated
- Support horizontal and vertical tracts of the lines with anti-vibration supports
- Weld/braze the joints, avoiding head welds that require use of sleeves or widening of the ipes
- When the joints are ready, blow into the pipes to remove any dirt
- Pressurize the system to check for any leaks.

The connections must be made by specialized personnel.

TABLE 1 - R410A RECOMMENDED DIAMETERS – PIPE THICKNESS 1MM

MODEL	Circuit no	Length eq. 10 m		Length eq. 20 m		Length eq. 30 m		Length eq. 40 m		Length eq. 50 m	
		Gas	Fluid	Gas	Fluid	Gas	Fluid	Gas	Fluid	Gas	Fluid
6.1	**1**	12	10	12	10	12	10	12	10	12	12
8.1	**1**	12	10	12	10	12	12	12	12	12	12
11.1	**1**	12	10	14	12	14	12	14	12	14	14
15.1	**1**	14	12	14	12	16	14	16	14	16	14
18.1	**1**	16	12	16	14	16	14	18	16	18	16
17.1	**1**	16	12	16	14	16	14	16	16	18	16
22.1	**1**	16	12	16	14	18	16	18	16	18	16
26.1	**1**	18	14	18	16	18	16	18	16	22	18
30.2	**2**	14	12	14	12	16	14	16	14	16	16
32.1	**1**	18	14	18	16	22	16	22	18	22	18
36.1	**1**	18	16	18	16	22	18	22	18	22	18
34.2	**2**	16	12	16	14	16	14	16	14	16	16
38.1	**1**	18	16	18	16	22	18	22	18	22	22
38.2	**2**	16	12	16	14	16	14	18	16	18	16
46.2	**2**	16	14	16	14	18	16	18	16	18	16
49.1	**1**	22	18	22	18	22	18	28	22	28	22
56.2	**2**	18	14	18	16	18	16	22	16	22	18
66.2	**2**	18	14	18	16	22	18	22	18	22	18
72.2	**2**	18	16	18	16	22	18	22	18	22	22
85.2	**2**	22	16	22	18	22	18	22	22	22	22
95.2	**2**	22	18	22	18	22	22	28	22	28	22
104.2	**2**	22	18	22	18	22	22	28	22	28	22

Note: the abovementioned diameters were chosen to increase system performance and to ensure proper operation in various conditions allowed, keeping the refrigerant load within reasonable limits

TABLE 2 -
REFRIGERANT CHARGE PER CIRCUIT IN SEPARATE SECTIONS, WITHOUT CONNECTION PIPES

MODEL	Cooling capacity without condenser [kg]	Cooling capacity with standard condenser [kg]	Cooling capacity with enlarged condenser [kg]	Cooling capacity with LN condenser [kg]	Cooling capacity with LN enlarged condenser [kg]
6.1	1,1	1,9	2,3	1,9	2,1
8.1	1,2	2,4	2,7	2,2	2,9
11.1	1,5	3,0	3,1	3,1	3,7
15.1	1,7	3,3	3,3	3,9	4,0
18.1	2,0	3,6	5,4	4,3	5,3
17.1	2,9	4,5	6,3	5,1	5,1
22.1	2,9	6,3	6,1	5,1	6,1
26.1	3,6	7,0	5,1	6,9	8,5
30.2	2,6	4,2	4,2	4,8	4,9
32.1	3,6	6,9	6,9	8,5	10,2
36.1	4,1	7,4	9,1	9,1	10,7
34.2	2,8	4,4	6,2	5,0	5,1
38.1	4,0	7,2	8,9	8,9	10,6
38.2	2,8	4,4	6,2	5,1	6,1
46.2	3,0	6,4	6,3	5,3	6,3
49.1	4,7	9,7	9,7	11,3	11,3
56.2	3,5	6,8	6,8	6,8	8,4
66.2	4,0	7,3	7,3	8,9	10,6
72.2	4,6	7,9	9,6	9,6	11,2
85.2	4,9	9,8	9,8	11,5	11,5
95.2	4,9	9,8	9,8	11,5	11,5
104.2	7,1	12,1	12,1	13,7	13,7

* The value of coolant quantity is indicative and calculated theoretically. Amounts may differ from those specified above.

TABLE 3 -
R410A ADDITIONAL COOLING CAPACITIES PER METER OF LINEAR PIPING

External diameter [mm]	Gas [kg]	Fluid [kg]
10	0.0045	0.0474
12	0.007	0.074
14	0.01	0.1
16	0.014	0.145
18	0.018	0.19
22	0.028	0.3
28	0.048	0.5

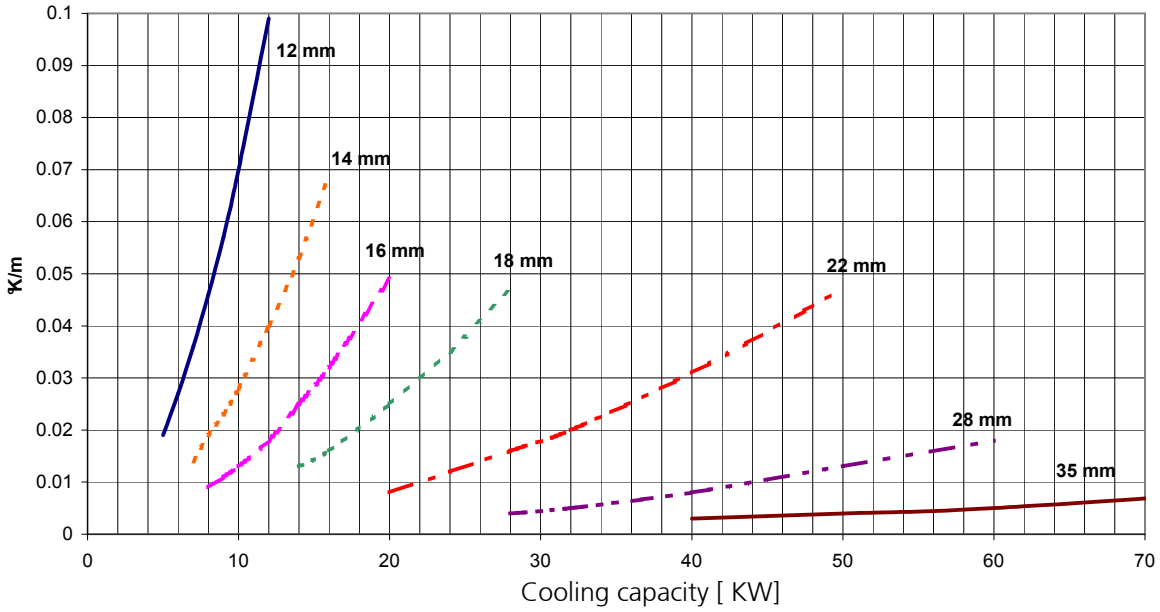
* Flow saturated temperature 45°C, fluid temperature 40°C
Oil additional suggested load: over 20m in linear development of the pipes, add a quantity of oil equal to 2% per mass of the total refrigerant in the circuit Refer to the type of oil indicated on the compressor identification plate.

TABLE 4 - CONFIGURATIONS

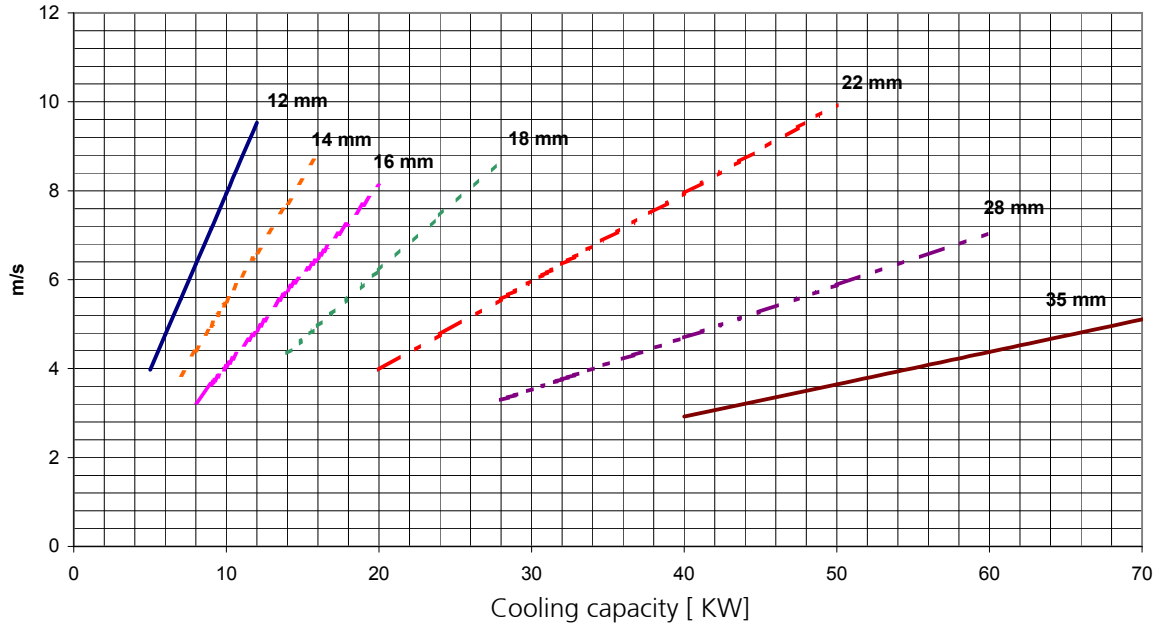
CONDENSER UNIT RELATIVE POSITION	GAS LINE SIPHONS	GAS LINE INSULATION	GAS LINE INSULATION	MAXIMUMHEIGHT DIFFERENCE BETWEEN SECTIONS	CONDENSER NON-RETURN VALVE
HIGH LEVEL CONDENSER UNIT	Every 6 m on vertical tracts	Only in the case of long tracts exposed to solar radiation or at high room temperatures	Necessary	30 m	Recommended for inlet
LOW LEVEL CONDENSER UNIT		Only in the case of long tracts exposed to solar radiation or at high room temperatures	Necessary in the building	8 m	Recommended for outlet

friction loss and flow velocity in the piping system

Saturation temperature variation in delivery line



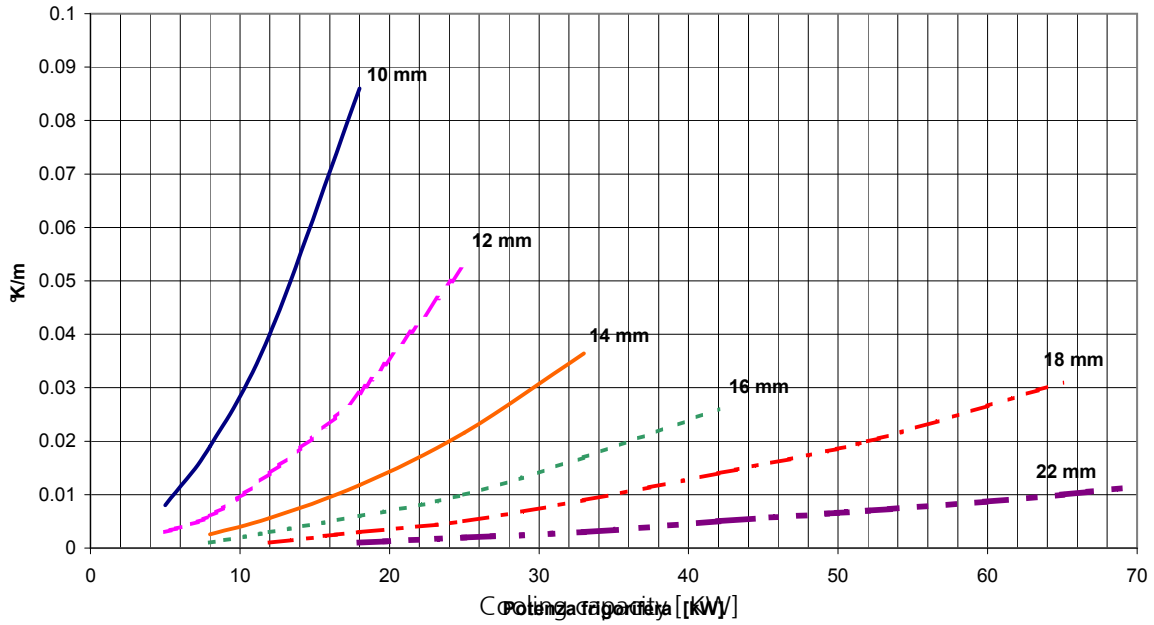
Flow velocity in delivery pipes



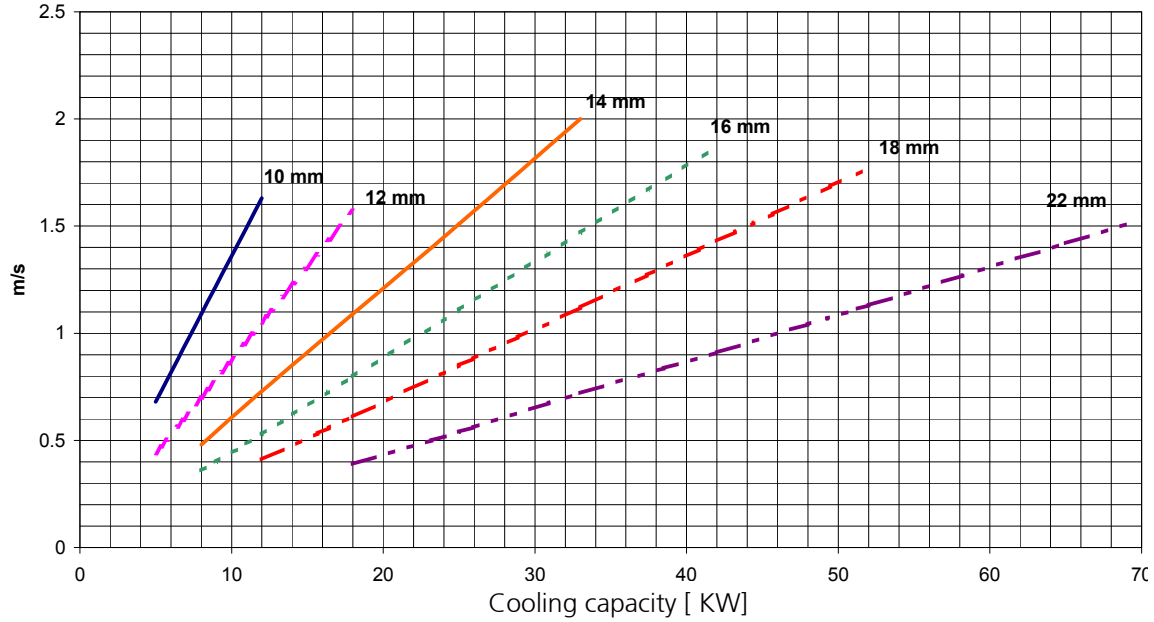
Note: Diagrams effective under the following conditions
Vapor saturation T 8°C
Overheating 5°C
Condenser saturation T 50°C
Subcooling 5°C

friction loss and flow velocity in the piping system

Saturation temperature variation in piping system



Flow velocity in piping system



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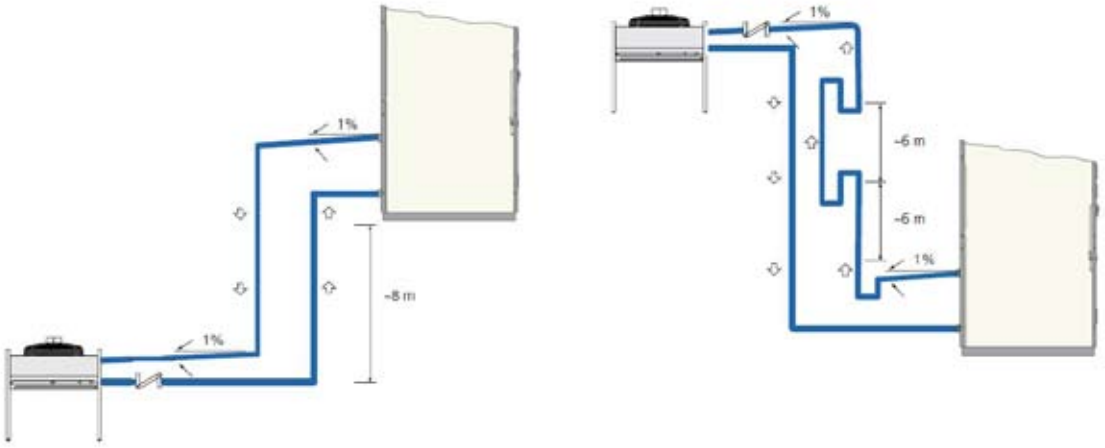


Figure 5 - Drawing of separate sections
(one with condenser above, one with condenser underneath)

6.4 VACUUM AND CHARGING THE COOLING SYSTEM

Open the valves of the internal unit to release pre-loaded nitrogen before completing the cooling system connections. Do not leave the cooling circuit open for more than 15-30 minutes because the high hygroscopicity of the oil may cause the absorption of moisture, damaging the circuit.
Create a vacuum in the entire system with a high-capacity vacuum pump able to attain a residual pressure of 0.1 mbar. Connect the vacuum pump to several points on the cooling circuit to ensure optimum evacuation.

Do not, for any reason, use the compressor as a vacuum pump, otherwise the warranty will be forfeited

Should you not have access to a high-power vacuum pump, so-called "triple evacuation" can be carried out by attaining a residual pressure of 35 mbar and thereby "break" the vacuum with anhydrous nitrogen at a manometric pressure of 1 bar. Repeating the procedure 3 times can remove 99% of impurities and non condensable gas.

After creating the vacuum, feed the system from the 1/4 " SAE connection on the fluid line. Feed in fluid form. Table 2 specifies the estimated cooling capacities for internal units and condensers, to which will be added the supply in the connection piping. Final capacity may differ slightly according to any necessary adjustments (see subsequent chapters).

6.5 SAFETY VALVES DISCHARGE LINE

The cooling circuits feature safety valves installed in the units. Depending on local regulations, it may be necessary to direct the valves discharge line to an appropriate area. The valves' discharge connection is threaded and measures 3/4 "G

6.6 HYDRAULIC CONNECTIONS

6.6.1 Connections to the plate condenser

Should the unit be equipped with integrated plate condensers,
connect the latter to the heat disposal system (evaporator tower, drycooler, ring).
The dimensional drawings show the various configurations of the hydraulic connections to the heat exchangers.We recommend you to follow the directions below:
– Use copper or steel pipes
– Use flexible pipes and three-piece connectors for the heat exchanger connection
– Install ball shut-off valves on the generators
– Install drainage taps at the lowest points of the circuit
– Install vent valves at the highest points.

It is obligatory to install a net filter with mesh size not exceeding 1 mm at the entrance to the condensers, to prevent clogging caused by dirt

Do not reverse the order of condensers inlet/outlet as this leads to performance degradation

Use of limey or highly calcareous water causes rapid degradation of the heat exchanger performance

Should it become possible that the hydraulic circuit will have to operate at zero or sub-zero temperatures, use a suitable amount of anti-freeze

Any two-way pressure controlled valves for controlling condensation may need to be installed outside the unit.
In the case of a Free Cooling unit, the hydraulic connection between the Free Cooling coil and the condenser(s) may need to be completed on the unit's exterior, according to the annexed diagrams.
The 3-way valve that controls flow of water in the condenser is supplied by the Manufacturer.

6.6.2 Connections to the chilled water coil The chilled water coil has a 3 - way modulating valve with floating servo-actuator, fitted as standard.
Notes on hydraulic connections (for either the main or additional coil):
– Use copper or steel pipes
– Insulate the pipes as required
– Install shut-off valves at the unit's in and out points.
– Install a thermometer and pressure gauge at the unit's in and out points.
Diameters and connection type required are indicated in the dimensional drawings.

Should it become likely that the fluid in the hydraulic system will fall to zero or sub-zero temperatures, add a suitable amount of anti-freeze

6.6.3 Connection to the condensate discharge

All the units are equipped with a siphon connected to the condensation drip tray discharge line. The discharge line should be installed at a slight inclination to aid flow.
Fill the siphon with water after making the connection and before putting the unit into service.

Figure 6

6.6.4 Connection to the hot water coil

Refer to the dimensional drawings with regard to the position and size of the water connections.

Should it become likely that the fluid in the hydraulic system will fall to zero or sub-zero temperatures, add a suitable amount of anti-freeze

6.6.5 Connection to the humidifier (HH versions)

The humidifier on "HH" versions needs to be supplied with untreated mains water preferably filtered of impurities and/or any dross. The diameters of attachments are given in the dimensional drawings.
It is recommended that the discharge piping to be made of non-conductive material.

It is obligatory to install a syphon for releasing water in the humidifier

The humidifier's discharge water can reach 100 °C

On no condition should the humidifier be supplied with demineralized or softened water

6.7 WIRING

6.7.1 Introduction

Before performing any operation to electrical system, make sure the power is off

Follow these instructions carefully:
- Check the circuits and components for any damage that may have occurred during transportation.
- Ensure the screws and bushes are all tightly connected.
- Ensure the network voltage and frequency conforms to the data on the unit's label and wiring diagram.
- Connect the wires in accordance with the wiring diagram.
- Connect the earth to the bar or connection in the control board.

Cable cross-section and line safety devices must conform to specifications in the wiring diagram

Variation in voltage supply must not exceed ±5% and maximum unbalance between phases must be less than 2%

The manufacturer warranty is forfeited if operation does not conform to the above

6.7.2 Alarms and external controls

The terminal board in the control board features free contacts for:
- Remote control of critical (first level) alarm and minor (second level) alarm.
- Remote operation mode of compressors and fans (optional).
- Remote control of the unit (switch on/off).
- Remote control of five contacts for signalling statuses or alarms that can be configured as required (optional alarms sheet).

The above mentioned contacts are numbered on the wiring diagram.

6.7.3 Connection to the remote condensers

7. OPERATION

7.1 PRELIMINARY CHECKS

– Check that electrical connection has been made correctly and that all clamps are tightly fastened.
– Check that voltage on the line terminals is in compliance with specifications.
– Check that, when present, the phase control relay gives consent.
– Check that there are no refrigerant leaks.
– Check the correct power supply of the compressor sump pre-heating resistance.

The pre-heating resistances are inserted automatically with the main isolating switch closed and unit in stand-by (or compressor remote control switches unexcited). The resistances must remain on for at least 12 hours before start-up

Each time, before the first run of compressors, check that compressor case temperature is at least 10 -15 °C above the room temperature.
Check that any hydraulic connections have been made correctly and in compliance with information on the machine data plate and/or in the supplied diagrams.
– Check that all taps present in the fridge circuit are open.
– Check that the hydraulic plant is loaded and has been bled.
– Check that all unit buffering and closure panels have been fixed well.

7.2 START-UP

– Check calibration of the control devices.
– Set the unit to "ON" functioning mode from the microprocessor control keyboard . Refer to the microprocessor manual for further indications.
– The first device/devices to be started are the air delivery fan/fans. Check the correct direction of rotation. Successively, in relation to the temperature and humidity of the recovery air, the compressors and/or the heating resistances and the humidifier may switch-on (if present).

It is advisable to disconnect the unit from the voltage supply only in the event of long periods of inactivity (e.g. for maintenance or seasonal holidays) and not for short periods

7.3 CHECKS DURING OPERATION

– A few minutes after compressors start-up, check the condensers temperature to ensure it is approximately 15°C above the room temperature (for units with remote condensers) or 5°C above the temperature of the integrated plate condensers outcoming water, but not below 35°C saturation corresponding to the condensation pressure.
– Make sure the operating variables (temperature, pressure) measured by probes on the machine and displayed through microprocessor control, correspond to the real values.
– Check the current requirements of the various users and compare them with the nominal values.
– After a few hours' operation, check the fluid indicator light has turned green.
– Ensure no bubbles appear in the passage signaling light. Continuous presence of bubbles could indicate a low level of coolant; occasional presence of bubbles is acceptable.
– Ensure that overheating of the supplied refrigerant is roughly between 5-7°C. Overheating occures due to difference between the temperature of the compressor inlet pipe (as ascertained with a contact thermometer) and the saturation temperature of evaporation (dew point for refrigerants with temperature "glides"), as ascertained with an inlet pressure gauge.

– Ensure undercooling of the refrigerant in the condenser's outlet fluid pipes is between 2-5°C. Undercooling is the difference between the fluid's saturated temperature (bubble point for refrigerants with temperature "glides"), as ascertained with a pressure gauge on the fluid pipe, and the temperature of the pipe, as ascertained with a contact thermometer. If the sub-cooling is too high, cooling is overload or non-condensable components are present in the cooling circuit.
– Make sure the refrigerant filter is not obstructed or clogged. To do this, simply detect the temperature of the fluid pipe immediately before and after the filter, and the filter will be clear if the difference is only small (a few °C are permissible).

7.4 FANS

DATATECH series are equipped with radial blade fans, with external rotor engine directly coupled to the shaft. No special maintenance is required for the fans as they have no coupling devices (belts, pulleys).
There are two types of fans, "AC" and "EC":
– AC: alternating current engine with adjustable speed due to an auto-transformer. The auto-transformer offers different output voltage and, by changing the cables, the motor can be powered at different voltages to obtain required performance in terms of air flow and static pressure. The units feature factory connection that can be checked and adapted, if necessary, according to the type of installation.
– EC: Fans with electronically commutated motor "brushless" motor. The fan is powered with alternating current, and speed is regulated by means of 0-10V dc control signal emitted by the microprocessor. Required speed can therefore be set directly by means of parameters on the display screen.

Both types of motor have alarm signalling; in the AC version, alarms are activated by thermal breakers, and in the EC version, alarms are activated due to thermal breakers, over-current, under-voltage, lack of one or more phases and blocked rotor.

The EC fan does not comprise a remote control switch and is constantly under-voltage from the moment the unit is switched on

7.5 AIR FILTERS

The units feature air intake filters of different degrees of efficiency. The filters must always be replaced in front of the unit.
The filters of direct expansion units are the same size as the evaporating coils, for either UNDER or OVER versions. Filters on chilled water units are at the top (for UNDER units) or behind the front panels (OVER units). Refer to the dimensional drawings.

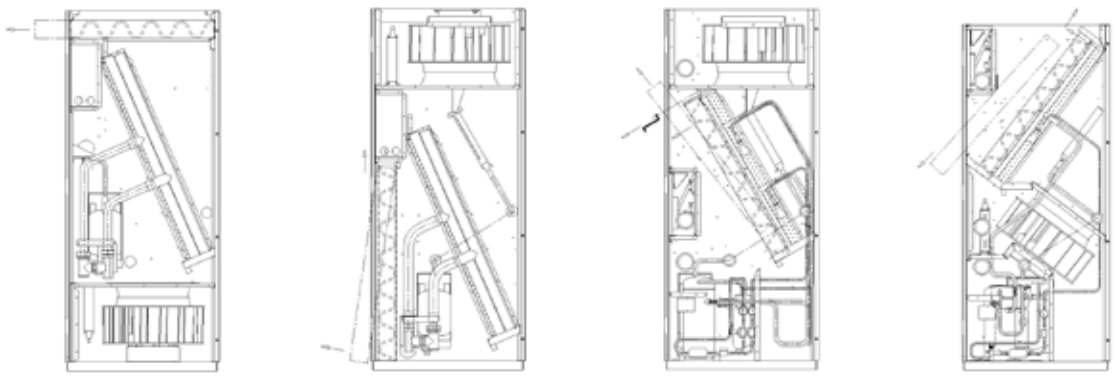


Figure 7

7.6 HUMIDIFER

DATATECH units are equipped with immersed electrode humidifiers, depending on the version. Make sure that all wiring and hydraulic connections have been made before use.
The humidifier is controlled automatically by the microprocessor, which regulates the flow of water in the cylinder according to specific algorithms and the required production of humidity. For further details check the humidifier and the microprocessor manuals.In case the humidifier requires mainenance or components to be replaced, release any water in the cylinder before proceeding.To ensure the proper operation and durability of the humidifier cylinders, supply water must have the following characteristics:

		Unit	Min	Max
Activity of hydrogen ions	pH		7	8.5
Specific conductivity at 20°C	$\sigma_{R,20\,°C}$	µS/cm	350	750
Total dissolved solids	TDS	mg/l	325	697
Fixed residue at 180°C	R_{180}	mg/l	227	487
Total hardness	TH	mg/l $CaCO_3$	50-100*	250-400*
Temporary hardness		mg/l $CaCO_3$	30-60*	150-300*
Iron + Manganese		mg/l Fe+Mn	0	0.2
Chlorides		ppm Cl	0	20-30*
Silica		mg/l SiO_2	0	20
Residual chlorine		mg/l Cl^-mg/l Cl^-	0	0.2
Calcium sulphate		$CaSO_4$	0	60-100*
Metal impurities		mg/l	0	0
Solvents, diluents, soaps, lubricants		mg/l	0	0

*** If two values are indicated, the first refers to slightly conductive water and the second to highly conductive water.**

Do not use softener for treatments

It is recommended not to use well water, industrial water, water from cooling circuits, or water that could be chemically or bacteriologically polluted. Do not to add disinfectants or corrosion inhibitors as these are potential irritants. Any particular characteristics of supply water, such as extremely low or high levels of conductivity, could require specific humidifier cylinders different from the standard, which can be arranged with the Manufacturer.See the humidifier manual for further information.

8. CONTROL AND SAFETY DEVICES

All control equipment is calibrated and tested at the factory before shipment of the machine. However the control and safety devices should be checked after the machine has been operated for a reasonable period of time. Calibration values are given in the following tables:

DEVICE	SET POINT	Differential/ band	NOTES
Temperature control	22 °C	2 °C	
Humidity control	50%	+5% dehumidif. -10% humidif.	

DEVICE	ACTIVATION	Differential/ band	NOTES
High pressure controller	37.8 bar	10.8 bar	Manual reset
Low pressure regulator	4.5 bar	1.5 bar	Manual/automatic control reset
High pressure alarm (sensor)	36 bar (R410A)	7 bar	Controlled automatic reset

All work on the control and safety equipment must be carried out exclusively by qualified personnel: incorrect calibration values could cause serious damage to the unit.

8.1 HIGH PRESSURE CONTROLLER

The high pressure (safety) controller stops the compressor when supplied pressure exceeds the calibration value and consequently the microprocessor will display an alarm.
Once the pressure controller tripped, it has to be reset manually by pressing the relative button, but only after pressure has dropped below the cutout set point value minus differential. The alarm can then also be reset manually on the microprocessor.

8.2 HIGH PRESSURE ALARM (ACTIVATED BY PRESSURE TRANSDUCER)

The units' cooling circuit comprises a sensor that stops the compressor before the pressure controller's pressure threshold is reached. The microprocessor automatically attempts to re-start the compressor, but only for a set number of times; and if high pressure persists, the compressor is shut down definitively and an alarm appears on the display screen. Resetting has to be carried out manually on the microprocessor.

8.3 LOW PRESSURE CONTROLLER

The low pressure controller stops the compressor when intake pressure falls below the calibration value. To check its operation, start up the compressor and, after approx 5 minutes, slowly close the relative fluid line, checking on the compressor's intake pressure gauge (previously installed) that the pressure controller is activated (to stop the compressor) when the calibration value is reached. Stopping the compressor does not make an alarm appear on the microprocessor immediately, as management of the low pressure alarm offers the possibility of attempting a certain number of automatic re-starts.

8.4 COMPRESSORS THERMAL PROTECTION

All compressors installed on Datatech units are protected thermally by relative internal devices that automatically disconnect power supply to the electric motor, or feature a thermostat/ clikson connected to the microprocessor that stops the compressor in the event of overheating. For the internal protection

devices version, the compressor automatically restarts after a variable period but only after cooling; if thermostat / clikson is connected to the microprocessor, the compressor can be restarted by cancelling the alarm on the display, as long as the thermostat has been reset.
The electrical diagrams supplied with the unit provide details on configuration for both versions.

8.5 PHASE SEQUENCE RELAY

Direct expansion units (*DE*) with three-phase power supply comprise a phase sequence monitoring device (phase sequence relay) that ensure the scroll compressors turn in the correct direction. The device also controls absence of one or more phases.
The phase relay generally features two LED lights that indicate operation status: meanings of the lights are indicated in the legend marked directly on the component.In the event of an alarm, the device disconnects the voltage supply to the auxiliary circuit (24V) and thereby also switches off the microprocessor.

8.6 FANS THERMAL PROTECTION

Fans in the evaporation section are always equipped with a contact that sends an alarm signal to the microprocessor.
The AC fans thermal protection prevents the overheating of the electric motor.The EC fans contact is signaling in event of overheating, absence of one or more phases, under-voltage, overload and rotor blocking.

8.7 AIR FLOW SENSOR

This device prevents the unit from operating in the absence of air flow. Control is carried out by a differential pressure gauge mounted on the evaporation coil and air filter. Appearance of the alarm on the microprocessor is delayed by the sensor's intervention. To check the operation:
– For AC fans : turn off the automatic switches of the ventilating section and compressors (QMV and QMC on the wiring diagram), then switch on the unit. The alarm should appear on the microprocessor in 20-30 seconds.
– For AC fans : turn off the compressors' automatic switches (QMC on the wiring diagram), remove from the microprocessor board the terminal that gives the EC fan command signal (terminal J4), switch on the unit as above and wait for the alarm.

8.8 DIRTY FILTER SENSOR (OPTIONAL)

Clogging of the air filter is controlled by a differential pressure gauge that measures pressure drop upstream and downstream of the filter.
The control sends a signal to the display indicating whether the filter needs to be cleaned or replaced. In the meantime, however, the machine continues to operate.

Clogging of the filter can reduce flow and therefore machine efficiency; we recommend you replace the filter as soon after the alarm as possible.

8.9 FAN DIFFERENTIAL PRESSURE/ AIR FLOW SENSOR

Depending on their optional devices and configurations, units can be fitted with a differential pressure transducer that detects the difference in pressure inside and outside (upstream) of the suction mouth. The difference in pressure is proportional, for each fan/mouth, to the square root of the difference in pressure according to the equation:

$$Q = n \cdot k \cdot \sqrt{\Delta P}$$

Whereby n is the number of fans, ΔP is expressed in Pa (Pascal), Q in m3/h and k is a constant depending on the vent

There are two versions, depending on the transducer and air flow control type:

a. Transducer with incorporated display not connected to the microprocessor. The display indicates the difference in pressure. The value is used with the above formula to calculate the air flow value of a single fan. Air flow for the entire unit is calculated by multiplying the latter value by the number of fans. This value is then compared with the catalogue/design data to see if any corrections need to be made for the case in hand.
b. Transducer without display, connected directly to the microprocessor. In this case the differential pressure or air flow value can be displayed directly on the microprocessor's display. Should the unit be fitted with EC type fans, the microprocessor can also automatically adjust the flow of air.

TABLE 6 - K CONSTANTS PER UNIT FRAME

Frame	SXS	XS	S	M	L	XL
K	138	217	350	350	350	350

8.10 AMBIENT TEMPERATURE AND HUMIDITY SET POINTS

The microprocessor regulates temperature and ambient humidity by switching the machine various devices on or off:

– Compressor(s) or chilled water coil (standard CW or ED versions)
– Electrical heating elements or hot water coil (CH or HH versions)
– Humidifier (HH versions)

To attain the required temperature in the area to be air conditioned, the microprocessor activates the compressors or opens the 3-way chilled water valve proportionally (gradually for compressors) to the difference between the measured temperature and the required temperature (otherwise known as temperature "set points"). The set point value is configured on the microprocessor. The electrical heating elements or the hot water coil are switched on should the temperature drops below the required value.

To control ambient humidity at the required value (otherwise known as humidity set point), the microprocessor activates the humidifier proportionally to the difference between the required humidity and the actual ambient humidity (if the latter is lower) .

Should ambient humidity be greater than the required value, the microprocessor follows this procedure:

– Activation of the cooling devices (cold water coil or compressors) at maximum capacity, regardless of room temperature.
– Activation of the heating devices if temperature drops below the required value.
– (Optional) only in the case of units with EC fans, air flow can be reduced via cooling coil. This involves, especially for direct expansion units, an increase in de-humidification operated by the coil itself.

8.11 ANTI-RECIRCULATION TIMER

This device has the function of preventing the compressor from starting and stopping too frequently, which can be caused by oscillation of external variables such as treated air. This parameter is included in the microprocessor functions.

It allows the compressor to start up after having been stopped, but only after a certain period of time (approx 6 minutes). Never change the default delay time: set incorrectly, this could cause serious damage to the unit.

9. MAINTENANCE AND PERIODIC CHECKS

9.1 WARNINGS

All operations described in this chapter MUST BE PERFORMED EXCLUSIVELY BY QUALIFIED PERSONNEL.

Make sure that the unit has been disconnected from the power supply before carrying out any operation or accessing internal parts.

The compressor head and discharge pipeline can reach high temperatures. Always exert caution when working in the vicinity of the compressor.

Adopt the maximum caution when operating in proximity to the finned coils as the aluminium fins are very sharp.

After completing the maintenance operations close the unit with the special panels

9.2 GENERAL INSTRUCTIONS

Carry out the following periodic checks to ensure the unit is operating correctly:

OPERATION	RECOMMENDED PERIOD
Check all safety and control devices operation as previously described	Montly
Check the tightening of electrical terminals both inside the control board and in compressor terminal boards. The movable and fixed contacts of the remote disconnecting switches must be cleaned periodically and replaced if show signs of deterioration	Montly
Check the cooling load on the fluid indication light	Montly
Check that the compressor has no oil leaks	Montly
Check that there are no leaks of water or water and glycol mixture from the hydraulic circuit	Montly
If the unit is to stay out of service for a long period, discharge the water from the pipes and heat generators (*EDW, *CW). This is compulsory if the ambient temperatures is expected to fall below the freezing point of the liquid employed	Seasonally
Check water level in the circuit	Montly
Check the proper operation of the flow controller	Montly
Check the compressor case heaters	Montly
Clean the metal filters on hydraulic pipes	Montly
Clean the finned coil or metal filters, if present, using compressed air in the opposite direction of the regular air flow. If fully clogged, use a water hose	Montly
Clean the filters of the control board ventilation	Montly
Complete a defrosting test	Montly
Check the condition, fastening and balance of the fans	Every 4 months
Check the fluid humidity indicator light (green = dry, yellow = moisture); if the light is not green change the filter	Every 4 months
Check that the machine does not emit any unusual noise	Every 4 months

9.3 REPAIRING THE REFRIGERANT CIRCUIT

If the refrigerant circuit has been repaired, perform the following operations:
– Leak test
– Vacuum and dehydration of refrigerant circuit
– Refrigerant load.

If the circuit is to be emptied, use the appropriate equipment to collect the refrigerant.

9.3.1 Leak test

Charge the refrigerant circuit to a pressure of 15 bar with dry nitrogen gas by means of a cylinder fitted with a pressure reducer. Check the circuit for leaks with a leak detector. The formation of bubbles or foam indicates the presence of leaks.
If leaks are found during the test, empty the refrigerant circuit and then repair the point of leakage by welding with appropriate alloys.

Do not use oxygen instead of nitrogen : explosion hazard.

9.3.2 High vacuum and dehydration of the refrigerant circuit

To generate a high vacuum in the refrigerant circuit use a high vacuum pump able to reach 0.1 mbar of absolute pressure with a flow rate of 10 m^3/h. With this type of pump, a single vacuum cycle is normally sufficient to reach an absolute pressure of 0.1 mbar.
If this type of pump is not available, or in the event that the circuit has been left open for a long period of time, you are strongly advised to use the triple evacuation method. This procedure is also prescribed in the event of moisture in the refrigerant circuit.The vacuum pump must be connected to the load inlet.Follow the procedure below:
– Evacuate the circuit until the pressure is at least of 35 mbar absolute. Charge the circuit with nitrogen to a relative pressure of approx. 1 bar.
– Repeat the operation described above.
– Repeat the operation described above for the third time in order to reach the highest degree of vacuum possible.

This procedure should guarantee the elimination of up to 99% of contaminants.

9.3.3 Refrigerant load

– Connect the refrigerant gas cylinder R410A to the male 1/4 SAE charge inlet on the liquid line, releasing a small amount of gas so that air in the connection hose is purged.
– The circuit must be charged exclusively with liquid; therefore, if the cylinder is not equipped with a float it must be turned upside-down.

9.4 ENVIRONMENTAL CONSIDERATIONS

Laws governing the use of substances detrimental to the ozone layer prohibit the dispersal of refrigerant gases in the environment, obliging users to recover refrigerants at the end of their use and consign them to the dealer or to specific collection centres.
Refrigerants R410A is mentioned among substances subject to special monitoring regimes established by law, therefore is subject to the prescriptions indicated above.

Use special care during maintenance operations in order to limit the risk of refrigerant leakage as much as possible.

10. DECOMMISSIONING THE UNIT

When the unit estimated span life ends and must be removed and replaced, adhere to the following rules:

– the refrigerant must be recovered by a qualified technician and sent to an authorised collection centre;
– also the compressor lubrication oil must be recovered and sent to a collection centre;
– the structure and components, if unusable, must be stripped down and separated according to the material type; this is particularly important for copper and aluminium, which are fairly abundant on the machine.

This procedure facilitates the collection, disposal, and recycling and reduces the environmental impact.

11. TROUBLESHOOTING

The following pages contain a list of the most common causes that can result in the shutdown or anomalous operation of the chiller. Faults are classified according to the easily identifiable symptoms.

In relation to possible corrective action pay maximum attention to the operations you intend to perform as overconfidence coupled with insufficient attention due to lack of expertise can lead to serious accidents. overconfidence may cause serious accidents to unexperienced operators, therefore we recommend that once the cause is identified you contact us or qualified technicians for assistance

TROUBLE	PROBABLE CAUSE	POSSIBLE SOLUTION
A) None of the compressors in operation. Fans not in operation. Display screen not in operation	Lack of network voltage	Check the line voltage
	Lack of control of the phase sequence relay (for models with three-phase compressors)	Check that the phase sequence is correct and the phase relay is not defective
	Main disconnecting switch on (position "O")	Turn the switch to the "I" position
B) None of the compressors in operation. Fans not in operation. Display screen is in operation.	The unit is in standby	Enable the unit
	Unit off in remote mode	Disable the external controls
	Unit off in monitoring mode	Enable unit operation via the monitoring network. If the unit is not connected to a monitoring network via a serial line, disable serial communication on the microprocessor
	Unit off in alarm mode	A "critical" alarm has occurred that caused the entire unit to shut down. Check the cause of the alarm and eventually reset correct operation
	Lack of voltage in the auxiliary circuit	Check condition of the fuses/ automatic switches on the auxiliary circuit and auxiliary transformer
C) Fans on. Compressors off. No alarm signal on the display	Ambient temperature in "set" or set point configured too high	Wait for room temperature to rise or lower the set point
	Compressors anti-recirculation timer in operation	Wait for at least 6 minutes
	The compressor contactors are broken or improperly connected to the auxiliary circuit	Check the connections or replace if broken
	Compressors automatic switches on	Check if the switches are on due to faulty compressors and turn them off
	Broken compressors	Check the compressors and replace them if required
D) The compressor keeps switching on and off	The compressor remote control switch is faulty	Check and replace if necessary
	Faulty compressor	Check and replace if necessary

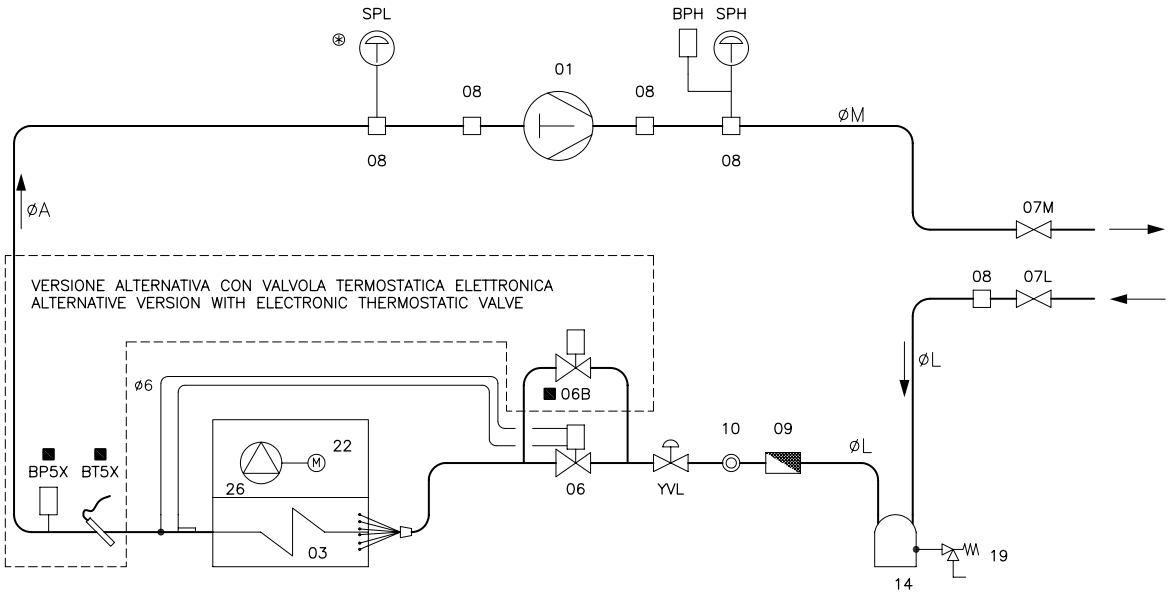
TROUBLE	PROBABLE CAUSE	POSSIBLE SOLUTION
E) The high pressure controller or microprocessor high pressure alarm trip	Supply (air or water) temperature above the maximum allowed limits	Wait for conditions to return to normal. If this problem persists on a regular basis, install larger condensers.
	Broken pressure controller or transducer	Check and replace if necessary
	Excessive coolant load	Discharge the surplus gas
	Dirty or clogged condenser	Clean with compressed air or, if necessary, with specific products
	The condenser fans are not working	Consult the remote condenser manual
	The condenser fans are not working or are working at too low speed	Condensation control parameters have been configured incorrectly on the microprocessor, or there is a fault with one of the speed regulators
	The metal filter of the water heat exchanger (condenser) is clogged.	Clean the filter
	The water is not circulating in the heat exchangers (condensers)	Check the interception valves and the circulation pumps and the relative control devices
	Non condensable gas in the cooling circuit	Empty the circuit, restore vacuum and reload
	Refrigerant filter is clogged	Check and replace
F) Low pressure controller trip	Broken pressure controller	Check and replace if necessary
	The unit is completelly empty	Check for any leaks and repair if required, restore vacuum and reload
	Lack of air flow	Check any ducts and state of the filters. Check for obstructions in the evaporator. Ensure the fans are turning in the correct direction and at the right speed
	Refrigerant filter is clogged	Check and replace
	Valve on fluid line not fully open	Check and open fully
	Thermostatic expansion valve does not work properly	Check; clean or replace if required.
G) Fans don't start up	Fan remote control switch is not excited	Check voltage at the ends of the remote disconnecting switch coil and the continuity of the coil itself
	The fan thermal breakers trip	Inspect the insulation between the windings and between the windings and the earth. If the insulation is OK, turn on the automatic switch and try to restart
	The fan motor is faulty	Check and replace if necessary
	Incorrect connections	Check and fix if required

TROUBLE	PROBABLE CAUSE	POSSIBLE SOLUTION
H) Lack of gas	Leak in the cooling circuit	After pressurising the circuit at about 4 bar, check with a leak tester. Repair, depressurize and fill with gas. See the paragraph on maintenance
I) The fluid pipe is frosted (downstream of the fluid valve)	Fluid valve partially closed	Open the valve fully
J) The fluid pipe is frosted (downstream of the fluid valve)	The fluid filter is clogged	Replace the filter
K) The unit continues to run without stopping	Lack of refrigerant gas	See point H
	The set point was incorrectly calibrated on the microprocessor	Check calibration
	The heat load is excessive	Check size of the system
	The compressor contactor is stuck	Check the contacts condition and replace if necessary
L) The unit works regularly but has an insufficient output	There isn't enough refrigerant liquid	See point H
	Moisture or non condensable components in the refrigerant circuit	Replace the filter; dry it if required and charge again
M) The compressor suction line is frosted	Thermostatic expansion valve does not work properly	Check and replace if necessary
	Lack of air flow	Check the filters, fans and ducts
	There isn't enough refrigerant liquid	See point H
	The fluid filter is clogged	Clean or replace it
	Valve on fluid line not fully open	Check and open fully
N) Abnormal noise in the system	There are vibrations in the piping	Fix the pipes with brackets
	The compressor is noisy	Check and replace if necessary
	The thermostatic valve is noisy	Check and add refrigerant liquid
	The panels vibrate	Install correctly

TROUBLE	PROBABLE CAUSE	POSSIBLE SOLUTION
O) Low room temperature	The temperature probe is faulty	Check and replace if necessary
	Heating is not working: the three-way valve is not working	Check the three-way supply valve
	Heating is not working: the electrical heating elements are not powered	Check the protection devices and look for the fault on the circuit
	Heating is not working: the heating elements are burnt out	Replace the faulty heating elements
P) High room temperature;high room temperature alarm	The thermal load is excessive or capacity is not suited to needs	See points K and L
	The heating elements are working to a higher than required temperature: the temperature probe is faulty	Replace the probe
	The three-way hot water valve is still active: the three-way valve command is faulty	Check working order of the three-way valve
Q) Low ambient humidity (only for HH units)	Exaggerated amount of new air intake in the cold season: area not insulated from the outside; the humidifier doesn't work	Close the door, insulate the room, decrease the new air intake and check operation of the humidifier
R) High ambient humidity(only for HH units)	Exaggerated amount of new air intake in the summer season: area not insulated from the outside	Close the door, insulate the room
	Exaggerated refrigerating output: heating is insufficient and ambient temperature is too low	If possible, increase the conditioner post heating
	Condensation discharge is at fault: there isn't a siphon on the discharge line	Install a siphon on the discharge line and fill it with water

TROUBLE	PROBABLE CAUSE	POSSIBLE SOLUTION
S) The evaporation coil is partially frosted	Poor transfer of air to the evaporating coil	Check the ducts and air filters
	Room temperature too low	See point Q
	Lack of refrigerant in the circuit: bubbles are visible in the control indicator.	Check for leaks and fix them before recharging with refrigerant.
	The thermostatic expansion valve is too closed: the suction line is too hot	a) Turn down the overheating and check the intake pressure. Optimal overheating is 5°C
	The thermostatic expansion valve is too closed: the bulb of the expansion valve is partially obstructed or the pressure intake pipe is obstructed	b) Replace the valve or release the control pipe
	The dehydration filter is blocked: there are bubbles in the flow indicator and the fluid line is colder at the outlet of the dehydration filter	Replace the dehydration filter.
	The collector's supply pipes are blocked or oil has accumulated in the coil: not all of the evaporator's circuits are working	Remove the obstructions; clean or replace the evaporator
T) The compressor is too hot	The thermostatic expansion valve is too closed	Decrease the temperature by opening the thermostatic valve
	See points H, I, J	See points H, I, J
U) The compressor is too cold and noisy	The thermostatic expansion valve is too open: the system is working with overheating too low (fluid is returning to the compressor)	Measure and calibrate again the overheating, close the valve.
	The thermostatic valve is faulty or the pressure intake line is obstructed	Replace the valve or remove the obstruction from the pressure intake line
	There are foreign bodies between the thermostatic valve rod and base	Clean the thermostatic valve rod and holes.
	The thermostatic valve bulb is not in proper contact with the intake line	Check the position of the bulb and tighten the sealing clamp
V) Oscillation of the electronic thermostatic valve	The condensation pressure is unstable	Stabilize the condensation pressure
	There is flash in the fluid line upstream of the valve	Check the amount of refrigerant or for any obstructions in the fluid line
	The temperature sensor is improperly fitted	Check that the temperature sensor of the electronic valve driver is properly fitted in place and that there is enough thermally conductive paste

DATATECH UEDA / OEDA



⊛ NON PRESENTE CON VALVOLA TERMOSTATICA ELETTRONICA
NOT PRESENT WITH ELECTRONIC EXPANSION VALVE

■ OPZIONALE–OPTIONAL

	A	M	L
6.1	16	12	10
8.1	16	12	10
11.1	18	12	10
15.1	22	16	12
17.1	22	16	12
18.1	22	16	12
22.1	22	16	12
26.1	28	18	16
30.2	2x22	2x16	2x12
32.1	28	18	16
36.1	28	18	16
34.2	2x22	2x16	2x12
38.1	28	18	16
38.2	2x22	2x16	2x12
46.2	2x22	2x16	2x12
49.1	35	22	18
56.2	2x28	2x18	2x16
66.2	2x28	2x18	2x16
72.2	28	18	16
85.2	35	22	18
95.2	35	22	18

	DESCRIZIONE	DESCRIPTION
01	COMPRESSORE	COMPRESSOR
06	VALVOLA TERMOSTATICA	THERMOSTATIC VALVE
06B	VALVOLA TERMOSTATICA ELETTRONICA	ELECTRONIC THERMOSTATIC VALVE
07L	RUBINETTO LINEA DEL LIQUIDO	LIQUID LINE VALVE
07M	RUBINETTO DI MANDATA	DISCHARGE VALVE
08	PRESA DI CARICA	CHARGING CONNECTION
09	FILTRO	FILTER
10	INDICATORE DI UMIDITA'	MOISTURE INDICATOR SIGHT GLASS
14	RICEVITORE DI LIQUIDO	LIQUID RECEIVER
19	VALVOLA DI SICUREZZA DI ALTA PRESSIONE	HIGH PRESSURE SAFETY VALVE
YVL	VALVOLA SOLENOIDE	SOLENOID VALVE
22	MOTORE ELETT. VENTILATORE	FAN ELECTRIC MOTOR
26	VENTILATORE	FAN
40	VALVOLA PRESSOSTATICA	PRESSOSTATIC VALVE
BP5X	TRASDUTTORE DI PRES. VALVOLA ELETT.	ELECTRONIC THERMOSTATIC VALVE PRESS. TRANDUCER
BPH	TRASDUTTORE DI ALTA PRESSIONE	HIGH PRESSURE TRANSDUCER
BT5X	SONDA DI TEMP. VALV.TERMOSTATICA ELETTRONICA	ELECTRONIC VALVE TEMPERATURE PROBE
SPH	PRESSOSTATO ALTA PRESSIONE	HIGH PRESSURE SWITCH
SPL	PRESSOSTATO BASSA PRESSIONE	LOW PRESSURE SWITCH

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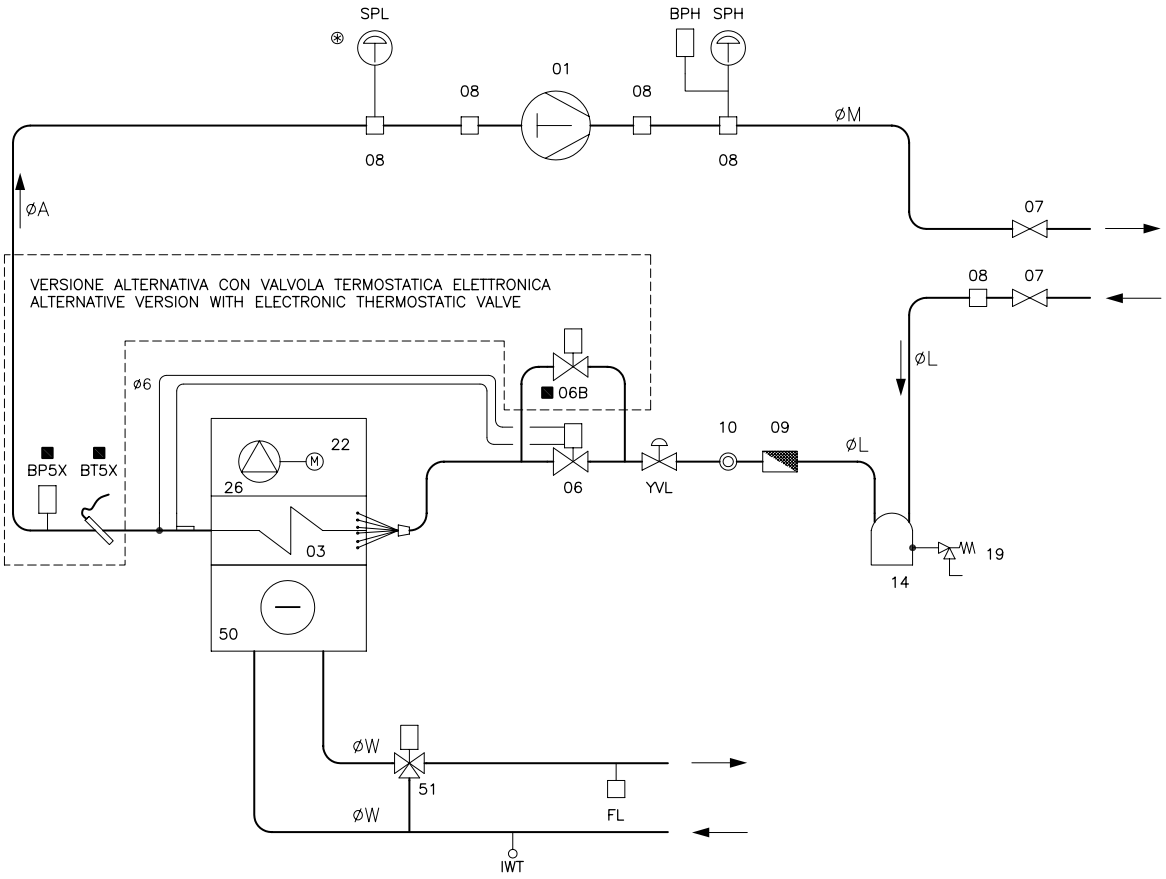
DATATECH UEDA/OEDA DC



⊛ NON PRESENTE CON VALVOLA TERMOSTATICA ELETTRONICA
NOT PRESENT WITH ELECTRONIC EXPANSION VALVE

	DESCRIZIONE	DESCRIPTION
01	COMPRESSORE	COMPRESSOR
06	VALVOLA TERMOSTATICA	THERMOSTATIC VALVE
06B	VALVOLA TERMOSTATICA ELETTRONICA	ELECTRONIC THERMOSTATIC VALVE
07	RUBINETTO LINEA DEL LIQUIDO	LIQUID LINE VALVE
08	PRESA DI CARICA	CHARGING CONNECTION
09	FILTRO	FILTER
10	INDICATORE DI UMIDITA'	MOISTURE INDICATOR SIGHT GLASS
14	RICEVITORE DI LIQUIDO	LIQUID RECEIVER
19	VALVOLA DI SICUREZZA DI ALTA PRESSIONE	HIGH PRESSURE SAFETY VALVE
YVL	VALVOLA SOLENOIDE	SOLENOID VALVE
22	MOTORE ELETT. VENTILATORE	FAN ELECTRIC MOTOR
26	VENTILATORE	FAN
40	VALVOLA PRESSOSTATICA	PRESSOSTATIC VALVE
50	BATTERIA AD ACQUA REFRIGERATA	CHILLED WATER COIL
51	VALVOLA A 3 VIE	3 WAY VALVE
BP5X	TRASDUTTORE DI PRES. VALVOLA ELETT.	ELECTRONIC THERMOSTATIC VALVE PRESS. TRANDUCER
BPH	TRASDUTTORE DI ALTA PRESSIONE	HIGH PRESSURE TRANSDUCER
BT5X	SONDA DI TEMP. VALV.TERMOSTATICA ELETTRONICA	ELECTRONIC VALVE TEMPERATURE PROBE
FL	FLUSSOSTATO	FLOW SWITCH
IWT	SONDA TEMPERATURA ACQUA	WATER TEMPERATURE PROBE
SPH	PRESSOSTATO ALTA PRESSIONE	HIGH PRESSURE SWITCH
SPL	PRESSOSTATO BASSA PRESSIONE	LOW PRESSURE SWITCH

■ OPZIONALE–OPTIONAL

	A	M	L	W
17.1	22	16	12	28
22.1	22	16	12	28
26.1	28	18	16	28
30.2	2x22	2x16	2x12	\
32.1	28	18	16	35
36.1	28	18	16	\
34.2	2x22	2x16	2x12	35
38.1	28	18	16	35
38.2	2x22	2x16	2x12	35
46.2	2x22	2x16	2x12	42
49.1	35	22	18	42
56.2	2x28	2x18	2x16	42
66.2	2x28	2x18	2x16	\
72.2	2x28	2x18	2x16	54
85.2	2x35	2x22	2x18	54
95.2	2x35	2x22	2x18	54

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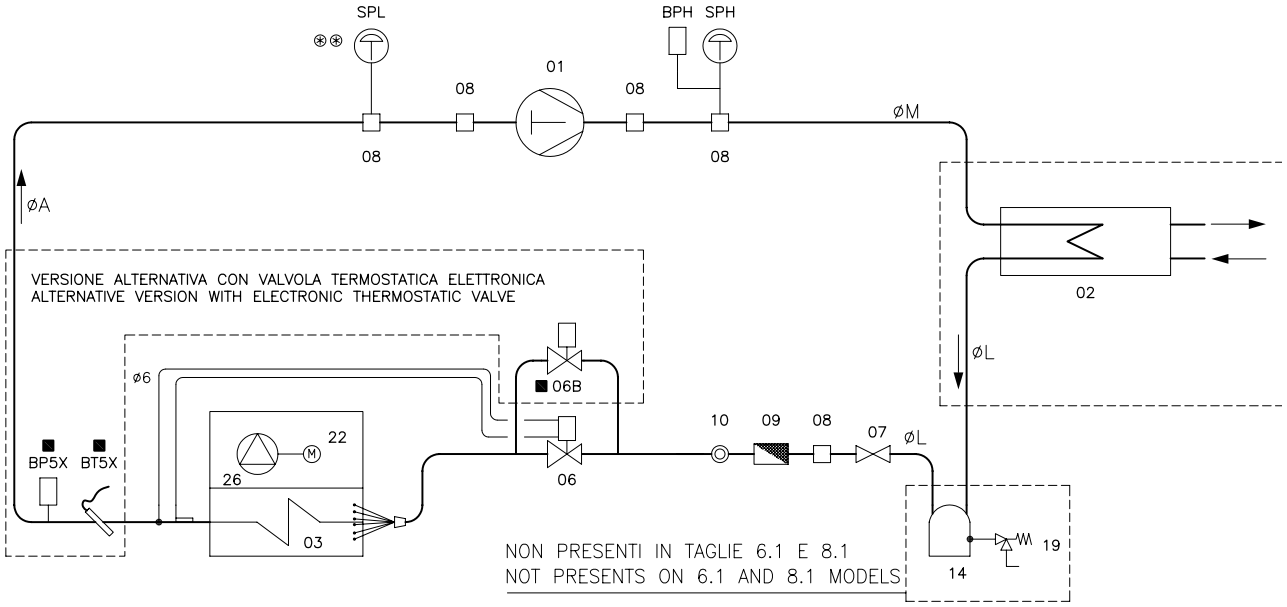
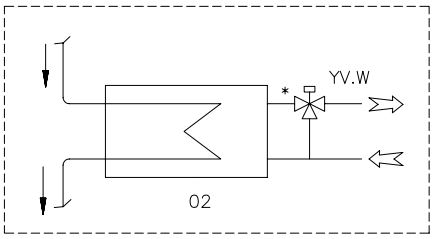
DATATECH UEDW / OEDW

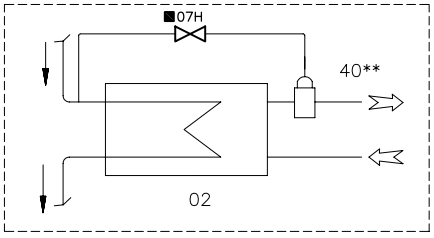


INSTALLAZIONE A CURA DEL CLIENTE
INSTALLATION AT CUSTOMER'S CARE
FORNITA A CORREDO / SUPPLIED LOOSE
OPTIONAL VALVOLA CONTR. COND. MOTORIZZATA 3 VIE
OPTIONAL 3 WAY CONDENSATION CONTROL VALVE



*SE PRESENTI 2 CONDENSATORI
VANNO COLLETTORATI A UNA SOLA VALVOLA
IF TWO CONDENSERS ARE PRESENT CONNECTED
TO ONE VALVE WITH MANIFOLDS

INSTALLAZIONE A CURA DEL CLIENTE
INSTALLATION AT CUSTOMER'S CARE
FORNITA A CORREDO / SUPPLIED LOOSE
OPTIONAL VALVOLA PRESSOSTATICA 2 VIE
OPTIONAL 2 Way pressostatic valve



⊛⊛ NON PRESENTE CON VALVOLA TERMOSTATICA ELETTRONICA
NOT PRESENT WITH ELECTRONIC EXPANSION VALVE

■ OPZIONALE–OPTIONAL

	A	M	L
6.1	16	12	10
8.1	16	12	10
11.1	18	12	10
15.1	22	16	12
17.1	22	16	12
18.1	22	16	12
22.1	22	16	12
26.1	28	18	16
30.2	2x22	2x16	2x12
32.1	28	18	16
36.1	28	18	16
34.2	2x22	2x16	2x12
38.1	28	18	16
38.2	2x22	2x16	2x12
46.2	2x22	2x16	2x12
49.1	35	22	18
56.2	2x28	2x18	2x16
66.2	2x28	2x18	2x16
72.2	28	18	16
85.2	35	22	18
95.2	35	22	18

	DESCRIZIONE	DESCRIPTION
01	COMPRESSORE	COMPRESSOR
02	CONDENSATORE	CONDENSER
06	VALVOLA TERMOSTATICA	THERMOSTATIC VALVE
06B	VALVOLA TERMOSTATICA ELETTRONICA	ELECTRONIC THERMOSTATIC VALVE
07	RUBINETTO LINEA DEL LIQUIDO	LIQUID LINE VALVE
08	PRESA DI CARICA	CHARGING CONNECTION
09	FILTRO	FILTER
10	INDICATORE DI UMIDITA'	MOISTURE INDICATOR SIGHT GLASS
14	RICEVITORE DI LIQUIDO	LIQUID RECEIVER
19	VALVOLA DI SICUREZZA DI ALTA PRESSIONE	HIGH PRESSURE SAFETY VALVE
22	MOTORE ELETT. VENTILATORE	FAN ELECTRIC MOTOR
26	VENTILATORE	FAN
40	VALVOLA PRESSOSTATICA	PRESSOSTATIC VALVE
BP5X	TRASDUTTORE DI PRES. VALVOLA ELETT.	ELECTRONIC THERMOSTATIC VALVE PRESS. TRANDUCER
BPH	TRASDUTTORE DI ALTA PRESSIONE	HIGH PRESSURE TRANSDUCER
BT5X	SONDA DI TEMP. VALV.TERMOSTATICA ELETTRONICA	ELECTRONIC VALVE TEMPERATURE PROBE
SPH	PRESSOSTATO ALTA PRESSIONE	HIGH PRESSURE SWITCH
SPL	PRESSOSTATO BASSA PRESSIONE	LOW PRESSURE SWITCH
07H	RUBINETTO PER TUBI CAPILLARI	CAPILLARY TUBE VALVE
YV.W	VALV. CONTR. CONDENSAZIONE. MOTORIZZATA 3 VIE	3 WAY CONDENSATION CONTROL VALVE

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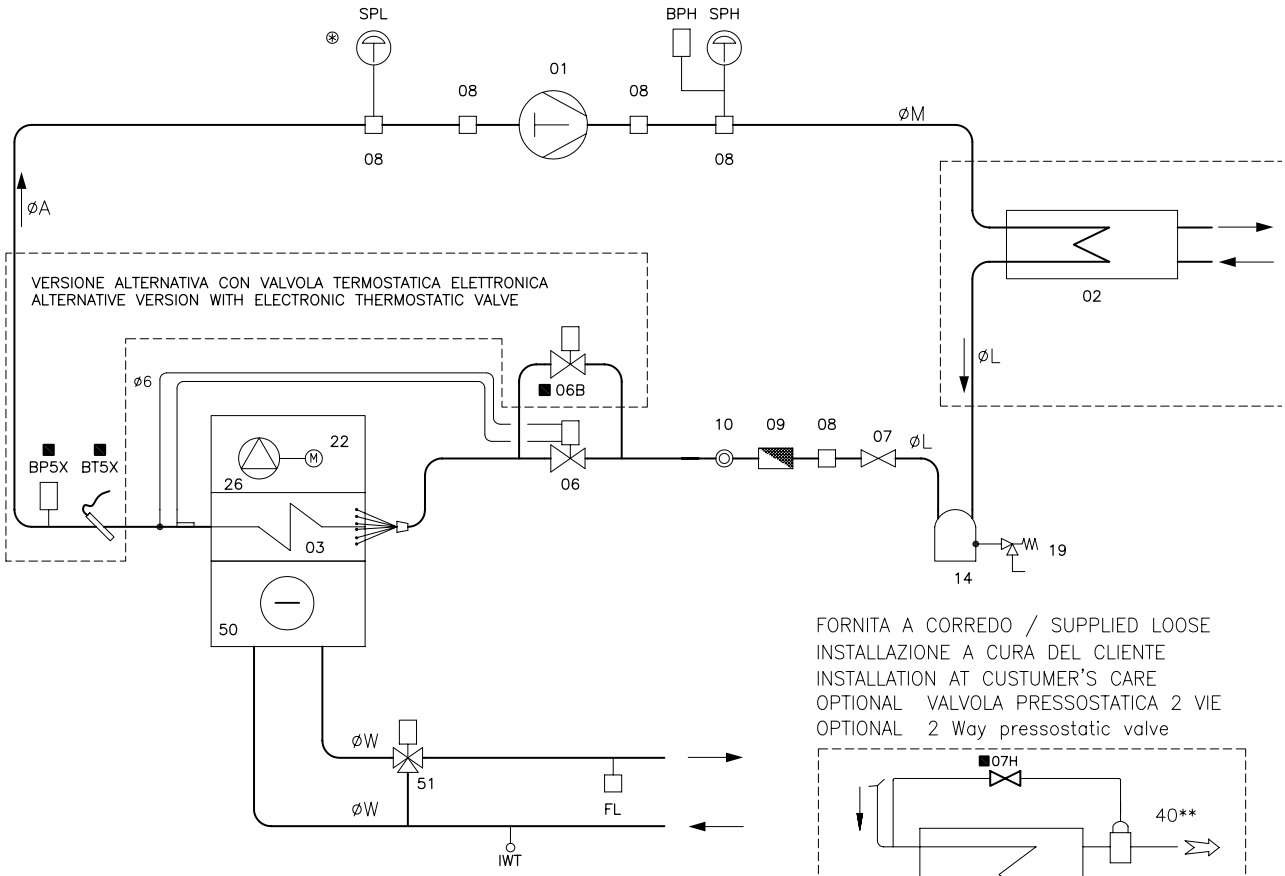
DATATECH UEDW / OEDW DC



	DESCRIZIONE	DESCRIPTION
01	COMPRESSORE	COMPRESSOR
02	CONDENSATORE	CONDENSER
06	VALVOLA TERMOSTATICA	THERMOSTATIC VALVE
06B	VALVOLA TERMOSTATICA ELETTRONICA	ELECTRONIC THERMOSTATIC VALVE
07	RUBINETTO LINEA DEL LIQUIDO	LIQUID LINE VALVE
08	PRESA DI CARICA	CHARGING CONNECTION
09	FILTRO	FILTER
10	INDICATORE DI UMIDITA'	MOISTURE INDICATOR SIGHT GLASS
14	RICEVITORE DI LIQUIDO	LIQUID RECEIVER
19	VALVOLA DI SICUREZZA DI ALTA PRESSIONE	HIGH PRESSURE SAFETY VALVE
22	MOTORE ELETT. VENTILATORE CENTRIF.	CENTRIFUGAL FAN ELECTRIC MOTOR
26	VENTILATORE	FAN
40	VALVOLA PRESSOSTATICA	PRESSOSTATIC VALVE
50	BATTERIA AD ACQUA REFRIGERATA	CHILLED WATER COIL
51	VALVOLA A 3 VIE	3 WAY VALVE
BP5X	TRASDUTTORE DI PRES. VALVOLA ELETT.	ELECTRONIC THERMOSTATIC VALVE PRESS. TRANDUCER
BPH	TRASDUTTORE DI ALTA PRESSIONE	HIGH PRESSURE TRANSDUCER
BT5X	SONDA DI TEMP. VALV.TERMOSTATICA ELETTRONICA	ELECTRONIC VALVE TEMPERATURE PROBE
FL	FLUSSOSTATO	FLOW SWITCH
IWT	SONDA TEMPERATURA ACQUA	WATER TEMPERATURE PROBE
SPH	PRESSOSTATO ALTA PRESSIONE	HIGH PRESSURE SWITCH
SPL	PRESSOSTATO BASSA PRESSIONE	LOW PRESSURE SWITCH
07H	RUBINETTO PER TUBI CAPILLARI	CAPILLARY TUBE VALVE

■ OPZIONALE–OPTIONAL

	A	M	L	W
17.1	22	16	12	28
22.1	22	16	12	28
26.1	28	18	16	28
30.2	2x22	2x16	2x12	\
32.1	28	18	16	35
36.1	28	18	16	\
34.2	2x22	2x16	2x12	35
38.1	28	18	16	35
38.2	2x22	2x16	2x12	35
46.2	2x22	2x16	2x12	42
49.1	35	22	18	42
56.2	2x28	2x18	2x16	42
66.2	2x28	2x18	2x16	\
72.2	28	18	16	54
85.2	35	22	18	54
95.2	35	22	18	54

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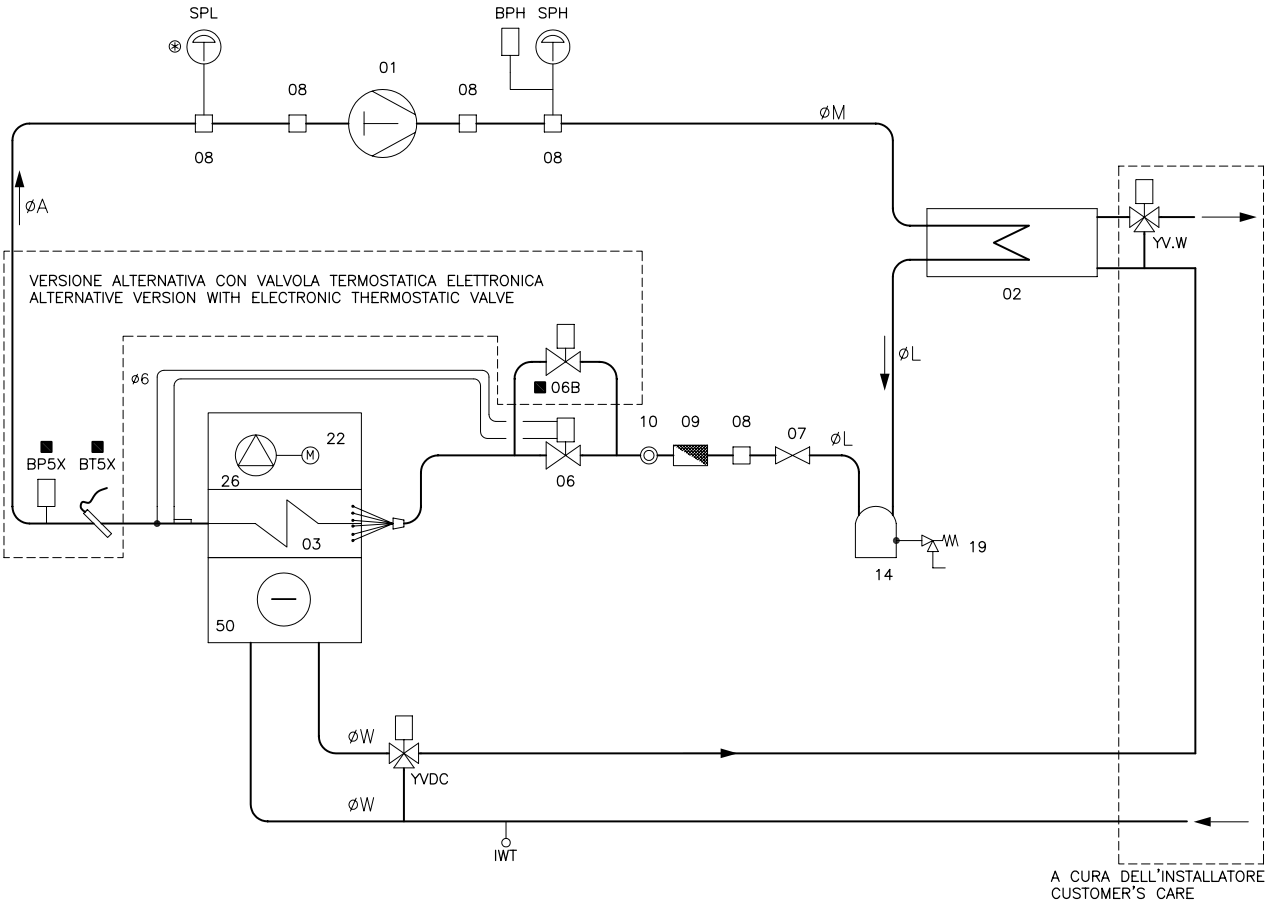
DATATECH UEDW / OEDW FC



⊛ NON PRESENTE CON VALVOLA TERMOSTATICA ELETTRONICA
NOT PRESENT WITH ELECTRONIC EXPANSION VALVE

■ OPZIONALE–OPTIONAL

	A	M	L	W
17.1	22	16	12	28
22.1	22	16	12	28
26.1	28	18	16	28
30.2	2x22	2x16	2x12	\
32.1	28	18	16	35
36.1	28	18	16	\
34.2	2x22	2x16	2x12	35
38.1	28	18	16	35
38.2	2x22	2x16	2x12	35
46.2	2x22	2x16	2x12	42
49.1	35	22	18	42
56.2	2x28	2x18	2x16	42
66.2	2x28	2x18	2x16	\
72.2	28	18	16	54
85.2	35	22	18	54
95.2	35	22	18	54

	DESCRIZIONE	DESCRIPTION
01	COMPRESSORE	COMPRESSOR
02	CONDENSATORE	CONDENSER
06	VALVOLA TERMOSTATICA	THERMOSTATIC VALVE
06B	VALVOLA TERMOSTATICA ELETTRONICA	ELECTRONIC THERMOSTATIC VALVE
07	RUBINETTO LINEA DEL LIQUIDO	LIQUID LINE VALVE
08	PRESA DI CARICA	CHARGING CONNECTION
09	FILTRO	FILTER
10	INDICATORE DI UMIDITA'	MOISTURE INDICATOR SIGHT GLASS
14	RICEVITORE DI LIQUIDO	LIQUID RECEIVER
19	VALVOLA DI SICUREZZA DI ALTA PRESSIONE	HIGH PRESSURE SAFETY VALVE
22	MOTORE ELETT. VENTILATORE CENTRIF.	CENTRIFUGAL FAN ELECTRIC MOTOR
26	VENTILATORE	FAN
40	VALVOLA PRESSOSTATICA	PRESSOSTATIC VALVE
50	BATTERIA AD ACQUA REFRIGERATA	CHILLED WATER COIL
YVDC	VALVOLA A 3 VIE ACQUA REFRIGERATA	CHILLED WATER 3 WAY VALVE
YV.W	VALVOLA A 3 VIE CONDENSATORE	CONDENSER 3 WAY VALVE
BP5X	TRASDUTTORE DI PRES. VALVOLA ELETT.	ELECTRONIC THERMOSTATIC VALVE PRESS. TRANDUCER
BPH	TRASDUTTORE DI ALTA PRESSIONE	HIGH PRESSURE TRANSDUCER
BT5X	SONDA DI TEMP. VALV.TERMOSTATICA ELETTRONICA	ELECTRONIC VALVE TEMPERATURE PROBE
IWT	SONDA TEMPERATURA ACQUA	WATER TEMPERATURE PROBE
SPH	PRESSOSTATO ALTA PRESSIONE	HIGH PRESSURE SWITCH
SPL	PRESSOSTATO BASSA PRESSIONE	LOW PRESSURE SWITCH
07H	RUBINETTO PER TUBI CAPILLARI	CAPILLARY TUBE VALVE

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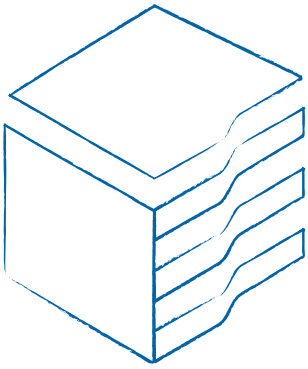

BLUE BOX
GROUP

Blue Box Group S.r.l.
I - 30010 Cantarana di Cona (VE) - Via Valletta, 5
Tel +39 0426 921111 - Fax +39 0426 302222
www.blueboxgroup.it - info@blueboxgroup.it