

INSTALLATION, USE AND MAINTENANCE MANUAL

V-IPER

Chillers and heat pumps
50 kW - 380 kW



PLUS

- » High efficiency under part load conditions
- » Class A in chiller and heat pump operating mode
- » Extended operating range
- » Intelligent modulation of the water flow rate
- » Counterflow solutions in every operating mode
- » Possibility to configure low-noise versions



Dear Customer,

Thank you for placing your trust in one of the products of producer

This product is the result of our work and our commitment to design, research, and production and has been made from the finest materials, employing state-of-the-art components and production technology.

The CE marking of the product ensures its compliance with the safety requirements of the following directives: the Machinery Directive, the Electromagnetic Compatibility Directive, the Electrical Safety Directive, and the Pressure Equipment Directive. Fulfillment of the Ecodesign requirements is fully in keeping with the environmental awareness that has always guided our company.

The company certification of the Quality and Safety management system ensures that product quality is constantly checked and improved, and that the product is manufactured in full compliance with the highest standards.

By choosing our product, you have opted for Quality, Reliability, Safety, and Sustainability.

ORIGINAL INSTRUCTIONS

Water chillers and heat pumps are in accordance with the law 2014/68/UE (PED) filling in D1 form, approved by the third notified body ICIM n°0425

The technical and dimensional data reported in this manual may be modified in view of any product improvement.

For any information, please contact the company info@galletti.it



The unit data are reported on the rating label in this page.

THE LABEL SHOWS THE FOLLOWING DATA:

- Series and size of the unit
- Date of manufacture
- Main technical data
- Manufacturer
- The label is applied on the unit, usually on the enclosing panels beside the condenser coil

IMPORTANT: NEVER REMOVE THE LABEL

- Numero di matricola dell'unità
- The serial number permits to identify the technical characteristics and the components installed
- Without this datum it will be impossible to identify the unit correctly

 	Galletti S.p.A. - Via L.Romagnoli 12/a 40010 Bentivoglio (BO) Italy Made in Italy CATEGORY 2
Serial number Code Date of production Cooling capacity (W) Heating capacity (W) Power supply Power input (kW) Weight (kg) Max power input (kW) Max running amperage (A) HP power input (kW) Refrigerant Max refrigerant pressure Max refrigerant temperature (°C)	

GENERAL CAUTIONARY NOTES

- Keep this manual intact in a safe place for the all life of the unit.
- Carefully read all the information contained in this manual, paying special attention to sections marked "Important" and "Warning"; failure to comply with the instructions provided could result in injury to persons or damage to the equipment.
- Should a fault occur, consult this manual and if necessary contact the nearest Galletti S.p.A. service centre.
- All installation and maintenance operations must be carried out by qualified personnel, unless otherwise indicated in this manual.
- The first start up must be carried out exclusively by qualified personnel and authorized by Galletti S.p.A. (see warranty sheet attached).
- Before performing any work on the unit, disconnect it from the power supply.
- Failure to comply with the rules provided in this manual will result in the immediate invalidation of the warranty.
- Galletti S.p.A. shall not accept any liability for injury or damage resulting from improper use of the equipment or failure to comply with the directions provided in this manual and on the unit it self.
- It's mandatory to install filters heat exchangers protection will immediately invalidate the warranty.

SAFETY SYMBOLS



Carefully read this manual.



Warning



Use personal protective equipment

USE SUITABLE PPE (GLOVES FOR REFRIGERANT, PROTECTIVE GOGGLES)

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1 THE V-IPER SERIES

1.1 FIELD OF APPLICATION

V-IPER air-condensed water chillers and heat pumps have been designed to cool and heat water for air conditioning and heating systems in residential or commercial buildings.

The V-IPER range units are intended for outdoor installation (IP24 protection degree), in a position not accessible to the public.

If protection grids are not provided (accessory) and if the

machine can be reached by non-specialised personnel, access to the finned coil must be prohibited using appropriate barriers. Do not install the unit in environments with gas or flammable dusts.

Do not install the unit in environments with gas or flammable dusts.

1.2 MAIN FEATURES

V-IPER is the new series of air cooled chillers and heat pumps designed to meet the needs of efficiency, configurability, reliability and ease of maintenance.

The series consists of 20 models with cooling capacities from 50 to 380 kW, in cooling only version or reversible heat pump.

The generously-sized finned pack heat exchanger is designed to optimize both the operation as an evaporator and as a condenser (also in terms of fin type and circuitry).

The fan sections, with their exclusive airfoil blades (HyBlade®) are characterized by extraordinary air performance and acoustics and represent the state of the art of the axial fan.

The air diffuser AxiTop® allows to raise the efficiency of the fan with benefits in terms of noise (in combination with the condensation control) and overall efficiency of the unit.

The V-IPERange adopts innovative solutions in the functioning and layout of the internal components of the hydraulic kit, that is now simplified to reduce connections and minimize the pressure drop on the water side inside the machine.

Each model is fully configurable with the choice of control options, hydraulic, acoustic, heat recovery without involving changes to the overall dimensions.

1.3 MODELS AND VERSIONS

The V-IPER series consists of 20 models with cooling capacities from 50 to 380 kW, in cooling only version or reversible heat pump. All models operates with R410A refrigerant.

» Configuration options

1	Expansion valve
A	Electronic
2	Pumps and accessories
0	Not present
1	Standard pump + expansion vessel + water filling valve
2	Double Standard pump + expansion vessel + water filling valve
3	High pressure pump + expansion vessel + water filling valve
4	High pressure double pump + expansion vessel + water filling valve
5	Option 1 + inverter
6	Option 2 + inverter
7	Option 3 + inverter
8	Option 4 + inverter
3	Buffer tank
0	Not present
S	Present (EXCLUDES HYDRO SMART FLOW)
4	Partial heat recovery
0	Not present
D	Desuperheater with water pump free contact
5	Air flow modulation
C	Condensing control with standard AC fans
E	Condensing control with electronic EC fans
6	Antifreeze kit
0	Not present
E	Base (plate exchangers only)
P	Additional protection for pump
S	Additional protection for pump and buffer tank
7	Acoustic insulation
0	Not present
1	Compressor silencing housing + acoustical enclosures
2	Acoustic attenuation on fans (AXITOP® diffuser)
3	Opz. 1 + Opz. 2
8	Refrigerant circuit options
0	None
M	Refrigerant pressure gauges
9	Remote control
0	Not present

NOTE: The choice of some options can make the choice of some others forbidden or make some selection (fields) mandatory. Please contact Galletti S.p.A. for verification.

2	RS485 connection port (Modbus protocol or Carel)
S	Remote simplified control panel
T	Touch screen control panel
X	Microprocessor remote controller
L	LON FTT10 serial board
B	BACNET IP / pCOWeb serial board
G	Programmed pCOWeb board
10	Special coils
0	Standard copper - aluminium coil (VPR H only)
I	Hydrophilic coated copper - aluminium coils (VPR H only)
R	Copper / copper coil (VPR H only)
M	Microchannel condensing coils with epoxy resin + UV treatment (only VPR C)
11	Vibration dampers
0	Not present
G	Base rubber vibration dampers
M	Base spring vibration dampers
12	Compressors options
0	Not present
1	Low air/water temp. = sump heater (chillers), coil heating cable (heat pumps)
13	Microprocessor controller
1	Advanced
2	Advanced + touch interface + USB
ACCESSORIES	
A	Coils protection grill
B	Hydro smart flow (EXCLUDES BUFFER TANK)
C	Pair of VIC-TAULIC quick couplings (and adapters if necessary)
D	ON/OFF status of the compressors
E	Remote control for power step limits
F	Configurable digital alarm card
G	Soft starter
H	Power factor correction capacitors
I	Dehydrating filter regulating kit
L	Double insulation - water side
M	0-10V signal for external user pump control (ONLY IF FIELD 2 = 0)
N	Regulating taps - tandem/trio

1.4 MAIN COMPONENTS

STRUCTURE - Galvanised steel sheet base with a textured polyester powder coating for outdoors, colour RAL9002. Structure built from steel sheet, with a textured polyester powder coating for outdoors (colour RAL9002) to ensure effective resistance to corrosive agents. Fastening devices are made of non-oxidizable carbon steel that has undergone surface-passivating treatments. The frame has structural reinforcements in the most stressed node, highlighted by careful study fem through advanced software, to ensure maximum strength under all conditions.

SCROLL COMPRESSORS - scroll compressors in tandem configuration or trio, with optional acoustical insulation. The levels of efficiency, reliability and noise of such components are the state of the art for the scroll compressor.

FAN DRIVE ASSEMBLY - Electric fan with 6-pole external rotor motor directly keyed to the axial fan, with internal thermal protection on the windings, complete with safety grille and dedicated supporting structure. The unique aerodynamic profile of

the blades (HyBlade) results in outstanding aerodynamic and acoustic performance. Electric fans with BLDC motor are available on request.

ELECTRONIC MICROPROCESSOR CONTROLLER - The electronic control enables the complete control of the unit. It can be easily accessed through a polycarbonate flap with IP65 protection rating. By reading the outdoor air temperature, it can automatically change the setpoint to adapt it to the outdoor load conditions or keep the unit running even in the harshest winter conditions. It is possible to set up LAN networks for controlling 4 units in parallel and the management of remote communication protocol via RS485 serial card (Carel or Modbus protocol), Lonworks, with GSM modem kit or PicoWeb Ethernet card. This control allows the recording of operating parameters and their storage in the memory as well as the ability to download via a control link as well as the management of the modulation of the pumps group and the Smart Defrost System.

HEAT EXCHANGER - Made of 8mm diameter copper pipes and aluminium fins. The special engineering of the heat exchangers allows defrost cycles to be carried out at maximum speed in the models with heat pump operation, which brings clear benefits in terms of the integrated efficiency of the whole cycle. For chiller only versions: microchannel heat exchanger consisting of aluminium-manganese alloy fins, long-life alloy channels and end sections, and coated copper user connection. Each microchannel contains partitions through which the coolant flows in the desuperheating, condensation, and supercooling stages. The condensing coils are mounted on vibration-damping mounts that allow expansion depending on the temperature.

PLATE HEAT EXCHANGER - Brazed corrugated plate heat exchangers made of stainless steel and optimised for use with R410A. The heat exchanger design has been optimized for partial load operation and makes it possible to maintain optimal heat exchange with modulation of the water flow rate by up to 30% in relation to the nominal point. In the case of dual circuit units, a single plate heat exchanger with a dual cooling circuit and single hydraulic circuit is used, thus reducing overall dimensions and maximizing efficiency.

2 INSPECTION, CONVEYANCE DIMENSIONAL AND SITING

2.1 INSPECTION

On receiving the unit, check that the packing is intact: the machine left the factory in perfect conditions and after thorough inspection.

Should you detect any signs of damage, immediately report them to the carrier and note them on the delivery slip.

Galletti S.p.A. Must be notified of the entity of the damage

within 8 days of the delivery date.

Check that the following items are present:

- starting up module,
- wiring diagram
- warranty certificate
- make sure that this manual is intact (64 pagine).

2.2 CONVEYACE

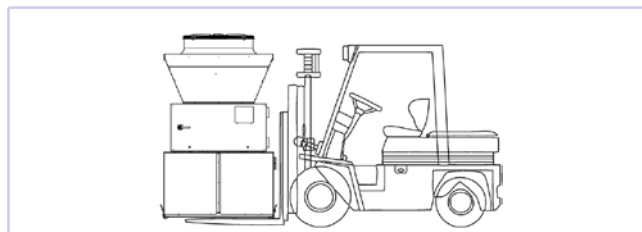
During handling it is compulsory to check dimensions, weights, centre of gravity and anchorages. Check as well that lifting and positioning devices conform to the current safety regulations. The unit leaves the factory screwed onto a wooden pallet, which allows it to be easily conveyed with a forklift truck.

The unit must be lifted using ropes or straps, anchored to the lifting points located on the unit base, that are longer than the height of the unit and bars and spacer boards placed on top of the unit so as not to damage the unit's sides or its upper part.

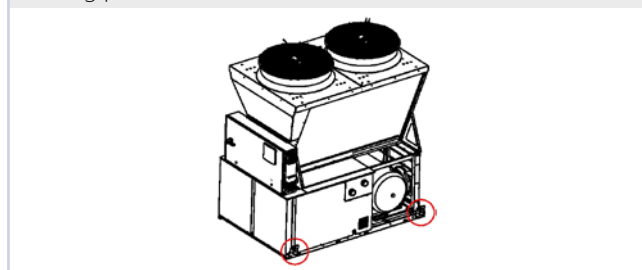
In this phase, before the definitive position, vibration damping supports can be installed (optional).

⚠ Warning In all lifting operations make sure that the unit is securely anchored in order to prevent accidental falls or overturning.

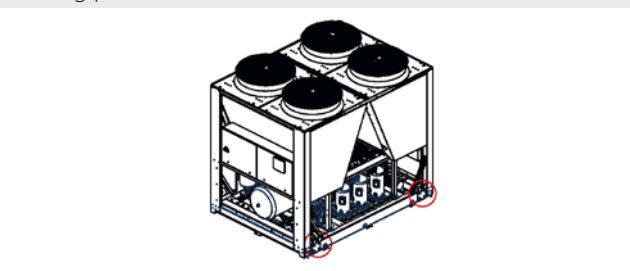
⚠ Use all available lifting points.



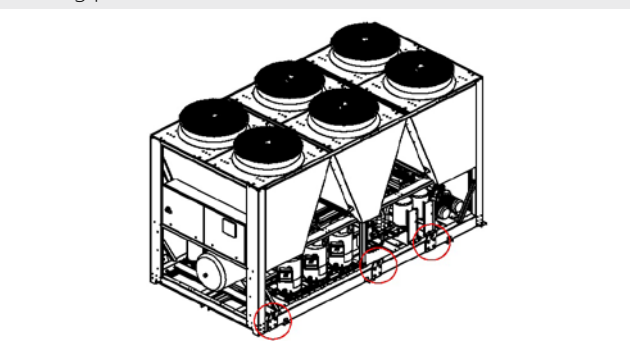
» Lifting points frame 1-2



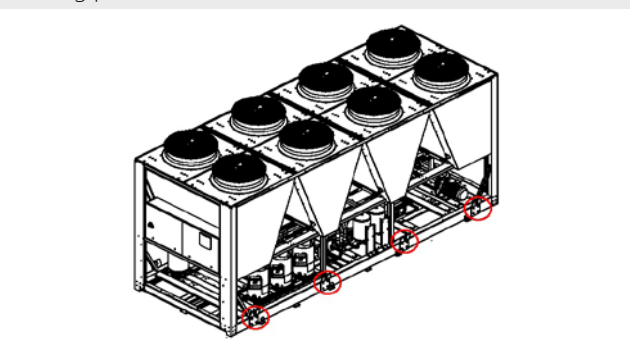
» Lifting points frame 3



» Lifting points frame 4



» Lifting points frame 5



2.3 SITING AND DAMPERS

It is important to bear in mind the following aspects when choosing the best site for installing the unit:

- Size and origin of water pipes;
- Location of the power supply;
- Solidity of the supporting surface;
- Avoid obstacles to the outflow of air from the fan which could cause back suction (see section on 2.4 Installation

clearance requirements and dimensional p. 9);

- Direction of prevalent winds: (position the unit so as to prevent prevalent winds from interfering with the fan air flow). Prevalent winds opposing the fan air flow will result in a maximum air temperature below the value indicated in the operating limits;
- Avoid the possible reverberation of sound waves; do not

install the unit in narrow or cramped spaces;

- Ensure adequate accessibility for maintenance or repairs (see section on 2.4 Installation clearance requirements and dimensional p. 9).

This appliance is not intended to be used by children or persons with physical, sensorial or mental problems, inexperienced or unprepared, without supervision. Be careful that children do not approach the appliance.

When installing the vibration dampers follow the instructions below:

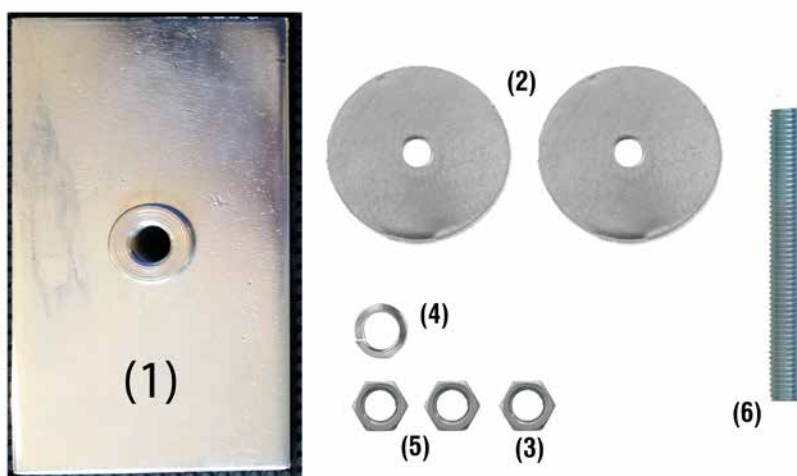
1. Screw the jack (6) into the vibration damper with jack support plate (1) all the way;
2. Screw the bolt (5) until the jack (6) is locked in place on the

vibration damper (1);

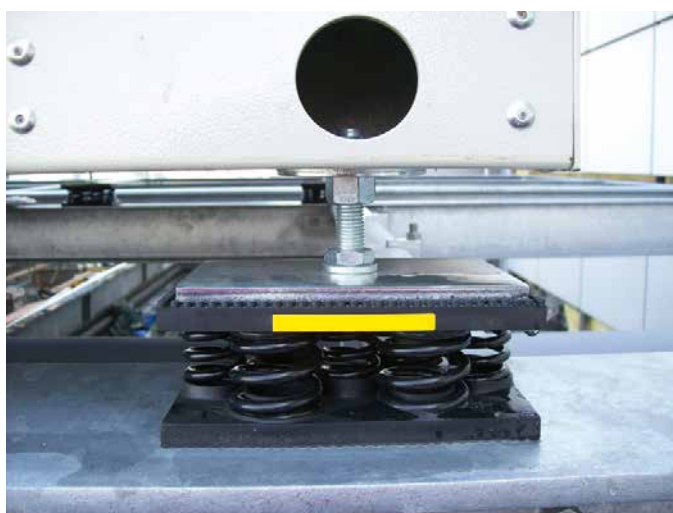
3. Screw the bolt (3) and insert one of the two disks (2) into the jack (6);
4. Insert the jack (6) into the hole on the unit base;
5. Adjust the height by turning the bolt (3);
6. Insert the second disk (2) into the jack (6) until it makes contact with the base;
7. Tighten the vibration damper with the split washer (4) and the bolt (5) to the unit base.

V-IPER	Vibration dampers
52 - 336	6
386	8

» Dampers components



» Correct damper installation




2.4 INSTALLATION CLEARANCE REQUIREMENTS AND DIMENSIONAL

To guarantee the proper functioning of the unit and access for maintenance purposes, it is necessary to comply with the minimum installation clearance requirements shown in figure V-IPER 52 - 62, p. 12, p. 13 p. 14 p. 15 e p. 16.

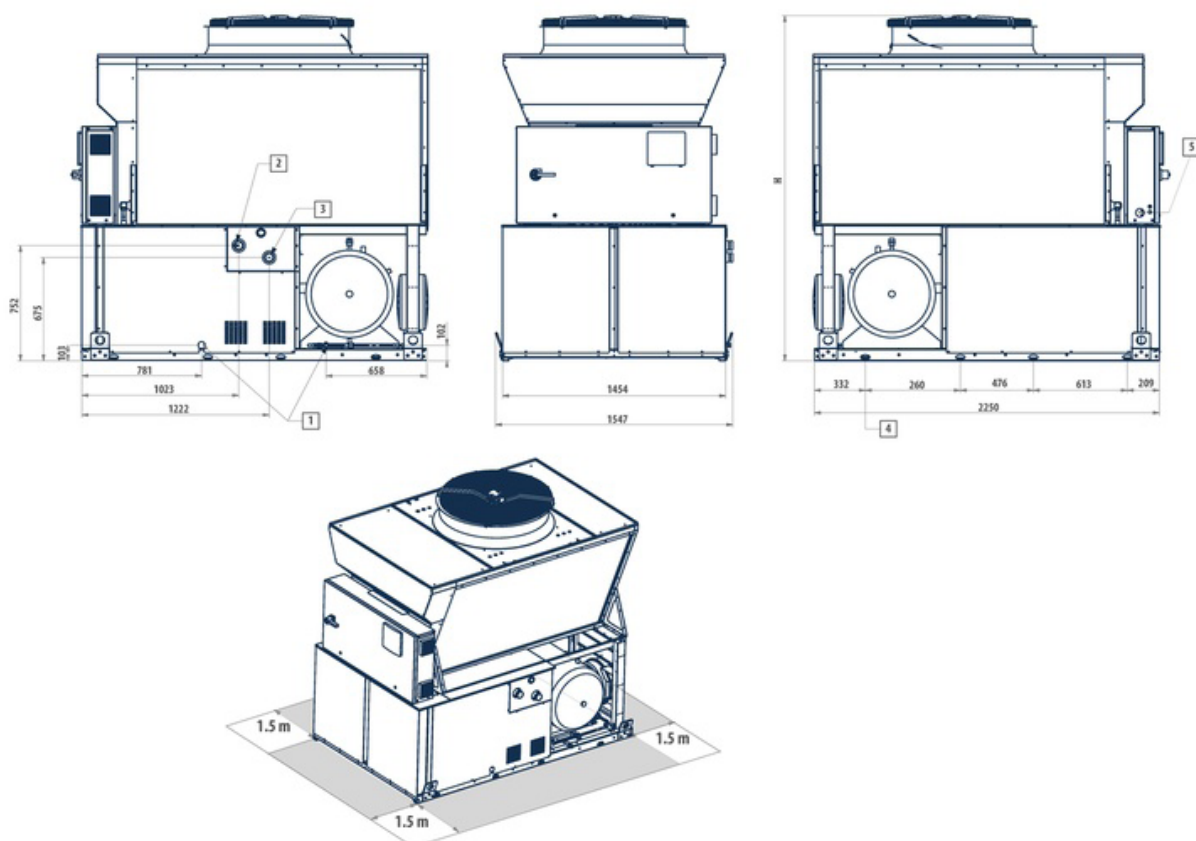
- Verify that there are no obstacles in front of the fans air outlet.

- Avoid any and all situations of backflow of hot air between air outlet and inlet of the unit.
- If even only one of the above conditions is not fulfilled, please contact the manufacturer to check for feasibility.
- In the design of the V-IPER series, special care has been taken to minimise noise and vibrations transmitted to the ground.

- Even greater insulation may be obtained, however, by using vibration damping base supports (available as optional accessories).
- If vibration damping base supports are adopted, it is strongly recommended also to use vibration damping couplings on the water pipes.
- Whenever the unit is to be sited on unstable ground (various types of soil, gardens, etc.) it is a good idea to provide a supporting base of adequate dimensions.

 **Warning** Heat pump units produce condensation while operating in the heating mode.

» V-IPER 52 - 62



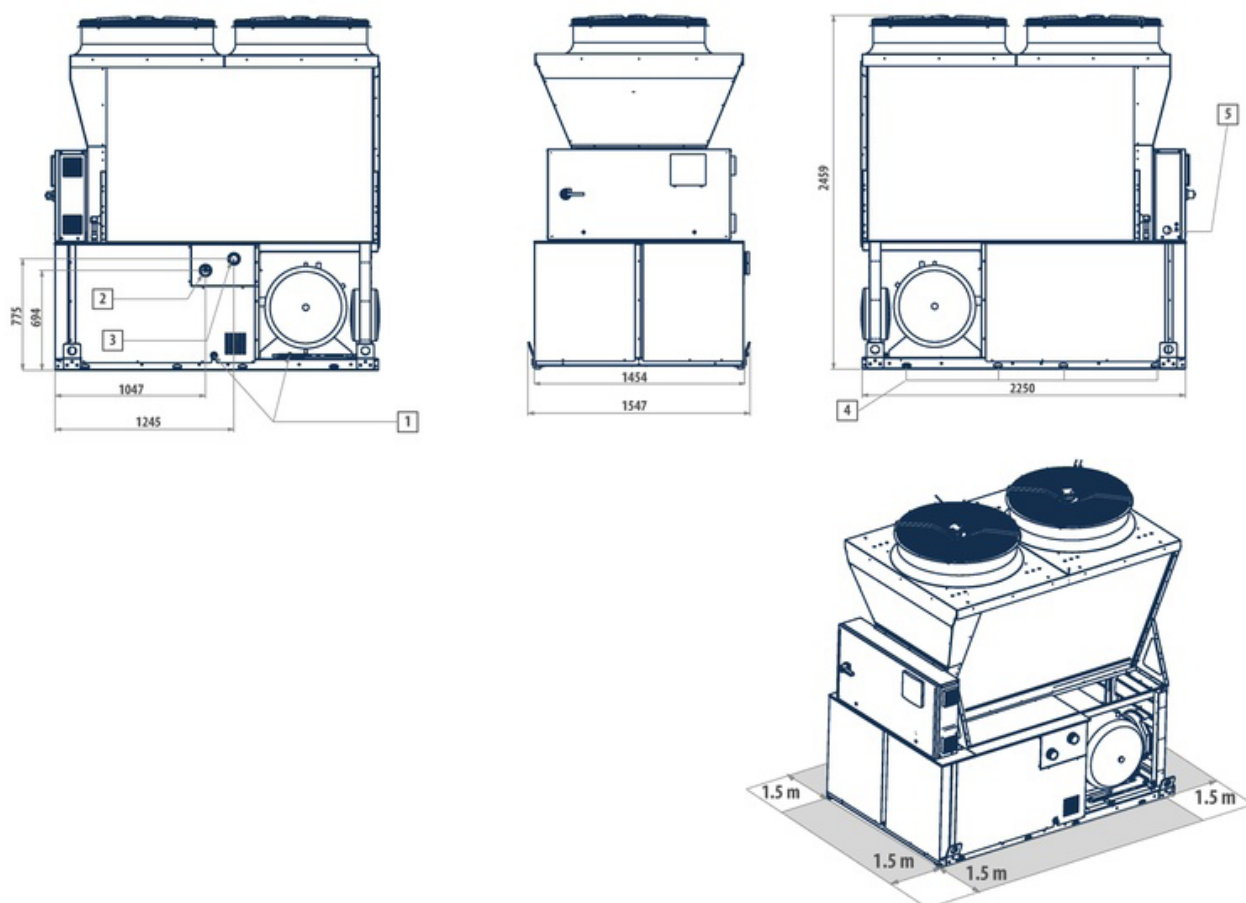
LEGEND

- 1 Water drainage 1/2" female
- 2 Water inlet Victaulic 2"
- 3 Water outlet Victaulic 2"
- 4 Vibration dampers
- 5 Power supply input

H CHILLER VERSION = 2459

H HEAT PUMP VERSION = 2252

*For the C version increase the distance to be complied to ensure an easy access to the machine to 2m in the coil extraction direction in order to allow the complete extraction of the microchannel coil.

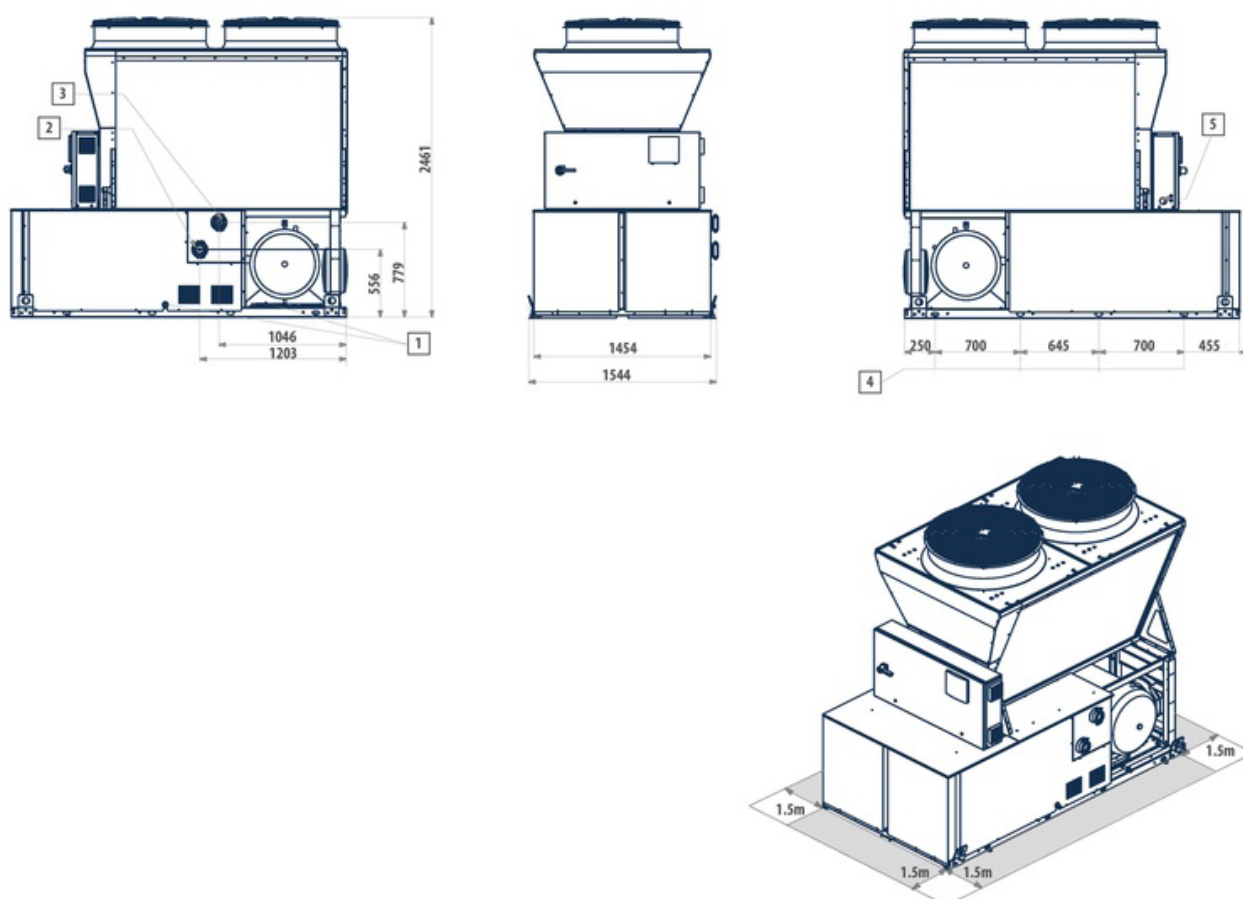


LEGEND

- 1 Water drainage 1/2" female
- 2 Water inlet Victaulic 2 1/2"
- 3 Water outlet Victaulic 2 1/2"
- 4 Vibration dumpers
- 5 Power supply input

*For the C version increase the distance to be complied to ensure an easy access to the machine to 2m in the coil extraction direction in order to allow the complete extraction of the microchannel coil.

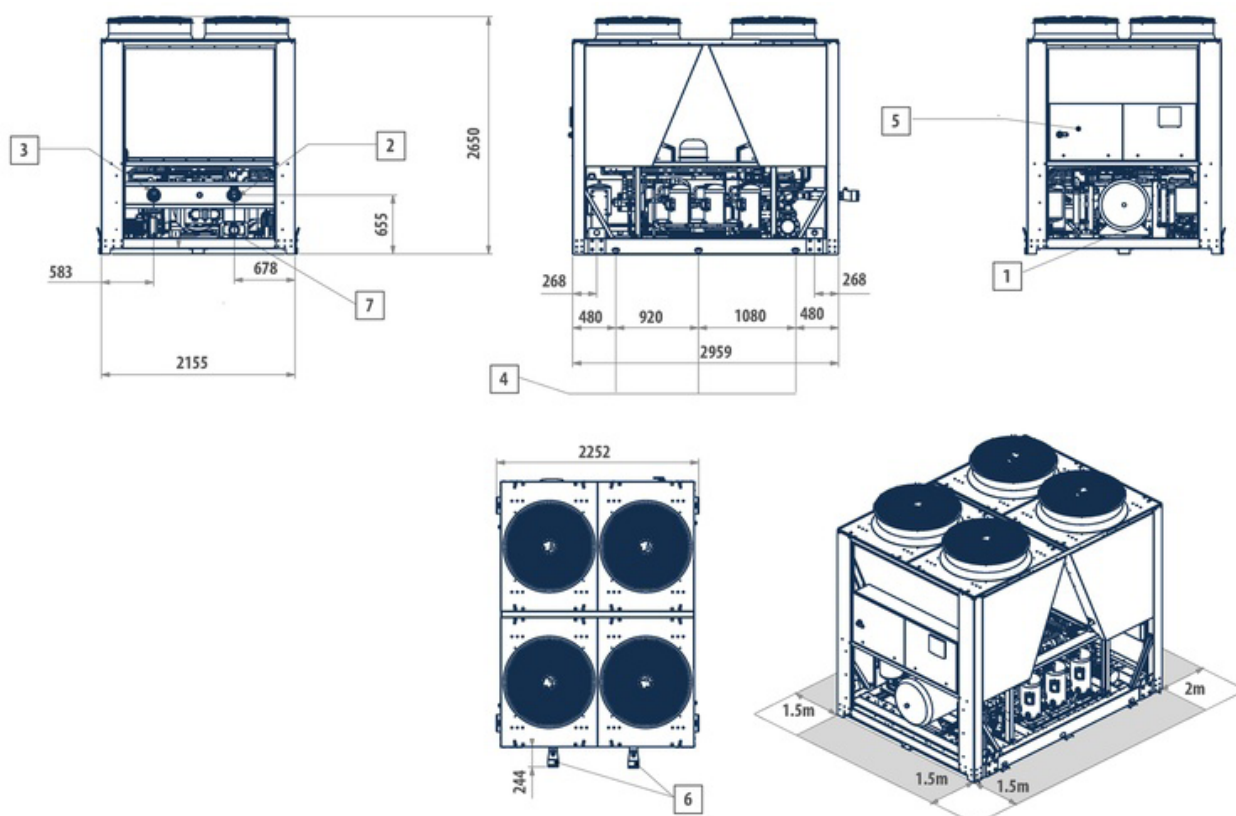
» V-IPER 114 - 134



LEGEND

- 1 Water drainage
- 2 Water inlet Victaulic 2 1/2"
- 3 Water outlet Victaulic 2 1/2"
- 4 Vibration dumpers
- 5 Power supply input

*For the C version increase the distance to be complied to ensure an easy access to the machine to 2m in the coil extraction direction in order to allow the complete extraction of the microchannel coil.



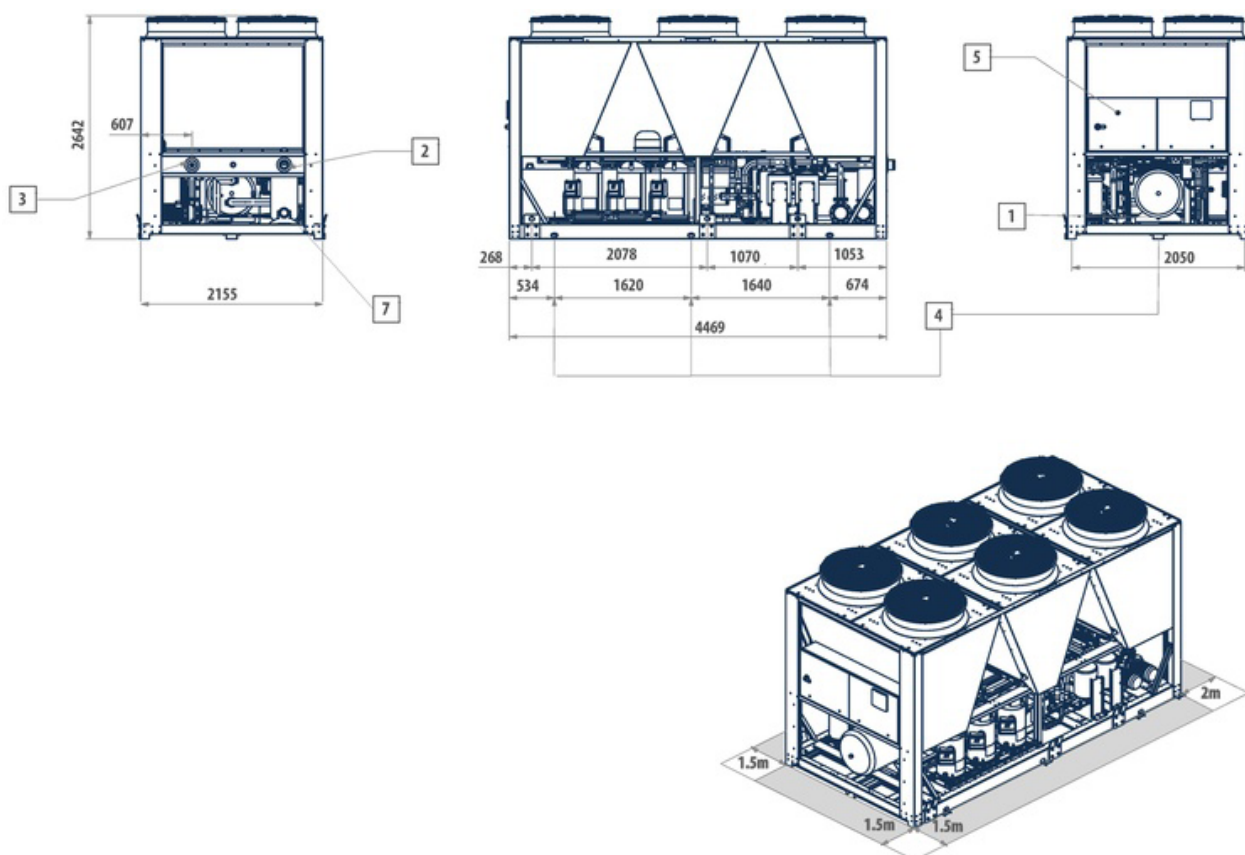
LEGEND

- 1 Water drainage
- 2 Water inlet Victaulic 4"
- 3 Water outlet Victaulic 4"
- 4 Vibration dampers
- 5 Electric control board
- 6 Victaulic adapter from 4" to 3" to be mounted on-site
- 7 Water outlet, evaporator only

POWER SUPPLY INPUT IN THE LOWER PART OF THE ELECTRIC CONTROL BOARD

*For the C version increase the distance to be complied to ensure an easy access to the machine to 2m in the coil extraction direction in order to allow the complete extraction of the microchannel coil.

» V-IPER 276 - 306 - 336

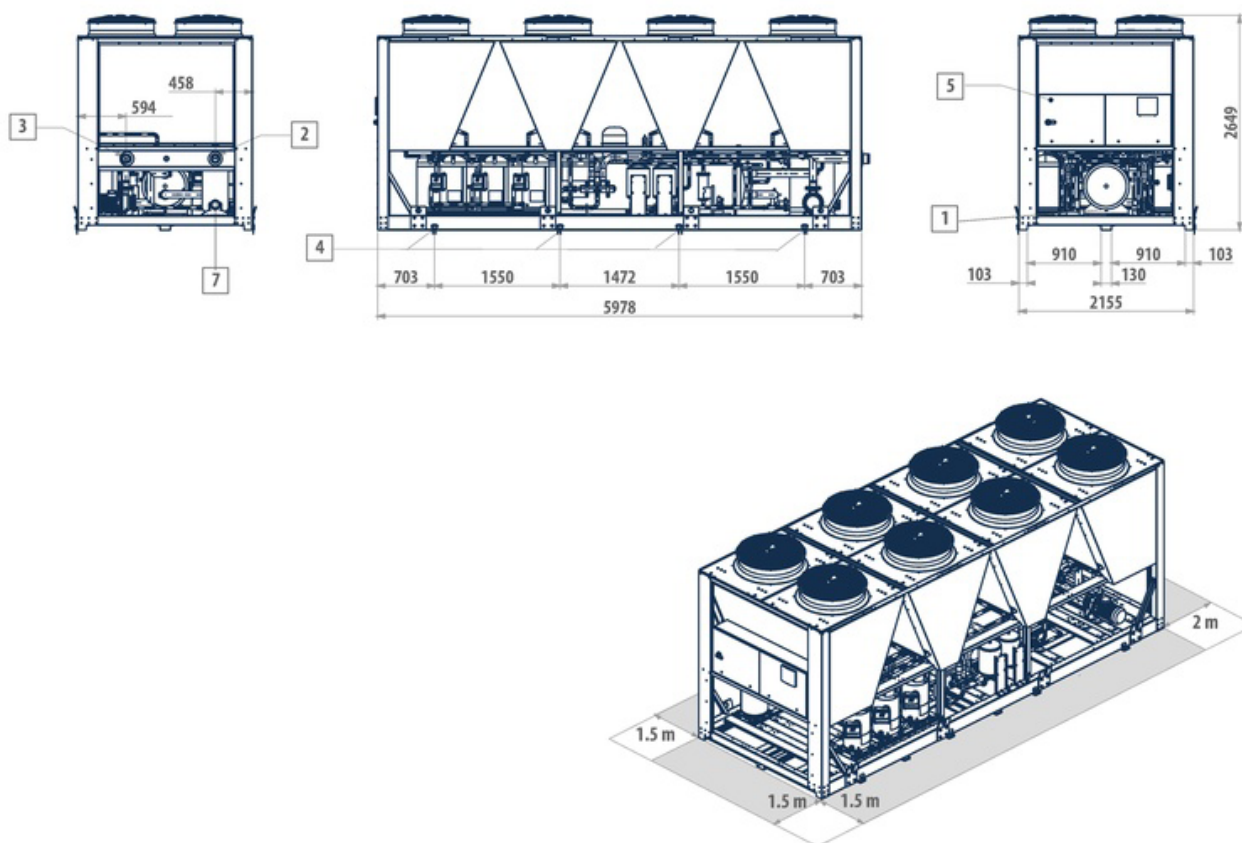


LEGEND

- 1 Water drainage
- 2 Water inlet Victaulic 4"
- 3 Water outlet Victaulic 4"
- 4 Vibration dampers
- 5 Electric control board
- 6 -
- 7 Water outlet, evaporator only

POWER SUPPLY INPUT IN THE LOWER PART OF THE ELECTRIC CONTROL BOARD

*For the C version increase the distance to be complied to ensure an easy access to the machine to 2m in the coil extraction direction in order to allow the complete extraction of the microchannel coil.



LEGEND

- 1 Water drainage
- 2 Water inlet Victaulic 4"
- 3 Water outlet Victaulic 4"
- 4 Vibration dampers
- 5 Electric control board
- 6 -
- 7 Water outlet, evaporator only

POWER SUPPLY INPUT IN THE LOWER PART OF THE ELECTRIC CONTROL BOARD

*For the C version increase the distance to be complied to ensure an easy access to the machine to 2m in the coil extraction direction in order to allow the complete extraction of the microchannel coil.

3 TECHNICAL FEATURES

3.1 V-IPER C WATER CHILLERS RATED TECHNICAL DATA

» V-IPER C water chillers rated technical data (first part)

VPR C		52	62	72	82	92	112	114	133	134	164
Power supply	V-ph-Hz	400 - 3N - 50									
Cooling capacity (1)(E)	kW	51,4	65,1	73,7	83,7	97,3	109	102	124	131	155
Total power input (1)(E)	kW	16,0	20,3	22,8	26,2	30,5	34,6	32,4	40,3	42,3	47,7
Absorbed rated current (1)	A	25,8	32,6	36,4	41,9	48,6	55,5	52,0	69,0	67,9	76,5
EER (1)(E)		3,21	3,21	3,23	3,19	3,19	3,16	3,16	3,10	3,10	3,26
Eurovent efficiency class (1)		A									
ESEER (E)		4,12	4,17	4,08	4,06	4,04	4,00	4,08	4,14	4,22	4,04
Maximum current absorption	A	40,0	50,0	59,0	68,0	74,0	81,0	79,0	98,0	101	125
Star up current	A	138	194	203	212	218	269	178	242	245	269
Compressors / circuits		2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	4 / 2	3 / 1	4 / 2	4 / 2
n° of axial fans		1	1	2	2	2	2	2	2	2	4
Air flow rate (1)	m³/h	21800	25000	43200	43200	48000	50622	50622	50622	50622	86400
Water flow (1)	l/h	8875	11249	12737	14458	16777	18824	17654	21514	22580	26818
Water pressure drop (1)(E)	kPa	37	45	47	41	31	29	31	24	24	36
Available pressure head - LP pumps (1)	kPa	154	141	189	182	174	141	140	138	136	159
Buffer tank volume	dm³	250	250	350	350	350	350	350	350	350	450
Expansion vessel volume	dm³	18	18	18	18	18	18	18	18	18	24
Unit connections diameter	"	2	2	2 1/2	2 1/2	2 1/2	2 1/2	2 1/2	2 1/2	2 1/2	4
Height	mm	2459	2459	2459	2459	2459	2459	2461	2459	2461	2650
Depth	mm	1547	1547	1547	1547	1547	1547	1544	1547	1544	2252
Length	mm	2250	2250	2250	2250	2250	2250	2752	2250	2752	2959
Sound power level (2)(E)	dB(A)	80	84	83	83	87	88	87	87	87	86
Sound pressure level (3)	dB(A)	52	56	55	55	59	60	59	59	59	58
Refrigerant charge - circuit 1 (4)	kg	6,5	8,0	9,2	10,4	11,9	13,2	6,4	15,1	7,9	9,8
Refrigerant charge - circuit 2 (5)	kg	-	-	-	-	-	-	6,4	-	7,9	9,8
Transport weight unit with pump and tank	kg	813	823	875	888	968	1048	1866	981	1945	1710
Operating weight unit with pump and full tank	kg	1163	1173	1225	1238	1318	1398	2316	1331	2395	2160

(1) Outdood air temperature 35°C, water temperature 12°C / 7°C (14511:2013)

(2) Sound power level measured according to UNI EN ISO 9614

(3) Sound pressure measured at a distance of 10 m in a free field with a directivity factor of 2

(4) If the two cooling circuits are unbalanced, it is the smaller circuit.

(5) If the two cooling circuits are unbalanced, it is the larger circuit.

(E) EUROVENT certified data

» V-IPER C water chillers rated technical data (second part)

VPR C		173	174	204	213	226	256	276	306	336	386
Power supply	V-ph-Hz	400 - 3N - 50									
Cooling capacity (1)(E)	kW	165	170	194	203	212	250	269	290	329	369
Total power input (1)(E)	kW	50,8	52,0	58,8	63,4	66,4	80,4	84,6	89,2	103	115
Absorbed rated current (1)	A	81,8	83,6	93,9	102	106	129	135	143	166	185
EER (1)(E)		3,26	3,28	3,30	3,21	3,20	3,12	3,18	3,26	3,18	3,20
Eurovent efficiency class (1)		A									
ESEER (E)		4,14	4,13	4,24	4,27	4,26	4,22	4,17	4,09	4,06	4,09
Maximum current absorption	A	125	136	148	149	162	195	206	222	247	274
Star up current	A	313	280	337	377	278	339	395	411	474	502
Compressors / circuits		3 / 1	4 / 2	4 / 2	3 / 1	6 / 2	6 / 2	6 / 2	6 / 2	6 / 2	6 / 2
n° of axial fans		4	4	4	4	4	4	6	6	6	8
Air flow rate (1)	m³/h	86400	86400	101244	101244	101244	101244	129600	151866	151866	172800
Water flow (1)	l/h	28517	29397	33459	35038	36645	43148	46354	50075	56730	63598
Water pressure drop (1)(E)	kPa	31	24	29	34	27	31	32	37	41	45
Available pressure head - LP pumps (1)	kPa	162	167	154	145	149	135	176	162	142	161
Buffer tank volume	dm³	450	450	450	450	450	450	750	750	750	750
Expansion vessel volume	dm³	24	24	24	24	24	24	24	24	24	24
Unit connections diameter	"	4									
Height	mm	2650	2650	2650	2650	2650	2650	2642	2642	2642	2649
Depth	mm	2252	2252	2252	2252	2252	2252	2252	2252	2252	2155
Length	mm	2959	2959	2959	2959	2959	2959	4469	4469	4469	5978
Sound power level (2)(E)	dB(A)	88	87	90	92	90	90	90	92	93	93
Sound pressure level (3)	dB(A)	60	59	62	64	62	62	62	64	65	65
Refrigerant charge - circuit 1 (4)	kg	20,6	10,6	12,1	25,3	13,1	15,1	12,9	15,0	15,0	20,7
Refrigerant charge - circuit 2 (5)	kg	-	10,6	12,1	-	13,1	15,1	20,5	20,8	25,1	24,7
Transport weight unit with pump and tank	kg	1228	1746	1901	1271	1903	1916	2634	2640	2714	3831
Operating weight unit with pump and full tank	kg	1578	2196	2351	1621	2353	2366	3384	3390	3464	4581

- (1) Outdood air temperature 35°C, water temperature 12°C / 7°C (14511:2013)
(2) Sound power level measured according to UNI EN ISO 9614
(3) Sound pressure measured at a distance of 10 m in a free field with a directivity factor of 2
(4) If the two cooling circuits are unbalanced, it is the smaller circuit.
(5) If the two cooling circuits are unbalanced, it is the larger circuit.
(E) EUROVENT certified data

3.2 V-IPER H HEAT PUMPS RATED TECHNICAL DATA

» V-IPER H heat pumps rated technical data (first part)

VPR H		52	62	72	82	92	112	114	133	134	164
Power supply	V-ph-Hz	400 - 3N - 50									
Cooling capacity (1)(E)	kW	51,8	65,1	72,3	84,1	96,0	108	103	124	130	154
Total power input (1)(E)	kW	16,3	20,8	22,9	26,6	30,1	34,4	33,2	40,1	42,0	48,5
Absorbed rated current (1)	A	26,2	33,4	36,5	42,6	47,9	55,2	53,3	68,6	67,3	77,8
EER (1)(E)		3,18	3,13	3,16	3,16	3,19	3,14	3,11	3,10	3,10	3,18
Eurovent efficiency class (1)(E)		A									
ESEER (E)		4,07	4,13	3,96	3,94	3,92	3,92	3,74	4,00	3,83	4,01
Heating capacity (2)(E)	kW	54,4	67,6	78,0	87,9	99,8	110	107	126	131	161
Total power input (2)(E)	kW	16,5	20,2	23,9	26,8	30,1	33,5	32,8	38,2	40,2	49,8
Absorbed rated current (2)	A	26,5	32,4	38,0	42,8	47,9	53,8	52,6	65,6	64,4	79,8
COP (2)(E)		3,30	3,35	3,26	3,28	3,32	3,30	3,26	3,31	3,27	3,24
Eurovent efficiency class (2)		A									
SCOP (E)		3,88	3,95	3,60	3,72	3,82	3,87	3,96	3,91	3,81	3,71
Energy efficiency		152	155	141	146	150	152	156	154	150	146
Energy efficiency class (3)		A++	A++	A+	A+	A++	A++	A++	A++	A++	A+
Maximum current absorption	A	40,0	50,0	59,0	68,0	74,0	81,0	79,0	98,0	101	125
Star up current	A	138	194	203	212	218	269	178	242	245	269
Star up current with soft starter	A	97,0	134	142	151	157	190	137	181	184	208
Compressors / circuits		2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	4 / 2	3 / 1	4 / 2	4 / 2
Air flow rate (1)	m³/h	21800	25000	42435	42435	48000	48000	48000	48000	48000	84870
Water flow (1)	l/h	8950	11252	12492	14522	16557	18638	17800	21400	22424	26572
Water pressure drop (1)(E)	kPa	38	45	45	41	30	28	32	23	28	35
Available pressure head - LP pumps (1)	kPa	153	139	189	182	174	142	140	139	132	159
Available pressure head - HP pumps (1)	kPa	243	226	262	255	248	239	237	235	229	198
Air flow rate (2)	m³/h	21800	25000	42435	42435	48000	48000	48000	48000	48000	84870
Water flow (2)	l/h	9394	11671	13467	15188	17268	19161	18512	21892	22785	27896
Water pressure drop (2)(E)	kPa	41	49	52	45	32	30	35	24	29	38
Available pressure head - LP pumps (2)	kPa	142	124	173	164	155	132	128	127	118	149
Available pressure head - HP pumps (2)	kPa	229	210	246	238	230	228	224	222	213	183
Buffer tank volume	dm³	250	250	350	350	350	350	350	350	350	450
Expansion vessel volume	dm³	18	18	18	18	18	18	18	18	18	24
Unit connections diameter	"	2	2	2 1/2	2 1/2	2 1/2	2 1/2	2 1/2	2 1/2	2 1/2	4
Height	mm	2252	2252	2459	2459	2459	2459	2461	2459	2461	2650
Depth	mm	1547	1547	1547	1547	1547	1547	1544	1547	1544	2252
Length	mm	2250	2250	2250	2250	2250	2250	2752	2250	2752	2959
Sound power level (4)(E)	dB(A)	80	84	83	83	87	88	87	87	87	86
Sound pressure level (5)	dB(A)	52	56	55	55	59	60	59	59	59	58
Refrigerant charge - circuit 1 (6)	kg	2,0	2,0	2,0	2,0	2,0	2,0	2,5	2,0	2,5	4,0
Refrigerant charge - circuit 2 (7)	kg	18,0	18,0	18,0	18,0	18,0	18,0	18,0	18,0	18,0	24,0
Transport weight unit with pump and tank	kg	938	950	990	1006	1092	1177	1435	1114	1478	1941
Operating weight unit with pump and full tank	kg	1288	1300	1340	1356	1442	1527	1785	1464	1828	2391

(1) Outdood air temperature 35°C, water temperature 12°C / 7°C (14511:2013)

(2) Outdood air temperature dry bulb 7°C / wet bulb 6°C, water temperature 40°C / 45°C (14511:2013)

(3) Seasonal energy efficiency class for LOW TEMPERATURE room heating under AVERAGE climatic conditions [EUROPEAN REGULATION No 811/2013]

(4) Sound power level measured according to UNI EN ISO 9614

(5) Sound pressure measured at a distance of 10 m in a free field with a directivity factor of 2

(6) If the two cooling circuits are unbalanced, it is the smaller circuit.

(7) If the two cooling circuits are unbalanced, it is the larger circuit.

(E) EUROVENT certified data

» V-IPER H heat pumps rated technical data (second part)

VPR H		173	174	204	213	226	256	276	306	336	386
Power supply	V-ph-Hz	400 - 3N - 50									
Cooling capacity (1)(E)	kW	162	167	190	204	212	249	270	289	326	367
Total power input (1)(E)	kW	50,9	52,5	59,9	64,7	67,8	80,1	85,1	90,7	104	116
Absorbed rated current (1)	A	81,9	84,4	95,7	104	109	128	136	146	167	186
EER (1)(E)		3,20	3,20	3,19	3,17	3,13	3,11	3,18	3,19	3,13	3,16
Eurovent efficiency class (1)(E)		A									
ESEER (E)		4,01	4,11	3,99	3,90	3,98	4,01	4,05	3,93	3,94	3,97
Heating capacity (2)(E)	kW	166	175	199	210	219	252	279	297	337	379
Total power input (2)(E)	kW	51,8	53,1	59,9	63,8	66,3	76,3	84,8	89,4	101	115
Absorbed rated current (2)	A	83,4	85,3	95,6	102	106	122	136	144	163	185
COP (2)(E)		3,22	3,30	3,33	3,31	3,32	3,31	3,29	3,33	3,31	3,28
Eurovent efficiency class (2)		A									
SCOP (E)		3,58	3,82	3,86	3,80	4,25	4,33	4,02	4,14	4,22	3,94
Energy efficiency		140	150	151	150	167	170	158	163	166	155
Energy efficiency class (3)		A+	A++	A++	A++	A++	A++	A++	A++	A++	A++
Maximum current absorption	A	125	136	148	149	162	195	206	222	247	274
Star up current	A	313	280	337	377	278	339	395	411	474	502
Star up current with soft starter	A	235	219	258	281	229	278	316	332	379	407
Compressors / circuits		3 / 1	4 / 2	4 / 2	3 / 1	6 / 2	6 / 2	6 / 2	6 / 2	6 / 2	6 / 2
Air flow rate (1)	m³/h	84870	84870	96000	96000	96000	96000	127305	144000	144000	169740
Water flow (1)	l/h	28058	28902	32873	35318	36553	42950	46552	49902	56273	63303
Water pressure drop (1)(E)	kPa	31	23	28	35	27	31	33	37	40	45
Available pressure head - LP pumps (1)	kPa	161	168	155	146	150	135	175	163	143	160
Available pressure head - HP pumps (1)	kPa	197	270	257	248	251	236	295	282	262	259
Air flow rate (2)	m³/h	84870	84870	96000	96000	96000	96000	127305	144000	144000	169740
Water flow (2)	l/h	28899	30371	34553	36514	38078	43756	48326	51503	58364	65654
Water pressure drop (2)(E)	kPa	32	25	31	37	29	32	35	39	43	48
Available pressure head - LP pumps (2)	kPa	153	159	144	133	137	118	162	149	123	145
Available pressure head - HP pumps (2)	kPa	184	261	245	234	238	219	280	267	241	243
Buffer tank volume	dm³	450	450	450	450	450	450	750	750	750	750
Expansion vessel volume	dm³	24	24	24	24	24	24	24	24	24	24
Unit connections diameter	"	4									
Height	mm	2650	2650	2650	2650	2650	2650	2642	2642	2642	2649
Depth	mm	2252	2252	2252	2252	2252	2252	2252	2252	2252	2155
Length	mm	2959	2959	2959	2959	2959	2959	4469	4469	4469	5978
Sound power level (4)(E)	dB(A)	88	87	90	91	90	90	90	91	93	93
Sound pressure level (5)	dB(A)	60	59	62	63	62	62	62	63	65	65
Refrigerant charge - circuit 1 (6)	kg	4,0	4,0	4,0	4,0	4,0	4,0	4,0	4,0	4,0	4,0
Refrigerant charge - circuit 2 (7)	kg	24,0	24,0	24,0	24,0	24,0	24,0	24,0	24,0	24,0	24,0
Transport weight unit with pump and tank	kg	2099	1981	2148	2196	2160	2186	2919	2926	3032	4329
Operating weight unit with pump and full tank	kg	2549	2431	2598	2646	2610	2636	3669	3676	3782	5079

(1) Outdood air temperature 35°C, water temperature 12°C / 7°C (14511:2013)

(2) Outdood air temperature dry bulb 7°C / wet bulb 6°C, water temperature 40°C / 45°C (14511:2013)

(3) Seasonal energy efficiency class for LOW TEMPERATURE room heating under AVERAGE climatic conditions [EUROPEAN REGULATION No 811/2013]

(4) Sound power level measured according to UNI EN ISO 9614

(5) Sound pressure measured at a distance of 10 m in a free field with a directivity factor of 2

(6) If the two cooling circuits are unbalanced, it is the smaller circuit.

(7) If the two cooling circuits are unbalanced, it is the larger circuit.

(E) EUROVENT certified data

4 MICROPROCESSOR CONTROL

Below are specified the microprocessor control functions.

The complete control instructions are described in service manual.



4.1 DESCRIPTION OF CONTROL PANEL

The control panel of the unit enables the user to display and set the unit's operating parameters and read the main operating data. In addition it indicates what mode (cooling or heating) the unit is operating in and signals any alarms that may have been triggered. Any new settings saved are stored in the card and used the next time the unit is switched on, even following a power failure.

4.1.1 Remote control panels (accessories)

Installing a PCDS remote control panel enables you to switch the unit on and off and set the operating mode (cooling - heating) from a distance and have a cumulative alarm indicator (thanks to an alarm signalling relay integrated in the electronic control device). Installing a PCD remote control panel instead provides remote access to all the electronic control functions installed in the unit.

4.1.2 Main functions

— Control over the temperature of water entering the

evaporator.

- Management of the defrosting function (only VPR H).
- Control of fan speed (standard feature of VPR H, optional for VPR C).
- Complete alarm management.
- Setup for serial line connection for supervisor system/tele-help.
- Setup for connection to a remote terminal that duplicates the functions of the electronic control.

4.1.3 Devices controlled

- Compressor
- Fans
- cycle reversing valve (only VPR H);
- Water circulation pump;
- Antifreeze heating element (optional)
- Electronic control internal alarm signalling relay (designed to control an indicator or buzzer).

4.2 USING THE CONTROL PANEL

4.2.1 Display

The graphic display shows the evaporator inlet and outlet water temperature as well as the notifications relating to the active components and current alarms.







4.2.2 Information about equipment status







Information regarding the status of the unit is provided by means of LEDs on the display.

SYMBOL	KEY	DESCRIPTION
	ALARM	Press the ALARM key to reset alarms. When there is an alarm, it will light up.
Prg	PROGRAM	Press PRG to access the main menu.

SYMBOL	KEY	DESCRIPTION
Esc	ESC	Press ESC to move up to a higher level in the menu.
	UP	Press UP to go to the next screen or increase the value of a parameter.
	ENTER	Press ENTER to go into the fields of parameters to be edited and to confirm changes.
	DOWN	Press DOWN to go to the previous screen or decrease the value of a parameter.

» Meaning of LEDs on the display:

SYMBOL	MEANING
	Pump 1 ON
	Pump 2 ON
	Compressors ON (N is the number of running compressors)
	Fans ON
	Heater ON
	Heat pump mode

SYMBOL	MEANING
	Chiller mode
	Defrost ON
	Unit in alarm status
	Oil Recovery Procedure - active
	Low noise compressors - active
	Low-noise fans - active

4.3 SWITCHING ON AND OFF AND CHANGING THE OPERATING MODE

The unit may be switched on and off from the control panel installed on the unit itself.

To enable remote ON-OFF switching from the PCDS or via an external switch (not supplied) make connections to terminals 18-30 (normally jumpered).

Remote **ON-OFF** open: unit OFF (keyboard disabled)

Remote **ON-OFF** closed: unit ON (possibility to switch the unit ON and OFF from the keyboard)

Warning Where remote ON-OFF switching is enabled, after a power failure occurs and power is restored the unit will go into the mode indicated by the remote input without considering any changes that have been made from the unit control panel That is:

remote **ON-OFF** open: the unit remains Off

remote **ON-OFF** closed: the unit starts again

4.3.1 Switching the unit on and off in the cooling or heating mode

To switch the unit on and off in both operating modes, follow the instructions below:

- Press **Esc** to go to the main screen.
- Keep the key **←** pressed down for at least 3 seconds.
- Using the arrows, select between "cooling" and "heating".

— Press key **Prg** to confirm unit ON or **Esc** to cancel the operation. Once you have made the selection, the display will return to the main screen.

It is not possible to change over directly from the cooling mode to the heating mode: to do so it is necessary to select the heating mode using the PCDS remote control (accessory) or close terminal bridge 19-30 on the electric control board.

4.3.2 Changing the operating mode

The unit leaving the factory has been configured for a fast, easy connection to the PCDS remote control (accessory), which enables the user to change the operating mode and turn the unit on and off from a distance.

If the unit is not equipped with this accessory, to select the operating mode it is necessary to use terminals 19-30 on the electric control board as follows:

- terminals 19-30 closed for cooling
- terminals 19-30 open for heating

Warning Only specialised personnel may access the electric control board.

Therefore, to enable the user to switch the unit on and off and change the operating mode safely and conveniently from a distance, it is recommended to install a PCDS remote control (or remote switches outside the unit).

4.4 DISPLAY AND SETTING OF OPERATING PARAMETERS

From the main screen press **Prg** to view the menu; using the arrow keys select the submenu concerned and press **←** to enter it. Below is a list of the items included in the main menu and the type of parameters contained in each.

4.4.1 Unit status

This menu provides general information regarding the status of the unit and its main components. It is in turn divided into 2 submenu items:

- Devices: status of compressors, heating element, fans, pumps.
- Electronic Valve: status of the electronic valves and reading of sensors

4.4.2 Inputs/Outputs Menu

From this menu it is possible to view, and if necessary override, the status of all controller inputs and outputs. The submenu items are:

- I/O status: the statuses of the analog and digital inputs and analog and digital outputs are displayed in order.
- I/O forcing: If enabled from the maintenance menu, all inputs and outputs read and governed can be manually controlled.

4.4.3 Setpoint Menu

Management of fixed setpoint and variable setpoint.

4.4.4 User Menu

From this menu, password protected (100), it is possible to configure the main chiller control logics. This menu is in turn divided into:

- Setpoints and Parameters: control logic, setpoint management, compressor rotation and any configurable digital inputs.
- Lan and supervision: enabling of On/Off logics and summer/winter changeovers; LAN logic and selection of parameters for serial communication.
- Alarms: configuration of the digital alarm output and definition of serious alarms
- Clock: clock setting and programming of unit ON/OFF time zones (only where a clock card is installed)

4.4.5 Maintenance Menu

Password protected (password not provided), this menu is divided into:

- Manual Control: enabling of manual override of the

- microcontroller inputs and outputs (managed thereafter from the I/O menu)
- Parameters: sensor offset and password change
- Running hours: run time of the main chiller devices and management of the related alarms
- History: list of past alarms and erasure of history
- Alarms: configuration of alarms

4.4.6 Manufacturer's menu

Password protected (password not provided), this menu is divided into:

- Unit Configuration: parameters that define the type of unit and the devices making it up
- Parameters: setting of essential operating parameters (condensation control, defrost function...)
- Alarms: configuration of alarms
- Initialisation and password: restoring of default parameters and password definition

4.4.7 Info Menu

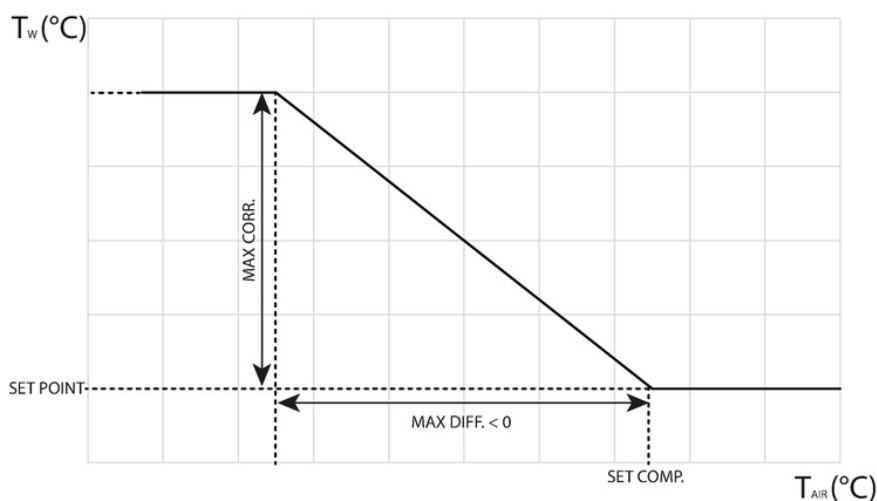
It contains the version, code and date of the software used; from here you can also set the display language.

4.5 SET POINT COMPENSATION

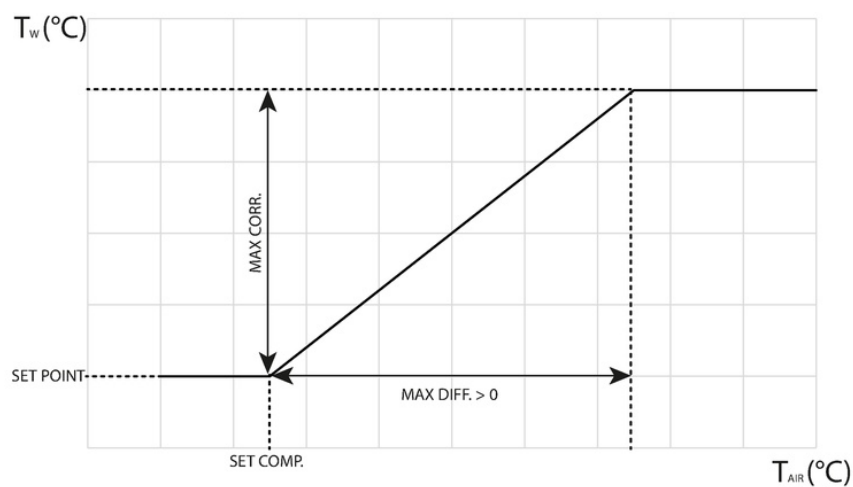
The compensation function corrects the control setpoint based on the outdoor temperature. For both the heating and cooling modes it is possible to select a compensation setpoint,

differential and max. adjustment.
The logic works as follows:

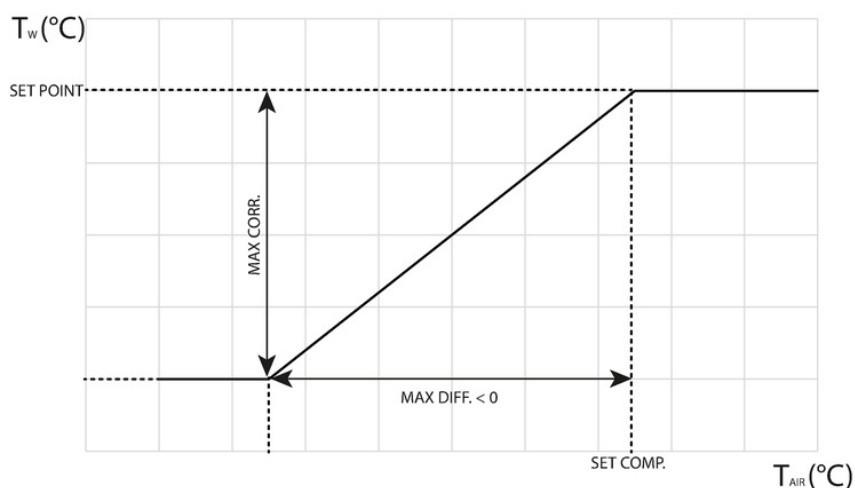
» Compensation mode Chiller - Diff.



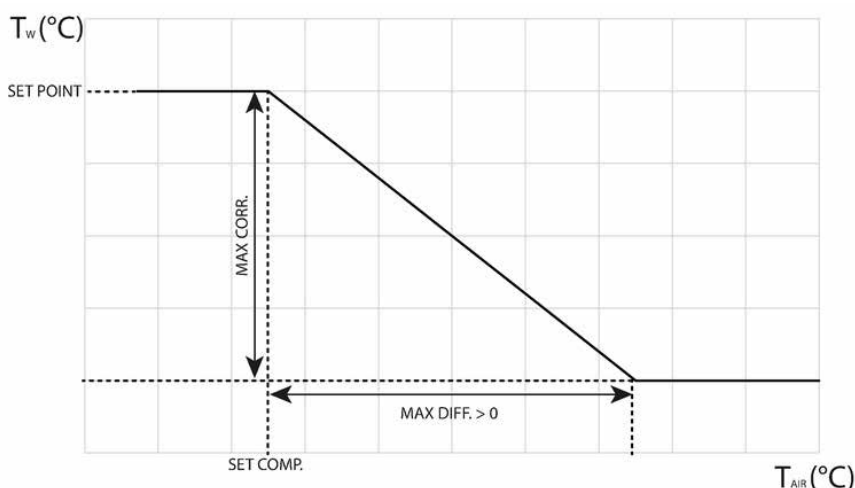
» Compensation mode Chiller - Diff. > 0



» Compensation mode HP - Diff.



» Compensation mode HP - Diff. > 0



EXAMPLE

Let us assume we have set the following parameters for the cooling mode:


- Cooling setpoint: 12 °C
- Compensation setpoint: 30 °C
- Differential: 10 °C
- Max compensation: 4 °C

When the outdoor temperature is less than 30°C the control setpoint (assuming that no other setpoint adjustment logics are

active) will be 12°C.

When the outdoor temperature is between 30°C and 40°C, the control setpoint is adjusted by an amount of compensation calculated on the basis of the adjustment ramp defined by the parameters themselves. (e.g. Text = 32°C; compensation = 0.8°C; active setpoint= 12 + 0.8 = 12.8°C). With temperatures above 40°C the amount of compensation will be 4°, resulting in a setpoint of (12 + 4) 16°C.

4.6 SIGNALS AND ALARMS

In case of an alarm status, by pressing this key  it will be possible to display the description For complete details, refer to the software manual.

5 START-UP

The first start up must be carried out exclusively by qualified personnel and authorized by Galletti S.p.A. (see warranty sheet attached).

At first start-up of the installation make sure to comply with current national regulations.

5.1 PRELIMINARY CHECKS

When starting up the unit for the first time or after a seasonal period of quiescence, it is advisable to have the following checks performed by specialised personnel:

- Check that the electrical connections have been made properly and that all the terminals are securely tightened.
- Check that the external power supply is within $\pm 5\%$ tolerance from the power supply reported on the unit identification label. If the power supply is subject to frequent voltage fluctuations, contact Galletti S.p.A. for advice on choosing suitable protections.
- Check for refrigerant leaks, with the aid of a leak detector if necessary
- Check that the plumbing connections have been properly made according to the indications given on the plates to be found on the unit itself (water inlet, water outlet etc.).
- Make sure that the pump is not blocked.
- Make sure that the water circuit is duly bled to completely eliminate the presence of air: load the circuit gradually and

open the air vent valves, which the installer should have set in place.

Warning before starting the unit, make sure all the covering panels are in place and secured with the fastening screws provided. To start the unit, move the main switch to on. Use the keypad of the electronic control as directed in section 6.3 Electrical data p. 28 to select the cooling or heating mode.

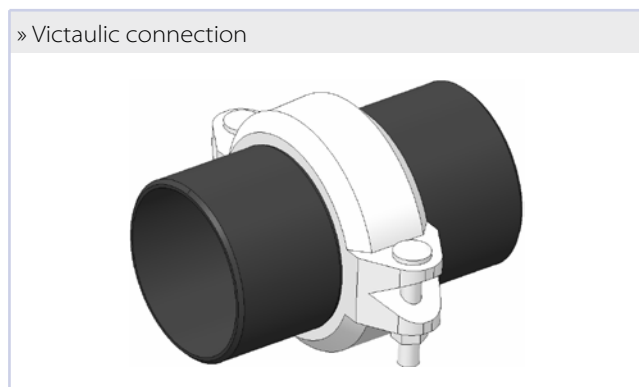
Warning You should not disconnect the unit from the power supply during periods when it is inoperative but only when it is to be taken out of service for a prolonged period (e.g. at the end of the season). To turn off the unit temporarily follow the directions provided in section 6.3 Electrical data p. 28.

Warning do not cut off power using the main switch: the latter device serves to disconnect the unit from the electricity supply when there is no passage of current, i.e. when the unit is already turned OFF.

6 PLUMBING AND ELECTRICAL CONNECTIONS

6.1 PLUMBING CONNECTION

All the units belonging to the V-IPER series are equipped with water differential pressure switch or flow switch, safety valve, water pressure gauge and automatic filling device and emptying tap. Furthermore, depending on the version, SCX units can be supplied complete with pump, expansion vessel and buffer tank.



6.1.1 General guidelines for plumbing connections

When you are getting ready to set up the water circuit for the evaporator you should follow the directions below and in any case make sure you comply with national or local regulations (use the diagrams included in this manual as your reference).

1. Connect the pipes to the chiller using flexible couplings to prevent the transmission of vibrations and to compensate for thermal expansions. These units are all configured for installation of the water inlet-outlet pipes outside the unit (on the rear) and these pipes are supplied as a standard accessory at no extra cost for the customer.
2. Install the following components on the piping:
 - Pair of quick-connection couplings with pipe section to be welded (optional item that may be selected from the price list). They facilitate the connecting operations to the plumbing system, greatly speeding up installation
 - temperature and pressure indicators for routine maintenance and monitoring of the unit. Pressure control on the water side allows to assess the correct functioning of the expansion tank and to detect water leakage in advance.
 - sumps on inlet and outlet piping for temperature detection, for a direct view of operating temperatures. They can also be consulted on the microprocessor on board the unit.
 - cut-off valves (gate valves) to isolate the unit from the hydraulic circuit.
 - metal net filter compulsory (inlet piping) with mesh no larger than 1 mm, to protect the heat exchanger from slag or impurities inside the piping. If the machine is combined with process cycles, it is recommended to install a readily serviceable uncoupling exchanger to prevent possible operation blockages and/or breakage of the plate evaporator.
 - air vent valve placed on the higher parts of the hydraulic circuit to bleed the air. The internal pipes of the unit are fitted with small air vent valves for bleeding the unit itself: this operation should be conducted when the unit is disconnected from the power supply - make sure that the circuit is completely full of water and check again to make sure there is no air before starting the pump for the first time.

- discharge cock and, where needed, drain tank in order to empty the system for maintenance or seasonal stops. Drainage valve is provided on the optional water buffer tank: this operation may only be carried out when the unit is disconnected from the power supply.

⚠ Warning Failure to use anti-freezing solutions may cause serious damage of the free-cooling coils and to the hydraulic/cooling circuit in general.

6.1.2 Recommended water circuit

⚠ Warning when making the plumbing connections, make sure there are no open flames in proximity to or inside the unit.

When setting up the water circuit, it is advisable to equip it with:

- valves for regulating (VI) the unit on the water pipes, immediately upstream and downstream from the unit itself, to be used in the event maintenance work is required;
- standard mechanical filter (FM) (OBLIGATORY!) on the pipe feeding the unit, in proximity to the latter;
- an air vent valve at the highest point of the circuit;
- escape pipe for the safety valve (VS), which, in the event the safety valve opens, diverts the jet of water to an area where it cannot harm persons or things, (**Important!**);
- vibration-damping couplings (**GA**) on the pipes to prevent vibrations from being transmitted toward the system.

Important! It is advisable to ensure that the pipes connected upstream and downstream from the unit are not smaller in diameter than the plumbing connections of the unit itself.

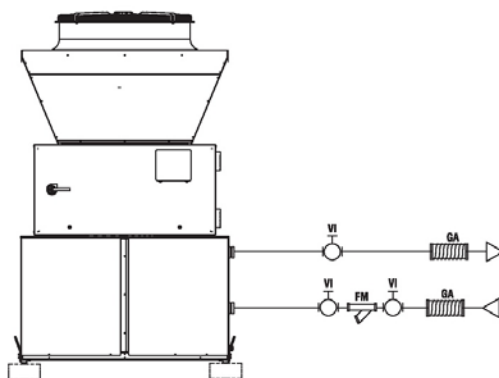
Important! During wintertime the water circuit (or the water chiller only) must be emptied to prevent damage caused by freezing; alternatively, the circuit may be filled with a mixture of water and glycol; the percentage of glycol necessary will depend on the lowest forecast temperature (see table):

Percentage by weight of ethylene glycol (%)	Mixture freezing temperature (°C)
0	0
10	-4
15	-8
20	-14
30	-18

Important! If different antifreeze product is to be used, please contact the manufacturer.

Failure to install filters and vibration dampers may cause problems of clogging, breakages and noise, for which the manufacturer may not be held liable.

» Recommended water circuit



LEGEND

VI	Regulation valve (not supplied)
GA	Vibration-damping coupling (not supplied)
FM	Mechanical filter (OBLIGATORY)

6.1.3 Filling the system

- Before you start filling, make sure that the system drainage cock is closed.
- Open all the air vent valves of the system and of the indoor units and chiller.

- Open the system regulating devices.
- To fill the circuit open slowly the water tap of the system (optional).
- When water starts coming out of the air vent valves of the indoor units, close them and continue filling until the pressure gauge reading is 1.5 bars.

6.2 ELECTRICAL CONNECTIONS

All operations must be performed by qualified service personnel in accordance with current laws and regulations. For any electrical work on the unit, refer to the electric diagrams supplied with the unit. It is recommended to make sure that:

- The characteristics of the mains power supply are adequate for the electrical inputs specified in the table of electrical data.

⚠ Warning Before carrying out any job on electrical parts, make sure the power supply is disconnected. Check that the mains electricity supply is compatible with the specifications (voltage, number of phases, frequency) shown on the unit rating plate. The supply voltage may not undergo fluctuations exceeding $\pm 5\%$ of the rated voltage. The electrical connections must be made in accordance with the wiring diagram provided with the unit and the regulations in force.

⚠ Warning Never attempt to modify internal electrical connections: any undue modifications will immediately invalidate the warranty.

An all-pole circuit breaker must be used on the electric panel upstream, conform to IEC Standards (contacts must be open at least of 3 mm), with suitable interruption capacity and differential protection, according to the electrical data table p. 28 described below, and installed as close as possible to the device.

For the machine power supply line, use H07RN-F rubber flexible cables, with section as indicated in the table p. 28. For the cable passage, use sheaths and channels suitable for outdoor installation. Provide a line switch and delayed-type fuses with features as indicated in the table p. 28. To access the electric control board it is necessary to remove the inspection panel (figure p. 27) by taking out the screws; introduce the power cable into the unit through the bushing on the side panel; then bring it to the electric control board through the cable holder provided. Tighten the wires securely to the terminals and clamp the cable in place with the cable holder (figure p. 27).

To preserve the protection degree of the machine, use a cable gland compatible with the sheath or power cable diameter, in

correspondence to the unit side panel hole.



An earth connection is mandatory: connect the earthing wire to the terminal provided on the electric control board (see the electric control board layout supplied with the unit), \perp marked.

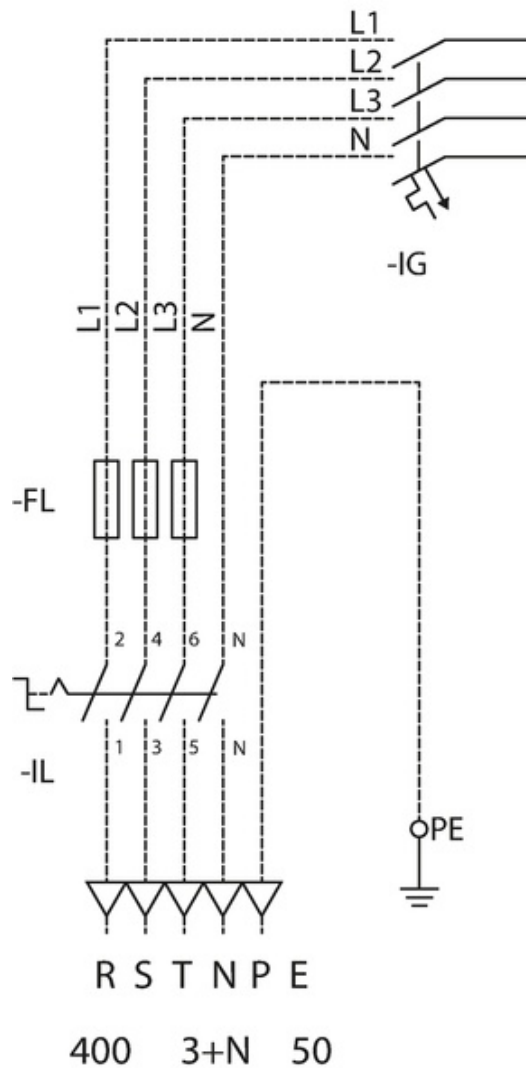
If you wish to include:

- a remote on/off switch
- a remote switch for changing over between the cooling and heating mode (VPR H only),
- a remote alarm indicator

It is a good idea to do so at this stage of the installation procedure, by connecting the switches or PCDS remote control (accessory) to the electric control board terminals as directed in section 6.3 Electrical data p. 28 and using the unit wiring diagram as your reference.

6.3 ELECTRICAL DATA

» Main electrical connection of units

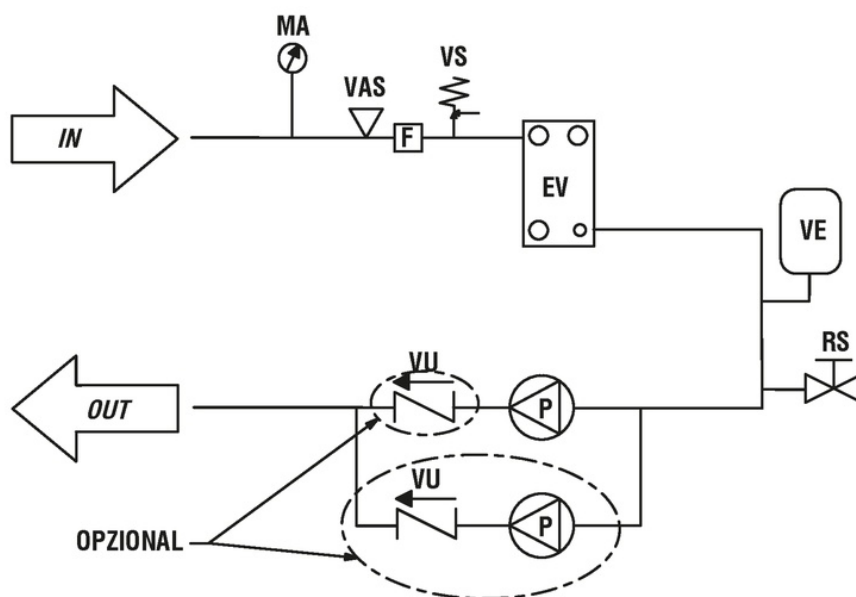


VP R C		52	62	72	82	92	112	114	133	134	164
Maximum power input	kW	22,0	27,9	32,8	37,6	41,1	44,6	44,0	54,1	55,9	69,0
Maximum current absorption	A	40,0	50,0	59,0	68,0	74,0	81,0	79,0	98,0	101	125
Star up current	A	138	194	203	212	218	269	178	242	245	269
Star up current with soft starter	A	97,0	134	142	151	157	190	137	181	184	208
Fan motor rated power	kW	1,69	1,57	3,12	3,12	3,77	3,77	3,77	3,77	3,77	6,24
Fan motor rated current	A	3,30	3,22	5,52	5,63	6,36	6,80	6,80	11,0	6,80	11,0
Pump motor rated power - LP pumps	kW	1,40	1,40	1,50	1,50	1,50	1,50	1,50	1,50	1,50	3,00
Pump motor rated current - LP pumps	A	2,45	2,45	3,20	3,20	3,20	3,20	3,20	3,20	3,20	6,10
Pump motor rated power - HP pumps	kW	2,20	2,20	2,20	2,20	2,20	3,00	3,00	3,00	3,00	3,00
Pump motor rated current - HP pumps	A	4,24	4,24	4,50	4,50	4,50	6,10	6,10	6,10	6,10	6,10
Power supply	V-ph-Hz	400 - 3N - 50									
Auxiliary power supply	V-ph-Hz	200-3-50									
Cross-section area of power cables	mm²	25	25	25	25	25	25	25	25	25	35
PCD connecting cables	mm²	AWG22									
PCDS connecting cables	mm²	1	1	1	1	1	1	1	1	1	1
Circuit breaker IL	A	63	63	63	80	80	100	80	100	100	125

VPR C		173	174	204	213	226	256	276	306	336	386
Maximum power input	kW	69,2	75,2	82,1	82,7	89,9	108	114	123	136	152
Maximum current absorption	A	125	136	148	149	162	195	206	222	247	274
Star up current	A	313	280	337	377	278	339	395	411	474	502
Star up current with soft starter	A	235	219	258	281	229	278	316	332	379	407
Fan motor rated power	kW	6,24	6,24	7,54	7,54	7,54	7,54	9,36	11,3	11,3	12,5
Fan motor rated current	A	11,3	11,0	12,7	13,6	13,6	13,6	16,7	20,4	20,4	22,3
Pump motor rated power - LP pumps	kW	3,00	3,00	3,00	3,00	3,00	3,00	4,00	4,00	4,00	5,50
Pump motor rated current - LP pumps	A	6,10	6,10	6,10	6,10	6,10	6,10	8,70	8,70	8,70	10,4
Pump motor rated power - HP pumps	kW	3,00	5,50	5,50	5,50	5,50	5,50	7,50	7,50	7,50	9,20
Pump motor rated current - HP pumps	A	6,10	6,10	6,10	6,10	6,10	6,10	13,6	13,6	13,6	17,2
Power supply	V-ph-Hz	400 - 3N - 50									
Auxiliary power supply	V-ph-Hz	200-3-50									
Cross-section area of power cables	mm ²	50	35	50	50	50	50	50	50	70	70
PCD connecting cables	mm ²	AWG22									
PCDS connecting cables	mm ²	1	1	1	1	1	1	1	1	1	1
Circuit breaker IL	A	160	125	160	160	160	160	200	200	250	250

6.4 WATER CIRCUIT

» V-IPER (evaporator and pump)

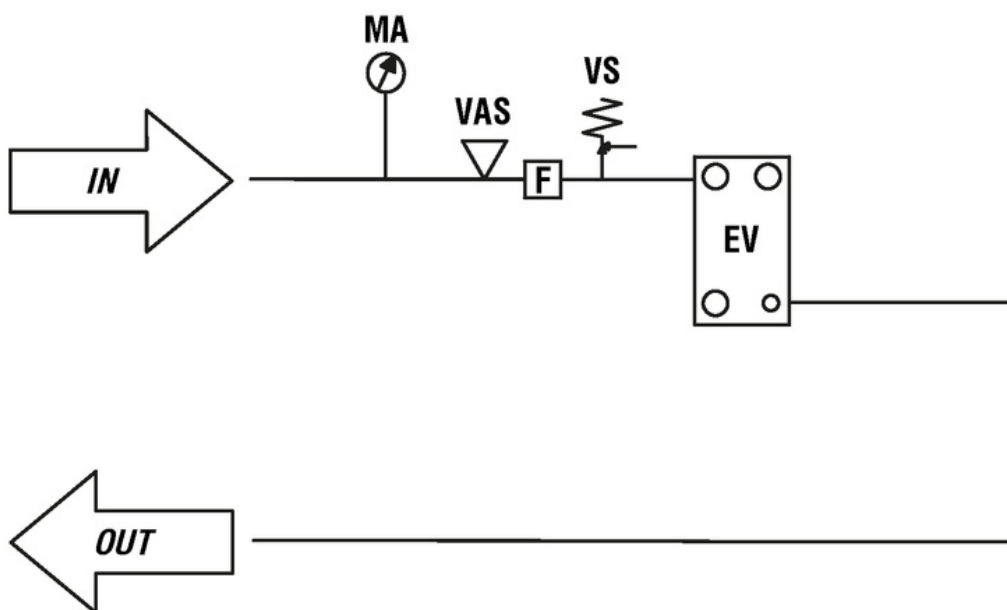


LEGEND

VR Water supply unit
 VS Safety valve
 EV Evaporator
 F Flow switch
 MA Water gauge
 VAS Air bleed hole

SA Storage tank
 VE Expansion vessel
 P Pump
 RS Drain
 VU Check valve
 RC Water charge

» V-IPER (evaporator)

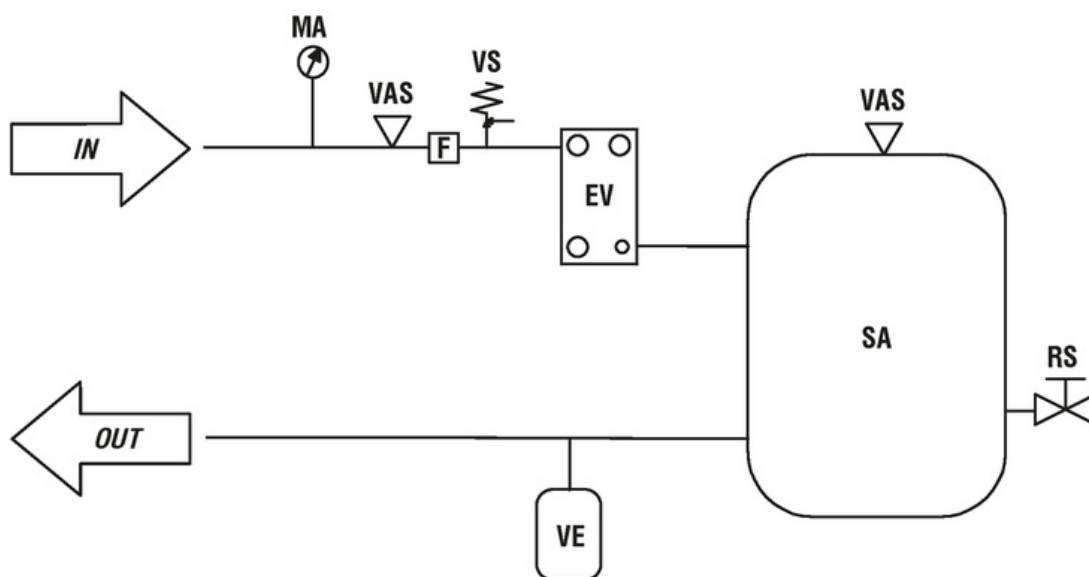


LEGEND

VR Water supply unit
VS Safety valve
EV Evaporator
F Flow switch
MA Water gauge
VAS Air bleed hole

SA Storage tank
VE Expansion vessel
P Pump
RS Drain
VU Check valve
RC Water charge

» V-IPER (evaporator and tank)

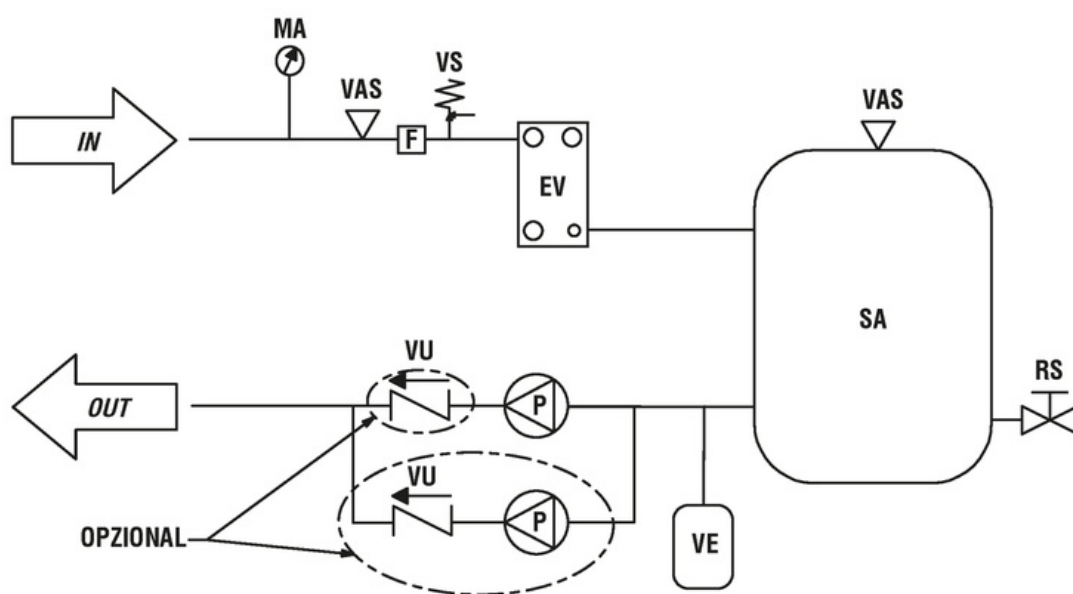


LEGEND

VR Water supply unit
VS Safety valve
EV Evaporator
F Flow switch
MA Water gauge
VAS Air bleed hole

SA Storage tank
VE Expansion vessel
P Pump
PD Water differential pressure switch
RS Drain
RC Water charge

» V-IPER (evaporator, pump and tank)



LEGEND

VR Water supply unit
 VS Safety valve
 EV Evaporator
 F Flow switch
 MA Water gauge
 VAS Air bleed hole

SA Storage tank
 VE Expansion vessel
 P Pump
 PD Water differential pressure switch
 RS Drain
 RC Water charge

7 OPERATING LIMITS

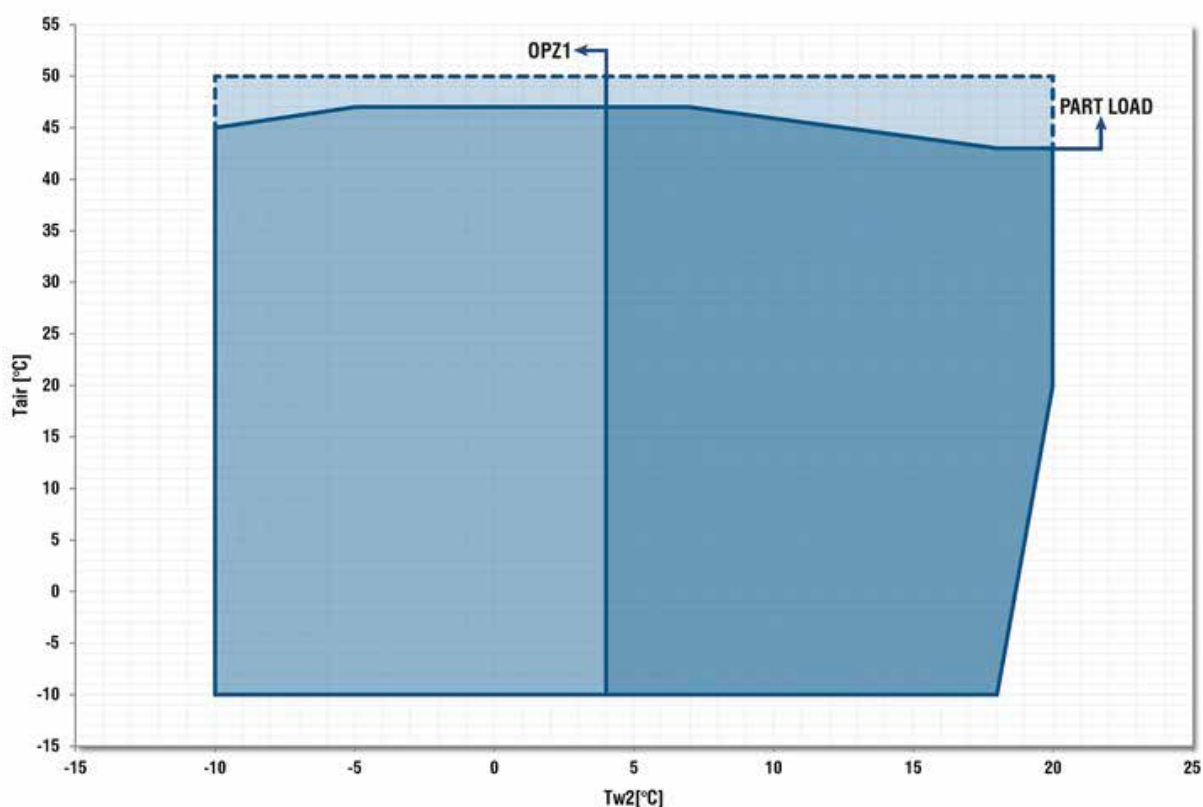
The graphs below illustrate the operating limits of the units V-IPER (in the case of continuous operation) in relation to the outlet water temperature and outdoor air temperature.

⚠ Warning The units are designed to work with water and air

temperatures falling within the range defined by the operating limits. Attempting to operate the units beyond these limits could cause irreparable damage to the units themselves.

7.1 OPERATING LIMITS IN CHILLER MODE

» Operating limits in chiller mode



OPT 1 Glycol + low temperature option

PART LOAD Partial load

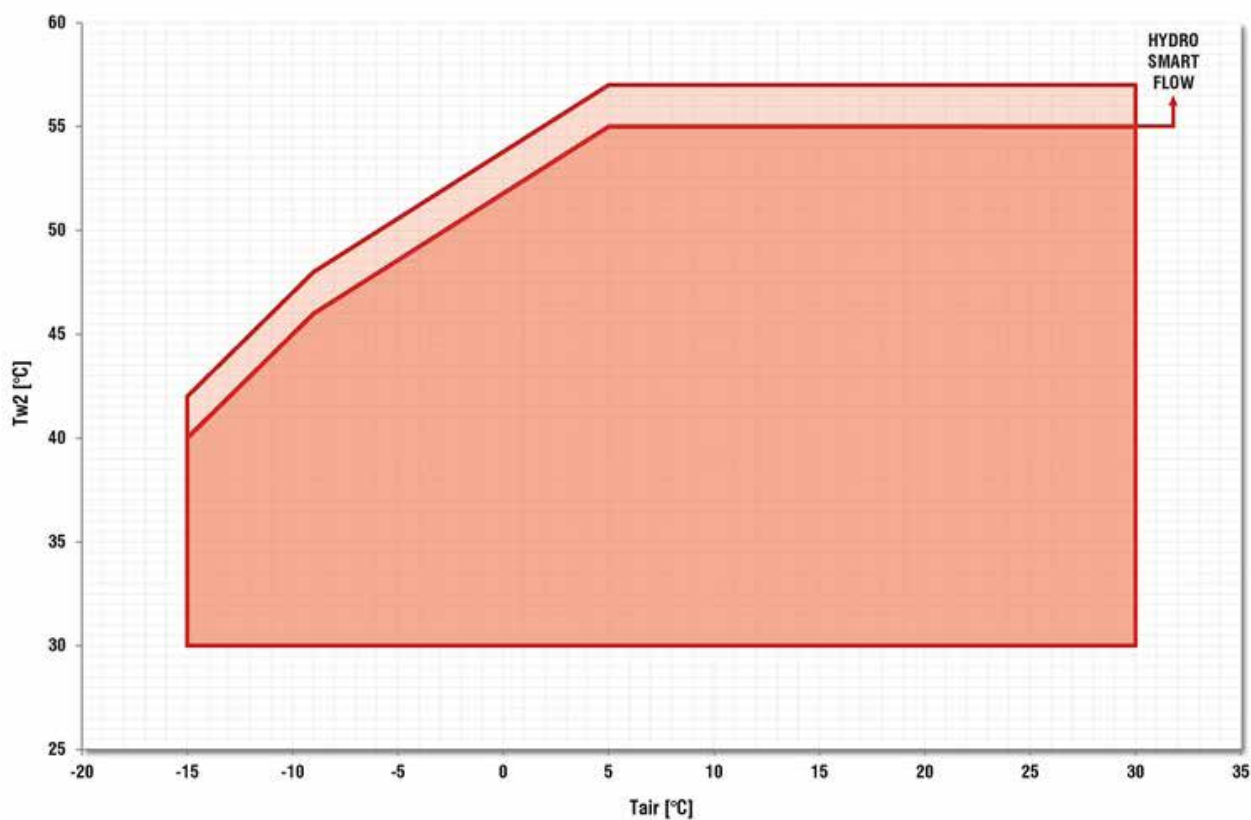
Tair Outdoor temperature (dry bulb)

Tw2 Water outlet temperature

Operating range calculated with temperature difference of 5°C on the water side.

7.2 OPERATING LIMITS IN HEAT PUMP MODE

» Operating limits in heat pump mode



T_{air} Outdoor temperature (dry bulb)
 $Tw2$ Outlet water temperature
Operating range calculated with temperature difference of 5°C on the water side.

7.3 THERMAL CARRYING FLUID

The units belonging to the V-IPERseries can work with mixtures of water and up to 35% ethylene glycol.

8 CONTROL AND SAFETY DEVICES

All the control and safety devices are set and tested in the factory before the unit is dispatched.

8.1 CONTROL DEVICES

8.1.1 Service thermostat

The service thermostat activates and deactivates the compressor according to the demand for chilled water (cooling mode) or heated water (heat pump mode), as determined by a sensor installed on the water exchanger inlet. This device is governed by the microprocessor control (see also the chapter regarding the microprocessor).

8.1.2 Control device settings

CONTROL DEVICES	SET POINT	MIN	MAX	DIFFERENTIAL
Service thermostat (outlet water temp. cooling mode)	11,5 °C	8 °C	20 °C	2 °C
Service thermostat (outlet water temp. heat pump mode)	45 °C	25 °C	47 °C	3 °C

8.2 SAFETY DEVICES

8.2.1 High pressure switch

The high pressure switch stops the compressor when the delivery pressure exceeds the set value.

8.2.2 Low pressure switch

The low pressure switch stops the compressor when the intake pressure falls below the set value.

8.2.3 Anti-recycle timer

The function of the timer is to prevent excessively frequent compressor starts and stops. This device is a function included in the microprocessor control; it prevents the compressor from starting up again after a stop until a set period of time has elapsed (approximately 5 minutes).

8.2.4 Antifreeze thermostat

The antifreeze thermostat situated at the evaporator outlet performs a dual function: it prevents ice from forming in the evaporator in the event of an excessive decrease in the water flow; it stops the unit in the event of a failure of the service thermostat. This device is governed by the microprocessor control (see also the chapter regarding the microprocessor).

8.2.5 Flussostato/pressostato acqua

The water differential pressure switch stops the unit in the event of an excessive reduction in the water flow, thus protecting it from the formation of ice (chiller operation) and excessively high condensation temperatures (heat pump operation).

8.2.6 Water safety valve

The water safety valve opens when the pressure within the water circuit reaches a level that may cause damage to the unit.

8.2.7 Safety device settings

Safety device	Start up	Differential	Resetting
Maximum pressure switch (bars)	42	-	Manual
Pressure safety valve (bars)	45	-	Manual
Minimum pressure switch (bars)	2	-	Automatic
Antifreeze thermostat (°C)	3	3	Manual
Water safety valve (bars)	4	-	-

8.2.8 Continuous charge monitoring

The advanced control, provided on the range as a standard feature, implements a constant control logic of the refrigerant charge without the use of refrigerant sensors. Through continuous monitoring of the characteristic parameters of the cooling cycle, V-IPER will detect a possible reduction in the amount of refrigerant and promptly report this situation to prevent more serious problems and protect the main components. In case of low refrigerant charge, it is mandatory to provide maintenance to recharge the refrigerant and check for any leaks.

9 ROUTINE MAINTENANCE AND CHECKS

It is recommended to carry out periodic checks of the safety devices (pressure switches and safety valves) and verify the absence of refrigerant leaks.

After the first start-up, the periodic checks must be carried out in conformity with the schedule and the manners provided for by current national regulations.

To keep the unit in good working order and guarantee the expected levels of performance and safety, it is necessary to carry out some periodic routine checks: some may be performed directly by the user while others must be carried out solely by specialised personnel.

9.1 CHECKS TO BE PERFORMED BY THE USER

The checks and operations described in this section may be easily performed by the user, provided that the latter shows a minimum of attention.

- Remove any dirt that has built up around the coil or objects trapped in the mesh protecting the coil itself (leaves, paper etc., to be carried out monthly).

⚠ Warning Be especially careful when working in proximity to finned coils since the aluminium fins are extremely sharp and can cause cuts.

- Check the level of water in the circuit using the water pressure gauge, which should indicate a pressure of about 1.5 bars (monthly).
- Check that the escape pipe of the water safety valve is tightly secured.

- Check the water circuit for leaks (monthly).
- If the unit is to remain out of service for a long time, drain the water (or other fluid present in the circuit) from the pipes and the unit itself. This is indispensable if during the period of quiescence the ambient temperature is expected to fall below the freezing point of the fluid used (seasonal operation). Drain the unit and parts of the circuit subject to the risk of freezing by opening the RS (optional) emptying tap.
- Before placing the unit back in service at the start of the season, refill the water circuit as directed in section 1.4 Main components p. 6.
- Check that the noise emissions of the unit are regular (monthly).
- If necessary, release the pump rotor ("P" and "S" version)

9.2 CHECKS AND MAINTENANCE TO BE PERFORMED BY SPECIALISED PERSONNEL

REQUIREMENTS

All the operations described in this section MUST ALWAYS BE PERFORMED BY QUALIFIED PERSONNEL.

⚠ Warning Before carrying out any work on the unit or accessing internal parts, make sure you have disconnected it from the mains electricity supply.

⚠ Warning The upper part of the compressor casing and the outlet pipe reach high temperatures. Be especially careful when working in their vicinity.

⚠ Warning Be especially careful when working in proximity to the finned coils: the aluminium fins are extremely sharp and can cause cuts.

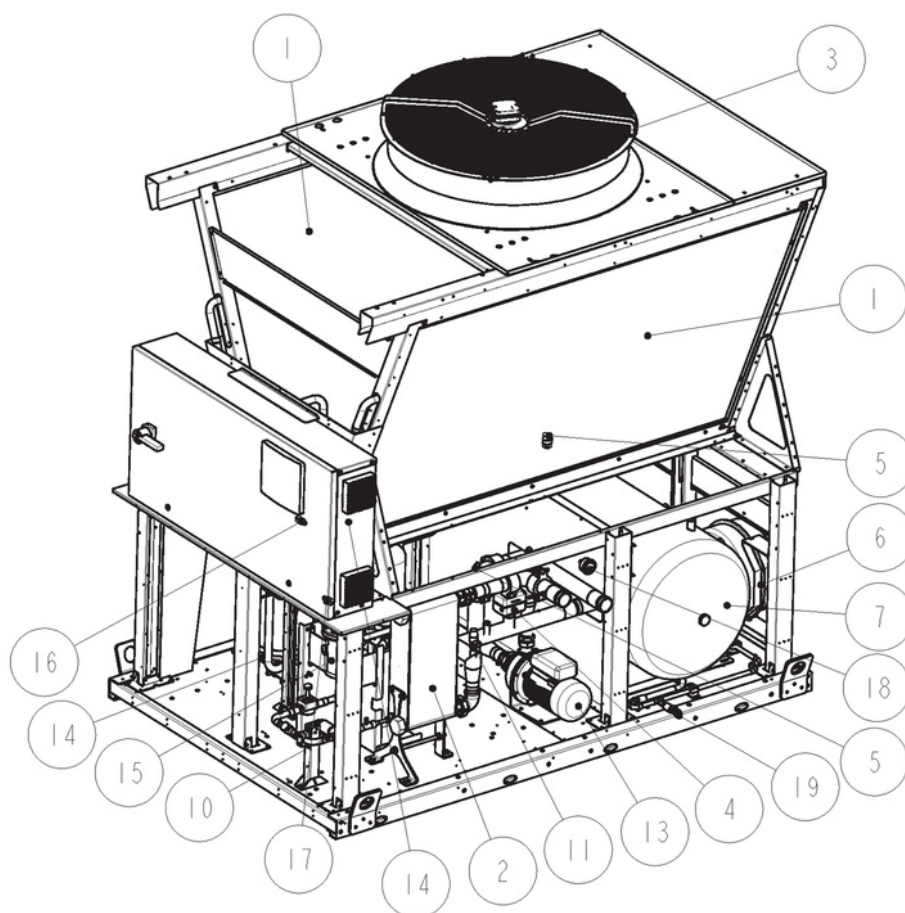
After completing maintenance jobs, always replace the panels enclosing the unit and secure them with the fastening screws provided.

The checks and operations described in this section must be carried out on a yearly basis by specialised personnel.

- Check the electric control board terminals to ensure that they are securely tightened: the movable and fixed contacts of the circuit breakers must be periodically cleaned and replaced whenever they show signs of deterioration.
- Check the compressor and pipes for oil leaks.
- Check the efficiency of the water differential pressure switch.
- Clean the metal filters mounted in the water pipes.
- Clean the finned coil by aiming a jet of compressed air in a direction opposite to the outflow of air, taking care not to bend the fins.

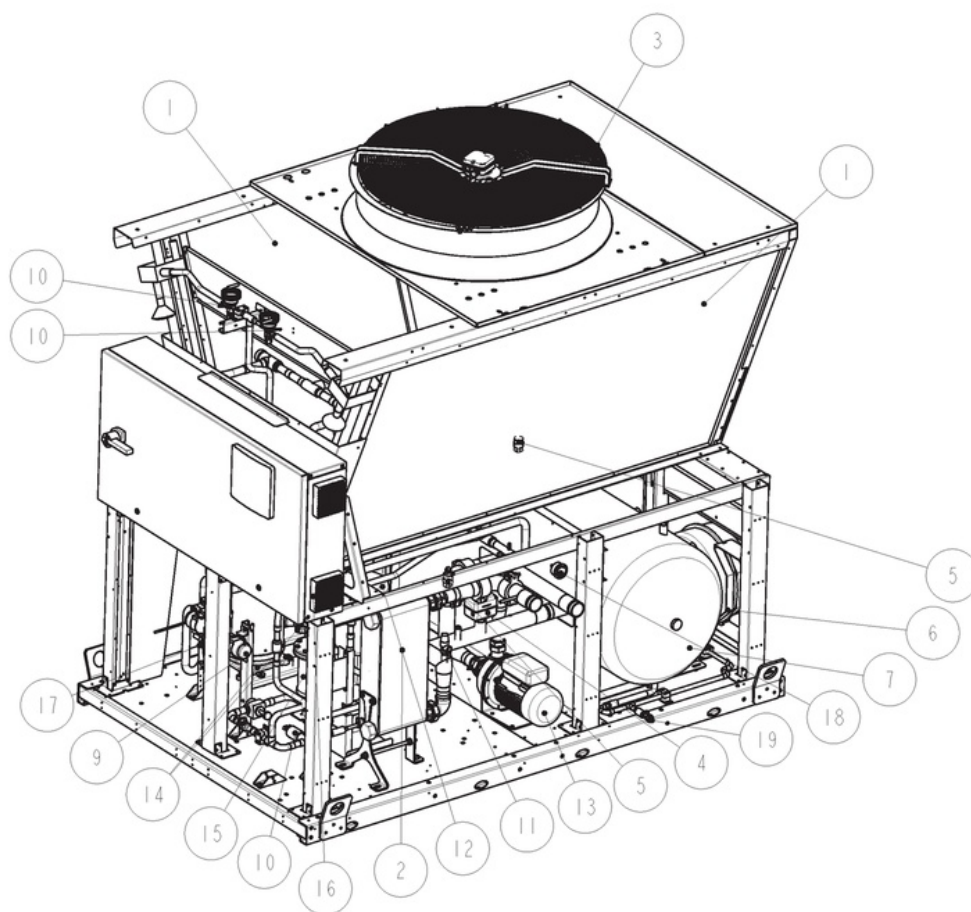
9.3 COMPONENTS DESCRIPTION

» VIPER C 52 - 62



DESCRIPTION

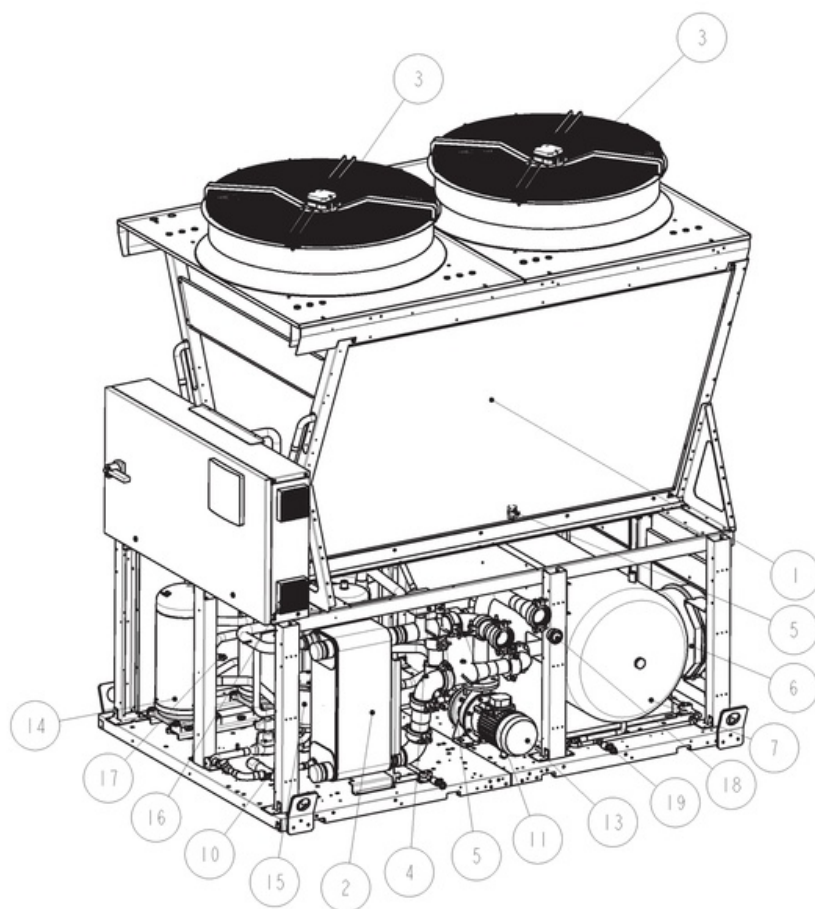
- 1 R410A-air heat-exchanger
- 2 R410A-water heat-exchanger
- 3 Fans
- 4 Water differential pressure switch (fan housing)
- 5 Automatic air purge valve
- 6 Expansion vessel (fan housing)
- 7 Buffer tank (accessory)
- 8 -
- 9 4 Way valve (VPR H)
- 10 Thermostatic valve
- 11 Water safety valve
- 12 Liquid receiver (VPR H)
- 13 Circulation pump
- 14 Compressor
- 15 Refrigerant filter
- 16 Low pressure switch and charge port
- 17 High pressure switch and charge port
- 18 Water gauge
- 19 Water charge



DESCRIPTION

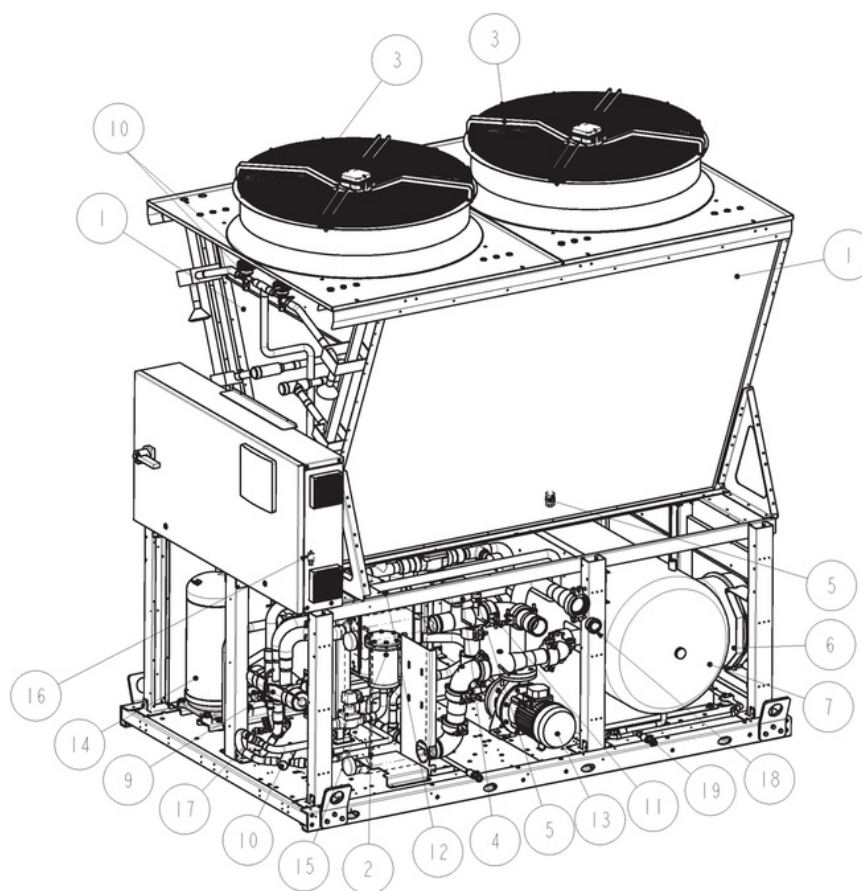
- 1 R410A-air heat-exchanger
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- 3 Fans
- 4 Water differential pressure switch (fan housing)
- 5 Automatic air purge valve
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- 8 -
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- 10 Thermostatic valve
- 11 Water safety valve
- 12 Liquid receiver (VPR H)
- 13 Circulation pump
- 14 Compressor
- 15 Refrigerant filter
- 16 Low pressure switch and charge port
- 17 High pressure switch and charge port
- 18 Water gauge
- 19 Water charge

» V-IPER C 72 - 82 - 92 - 112 - 133



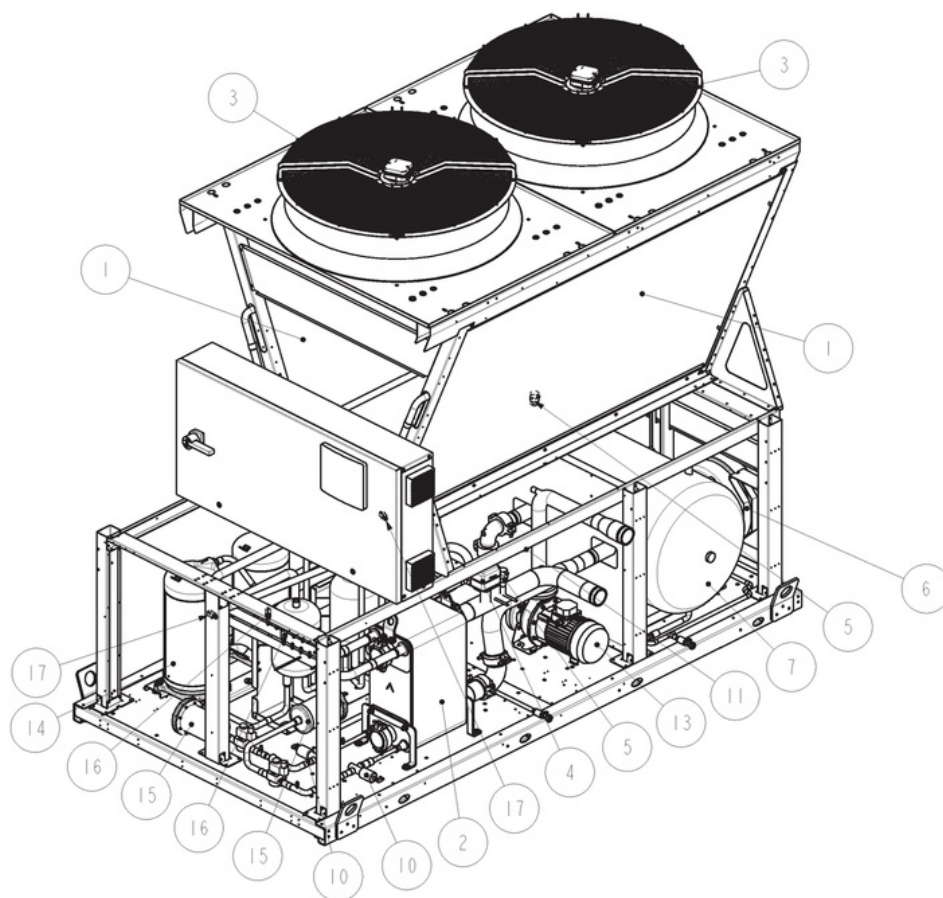
DESCRIPTION

- 1 R410A-air heat-exchanger
- 2 R410A-water heat-exchanger
- 3 Fans
- 4 Water differential pressure switch (fan housing)
- 5 Automatic air purge valve
- 6 Expansion vessel (fan housing)
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- 10 Thermostatic valve
- 11 Water safety valve
- 12 Liquid receiver (VPR H)
- 13 Circulation pump
- 14 Compressor
- 15 Refrigerant filter
- 16 Low pressure switch and charge port
- 17 High pressure switch and charge port
- 18 Water gauge
- 19 Water charge



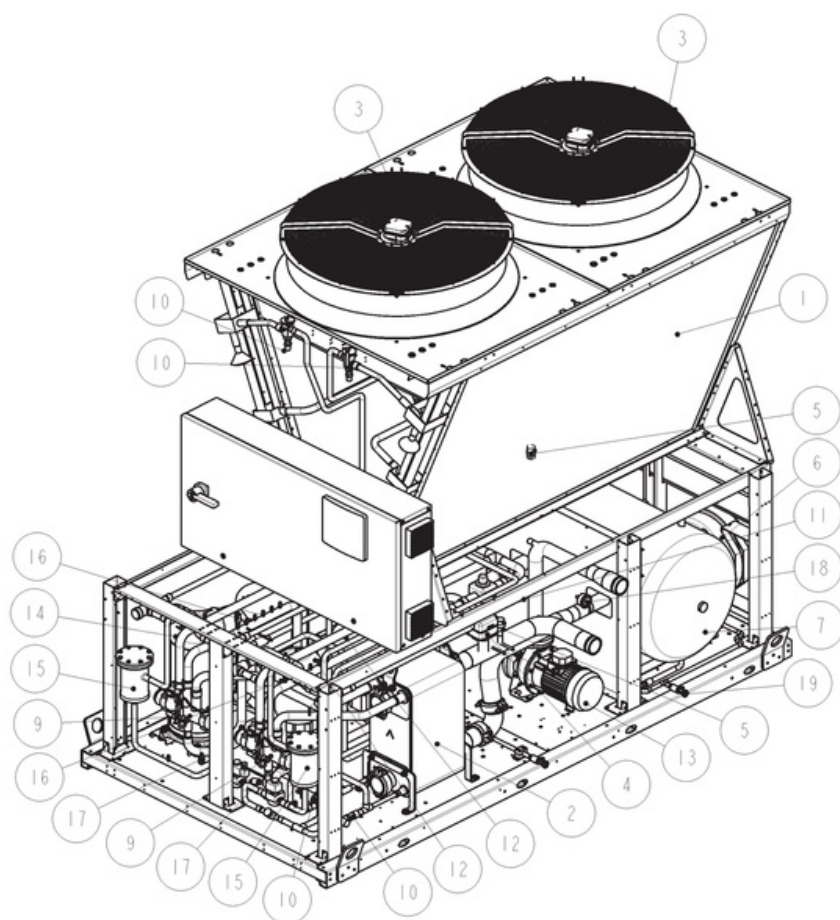
DESCRIPTION

- 1 R410A-air heat-exchanger
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- 3 Fans
- 4 Water differential pressure switch (fan housing)
- 5 Automatic air purge valve
- 6 Expansion vessel (fan housing)
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- 8 -
- 9 4 Way valve (VPR H)
- 10 Thermostatic valve
- 11 Water safety valve
- 12 Liquid receiver (VPR H)
- 13 Circulation pump
- 14 Compressor
- 15 Refrigerant filter
- 16 Low pressure switch and charge port
- 17 High pressure switch and charge port
- 18 Water gauge
- 19 Water charge



DESCRIPTION

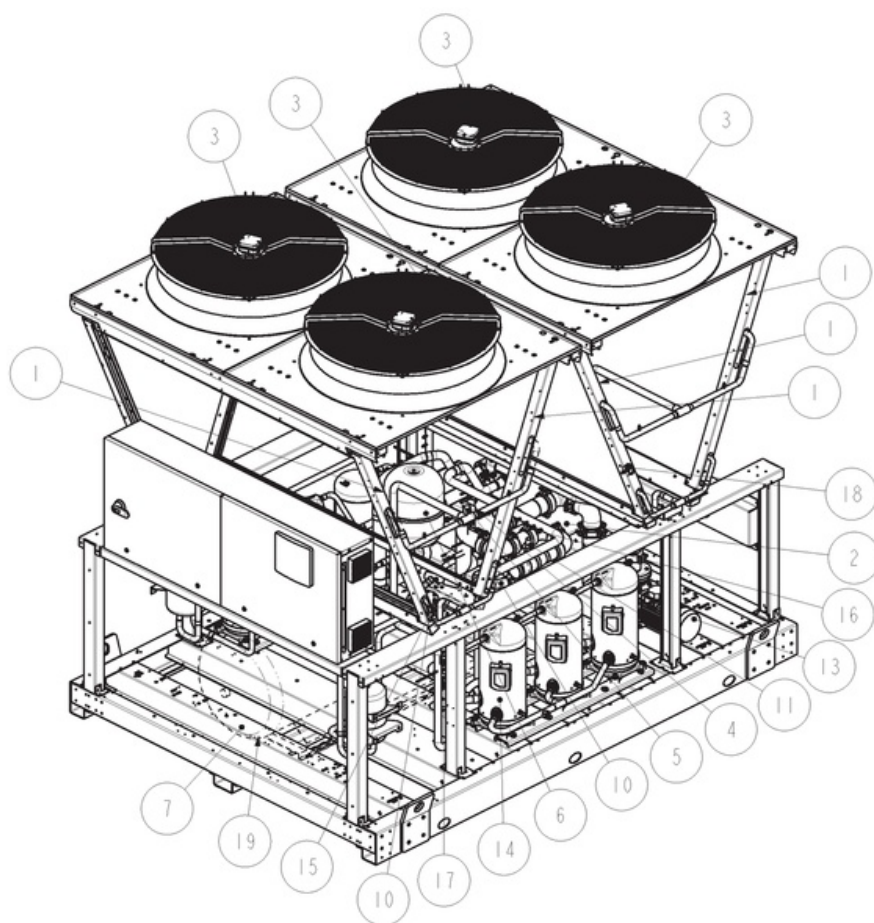
- 1 R410A-air heat-exchanger
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- 4 Water differential pressure switch (fan housing)
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- 14 Compressor
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- 16 Low pressure switch and charge port
- 17 High pressure switch and charge port
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- 19 Water charge



DESCRIPTION

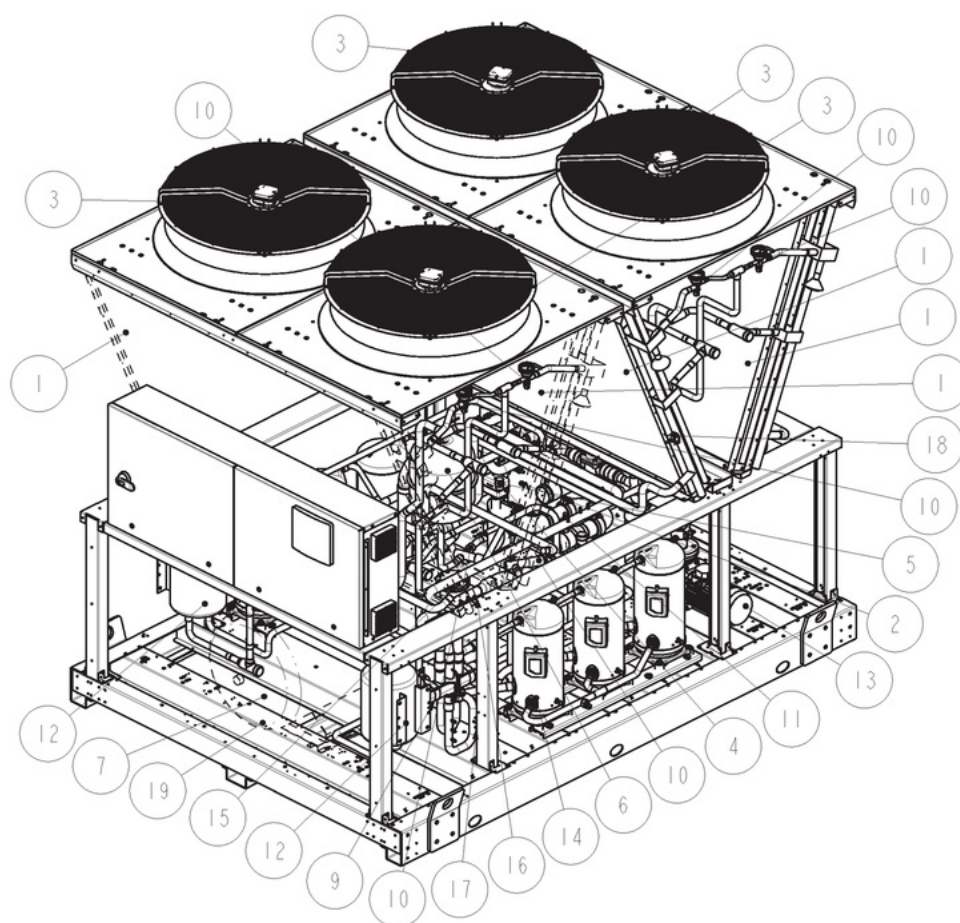
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- 10 Thermostatic valve
- 11 Water safety valve
- 12 Liquid receiver (VPR H)
- 13 Circulation pump
- 14 Compressor
- 15 Refrigerant filter
- 16 Low pressure switch and charge port
- 17 High pressure switch and charge port
- 18 Water gauge
- 19 Water charge

» V-IPER C 164 - 174 - 204 - 226 - 256



DESCRIPTION

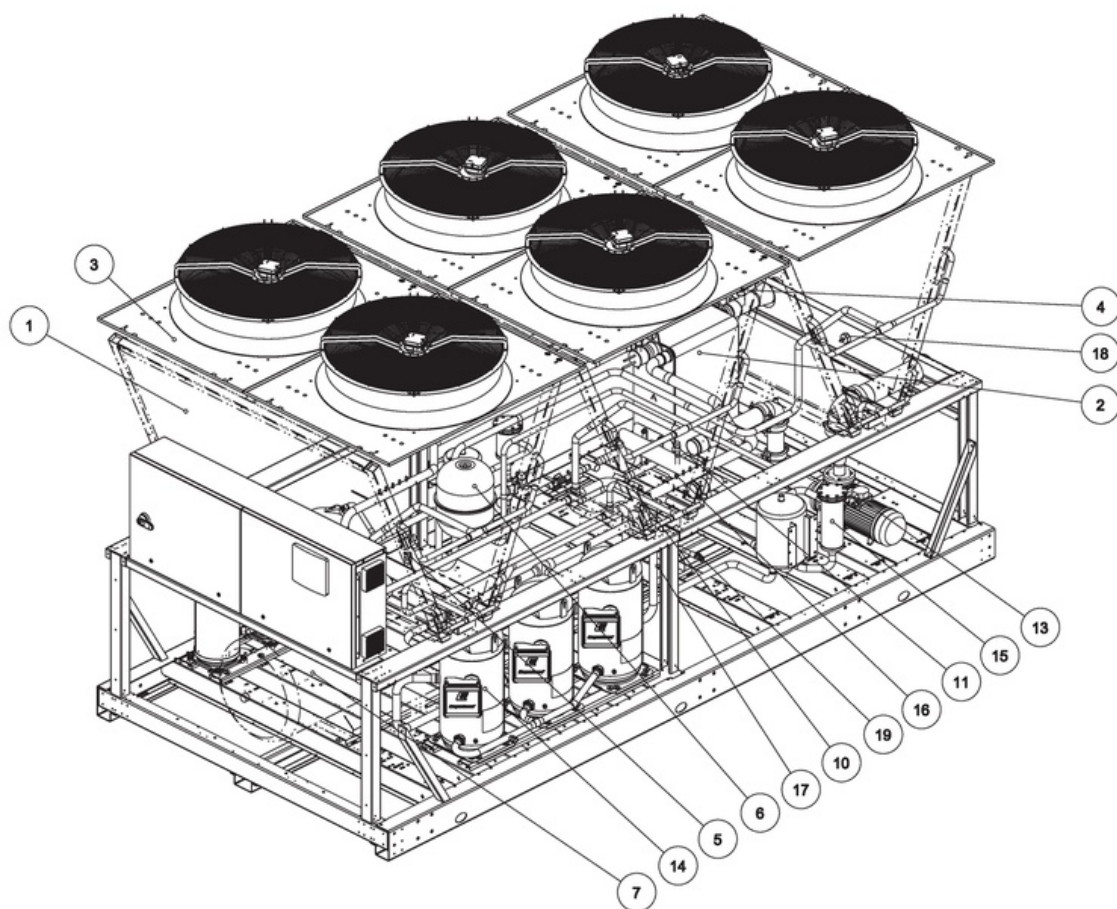
- 1 R410A-air heat-exchanger
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- 12 Liquid receiver (VPR H)
- 13 Circulation pump
- 14 Compressor
- 15 Refrigerant filter
- 16 Low pressure switch and charge port
- 17 High pressure switch and charge port
- 18 Water gauge
- 19 Water charge



DESCRIPTION

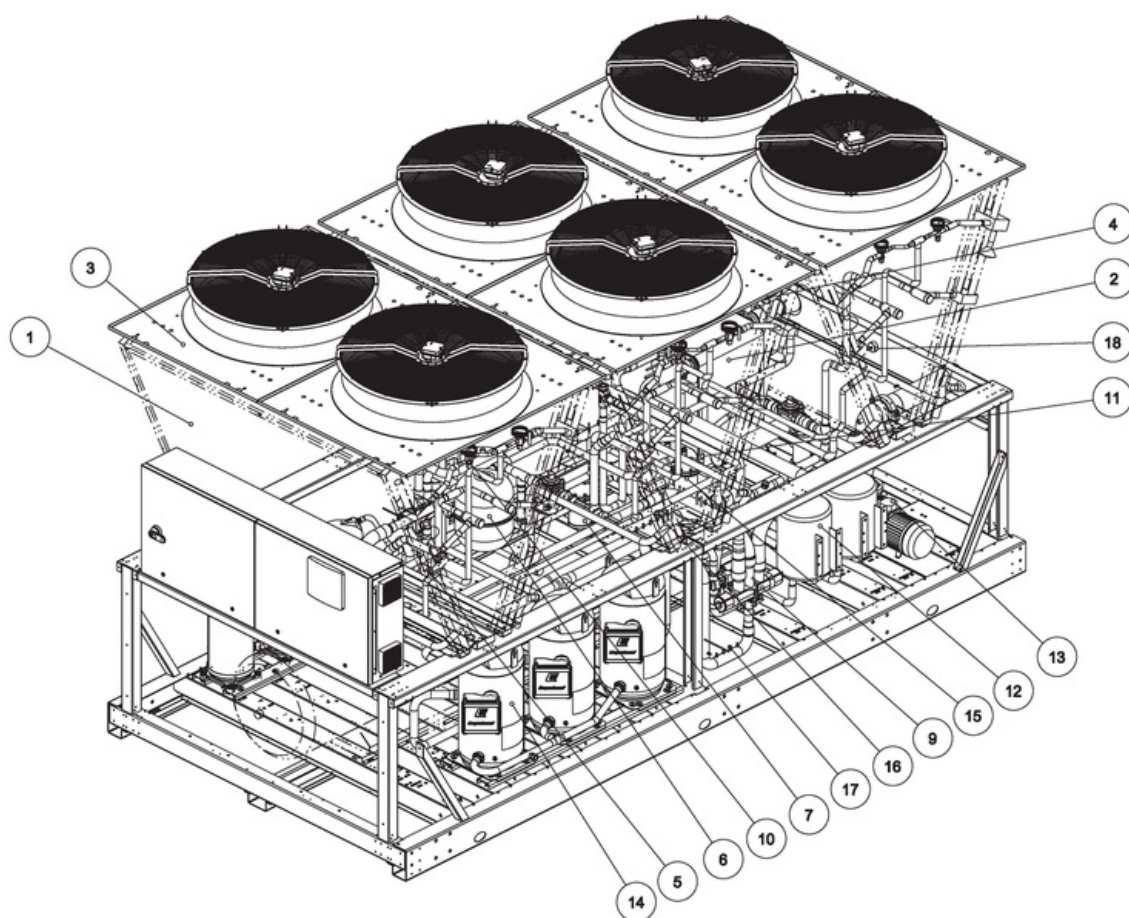
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- 4 Water differential pressure switch (fan housing)
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- 8 -
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- 10 Thermostatic valve
- 11 Water safety valve
- 12 Liquid receiver (VPR H)
- 13 Circulation pump
- 14 Compressor
- 15 Refrigerant filter
- 16 Low pressure switch and charge port
- 17 High pressure switch and charge port
- 18 Water gauge
- 19 Water charge

» V-IPER C 276 - 306 - 336



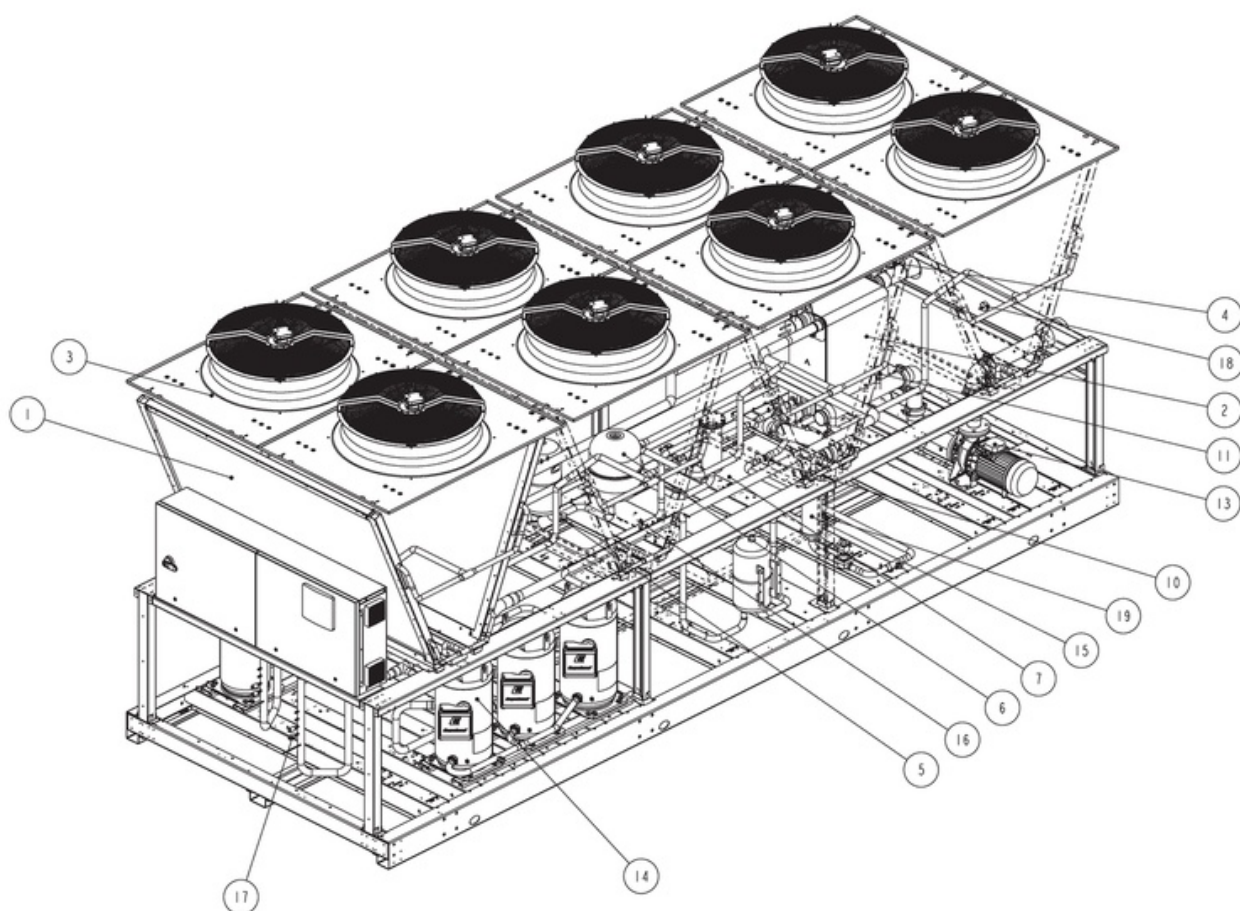
DESCRIPTION

- 1 R410A-air heat-exchanger
- 2 R410A-water heat-exchanger
- 3 Fans
- 4 Water differential pressure switch (fan housing)
- 5 Automatic air purge valve
- 6 Expansion vessel (fan housing)
- 7 Buffer tank (accessory)
- 8 -
- 9 4 Way valve (VPR H)
- 10 Thermostatic valve
- 11 Water safety valve
- 12 Liquid receiver (VPR H)
- 13 Circulation pump
- 14 Compressor
- 15 Refrigerant filter
- 16 Low pressure switch and charge port
- 17 High pressure switch and charge port
- 18 Water gauge
- 19 Water charge



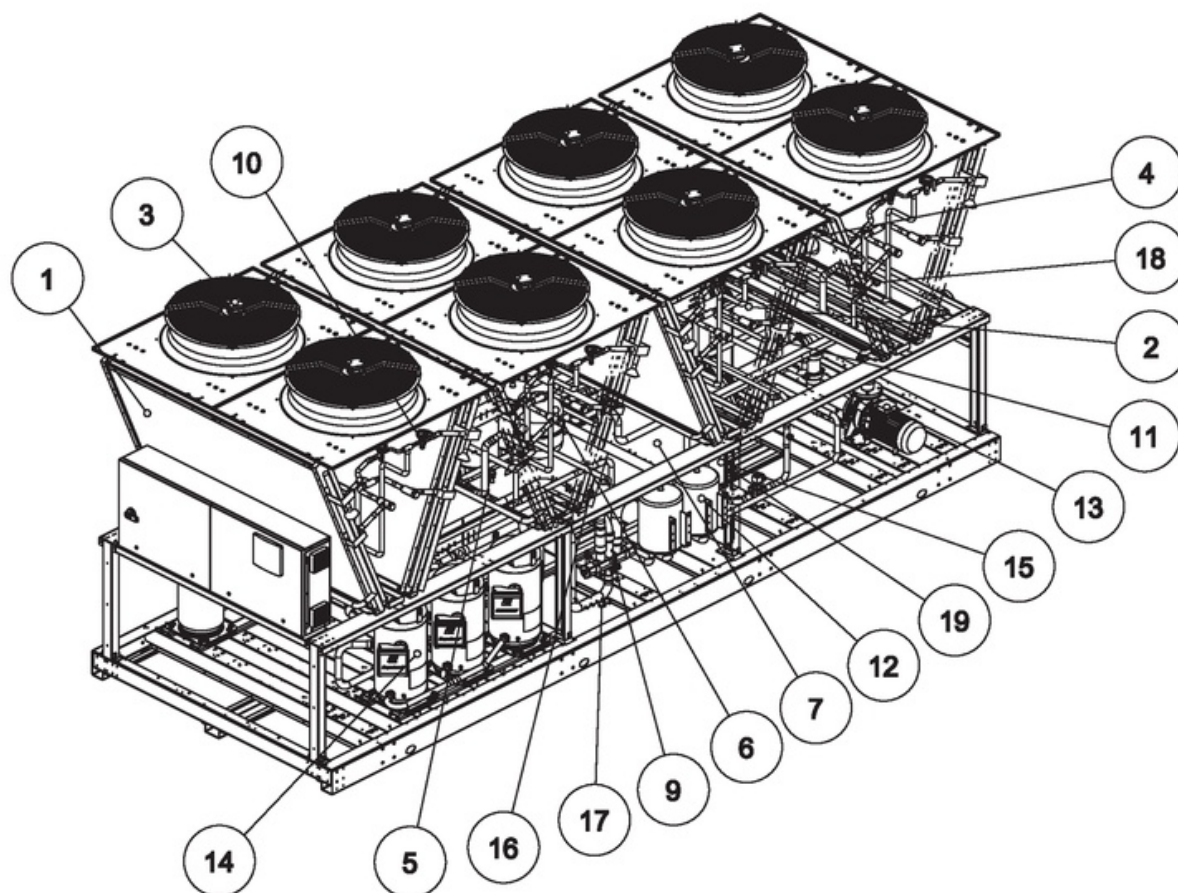
DESCRIPTION

- 1 R410A-air heat-exchanger
- 2 R410A-water heat-exchanger
- 3 Fans
- 4 Water differential pressure switch (fan housing)
- 5 Automatic air purge valve
- 6 Expansion vessel (fan housing)
- 7 Buffer tank (accessory)
- 8 -
- 9 4 Way valve (VPR H)
- 10 Thermostatic valve
- 11 Water safety valve
- 12 Liquid receiver (VPR H)
- 13 Circulation pump
- 14 Compressor
- 15 Refrigerant filter
- 16 Low pressure switch and charge port
- 17 High pressure switch and charge port
- 18 Water gauge
- 19 Water charge



DESCRIPTION

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- 2 R410A-water heat-exchanger
- 3 Fans
- 4 Water differential pressure switch (fan housing)
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- 6 Expansion vessel (fan housing)
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- 8 -
- 9 4 Way valve (VPR H)
- 10 Thermostatic valve
- 11 Water safety valve
- 12 Liquid receiver (VPR H)
- 13 Circulation pump
- 14 Compressor
- 15 Refrigerant filter
- 16 Low pressure switch and charge port
- 17 High pressure switch and charge port
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- 19 Water charge
































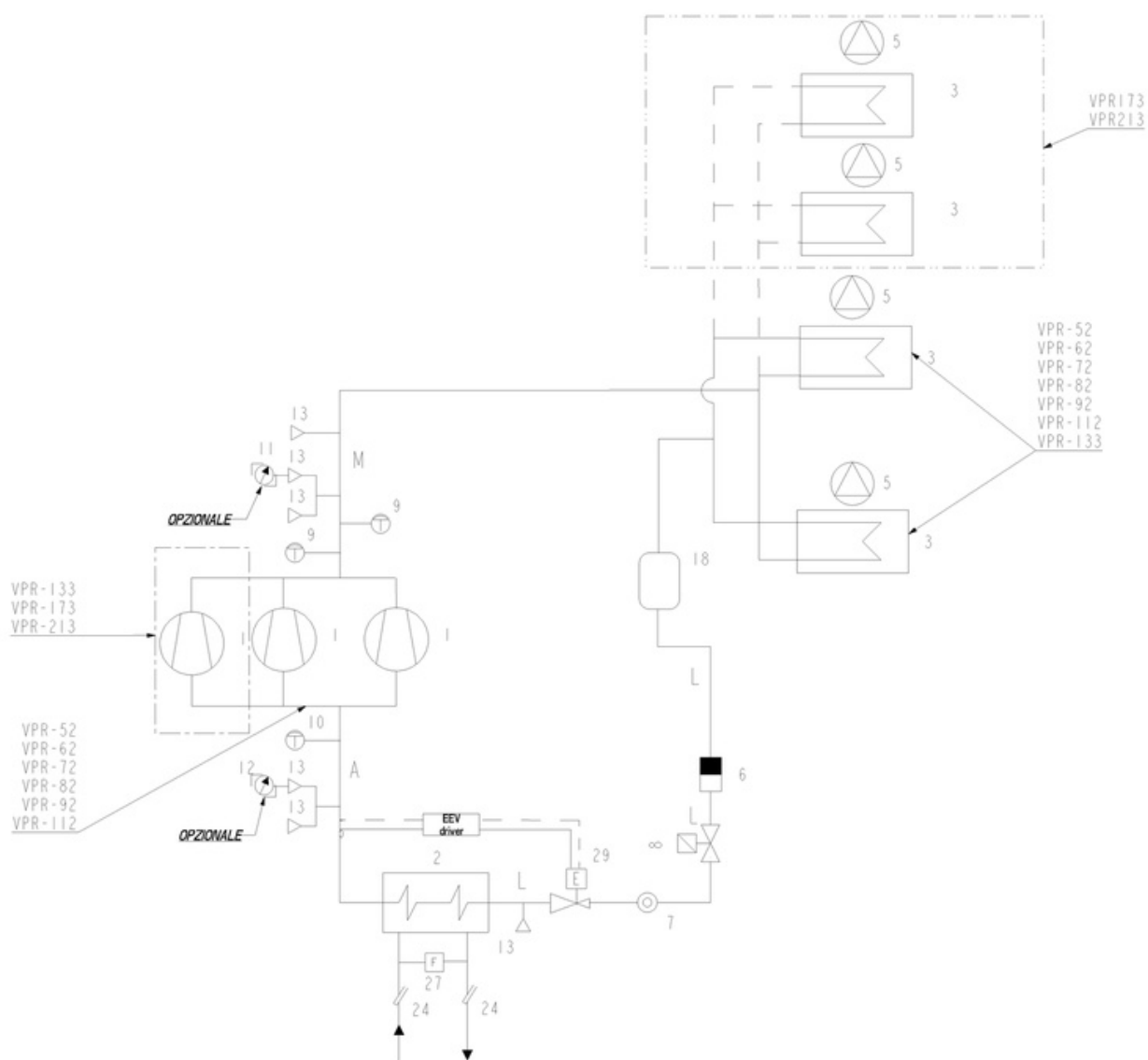
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- 1 R410A-air heat-exchanger
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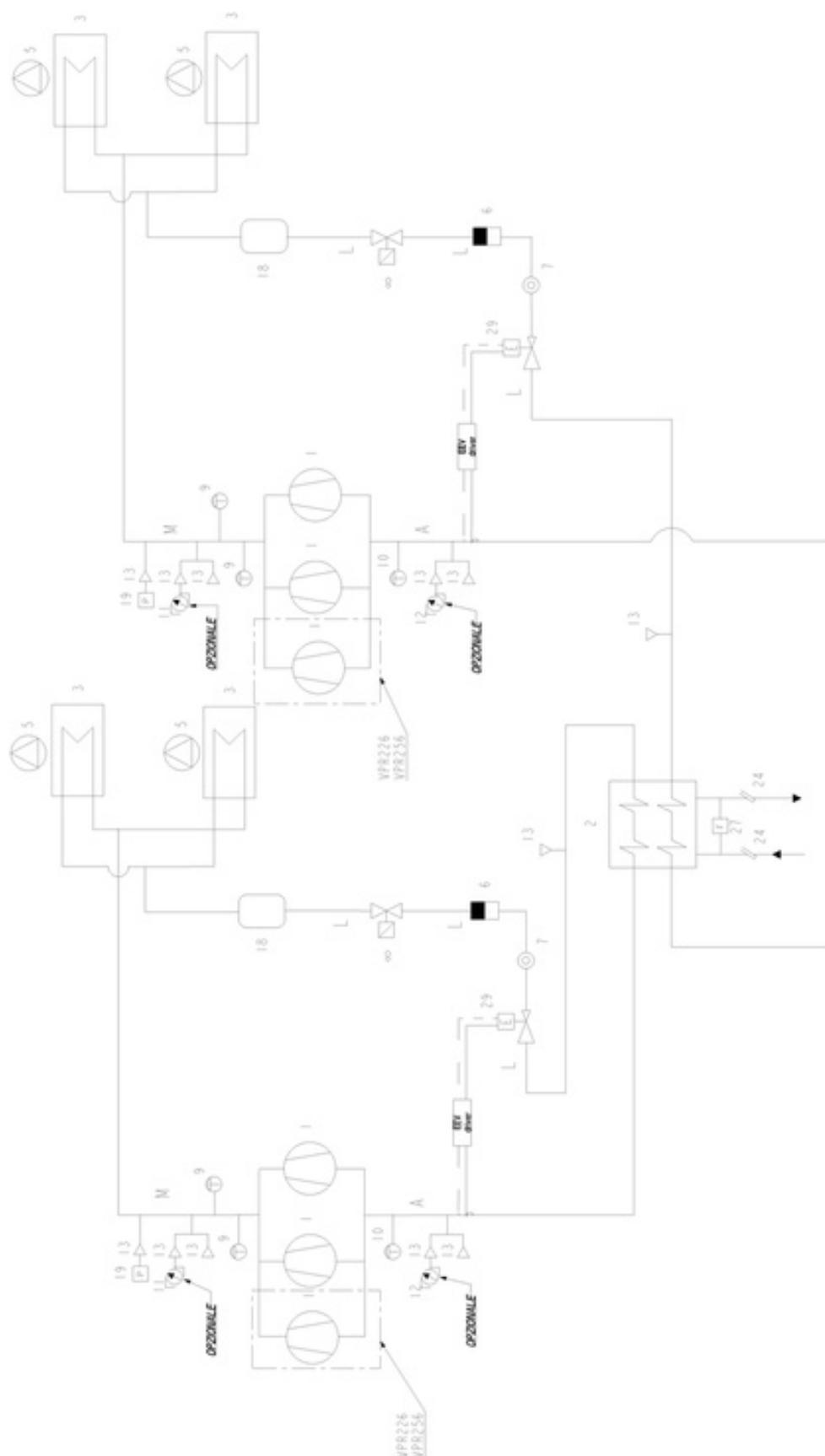
10 COOLING CIRCUITS

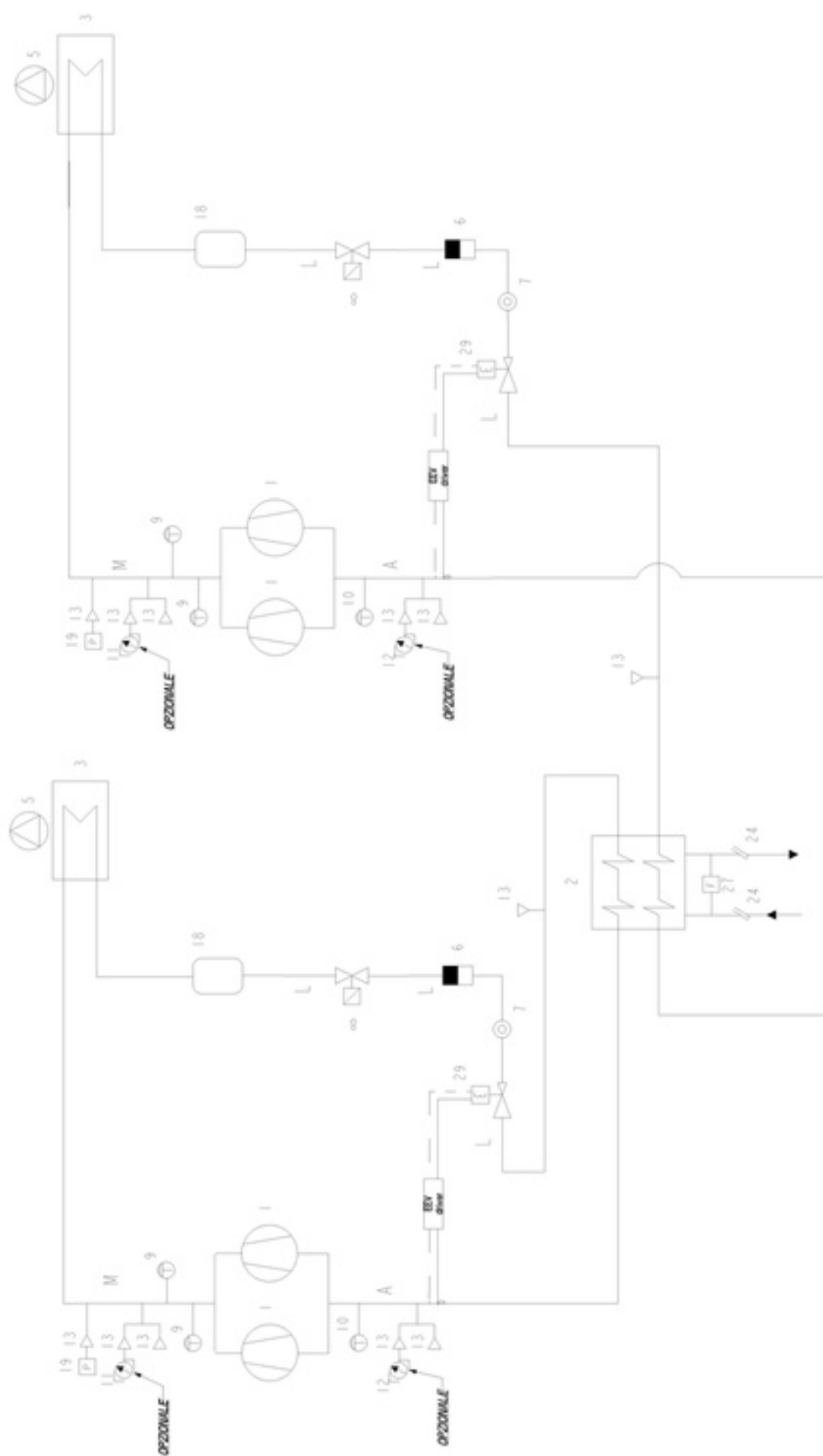
» Legenda

N°	COMPONENT	SYMBOL
1	Compressor	
2	Evaporator	
3	Condensator	
4	Thermostatic valve	
5	Electrical fan	
6	Filter	
7	Sight glass	
8	Solenoid valve	
9	High pressure switch	
10	Low pressure switch	
11	High pressure gauge	
12	Low pressure gauge	
13	Service connection	
14	Differential pressure switch	
15	Check valve	
16	4 Way diversion valve	
17	Liquid separator	
18	Liquid receiver	
19	Pressure transducer	
20	Liquid distributor	
21	Oil pressure switch	
22	Desuperheater	
23	Shut-Off valve	
24	Pocket	
25	Security valve	
26	Fusible plug	
27	Flow switc	
28	Restrictor	
29	Electronic expansion valve	

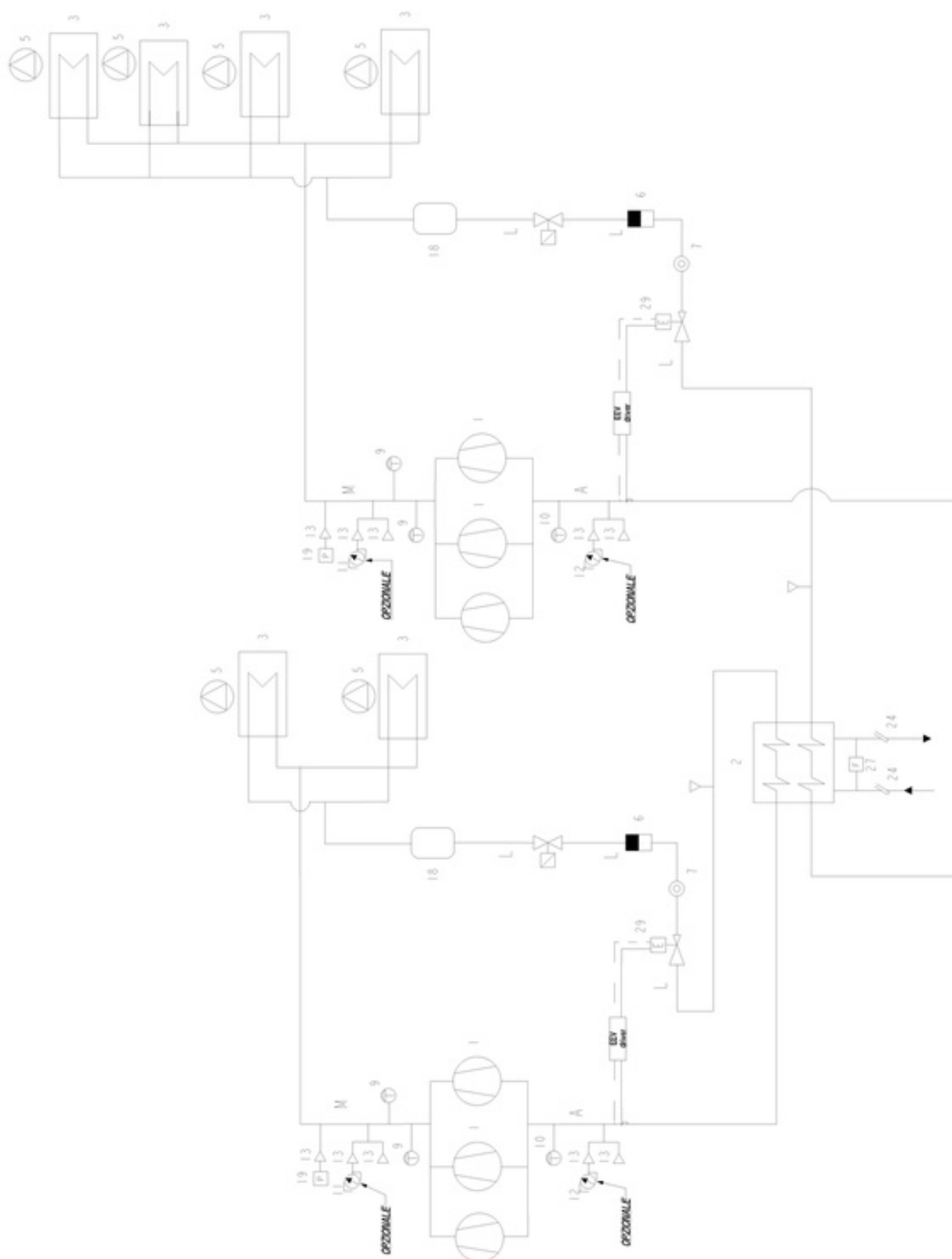


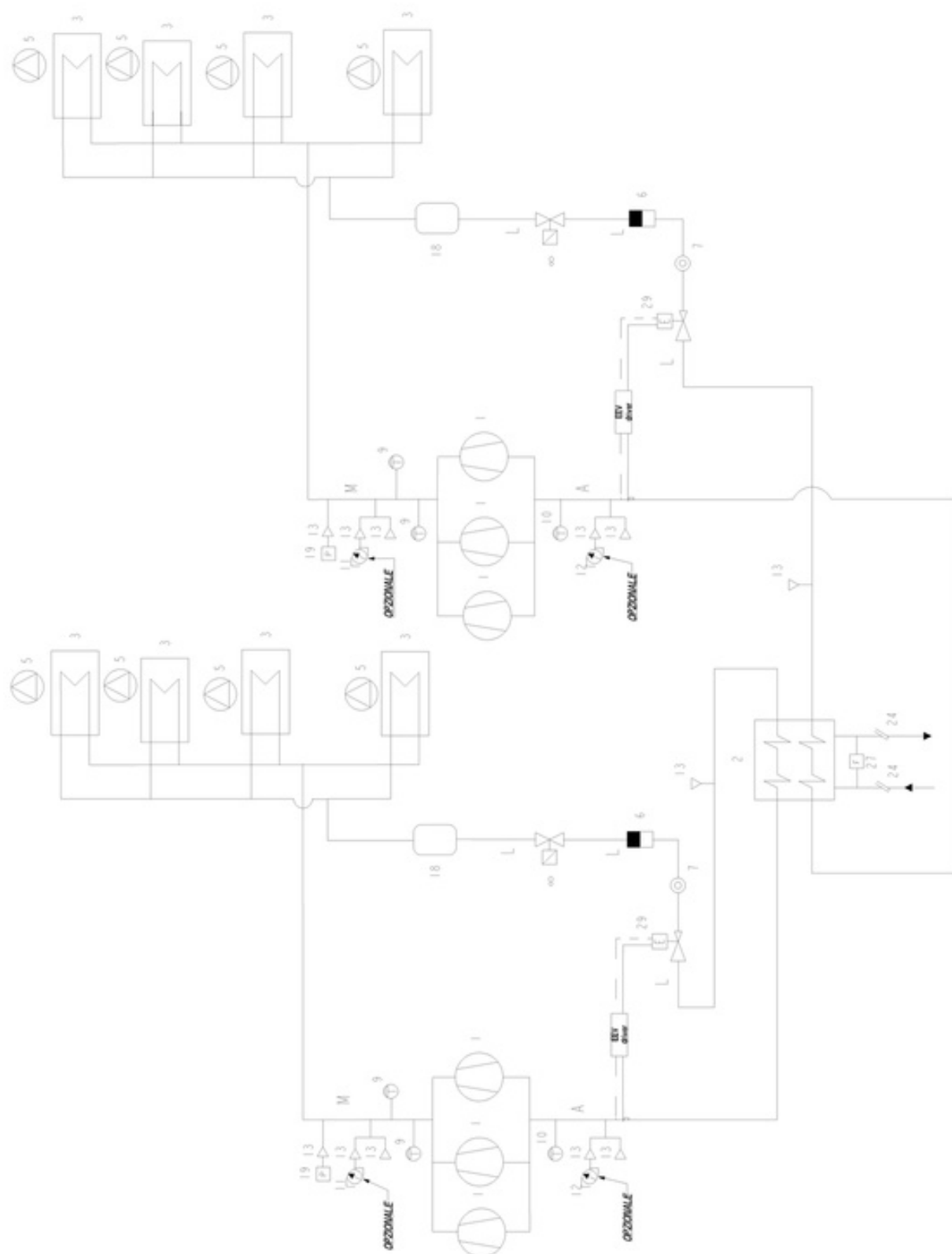
» V-IPER C 164 - 174 - 204 - 226 - 256 Cooling circuit



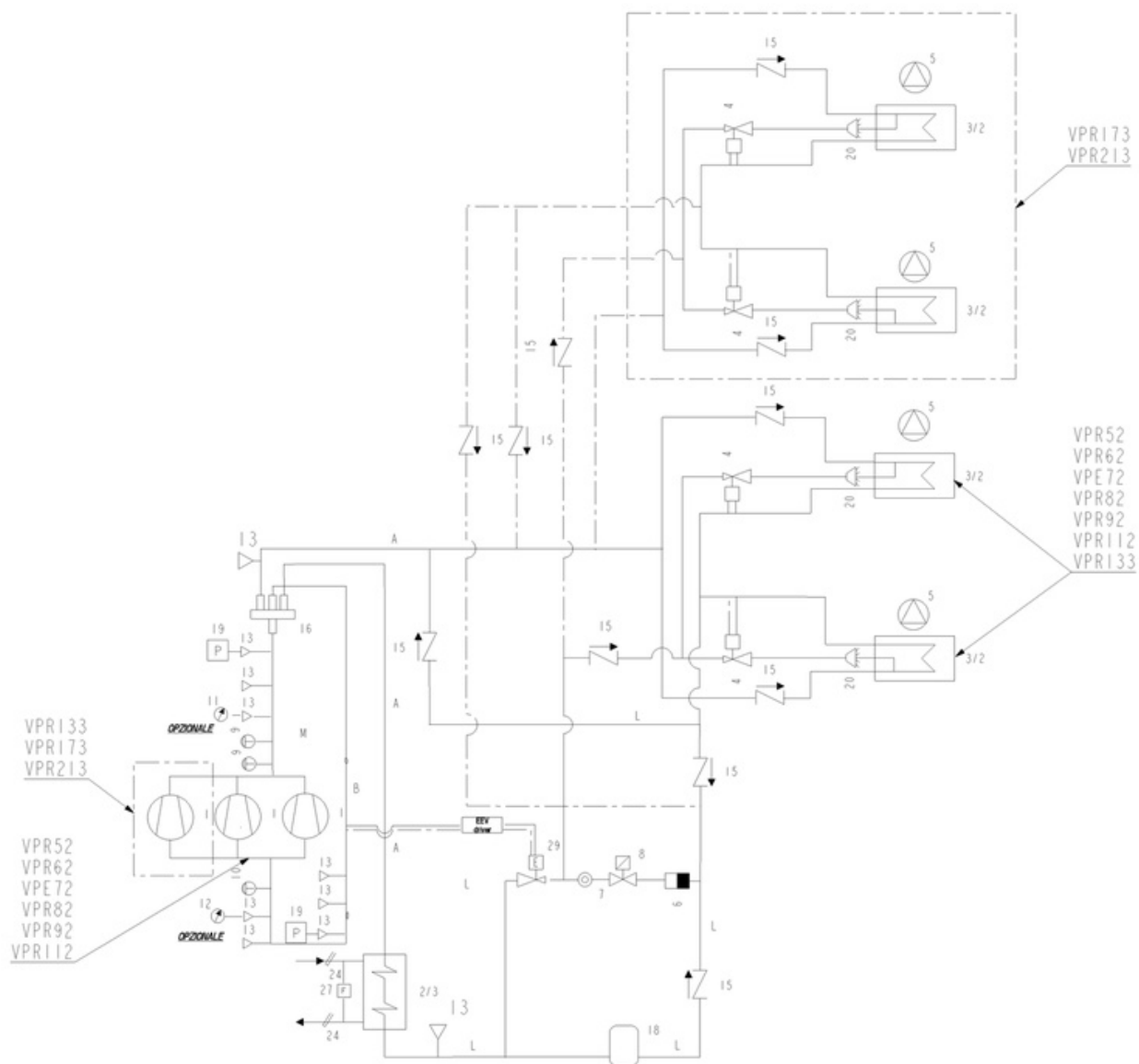


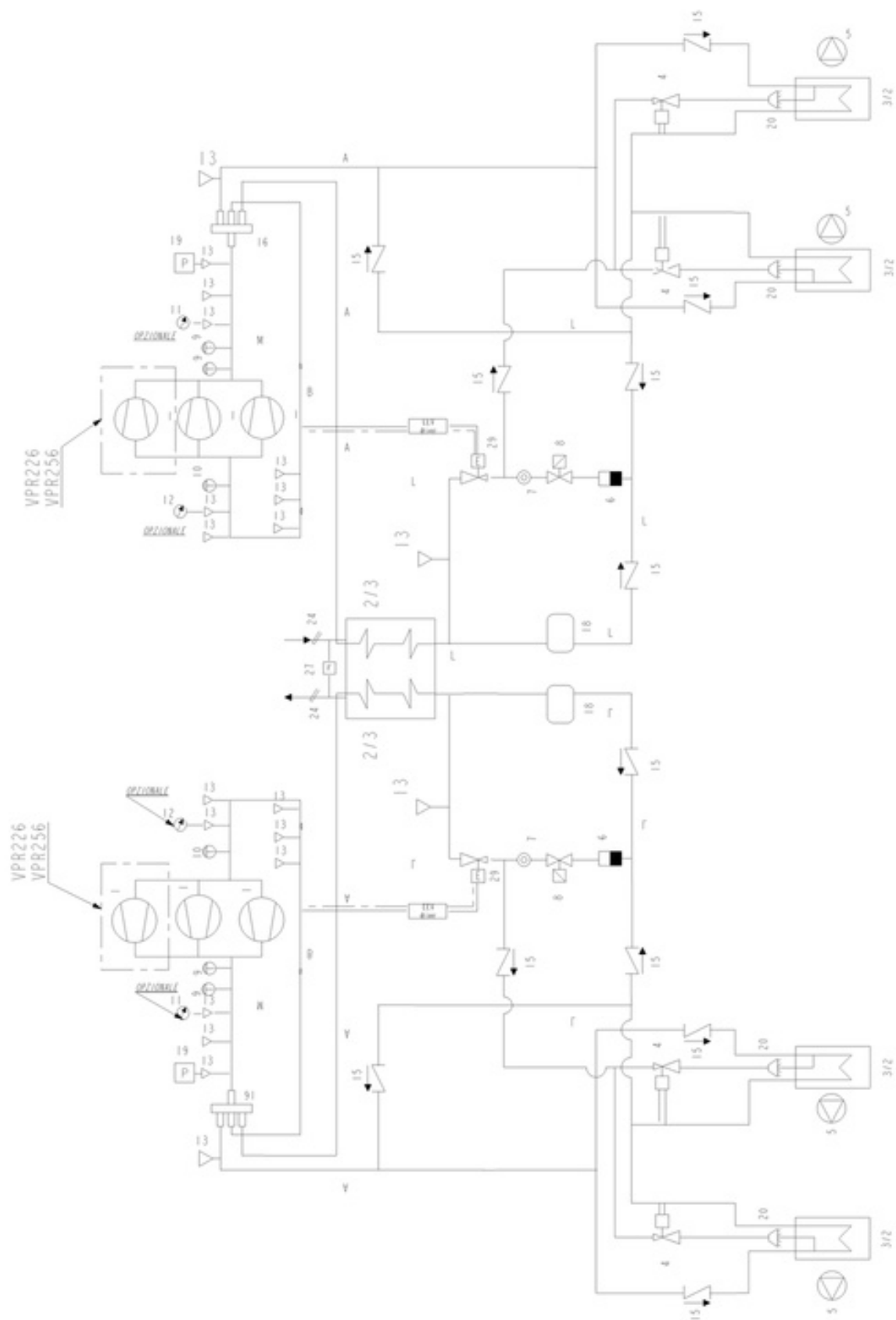
» V-IPER C 276 - 306 - 336 Cooling circuit



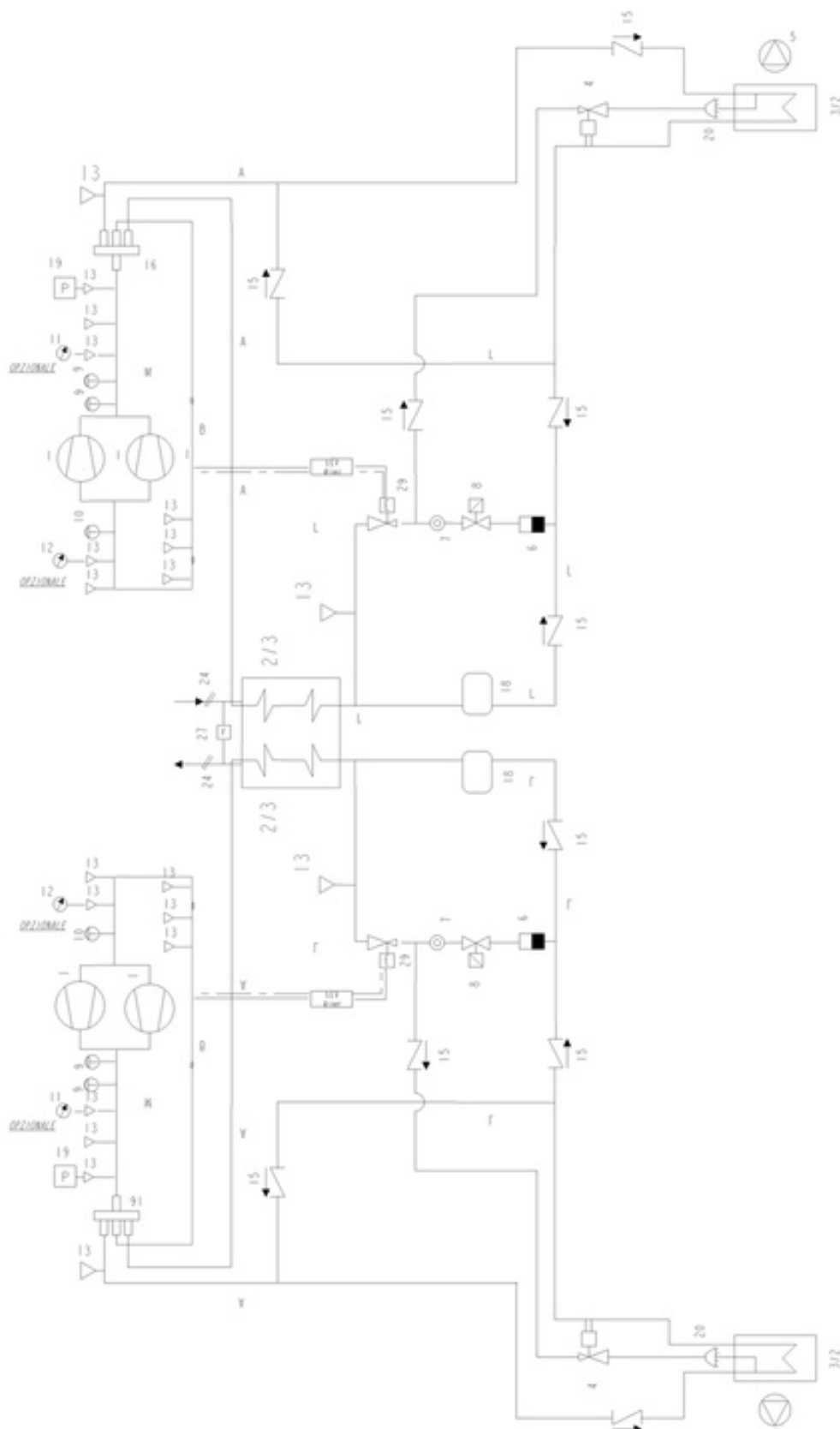


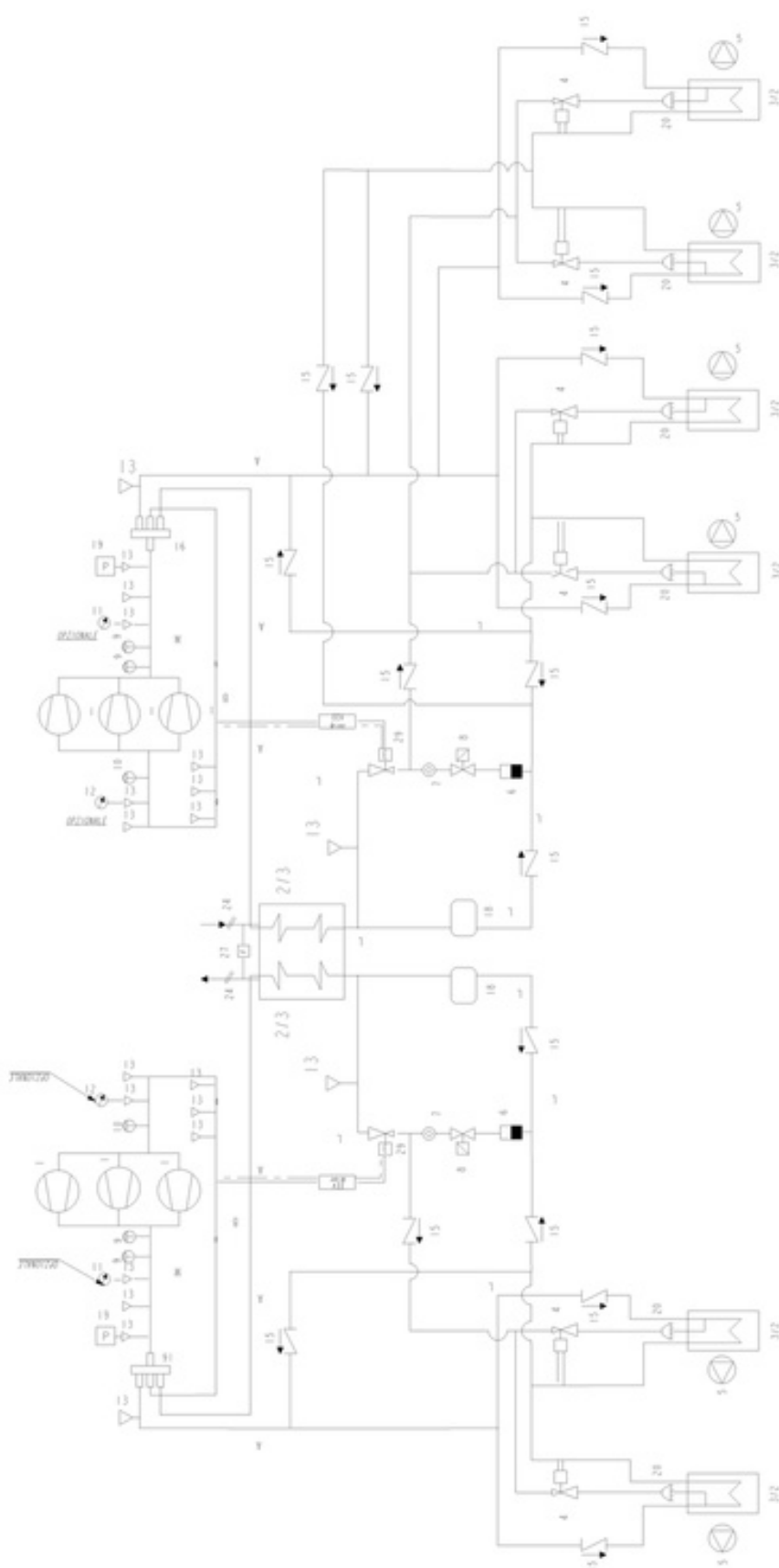
» V-IPER H 52 - 62 - 72 - 82 - 92 - 112 - 133 - 173 - 213 Cooling circuit



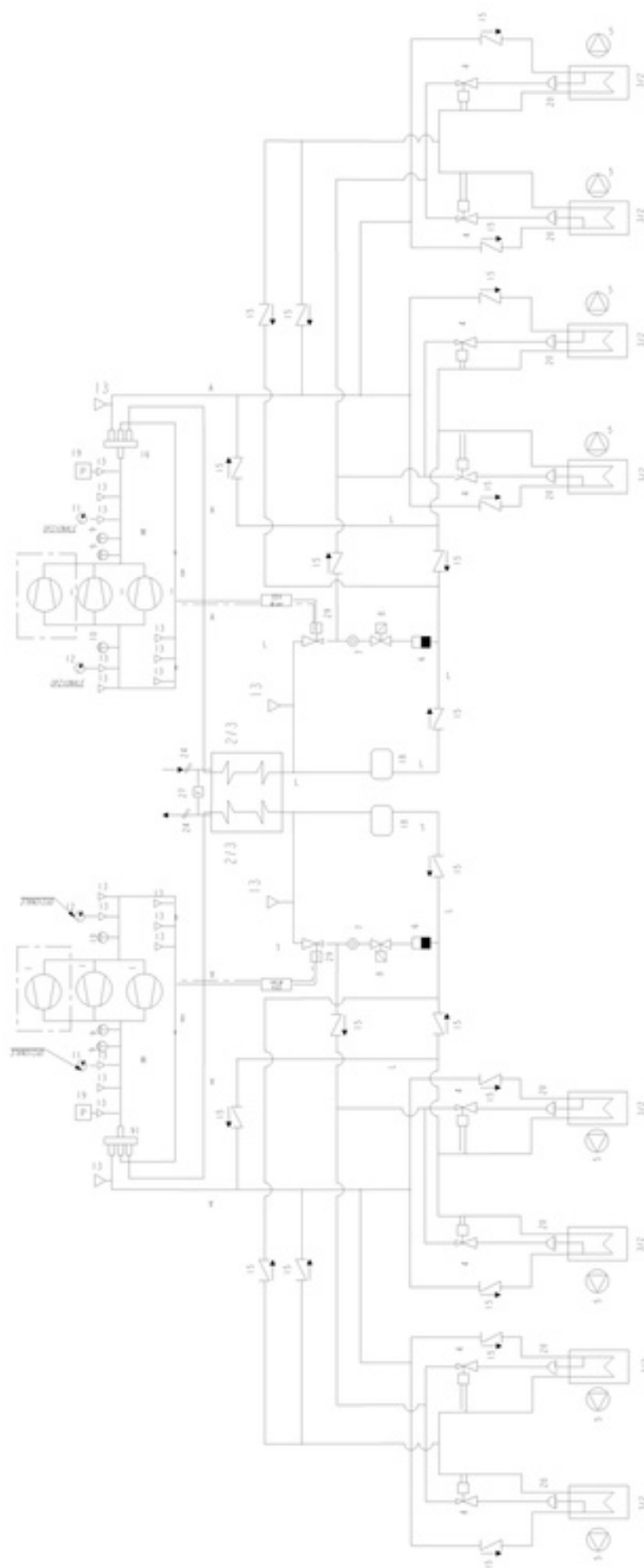


» V-IPER H 114 - 134 Cooling circuit





» V-IPER H 386 Cooling circuit





11 TROUBLESHOOTING

In this section you will find a list of the most common problems that may cause the chiller unit to stop or malfunction. Possible remedies are shown alongside a description of easily identifiable remedies.

⚠ Warning Extreme care should be taken when performing work or repairs on the unit: overconfidence can result in injuries, even serious ones, to inexperienced individuals. Operations marked with the letter "U" can be performed directly by the user, who must carefully follow the instructions provided in this manual. Operations marked with the letter "S" may be performed exclusively by specialised personnel. Once the cause has been identified, you are advised to contact a Galletti S.p.A. service centre or a qualified technician for help.

SYMPTOM			Who can take corrective action U = User S = specialised personnel	Possible control panel indication	Probable cause	Possible remedy
A The unit does not start	X	X	S	EU E0	Faulty connection or contacts open. Wrong voltage	Check the voltage and close the contacts
	X	X	S		Not enabled by remote controls	Check the efficiency of the water circulation pump, pressure switch, bleed air from the circuit; check whether contacts 16 and 30 on the terminal board are closed
	X	X	U		Anti-recycle timer active	Wait 5 minutes until the timer enables operation
	X	X	S	E1	Service thermostat sensor defective	Check and replace if necessary
	X	X	U		Not enabled by service thermostat	System at the set temperature, no demand; Check the setting
	X	X	U	A1	Not enabled by antifreeze thermostat	Check the water temperature. Checking the antifreeze setting
	X	X	S	E2	Antifreeze sensor defective	Check whether it is functioning properly
	X	X	S		Tripping of main circuit breaker	Check for the presence of short circuits in the wiring or windings of the pump, fan and compressor motors or in the transformer
	X	X	S	L1 H1	Not enabled by high or low pressure switch	See items D-E
	X	X	S		Compressor defective	See item B
B The compressor does not start	X	X	S		Compressor burnout or seizure	Replace the compressor
	X	X	S		Compressor contactor deenergized	Check the voltage at either end of the compressor contactor coil and verify the continuity of the coil itself
	X	X	S		Power circuit open	Locate the cause that tripped the protection; check for the presence of short circuits in the wiring or windings of the pump, fan and compressor motors or in the transformer
	X	X	S		Power circuit open	The compressor has operated in critical conditions or there is insufficient refrigerant within the circuit: check the working conditions and make sure they fall within the operating limits. Refrigerant leak: refer to item G
C The compressor starts up and stops repeatedly	X	X	S	L1	Minimum pressure switch has tripped	See item E
	X	X	S		Compressor contactor defective	Check and replace if necessary
	X	X	U		Wrong set-point or differential setting	Change them according to the indications given in the tables.
	X	X	S		Lack of refrigerant	See item G
D The compressor does not start because the maximum pressure switch has tripped	X	X	S	H1	Pressure switch failure	Check and replace
	X	X	S	H1	Excessive refrigerant charge	Discharge the excess gas
	X		U	H1	Finned coil obstructed, insufficient air flow	Remove dirt from the coil and any obstacles to air flow.
	X	X	S	H1	Fan not working	See item F
		X	U	H1	Water circulation pump blocked	Release the pump
		X	S	H1	Water circulation pump defective	Check the pump and replace it if necessary.
	X	X	S	H1	Presence of incondensable gas in the cooling circuit	Recharge the circuit after having drained and evacuated it
	X	X	S	H1	Refrigerant filter clogged	Check and replace

SYMPTOM			Who can take corrective action U = User S = specialised personnel	Possible control panel indication	Probable cause	Possible remedy
E The compressor does not start because the minimum pressure switch has tripped	X	X	S	L1	Pressure switch failure	Check and replace
	X	X	S	L1	Unit completely empty	See item G
		X	U	L1	Finned coil obstructed, insufficient air flow	Remove dirt from the coil
	X		S	L1	Water circulation pump blocked	Release the pump
	X		S	L1	Water circulation pump defective	Check the pump and replace it if necessary.
		X	S	L1	Presence of frost on the evaporating coil	See item O
		X	S	L1	Evaporator fan not working	See item F
	X	X	S	L1	Refrigerant filter clogged	Check and replace
	X	X	S	L1	Expansion valve is not working properly	Check and replace if necessary
	X	X	S	L1	Presence of humidity in the cooling circuit	Replace the filter and, if necessary, dry out the circuit and recharge
F The fans do not start	X	X	S	H1 L1	Fan contactor deenergized (SCX only)	Check the voltage at either end of the compressor contactor coil and verify the continuity of the coil itself
	X	X	S	H1 L1	No power output by the fan speed control card (only SCX H or SCX with condensation control)	Check and replace if necessary
	X	X	S	H1 L1	The fan's internal thermal protection has tripped	Check the fan conditions and the air temperature while the unit is running.
	X	X	S	H1 L1	Fan motor defective	Check and replace if necessary
	X	X	S	H1 L1	Loose electrical connections	Check and fasten securely
G Lack of gas	X	X	S	L1	Cooling circuit leak	Check the cooling circuit using a leak detector after pressurising the circuit to approximately 4 bars Repair, evacuate and refill
I Frost in liquid pipe downstream from a filter	X	X	S	H1 L1	Liquid filter clogged	Replace the filter
L The unit works continuously without ever stopping	X	X	S		Lack of refrigerant gas	See item G
	X	X	U		Wrong setting of operating thermostat	Check the setting
	X	X	S		Thermal overload	Reduce the thermal load
	X	X	S		Compressor does not provide the rated heating capacity	Check and replace or overhaul
	X	X	S		Liquid filter clogged	Replace
M The unit works regularly but with an insufficient capacity	X	X	S		Low level of refrigerant	See item G
	X	X	S		4-way cycle reversing valve defective	Check the valve power supply and coils and replace the valve if necessary
N Frost in the compressor intake pipe	X	X	S		Expansion valve is not working properly	Check and replace
	X		S		Water circulation pump blocked	Release the pump
	X	X	S		Water circulation pump defective	Check the pump and replace it if necessary.
	X	X	S		Low level of refrigerant	See item G
	X	X	S		Liquid filter clogged	Replace
O The defrosting cycle is never activated		X	S		4-way cycle reversing valve defective	Check the valve power supply and coils and replace the valve if necessary
		X	S		The defrost thermostat has broken down or has been set incorrectly	Check and replace if defective or change the setting
P Abnormal noises detected in the system	X	X	S		The compressor is noisy	Check and replace if necessary
	X	X	S		The panels vibrate	Fasten properly

12 RETIRING THE UNIT

When the unit has reached the end of its working life and needs to be removed and replaced, a series of operations should be carried out: In particular, the disposal of the unit should be carried out solely by qualified technicians specifically trained for this type of equipment, in conformity with current regulations.

Main components and materials:

- Plastic (ABS) and pre-painted or painted sheet metal
- Heat exchanger: copper and aluminium / steel
- Electric motors: copper, aluminium, iron
- Fans: plastic material (ABS) or aluminium/iron
- Internal structure: galvanized sheet (ferrous materials)
- Refrigerant piping: copper / brass
- Packaging: cardboard / polystyrene / wood
- Instructions: paper

The refrigerant gas and the compressor's lubricating oil must be recovered and sent to an authorized collection center.

In general, the structure and the components (if they can no longer be used) must be disassembled and separated according to the main type of material. Especially for the parts made of iron, copper, and aluminum, which are present in large quantities in the product.

If the unit contains electronic boards or controls of any kind, at the time of disposal of the unit, it is necessary to consider these components to be "electrical and electronic waste," and they must be disposed of in accordance with the requirements of Directive 2012/19/EU - (also known as the WEEE (Waste Electrical and Electronic Equipment) – Directive.

These products should be handled properly and the materials that they are made of – such as copper, iron, steel, aluminum, glass, silver, gold, lead, and mercury – should be sorted for recycling, thereby avoiding a waste of resources that can be reused to manufacture new equipment, thus contributing to environmental sustainability.

To learn the EWC (European Waste Catalog) code of the different types of materials listed above, refer to Decision 2014/955 /EU of the European Commission (and any subsequent amendments thereto).



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