Installation and maintenance manual

SYSCW-AR R513

07R / 09R

Water source heat pump

R513-A

1.8 ➔ 2.6kW

1.7 ➔ 2.0kW

250 ➔ 460 m³/h

CE

INSTALLATION INSTRUCTION — English

NOTICE D'INSTALLATION — Français

INSTALLATIONSHANDBUCH — Deutsch

ISTRUZIONI INSTALLAZIONE — Italiano

INSTRUCCIONES DE INSTALACIÓN — Español

English

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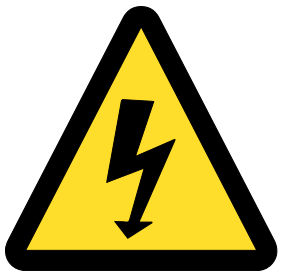


POWER SUPPLY MUST BE SWITCHED OFF BEFORE STARTING WORK IN THE ELECTRIC CONTROL BOX

1. GENERAL RECOMMENDATIONS

The purpose of this Manual is to provide users with instructions for installing, commissioning, using and maintaining the units. It also contains instructions on starting up the machine as well as recommendations to avoid bodily injury and risks of damage to the device during its operation.

It does not contain the complete description of all the maintenance operations guaranteeing the unit's long life and reliability. Only the services of a qualified technician can guarantee the unit's safe operation over a long service life.

Please read the following safety precautions very carefully before installing the unit.

1.1. SAFETY DIRECTIONS

Follow the safety rules in force when you are working on your appliance.

The installation, commissioning, use and maintenance of these units should be performed by qualified personnel who have a good knowledge of standards and local regulations, as well as experience of this type of equipment.

This appliance has not been designed for use by persons (including children) with reduced physical, sensorial or mental faculties or by persons without any experience or knowledge of heating systems, unless they act under the safety and supervision of a responsible person or have received prior training concerning the use of the appliance.

The unit should be handled using lifting and handling equipment appropriate to the unit's size and weight.

Any wiring produced on site must comply with the corresponding national electrical regulations.

Make sure that the power supply and its frequency are adapted to the required electric current of operation, taking into account specific conditions of the location and the current required for any other appliance connected to the same circuit.

The unit must be EARTHED to avoid any risks caused by insulation defects.

Work must not be carried out on the electrical components if water or high humidity is present at the installation site.

SAFETY SYMBOLS

ELECTRIC VOLTAGE

ROTATING PART

RISK OF CUTTING

RISK OF BURNS

RISK OF ASPHYXIA

PRESSURIZED EQUIPMENT

1.2. WARNING

Cut off the power supply before starting work on the appliance.

When forming the hydraulic connections, ensure that no impurities are introduced into the pipe work.

The manufacturer declines any responsibility and the warranty becomes void if these instructions are not complied with.

If you encounter a problem, please call the Technical Department for your area.

If possible, assemble the compulsory or optional accessories before placing the appliance in its final location (see instructions provided with each accessory).

To familiarize yourself fully with the appliance, we recommend that you also read our Technical Instructions.

The information contained in these Instructions is subject to modification without advance notice.

1.3. EQUIPMENT SAFETY DATA

Safety data	R513A
Toxicity level	Low.
In contact with the skin	Dermal contact with the rapidly evaporating liquid can cause frostbite to the tissue. In the event of contact with the liquid, warm the frozen tissue with water and notify a physician. Remove contaminated clothing and shoes. Wash clothes before reuse
In case of eye contact	Steam has no effect. Splashing or splashing liquid can cause burns. Clean immediately with eye drops or clean water for at least 15 minutes. Seek medical attention urgently.
Ingestion	Burns can occur if this happens. Do not induce vomiting. When the patient is conscious, wash the mouth with water. Seek medical attention urgently.
Inhalation	If inhaled, move to fresh air and give oxygen if necessary. Perform artificial respiration if the patient is no longer breathing or is short of air. In the event of cardiac arrest, perform external CPR. Seek immediate medical attention.
Other medical advice	Cardiac sensitivity may, in the presence of circulating catecholamines such as adrenaline, lead to increased arrhythmias and subsequent cardiac arrest if exposed to high concentrations.
Occupational exposure limits	R513A: Recommended limit: 1,000 ppm - 8 hours.
Stability	Room temperature stable product
Conditions to avoid	Pressure build-up due to high temperatures can cause the container to explode. Protect from sunlight and do not expose to a temperature >50°C.
Dangerous reactions	Possibility of dangerous reactions in case of fire due to the presence of F and/or Cl radicals
General precautions	Avoid inhaling high concentrations of vapors. Atmospheric concentrations should be minimized and kept as far as possible below the occupational exposure limit. Steam is heavier than air and concentrates at a low level and in small places. Exhaust ventilation at the lowest levels.
Respiratory protection	If there is any doubt about the air concentration, breathing apparatus approved by the health services should be used. These devices will contain oxygen or allow better breathing.
Storage	The containers must be placed in a dry and cold place away from any risk of fire, direct sunlight and away from any heat source such as radiators. Temperatures should not exceed 50°C.
Protective clothing	Wear coveralls, impermeable gloves and goggles or a face shield.
Procedure in case of spillage or a leak	Make sure that everyone wears the appropriate protective clothing and respirators. If possible isolate the source of the leak. Encourage evaporation of small spills provided there is adequate ventilation. Large spills: ventilate the area. Contain spill with sand, earth or other suitable absorbent material. Prevent liquid from entering drains, sewers, basements and manholes as the vapor can create a suffocating atmosphere.
Waste disposal	Preferably to be recovered and recycled. If this is not possible, ensure that they are destroyed in an authorized area able to absorb and neutralize acids and other toxic manufacturing products.
Fire fighting data	R513A: Non-flammable at ambient temperatures and atmospheric pressures.
Containers	Containers exposed to fire must be kept cold by means of water jets. Containers may burst if overheated.
Fire protection equipment	In case of fire, wear self-contained breathing apparatus and protective clothing.

2. INSPECTION AND STORAGE

At the time of receiving the equipment carefully cross check all the elements against the shipping documents in order to ensure that all the crates and boxes have been received. Inspect all the units for any visible or hidden damage.

In the event of shipping damage, write precise details of the damage on the shipper's delivery note and send immediately a registered letter to the shipper within 48 hours, clearly stating the damage caused. Forward a copy of this letter to the manufacturer or his representative.

Never store or transport the unit upside down. It must be stored indoors, completely protected from rain, snow etc. The unit must not be damaged by changes in the weather (high and low temperatures). Excessively high temperatures (above 60 °C) can harm certain plastic materials and cause permanent damage. Moreover, the performance of certain electrical or electronic components can be impaired.

3. WARRANTY

The appliances are delivered fully assembled, factory tested and ready to operate.

Any modification to the units without the manufacturer's prior approval, shall automatically render the warranty null and void.

The following conditions must be respected in order to maintain the validity of the warranty:

- Commissioning shall be performed by specialised technicians from technical services approved by the manufacturer.
- Maintenance shall be performed by technicians trained for this purpose.
- Only Original Equipment spare parts shall be used.
- All the operations listed in the present manual shall be performed within the required time limits.

THE WARRANTY SHALL BE NULL AND VOID IN THE EVENT OF NON-COMPLIANCE WITH ANY OF THE ABOVE CONDITIONS.

4. TECHNICAL SUPPORT AND AFTER-SALES SERVICE HOTLINE

For technical questions, work under warranty, commissioning, a manufacturer's visit or repair quotations.

Our technical support and after-sales service hotline can be reached on:

- (0)891 700 407 in France
- support@systemair.fr for export customers

5. PRESENTATION

The **SYSCW-AR** units are produced in compliance with state-of-the-art design and manufacturing standards. This guarantees their high performance and reliability as well as their compatibility with all types of air conditioning installations. The unit, designed for an indoor mounted application, is not suitable for any uses other than those specified in this manual.

Following assembly of the units in the factory:

1. the electrical circuits are tested.
2. refrigeration circuits receive their operational refrigerant charge and are subject to pressurized leak detection tests.
3. The **SYSCW-AR** units are tested.

These tests are conducted to guarantee the correct operation and quality of our products.

6. CONTENTS OF PACKAGE

Package contents:

1 appliance

1 installation manual

6.1. OPTIONAL ACCESSORIES

1 Remote control

On opening the box, check that all of the accessories required for installation are present.

7. DIMENSIONS

SEE APPENDIX

8. HANDLING

8.1. NET WEIGHT

MODELS			07R		09R	
			STANDARD	LOW HEIGT	STANDARD	LOW HEIGT
WEIGTH	WITH CASING	kg	70		73	
	WITHOUT CASING	kg	55		58	

8.2. GENERAL HANDLING

A pallet truck or a forklift truck can be used to handle the **SYSCW-AR** units when palletized.

- Take care to avoid any rough handling or impacts when unloading and moving the appliance.
- Before hoisting the appliance into position, perform a test lift to ensure stability and balance. Avoid twisting or uneven lifting of the units.
- The units shall be carefully inspected before unit installation to make sure this has not happened.
- All of these sections are inspected before they leave the factory. Prior to commissioning, it is therefore important to make sure that no bolts, screws or other fastening components are loosened or missing.

Caution

Never subject the metal work (panels, posts) of the **SYSCW-AR** to handling constraints, as only its base is designed for that purpose.

Caution

To avoid irreversible damage, do not tilt the **SYSCW-AR** by more than 45° during handling.

9. TECHNICAL SPECIFICATIONS

9.1. MODELS DESIGNATION

CW-AR07R	.	H	.	VN	.	HB	.	ER	.	LN	.	SYS	.	EC	.	BA	.	MBRT	.	CB	.	RCSM	.	FTG
①		②		③		④		⑤		⑥		⑦		⑧		⑨		⑩		⑪		⑫		⑬

REP.		Description	
①	Size	**CW-AR07R** : SYSCW-AR R513A size 07	**CW-AR09R** : SYSCW-AR R513A size 09
②	Version	**H** : Heat pump	
③	Cabinet	**VN** : STD no cabinet **VC** : Std cabinet	**VNL** : Low No Cabinet **VCL** : Low cabinet with RF
④	Hydraulic	**HB** : Hydraulic connection bottom **HBK** : Hydraulic connection back	**HR** : Hydraulic connection right side **HL** : Hydraulic connection left side
⑤	Electrical	**ER** : Electrical connection right side	**EL** : Electrical connection left side
⑥	Acoustic	**LN** : Standard Low Noise	**XLN** : Extra low noise
⑦	Brand	**SYS** : Systemair	
⑧	Fan type	**AC** : Ventilateur moteur AC	**EC** : Ventilateur moteur EC
⑨	Air filter	**BA** : G2 filter - bottom - dessous (fixed feet)	**FA** : G2 filter - front (adjustable feet)
⑩	Communication protocol	**MBRT** : Modbus RTU **BNMS** : Bacnet MSTP	**LON** : LON
⑪	Protection	Blank : Porte fusible	**CB** : Circuit breaker
⑫	Remote control	Blank : Without remote thermostat **RCSM** : POL822 Siemens mounted	**RCS** : POL822 Siemens (wall mounting)
⑬	Cabinet option	Blank : Without grille	**FTG** : grille for cabinet (between feet - Filter BA)

The product plate on the device shows the full model reference number and should be used to check that the actual unit matches the model ordered. It also provides the following information:

- ➢ General information
  - ✔ serial number
  - ✔ year of manufacture
  - ✔ IP index
- ➢ Electrical information
  - ✔ supply voltage
  - ✔ maximum operating current
  - ✔ starting current
- ➢ Thermodynamic circuit information
  - ✔ type of refrigerant
  - ✔ refrigerant charge in each circuit
  - ✔ Service pressure of refrigeration circuit
  - ✔ refrigeration circuit service temperatures
- ➢ Hydraulic circuit information
  - ✔ nominal water flow
  - ✔ maximum water pressure

9.2. PHYSICAL CHARACTERISTICS

9.2.1. SYSCW-AR - EC MOTOR

Models			07R			09R		
			PV	MV	GV	PV	MV	GV
Total cooling capacities (1)		W	1618	1690	1700	2001	2040	2051
Sensible cooling capacities (1)		W	1208	1410	1660	1440	1600	1833
Total absorbed power (3)		W	326	345	362	463	480	502
EER according to EN14511			4.96	4.9	4.7	4.32	4.25	4.09
Total Heating capacities (2)		W	1801	1790	1793	2638	2630	2632
Total absorbed power (3)		W	436	395	385	640	610	597
COP according to EN14511			4.13	4.53	4.66	4.12	4.31	4.41
VENTILATION								
Setpoint voltage		V	3.53	5.13	5.99	5.13	5.99	7.28
Air flow		m^3/h	250	340	400	340	400	460
Fan absorbed power		W	10	15	20	15	20	28
Air filter - Number / Efficiency			1/G2					
Air filter (FA) - Dimensions / Thickness		mm	660 x 205 / 6					
Air filter (BA) - Dimensions / Thickness		mm	595 x 187 / 6					
HYDRAULIC CIRCUIT								
Water exchanger		Nbr	1					
Water pressure max.		bar	10					
Cooling mode	Nominal water flow	l/h	336	351	355	425	434	439
	Water pressure drop at nominal flow	kPa	3.42	3.75	3.84	5.6	5.84	5.97
	Minimum water flow	l/h	168	180	180	213	217	220
Heating mode	Nominal water flow	l/h	395	405	410	578	586	593
	Water pressure drop at nominal flow	kPa	4.8	5.06	5.2	10.5	10.8	11.1
	Minimum water flow	l/h	198	203	205	289	293	297
Water connections Input/output		pouces	ISO G 1/2" INT					
Condensate outlet Ø		mm	15 x 20					
REFRIGERANT CIRCUIT								
Number of circuit		Nbr	1					
Refrigerant			R513A					
Compressor type			Rotary					
Load		g	500			490		
ELECTRICAL DATA								
Electrical power supply			230V / 1Ph / 50Hz ±10%					
Max. current (4)		A	4.6			5.7		
starting current (5)		A	16			16.5		
ACOUSTICAL DATA								
Sound power level (6)		dB(A)	47.2	49.8	51.5	49.8	51.5	54.3
Sound pressure level (6)		dB(A)	38.2	40.8	42.5	40.8	42.5	45.3
NR (6)		dB(A)	32	34	36	34	36	40

(1) Nominal cooling capacities based on : entering air temperature of 27 °C dry bulb, 19 °C wet bulb with entering water temperature of 30 °C.

(2) Nominal heating capacities based on : entering air temperature of 20 °C dry bulb, 15 °C wet bulb with entering water temperature of 20 °C.

(3) Absorbed power (compressor + fan) at nominal conditions.

(4) Nominal currents are given at +/- 5%.

(5) Starting currents are given at +/- 10%.

(6) Informative data, considering an hypothetical sound attenuation of the room and installation of 9dB.

9.2.2. SYSCW-AR - AC MOTOR

Models			07R			09R		
			PV	MV	GV	PV	MV	GV
Total cooling capacities (1)		W	1618	1690	1700	2001	2040	2051
Sensible cooling capacities (1)		W	1208	1410	1660	1440	1600	1833
Total absorbed power (3)		W	329	355	396	462	487	532
EER according to EN14511			4.92	4.75	4.29	4.33	4.19	3.86
Total Heating capacities (2)		W	1801	1790	1793	2 638	2 630	2 632
Total absorbed power (3)		W	439	405	419	639	617	627
COP according to EN14511			4.11	4.41	4.28	4.13	4.26	4.20
VENTILATION								
Air flow		m^3/h	250	340	400	340	400	460
Fan absorbed power		W	12	25	54	14	27	58
Air filter - Number / Efficiency			1/G2					
Air filter (FA) - Dimensions / Thickness		mm	660 x 205 / 6					
Air filter (BA) - Dimensions / Thickness		mm	595 x 187 / 6					
HYDRAULIC CIRCUIT								
Water exchanger		Nbr	1					
Water pressure max.		bar	10					
Cooling mode	Nominal water flow	l/h	336	351	355	425	434	439
	Water pressure drop at nominal flow	kPa	3.42	3.75	3.84	5.6	5.84	5.97
	Minimum water flow	l/h	168	180	180	213	217	220
Heating mode	Nominal water flow	l/h	395	405	410	578	586	593
	Water pressure drop at nominal flow	kPa	4.8	5.06	5.2	10.5	10.8	11.1
	Minimum water flow	l/h	198	203	205	289	293	297
Water connections Input/output		pouces	ISO G 1/2" INT					
Condensate outlet Ø		mm	15 x 20					
REFRIGERANT CIRCUIT								
Number of circuit		Nbr	1					
Refrigerant			R513A					
Compressor type			Rotary					
Load		g	500			490		
ELECTRICAL DATA								
Electrical power supply			230V / 1Ph / 50Hz ±10%					
Max. current (4)		A	4.6			5.7		
starting current (5)		A	16			16.5		
ACOUSTICAL DATA								
Sound power level (6)		dB(A)	47.2	49.7	52	49.7	52	54.4
Sound pressure level (6)		dB(A)	38.2	40.7	43	40.7	43	45.4
NR (6)		dB(A)	32	34	37	34	37	40

(1) Nominal cooling capacities based on : entering air temperature of 27 °C dry bulb, 19 °C wet bulb with entering water temperature of 30 °C.

(2) Nominal heating capacities based on : entering air temperature of 20 °C dry bulb, 15 °C wet bulb with entering water temperature of 20 °C.

(3) Absorbed power (compressor + fan) at nominal conditions.

(4) Nominal currents are given at +/- 5%.

(5) Starting currents are given at +/- 10%.

(6) Informative data, considering an hypothetical sound attenuation of the room and installation of 9dB.

9.3. ELECTRIC SPECIFICATIONS

A variance of ±10% is acceptable in relation to the operating voltage marked on the appliance's Maker's Plate.

Operating voltages:

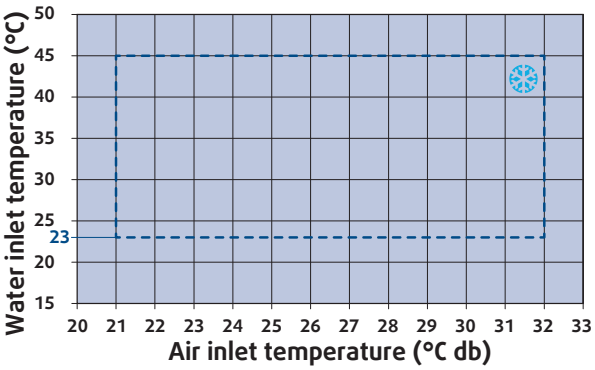
➢ 230V / 1 ph / 50 Hz ±10%

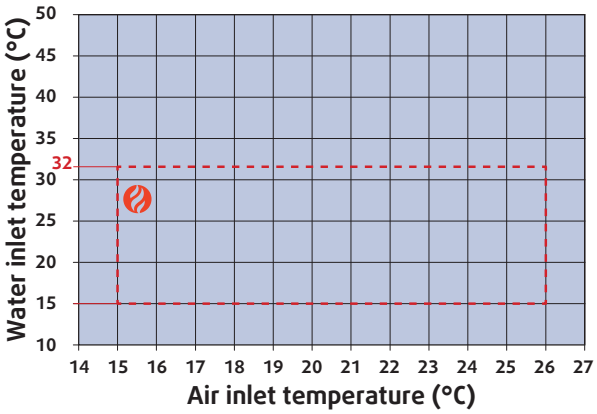
Comments: the stated voltages represent the accepted range. However, certain components may be subject to premature wear on appliances operating continuously, for extensive periods, on abnormally low or high voltages.

MODEL		Fuse aM	Full load current (max)	Starting amperage
07R	A	6	4.6	16
09R	A	6	5.7	16.5

9.4. OPERATING LIMITS

9.4.1. TEMPERATURE LIMITS

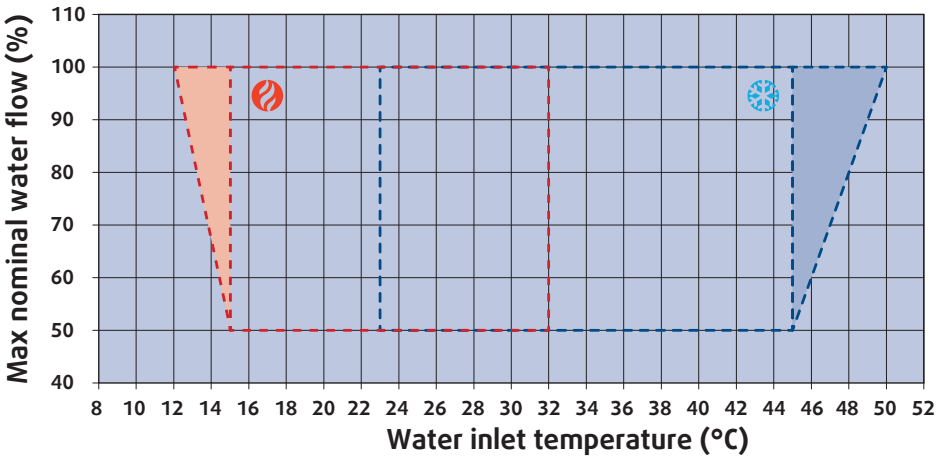




9.4.2. FLOW LIMITS

MODELS		07R	09R
PV - Minimum air flow	m³/h	250	340
MV - Nominal air flow *	m³/h	340	400
GV - Maximum air flow	m³/h	400	460

* Conditions in accordance with the standard: EN 14511-2



Conditions in accordance with the standard: EN 14511-2

Caution

Operation within the shaded ranges requires special attention to the minimum water flow rate.

MODELS		07R		09R	
		❄	🔥	❄	🔥
Nominal water flow	l/h	351	405	434	586
50% Nominal water flow	l/h	180*	203	217	293
Maximum hydraulic pressure	bar	10		10	

* Cutoff water flow: 180l/h

9.5. REFRIGERATION SPECIFICATIONS

9.5.1. REFRIGERANT CIRCUIT DIAGRAM

SEE APPENDIX

9.5.2. REFRIGERANT CHARGE

Caution

This equipment contains fluorinated gas with greenhouse gas effects covered by the Kyoto agreement.

The type and quantity of refrigerating fluid per circuit are indicated on the product plate.

The installer and end user will get informed on local environmental regulations for the installation, operation and disposal of the equipment ; more particularly, for the collection of substances hazardous for the environment (refrigerating fluid, oil, antifreeze, etc.). A refrigerating fluid, whatever it is, must not be vented. Refrigerating fluids must be handled by skilled personnel.

Caution

SYSCW-AR units use the R513A fluoro-carbonated fluid, belonging to group 2 as defined in directive 2014/68/UE. Considering the maximum operating pressure of these units (18 bar g), they integrate category 2 (or lower) components as defined in directive 2014/68/UE.

9.5.3. FLUOROCARBON GAS REGULATIONS

The EC No. 517/2014 regulation covering fluorinated greenhouse gases requires of refrigeration equipment operators to comply with the following five obligations:

1. Installation, servicing, maintenance as well as checking the sealing must be carried out by qualified personnel.
2. The fluorinated gas must be recovered during servicing and maintenance as well as the end of the installation.
3. All the necessary measures must be taken to prevent the leakage of fluorinated gases and any leaks must be repaired as rapidly as possible.
4. Regular checks on any leaks must be performed according to the following conditions:
   - ✔ for equipment containing fluorinated greenhouse gases in quantities greater than or equal to the equivalent of 5 tonnes of CO_2 but less than the equivalent of 50 tonnes of CO_2: at least every twelve months or, if a leak detection system is installed, at least every twenty-four months
   - ✔ for equipment containing fluorinated greenhouse gases in quantities greater than or equal to the equivalent of 50 tonnes of CO_2 but less than the equivalent of 500 tonnes of CO_2: at least every six months or, if a leak detection system is installed, at least every twelve months
   - ✔ for equipment containing fluorinated greenhouse gases in quantities greater than or equal to the equivalent of 500 tonnes of CO_2: at least every three months or, if a leak detection system is installed, at least every six months.
5. A document grouping a description of all the operations carried out on the cooling circuit must be drafted and conserved.

Caution

Non-compliance with one of these obligations constitutes an offense and can result in financial penalties.
Furthermore, compliance of the equipment with the fluorinated gases regulation must be proven to the insurance company.

9.5.3.1. CALCULATING GREENHOUSE GAS QUANTITIES

Greenhouse gas quantity (kg of CO_2) = Quantity of gas (kg) x gas' GWP

Quantity of greenhouse gas expressed in weight (kg) and CO_2 equivalent

Quantity of gas: amount of gas contained in the machine in kg (see ID plate)

GWP (Global Warming Potential) of the gas contained in the machine (see ID plate)

➢ **GWP for the R513A = 631**

10. INSTALLATION

Caution

The unit is not designed to withstand weights or stresses from adjacent equipment, pipe work or constructions. Any foreign weight or stress on the unit structure could lead to a malfunction or damage, which could prove hazardous to personnel and property. In such an event, the warranty shall be voided.

Caution

The unit base shall be arranged as indicated in the manual. There could be a risk of personal injury or damage to property in the event of the unit being incorrectly supported.

1. To avoid any damage, this equipment must not be used to supply heating or cooling during building work.
2. Check that the voltage, the number of phases and the capacity of the unit comply with the installation plans.
3. Check the size of the unit in relation to the plans to ensure that the unit will be installed in the right location.
4. Take particular care over the location and routing of the water pipes and the condensate drainage pipe as well as the electrical wiring. The location and routing of these items must be clearly indicated on the plans.
5. It is always advisable for the heat pump installer to consult with all the various entrepreneurs responsible for the pipe work and electrical installation on the site.
6. We advise the installer to cover the appliances with a plastic sheet to protect it during the final building work.
   This is particularly important if work such as spraying the joists with fire retardant, sanding, spray painting and plastering has not been completed.

10.1. SITING THE INSTALLATION

This equipment is designed EXCLUSIVELY for INDOOR installation.

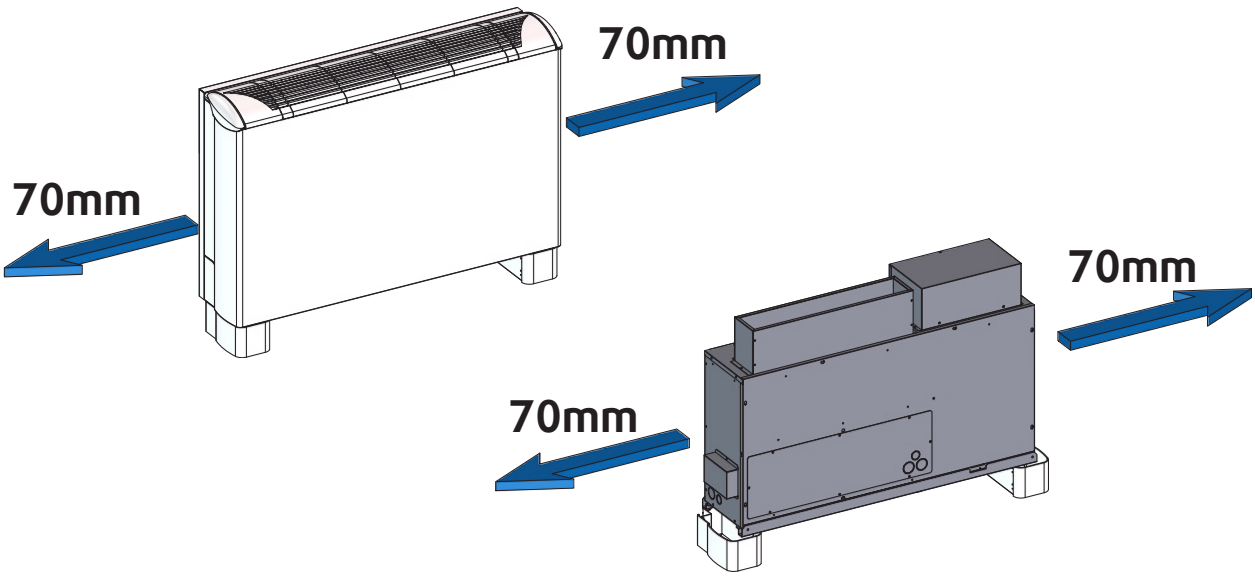
In general, sheltered locations such as garages, roof space, etc, do not provide sufficient protection against extreme temperatures and/or humidity and may be harmful to the unit's performance, reliability and service life.

The unit must be installed on a firm level foundation, of adequate strength to support its full operating weight.

1. **Install the unit in a location allowing easy removal of the filter and the access panels to the electrical box/compressor and fan by leaving sufficient free space for servicing personnel to perform maintenance and repairs. Leave sufficient space for the water and electricity connections.**
2. The unit must be pitched slightly towards condensate drain outlet to provide positive drainage of condensates.
3. We recommend the installation of a siphon on the condensate outflow to avoid unpleasant odours travelling back up the pipe.
4. All electrical and ductwork connections to the unit must be made via flexible connections to prevent transmission of vibration.
5. In addition to the service clearances noted on the dimension sheet it is essential that provision is made for adequate and safe service access.

The units are designed to be installed in a controlled environment. Each unit should be located on the installation plans. Inspect the carton for specific tagging numbers and references (models, size, left hand or right hand). The supply, return and condensation piping should be located accordingly making sure the piping will fit into the confines of the fan coil chassis and cabinet.

10.2. CLEARANCE

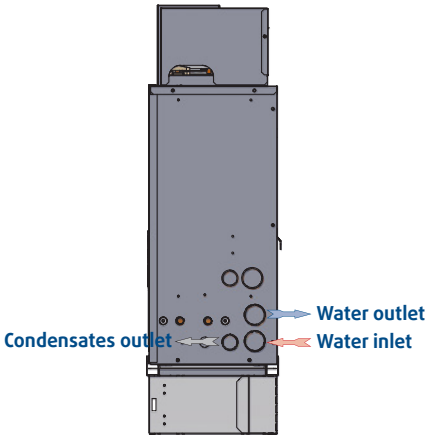


10.3. UNIT INSTALLATION

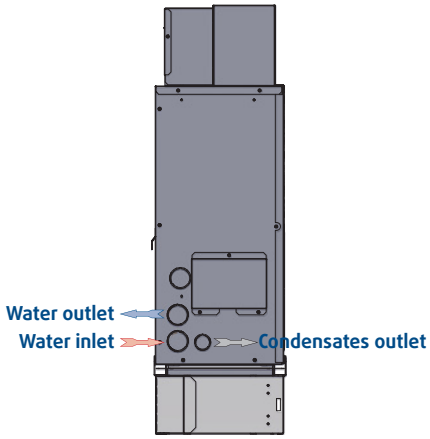
10.3.1. CONNECTION POSITIONS

Factory-configured water connections are available in 4 different positions:

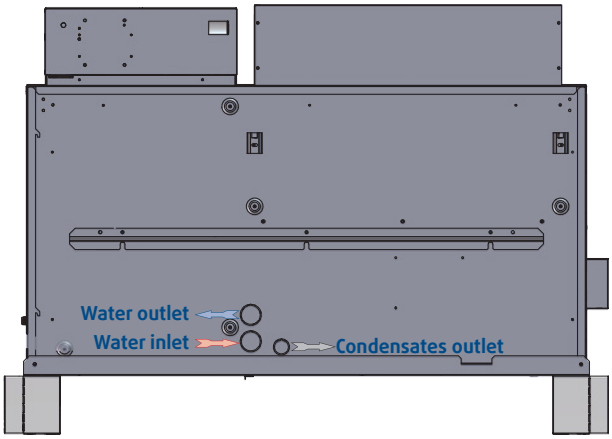
➢ right side



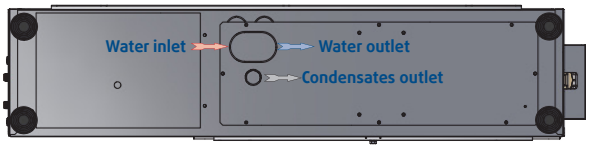
➢ left side



➢ rear panel



➢ underneath (option not available when the air filter is fitted underneath the appliance)

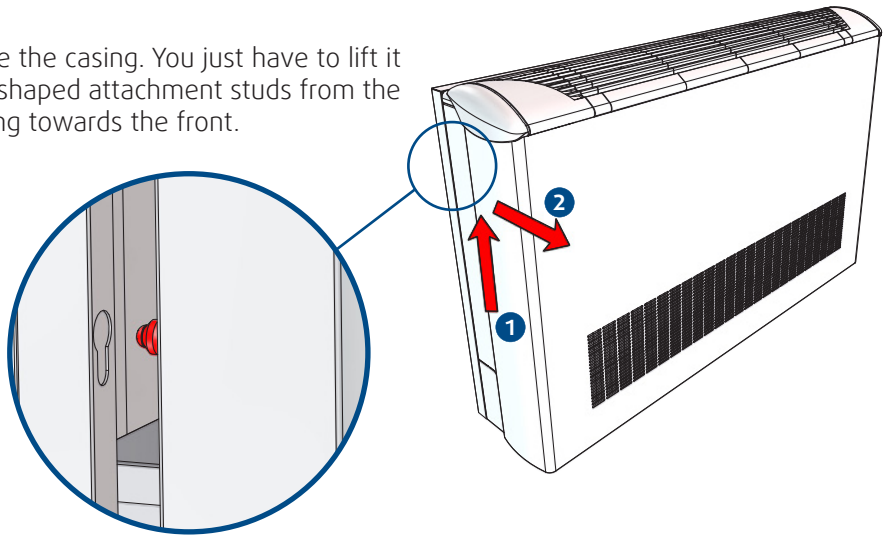


10.3.2. CABINET REMOVAL

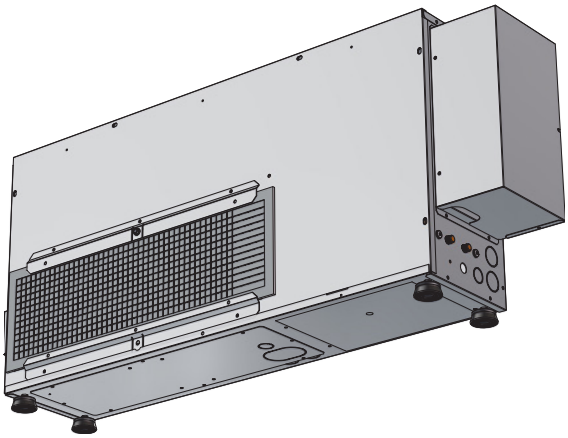
Caution

When removing cabinet do not pull or lift it up by the discharge grilles, to avoid any damages on articulated fasteners of the access doors.

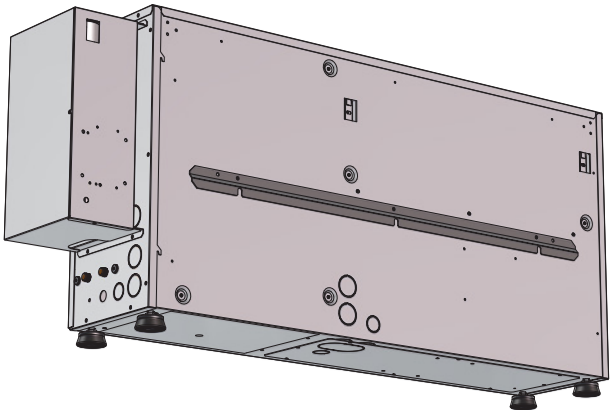
No tools are required to remove the casing. You just have to lift it up slightly to release the olive-shaped attachment studs from the buttonholes. Then pull the casing towards the front.



10.3.3. ANCHORING TO THE GROUND



Models with a frontal air intake are equipped with four height-adjustable feet to facilitate levelling the appliance. We recommend that the appliances are installed at a slight angle to favour condensate run-off.

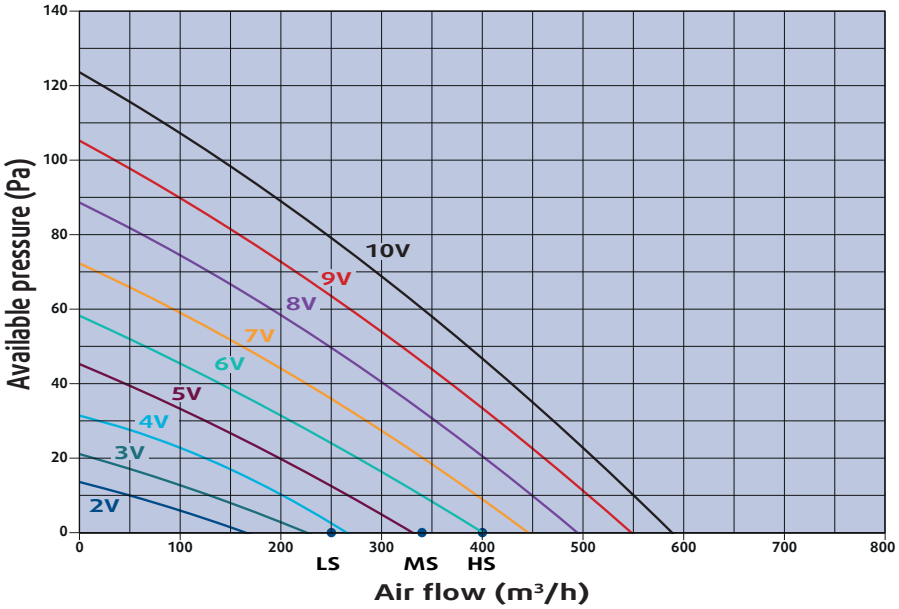


We recommend the use of an angle bracket to attach the appliance to the wall.

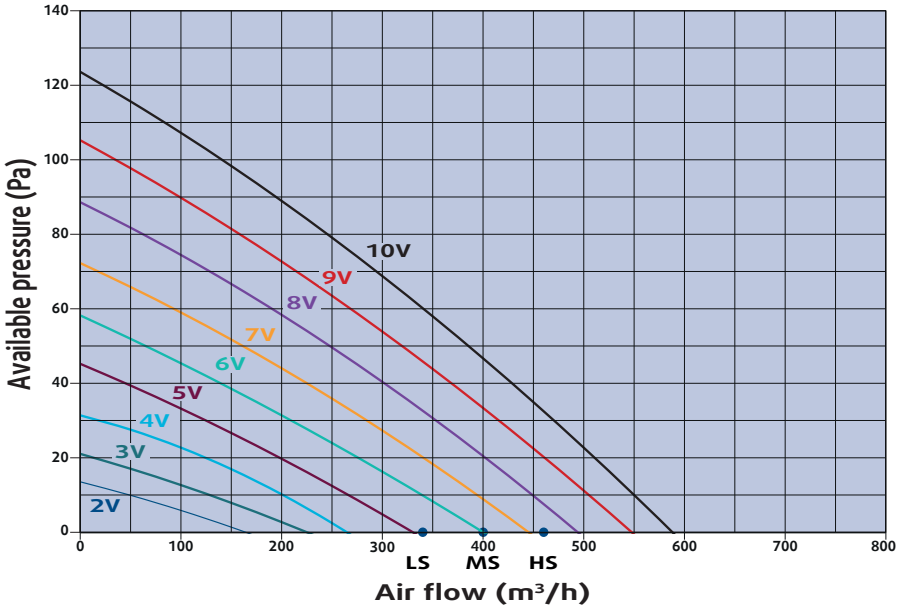
SEE APPENDIX

10.4. AERAULIC ADJUSTEMENT

10.4.1. MODEL SYSCW-AR 07R - EC MOTOR



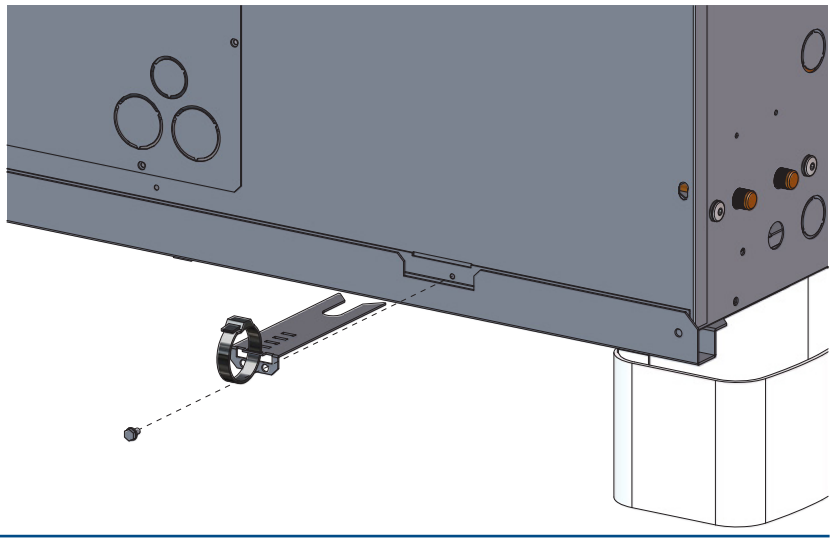
10.4.2. MODEL SYSCW-AR 09R - EC MOTOR



11. UNCLAMPING THE COMPRESSOR

Caution

Before the first start-up the compressor transport clamping be removed. Failure to do this could result in vibrations, high noise and could lead to the refrigerant tubes breaking.



Unclamping the compressor requires removing the body. It is done by removing the clamping tab accessible from the front of the SYSCW-AR unit.

12. HYDRAULIC LINKS

Caution

THE WARRANTY DOES NOT COVER DAMAGE DUE TO CORROSION RESULTING FROM ELECTROLYTIC PHENOMENA.

12.1. WATER QUALITY

The water must be analyzed; the hydraulic network system installed must include all elements necessary for water treatment: filters, additives, intermediate exchangers, drain valves, vents, check valves, etc., according to the results of the analysis.

Caution

The SYSCW-AR must not run on a network with open loops, likely to cause incidents related to oxygenation, or with non treated table water.

Using improperly treated or non treated water in the **SYSCW-AR** may cause scaling, erosion, corrosion or algae or sludge deposits in the exchangers. Refer to a specialist skilled in water treatment to determine any treatment to apply. The manufacturer will not be held liable for damages caused when non treated or improperly treated water, demineralized water, salty water or sea water are used.

Apply the following guidelines :

- No NH_4^+ ammonium ions in the water, highly detrimental to copper. <10mg/l
- Cl- chloride ions are detrimental to copper with a risk of puncture by picking corrosion. <10mg/l.
- SO_4^{2-} sulphate ions may cause perforating corrosion. < 30mg/l.
- No fluoride ions (<0.1 mg/l)
- No Fe^{2+} and Fe^{3+} ions, particularly in case of dissolved oxygen. Fe< 5mg/l with dissolved oxygen < 5mg/l. The presence of these ions with dissolved oxygen indicates corrosion of steel parts, likely to generate corrosion of copper parts under Fe deposits, particularly in the case of multitubular exchangers.
- Dissolved silica: silica is an acid element of water and may also cause corrosion. Content < 1mg/l.
- Water hardness: Values between 10°fH and 30°fH may be recommended. This facilitates scaling deposits likely to limit copper corrosion. Excess TH values may lead to clogging the pipes.
- TAC<100
- Dissolved oxygen: Prevent any sudden change in the water's oxygenation conditions. Also, avoid deoxygenating water by sparging inert gas as well as overoxygenating it by pure oxygen sparging. Disturbing oxygenation conditions destabilizes copper hydroxides and particle salting-out.
- Electrical Resistivity - Conductivity: The higher the resistivity, the slower the corrosion. Values above 3000 ohm/cm are preferred. A neutral environment favours maximum resistivity. For electrical conductivity, values around 200-600 S/cm can be recommended.
- pH: neutral pH at 20°C (7 < pH < 9)

Caution

If the water circuit is to be drained for a time exceeding one month, the circuit must be fully charged with nitrogen to prevent any risk of corrosion by differential venting.

Caution

Correct water treatment is critical, and particular care must be taken to ensure that the type of treatment utilized is appropriate.

The recommendations of a company specializing in such matters must be sought and applied.

The manufacturer or their representative cannot be held liable in the event of the use of water that is untreated or of nonconforming quality.

12.2. RECOMMENDATIONS FOR HYDRAULIC CONNECTIONS

1. It is recommended that all units are connected to a water supply and return pipe system of the Tickelman Loop type. The Tickelman Loop system is self-balancing and thus only requires manual balancing if a large number of units with different flow and pressure loss characteristics are connected to a single hydraulic loop. A very simple way of checking the hydraulic balance is to measure the temperature difference between the water connections. To ensure a correct water flow, the difference must be in the region of 3 to 7 °C in Cooling mode and 2 to 5°C in Heating mode.
   A system with two parallel pipes can also operate in a perfectly adequate manner, but it is more difficult to achieve, and to maintain, balance.

2. **Never connect a unit to the water supply and return lines without completely cleaning and flushing out the hydraulic loop beforehand.** After performing these operations, the units must be connected, with all valves completely open, ready for the system to be filled with water.

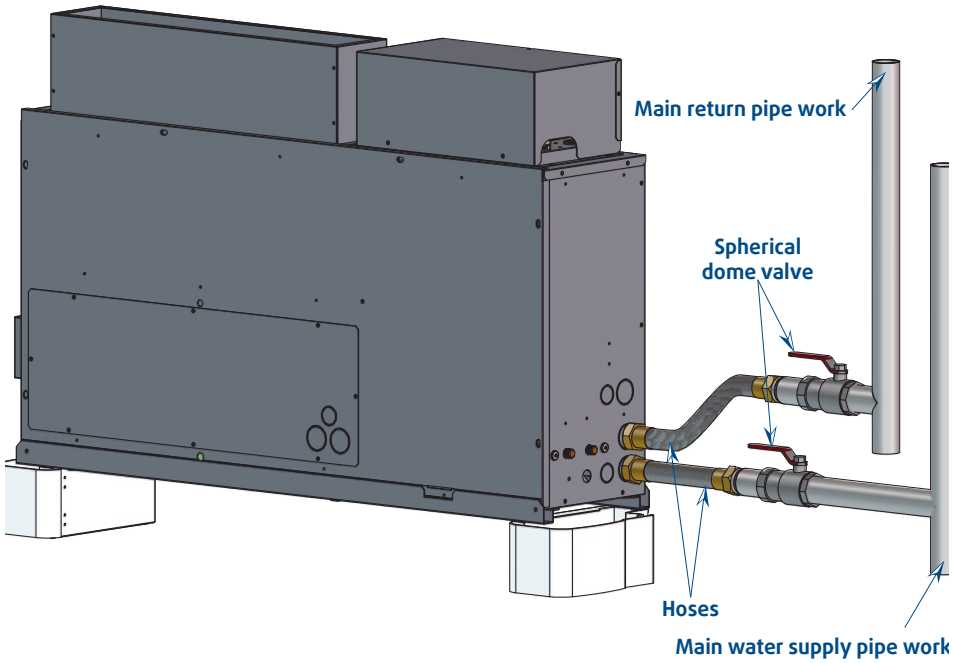
3. Water exchanger clogging reduces efficient appliance operation. We recommend the installation of a **strainer filter** (Ø 0.8mm) on the appliance's water inlet pipe. The filter must be installed if the water circuit cannot be cleaned. This filter should be installed between two cut-off valves and it must remain easily accessible for the user so that it can be checked at regular intervals.

4. Steel, copper or P.V.C. pressure pipes may be used.

5. It is advisable to make the unit's water supply and return conveyance lines with short lengths of high-pressure hose, as they form excellent shock absorbers for unit operating noise and hydraulic pressure surges.
   One of the hose ends must be fitted with a rotating connector to facilitate removal for maintenance. Rigid pipes can be connected directly to the unit, but this is not recommended due to their inability to absorb vibrations and noise.
   Rigid pipes must be equipped with removable connectors to facilitate future removal of the unit from its location.

6. Certain flexible hose threaded connectors are supplied with sealing paste. If this is not the case, use Teflon tape to create a tight seal.

7. Each unit must be equipped with isolation valves on the water inlet and outlet pipes. The return isolation valve is used for both cutting off the water supply and balancing the installation's water flow. As it is used to establish the balance of the flows, **it must be equipped with a lockable position end stop**. This end stop ensures that, after the valve is closed, it can only be re-opened as far as the position required to maintain a balanced water flow.

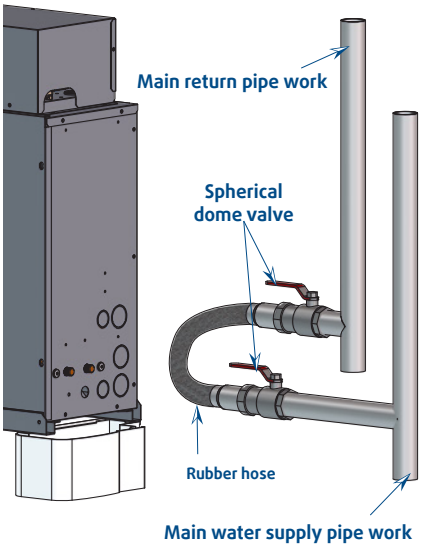


8. Use steel, copper or P.V.C. pipes for the condensates drainage pipe. Each unit is supplied with a connector for condensates drainage.
9. No point of the condensates drainage pipe work should be located above the level of one of the units' condensate drainage outlet connection.
10. The circuits' high points must be bled of air.
11. Comply with current regulations in terms of dielectric isolation of the connectors and the pipe work.

12.3. RECOMMENDATIONS FOR CLEANING AND FLUSHING OUT THE SYSTEM

1. Before commissioning an appliance for the first time, the water loop must be cleaned and rinsed out to remove any dirt and manufacturing debris.
   If the appliances are equipped with isolation valves (either electric or pressostatic), the water supply and return conveyance circuits to and from each machine must be connected to each other. This will avoid any dirt being introduced into the units.
   Flushing water through the units is acceptable if they are not equipped with water flow control devices.

INTERCONNECTED CONVEYANCES



2. The system must be filled from the mains water supply. All air bleeds must be open during filling. Close the air bleeds once the system is filled.
   The installer must start the main circulation pump with the water top-up tap on the pressure reduction valve in the open position. Check the air bleeds by increasing order of height to ensure water flows freely throughout the entire system.
   Power supply to the cooling tower must be shut down, and the water loop temperature regulation thermostat must be set at 27 °C.
   As the water circulates through the system, the installer must seek out and repair any possible pipe work leaks. The drain cocks, on the lowest points on the circuit, must be open for flushing out and chasing out any impurities. Ensure that the mains water valves are adjusted to allow water to enter at the same speed as it exits. Check the pump inlet pressure gauge and manually adjust the compensating valve to maintain the same pressure before and after the opening of the drain taps. Flushing must be performed for at least two hours, or longer if necessary, until clear and clean water is obtained at the drain taps.
3. Stop the additional heating and the water circulation pump. Open all the bleed points and the drain taps to empty the system completely. The short-circuited water supplies and returns must now be connected to the units' inlet and outlet connections. It is recommended to use Teflon tape on the pipe connector threads. Do not use sealing paste on the hoses' rotating connecters.
4. **Formerly, sodium tri-phosphate used to be recommended as a cleaning agent for flushing.** However, nowadays numerous countries forbid the introduction of phosphates into their wastewater networks. **Therefore, it is now recommended that the system is flushed out with hot water (30 °C).**
5. Fill the system again with clean water. Test the water acidity level (litmus paper), and treat as required to obtain a slightly alkaline water quality.
   At this stage, the recommended percentage of anti-freeze can be added. Use commercial quality anti-freeze specifically intended for air conditioning systems. Do not use automobile radiator anti-freeze.
6. On the main electrical cabinet, adjust the heater set temperature point at 20 °C and the cooling tower set temperature at 30 °C. Connect the power supply to all motors and start the circulation pumps.

When the normal flow level has been reached through all components, including the cooler (irrespective of the season) and when the air is bled form the system and the loop temperature has stabilised, each appliance is ready to be checked, tested and started for balancing the air and water flows.

13. WIRING DIAGRAM AND LEGEND

13.1. WIRING DIAGRAM

SEE APPENDIX

SE4942	SYSCW-AR 07R/09R AC	Control Siemens POL423	230V 50Hz +/- 10%
SE4943	SYSCW-AR 07R/09R EC	Control Siemens POL423	230V 50Hz +/- 10%
SE4958	SYSCW-AR 07R/09R EC	Control Siemens POL636	230V 50Hz +/- 10%

13.1.1. POWER SUPPLY

The power supply must be protected by an FFG mains circuit breaker.

All the electrical installations and wiring associated with this equipment must comply with local installations regulations.

Connection to the terminals N, L and ⏚ .

- L : phase
- N : neutral
- ⏚ : P-E ground

13.1.2. WIRING DIAGRAM KEY DESCRIPTIONS

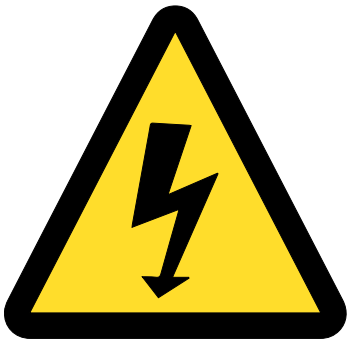
SEE APPENDIX

13.1.3. PRESSOSTATS SETTING

LP : Low Pressure fixed setting: 0.5 bar (7.25 PSI) reset at 1.5 bar (21.7 PSI)

HP : High Pressure fixed setting: 18 bar (260 PSI) reset at 13 bar (190 PSI)

14. ELECTRICAL CONNECTIONS



WARNING

BEFORE CARRYING OUT ANY WORK ON THE EQUIPMENT, MAKE SURE THAT THE ELECTRICAL POWER SUPPLY IS DISCONNECTED AND THAT THERE IS NO POSSIBILITY OF THE UNIT BEING STARTED INADVERTENTLY. ALSO MAKE SURE THAT THE ALARM INDICATOR CABLES ARE DISCONNECTED.

NON-COMPLIANCE WITH THE ABOVE INSTRUCTIONS CAN LEAD TO INJURY OR DEATH BY ELECTROCUTION.

The electrical installation must be performed by a fully qualified electrician, and in accordance with local electrical standards and the wiring diagram corresponding to the unit model.

Any modification made without our consent will void the unit's warranty.

The power supply cable section must be sufficient to provide the appropriate voltage to the unit's power supply terminals, both at start-up and under full load operating conditions.

The power supply cable shall be selected in accordance with the following criteria:

1. Power supply cable length.
2. Maximum current draw of unit in operation.
3. Maximum current draw of unit at start-up
4. Installation method of power supply cables.

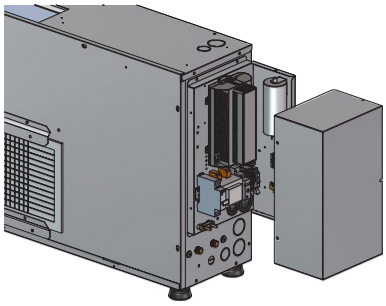
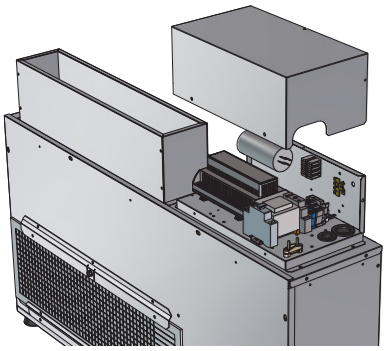
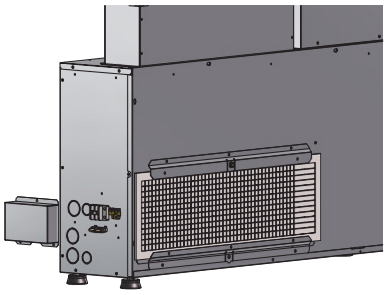
It is recommended to provide short circuit protection by means of a type aM fuse or a circuit breaker with high breaking capacity on the distribution board. Protection must be selected according to the current values shown in § **ELECTRIC SPECIFICATIONS**, page 9

If the local control includes an remote ambient temperature sensor and/or a set temperature adjustment module, these shall be connected with shielded cable and shall not pass through the same conduits as the power supply cables as the voltages induced may create reliability faults in the unit's operation.

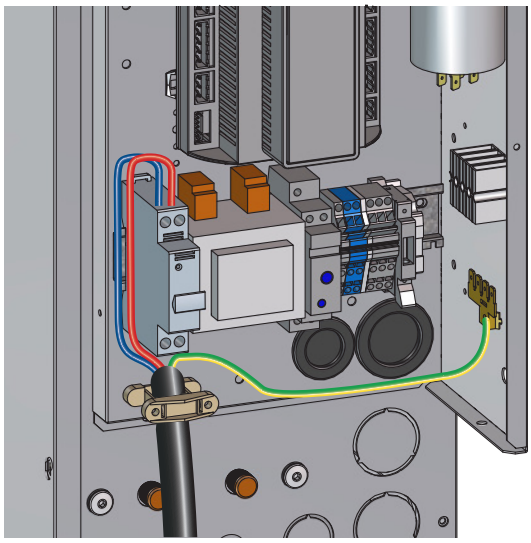
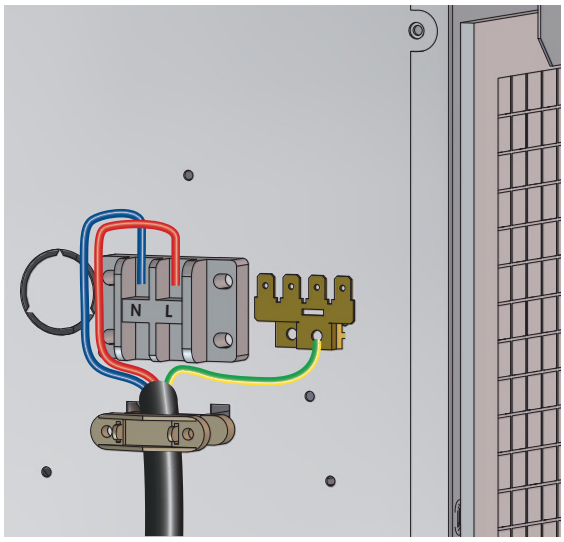
14.1. UNIT POWER SUPPLY

The position of the electrical connections depends on the type of appliance and the chosen options. The electrical connections can be made either on the connection box on the right hand side or on the top of the appliance, or on a remote terminal box located on the left hand side of the appliance.

1. Open the electrical box

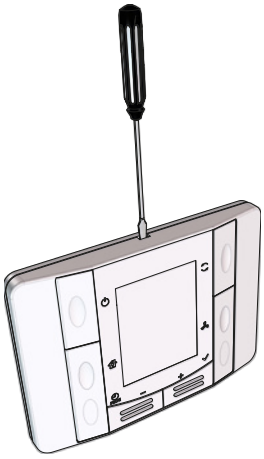




2. Connect the power supply cable in relation to the type of appliance:
   - ✔ On the mains protection fuse holder
   - ✔ On the circuit breaker
   - ✔ on the terminal block

14.2. REMOTE CONTROL

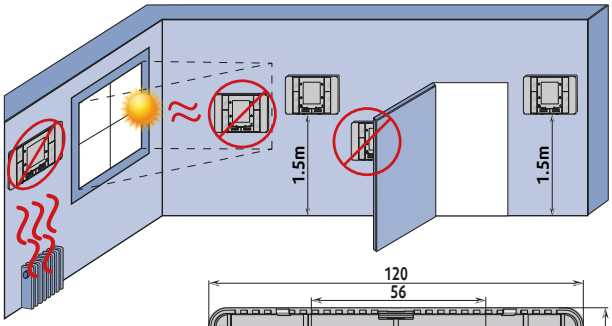
14.2.1. WALL MOUNTING

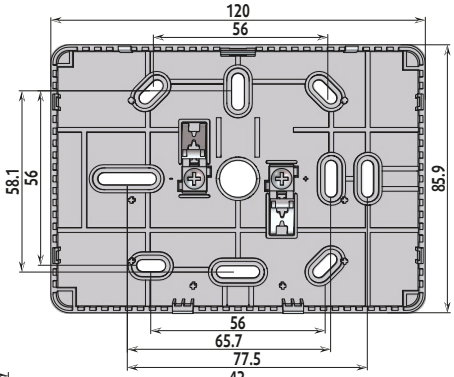


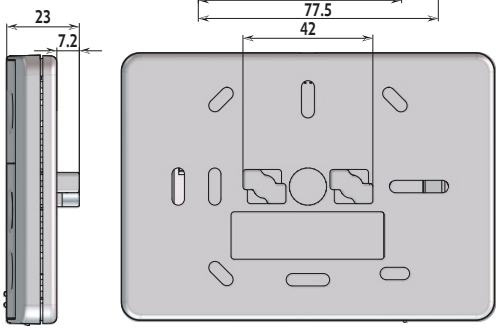
1. Separate the remote control from its rear plate.

Checking the support bracket :

Ensure that the wall surface is completely flat at the point where you wish to install the remote control, as it is important that the remote control is not twisted on installation, because any bending could lead to the control not clipping together properly and result in operating difficulties.







2. Fitting the rear plate :

➢ Present the rear plate to the desired location and align it with a spirit level.

➢ Mark the screw locations.

➢ Make a hole or install appropriate plugs according to the material (wood, concrete, plasterboard etc.).

➢ Screw the rear plate to the wal.

3. Wire the remote control in accordance with the wiring diagram.

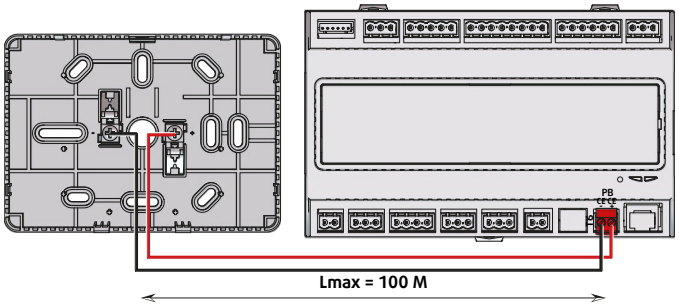
4. Clip the remote control onto the rear plate.

14.2.2. ELECTRICAL CONNECTIONS

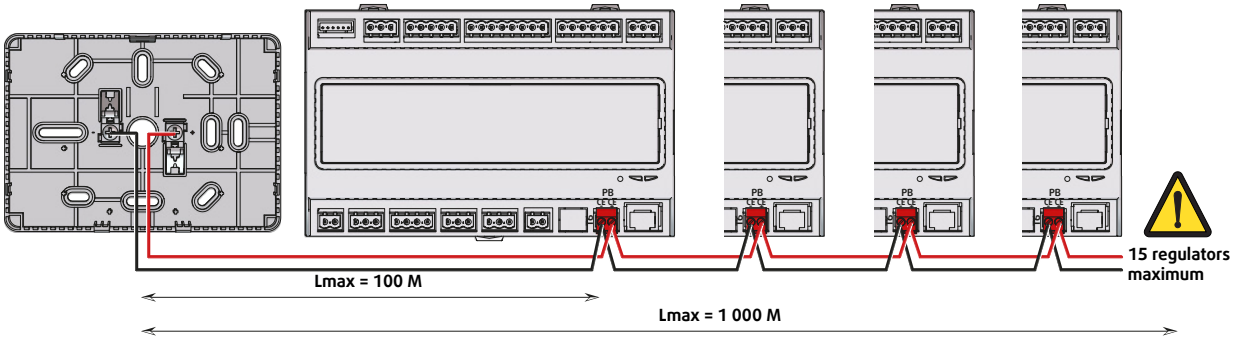
The control return must be connected as per the following diagrams.

For the connection, use a KNX TP1 type cable (Twisted pair with insulation) with a 0.8mm^2 cross-section.

SYSCW-AR - AUTONOMOUS



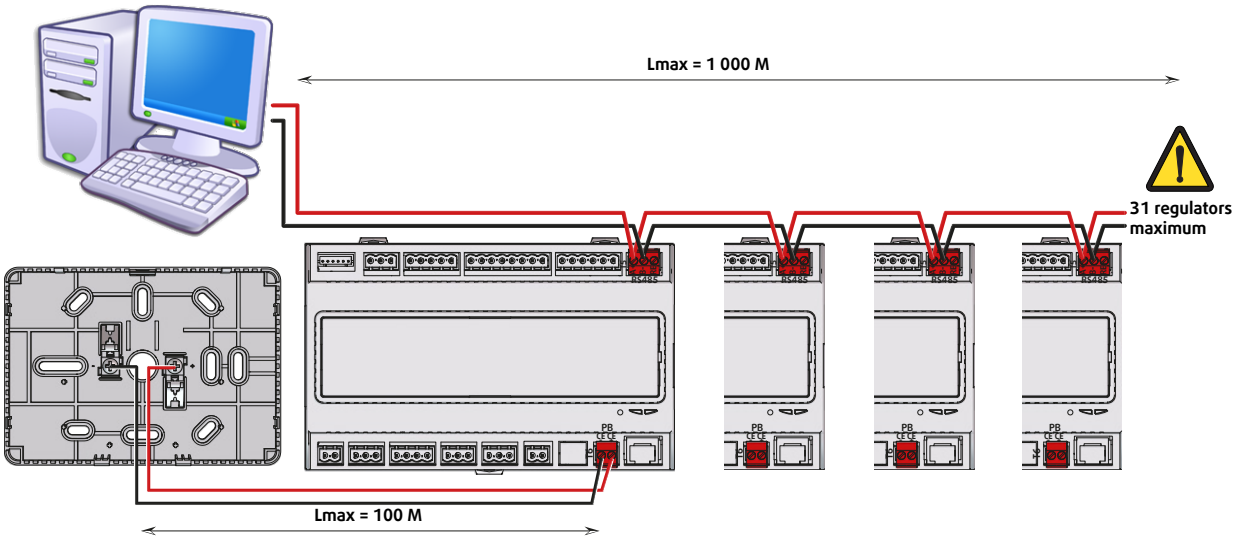
SYSCW-AR - MASTER/SLAVES



Caution

Master/slaves operation requires the allocation of a specific address to each controller. This addressing occurs by connecting a POL871 or POL895 display to the "BSP-BUS" port of each controller.

SYSCW-AR - MODBUS



15. REGULATION

SYSCW-AR units are fitted with an electronic control system. It provides the command, control and alarm functions.

15.1. ORDER OF PRIORITY FOR CONTROL SYSTEMS

The integrated regulator in the **SYSCW-AR** can be controlled by various interfaces and systems. The order of priority for each drive system is as follows:

1. The all remote control: the commands are given by the user directly on the unit
2. Digital inputs: the client can transmit commands electro-mechanically over 2 dry contacts:
   - ✔ Input **D1**: ON/OFF
   - ✔ Input **D2** : summer/winter
   - ✔ Input **D3** or **X2**: configurable

3. The BMS : the remote supervision transmits it commands according to the communication protocols
4. Timing programming: this scheduling is integrated in the regulator

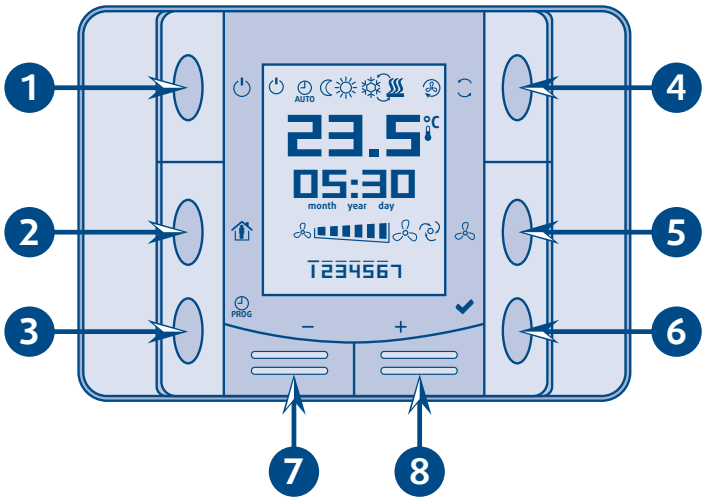
15.2. WALL-MOUNTED CONTROL

This control is a liquid crystal display with 8 buttons.

It enables the end user to interface with the unit:

- ➢ activation
- ➢ setpoint change
- ➢ ventilation speed
- ➢ alarm code...

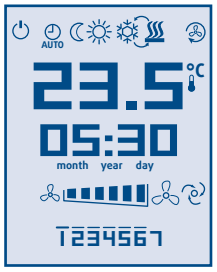
It also includes a temperature sensor to measure the ambient temperature.



15.2.1. KEYPAD

	Name	Icons	Functions
1	ON/OFF		Briefly press to switch the unit on or off. Press and hold to activate scheduling. To disable the time programming, press briefly.
2	Eco/Comfort modes		Briefly press to toggle from eco to comfort mode.
3	Scheduling Time settings	PROG	Press and hold to set the unit's date and time. When the minutes are set, the unit displays the normal operating screen. Briefly press to access time programming.
4	Operating mode		Briefly press to change the operating mode. COOL/HEAT/AUTO CHANGEOVER/ VENTILATION In auto-changeover mode, the control displays the active temperature control mode.
5	Ventilation		Press to modify the ventilation speed. As EC fan speed gradually changes, there may be a lapse of time before the required speed is reached.
6	Confirmation		Confirms the modification of a setting
7	-		Edits the value of a setting when it is selected.
8	+		

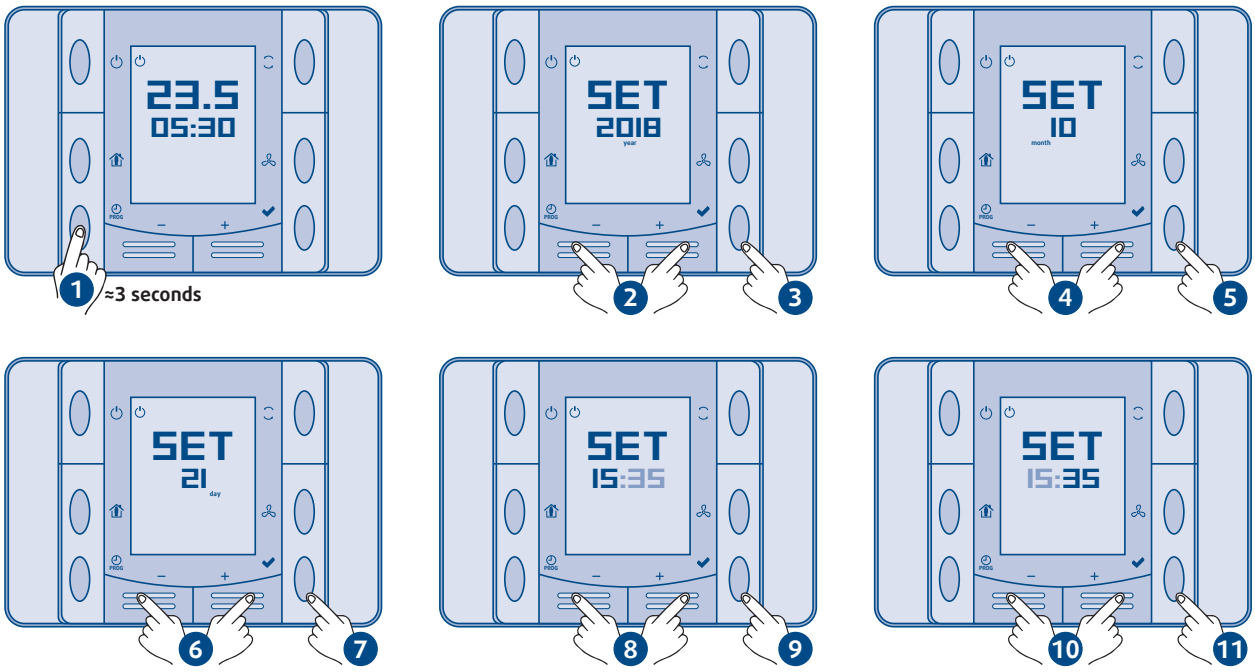
15.2.2. SCREEN



Icons	Meanings
	SYSCW-AR off
AUTO	Hourly programming active
	Operation in Eco mode
	Operation in Comfort mode
	COOL mode
	HEAT Mode
	Auto-changeover mode. The control displays the active heat or control mode.
	Ventilation only
23.5	When the unit is off, the temperature displayed is that measured by the control's internal sensor. When the unit is on, the temperature displayed is that of the setting set by the user.
05:30	System time
	Fan speed In all modes, the number of bars shows the fan's actual operating speed. As EC fan speed gradually changes, there may be a lapse of time before the required speed is reached. The symbol indicates that the ventilation speed is controlled automatically.
T234567	Scheduling day and time slot

15.2.3. TIME SETTINGS

Press and hold the PROG button to set the unit's date and time. Set in the following sequence: year, month, day, hour, minutes. When the minutes are set, the unit displays the normal operating screen.



This setting is important for the alarm log as well as to display the time on the room thermostat.

Caution

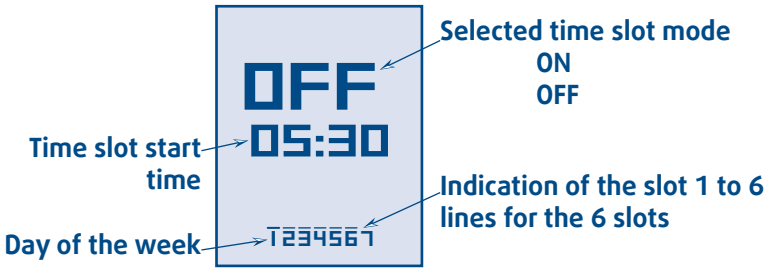
A power outage leads to the loss of time after 6 hours.

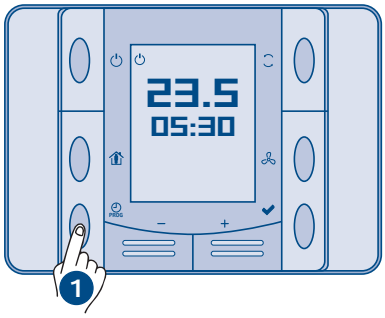
15.2.4. SCHEDULING

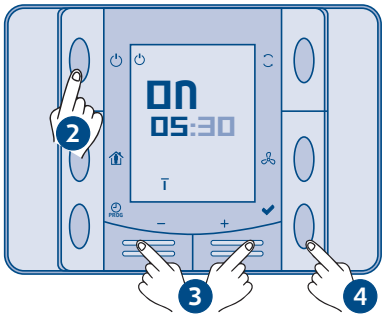
Scheduling is used to select the unit activation and shutdown times. Each day is broken down into 6 time slots set by

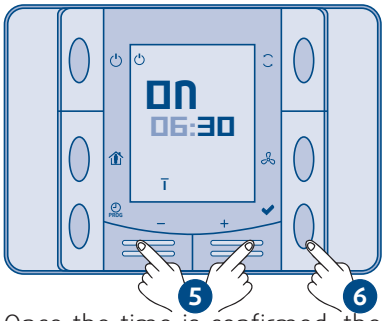
- A start time
- A state: ON or OFF

To open the time programming, briefly press the PROG button.

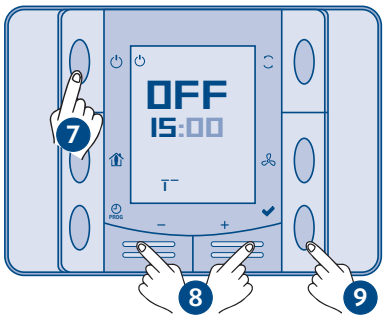


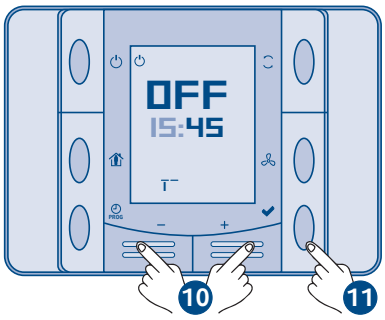


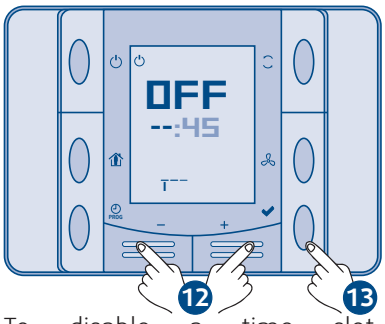




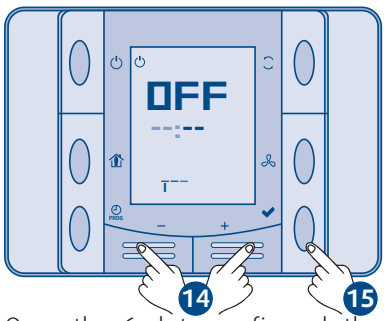
Once the time is confirmed, the following slot is displayed







To disable a time slot, replace the time with " -- : --"



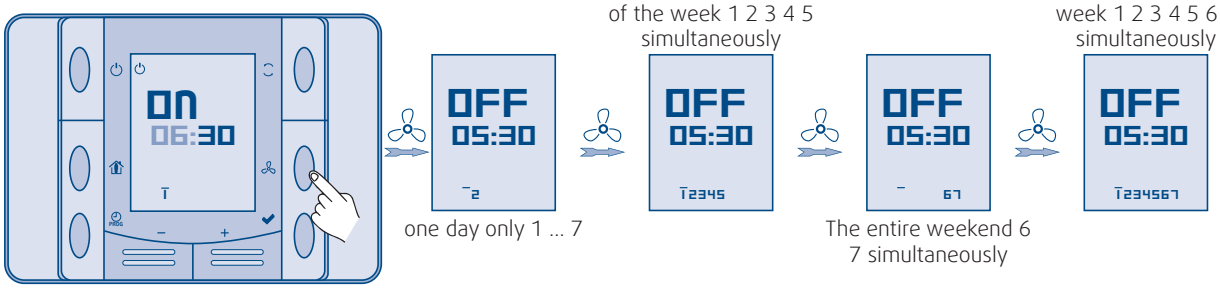
Once the 6 slots confirmed, the first slot of the day is displayed.

Information

To close, you can briefly press the PROG button again.

Information

After an idle period of 30s, the time programming menu will close, but all the changes will be saved.



If the unit is in time programming mode, the unit will switch to the mode shown in the current slot until the next slot begins. Its state will then be the one of the future slot.

16. FINAL TASKS

Place the plugs back on the valves and check that they are properly tightened.

If needed, fix the cables and the pipes on the wall with clamping collars.

Operate the **SYSCW-AR** in the presence of the user and explain all functions.

Show him how to remove, clean and place back the filters.

17. STARTING - RECOMMENDATIONS - SETTINGS

1. Check that all the water valves are open and that water circulates in the appliance before making any demand for heating or cooling.
2. Ensure that the units are connected correctly to the mains power supply (Refer to the § **ELECTRIC SPECIFICATIONS**, page 9 and in § **WIRING DIAGRAM**, page XV).
3. **Check that all of the appliance's electrical connections have been tightened**
4. Before attempting any start-up, ensure that the air and water temperatures are within the appliance's operating limits (in § **OPERATING LIMITS**, page 10).
5. Rotate the fan by hand to ensure that it turns freely and that the fan turbine is properly attached to the motor shaft.
6. Check that the condensates drainage pipe is properly attached and free of any blockages.
7. Check the correct positioning of the filters and that they a clean and accessible.
8. Ensure that the finned heat exchanger surfaces are clean. Clean if required.
9. Check that the connection hoses are correctly fitted and ensure that the appliance's water circuit has been correctly bled of any air.
10. Ensure that no Alarm code is displayed when the mains power supply is switched on (Refer to the § **ALARM CODES**, page 31).
11. Carry out the usual checks on the main water loop and particularly to ensure that the water circulation pump operates correctly.

Caution

Non-compliance with this rule may result in irreversible damage. In addition, we recommend the use of a flow controller on the units' inlet pipe (not supplied).

Caution

Before the first start-up the compressor transport clamping be removed. Failure to do this could result in vibrations, high noise and could lead to the refrigerant tubes breaking.

17.1. COMMISSIONING

After performing all the above-mentioned checks, proceed with creating a demand for Cooling and Heating or vice versa.

17.1.1. DEMAND FOR COOLING

1. With the key on the control module, select COOL mode and then set the minimum temperature with the UP and DOWN arrows. The ambient temperature should be within the operating limits (Refer to the § **OPERATING LIMITS**, page 10). In the same way, during the pre-commissioning checks, the exchanger pump(s) water loop inlet temperature should be within the limits corresponding to each operating mode (Refer to the § **OPERATING LIMITS**, page 10). Reminder: if one of these factors is situated at its minimum or maximum level, the other should be situated at a normal level in order to ensure the unit's correct and normal operation.
2. Ensure that the thermostat is connected properly and set the set temperature below the ambient temperature of the zone to be cooled. After 3 minutes, the compressor starts operating.
3. When the appliance has been operating for a few minutes, check the presence of cold air at the blowing grille.
4. When the appliance has been operating for a few minutes, check the temperature of the unit's outlet water. Generally, this should be around 5°C above the unit's water loop inlet temperature. A variance lower than 3.5°C indicates that the water flow is too high, whilst a variance higher than 8°C indicates that the water flow is too low.
5. Adjust the isolation/balancing valve on the outlet water pipe to obtain the appliance's nominal water flow (Refer to the Maker's Plate)
6. Check that the condensates drainage system is working properly and check that a siphon is included in the drainage line.
7. Check for the absence of vibrations and water leaks.
8. When all the above tests have been completed, adjust the system to maintain the desired comfort level.

17.1.2. DEMAND FOR HEATING

1. With the key on the control modules, select HEAT mode and then set the maximum temperature with the UP and DOWN arrows. The ambient temperature should be within the operating limits (Refer to the § **OPERATING LIMITS**, page 10). In the same way, during the pre-commissioning checks the exchanger pump(s) water loop inlet temperature should be within the limits corresponding to each operating mode (Refer to the § **OPERATING LIMITS**, page 10). Reminder: if one of these factors is situated at its minimum or maximum level, the other should be situated at a normal level in order to ensure the unit's correct and normal operation.
2. Ensure that the thermostat is connected properly and set the set temperature above the ambient temperature of the zone to be cooled. After 3 minutes, the compressor starts operating.
3. When the appliance has been operating for a few minutes, check the presence of hot air at the blowing grille.
4. When the appliance has been operating for a few minutes, check the temperature of the unit's outlet water. Generally, this should be around 3°C below the unit's water loop inlet temperature. A variance lower than 2°C indicates that the water flow is too high, whilst a variance higher than 6°C indicates that the water flow is too low.
5. Adjust the isolation/balancing valve on the outlet water pipe to obtain the appliance's nominal water flow (Refer to the Maker's Plate)
6. Check for the absence of vibrations and water leaks.
7. When all the above tests have been completed, adjust the system to maintain the desired comfort level.

Note: If the unit does not operate, perform a fault diagnosis (Refer to the § **MAINTENANCE**, page 28). If the fault analysis does not enable the cause of the problem(s) to be determined or if the unit still does not operate, contact a qualified after-sales technician to obtain a correct diagnosis and to repair the equipment.

17.1.3. FINAL CHECK

1. All panels and fan guards are in place and secured.
2. Unit clean and free of any installation material.

18. MAINTENANCE

Maintenance in accordance with our instructions will prolong the service life of your **SYSCW-AR** :

- Better refrigeration performance
- Reduced power consumption
- Accidental component breakage prevention
- Prevention of heavy, late, and expensive maintenance work
- Environment protection

Depending on actual operational constraints and regulatory changes, the installer might recommend increased maintenance operations and more frequent inspections.

Caution

The user is responsible for ensuring that the unit is in perfect working order and that the technical installation and **minimum maintenance** operations have been performed by a qualified technician in accordance with the procedures described in this manual.

18.1. MAINTENANCE PROCEDURES

18.1.1. GENERAL

These units have been designed for minimum maintenance through the use of permanently lubricated components. However, there are operational maintenance requirements that require regular attention to ensure optimum performance.

Maintenance must be performed by appropriately experienced personnel only.

WARNING : Isolate unit from power supply before working on unit.

On commissioning, a record of voltages, current draw and temperature variances should be made. Thereafter, on an annual basis further measurements can be compared to these initial values and will be useful for giving an overall indication for the equipment's general condition.

18.1.2. GENERAL INSPECTION

Carry out a visual inspection of the complete installation in service.

Check the general cleanness of the installation, and check if the condensate evacuations is not blocked.

Check the condition of the condensate tray by pulling it out of the casing.

18.1.3. REFRIGERATION CIRCUIT

Clean the heat exchanger using a special product for aluminium-copper heat exchangers, and rinse with water. Do not use hot water or steam, as this could cause the pressure of the refrigerant to rise.

Check that the surface of the aluminium fins of the heat exchanger is not damaged by impacts or scratches, and clean with an appropriate tool if necessary.

The refrigeration system is hermetically sealed and should require no regular maintenance. However, it is recommended to leak test the refrigerant system and check the general operating conditions and control devices on a regular basis. The operating pressures should be checked particularly as they are an excellent guide for maintenance. Pressure checks are performed by means of the LP and HP pressures take-offs on the fascia. The gas contained in the pressure gauge hoses must be re-injected as the gas charge is very low.

18.1.4. ELECTRICAL SECTION

Check that the main power supply cable is not damaged or altered in such a way as to affect the insulation.

The contact surfaces of relays and contactors should be inspected regularly by an electrician and replaced as judged necessary. On these occasions the control box should be blown out with compressed air to remove any accumulation of dust or other contaminants.

Check the earth grounding connection.

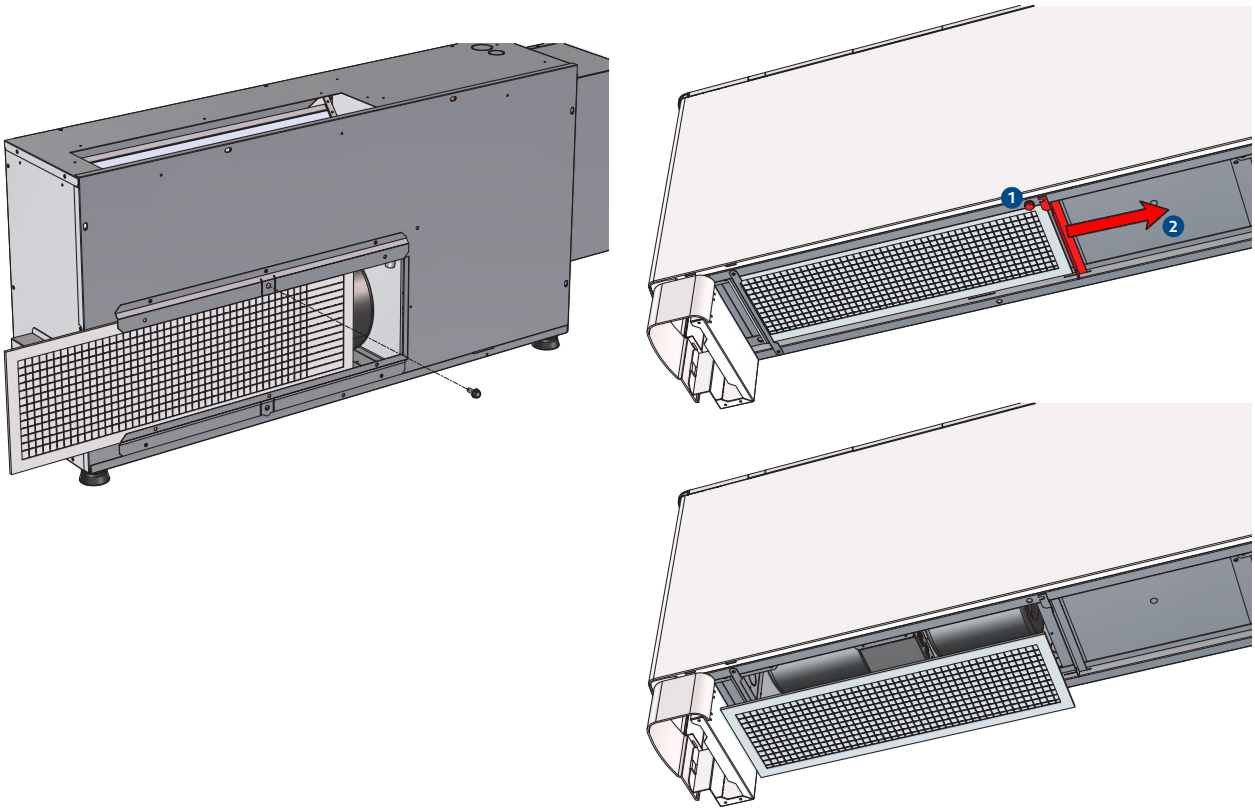
18.1.5. AIR FILTER

In order for the installation to operate correctly, it is essential to regularly clean the air filter located in the intake of the indoor unit.

When clogged, the filter reduces the air flow through the heat exchanger of the indoor unit, which in turn reduces the efficiency of the installation and inhibits the cooling of the fan motor.

Check the cleanness of the indoor heat exchanger.

The filters must be changed at regular intervals. The frequency is dependent on the specific application conditions. Certain installations, for example in hotels where there large amounts of fluff due to the frequent bedding changes and the presence of fitted carpets, require more frequent filter changes. It is recommended that the filters are checked every 60 days during the first year of operation in order to determine the frequency required. If it is not possible to see light through the filter when it is held up to the sun or in front of a strong light, the filter must be replaced. A more rigorous standard of cleanliness may be required.



Caution

The fan coil unit shall have a filter installed in the return air side. The attachment systems must be relocked in place after changing the filter.

Non compliance with these instructions can affect the unit's electrical safety and render the qualified personnel performing the work liable for any ensuing damage.

18.1.6. FAN MOTOR ASSEMBLY

There is no particular maintenance on fan and motor assembly. All fan coil units utilize permanently lubricated fan motor bearings.

However during periodic maintenance, check that fan wheel does not touch the housing and adjust, if necessary, clearance.

If fan motor overload protection open, wait for automatic overload reset and try to determine the cause.

18.2. FAULT FINDING

18.2.1. NEITHER THE FAN NOR THE COMPRESSOR OPERATE

1. The system is in alarm mode when the mains power supply is switched on. Check the points mentioned in § **ALARM CODES**, page 31 for diagnosis.
2. Check the wiring of the remote control.
3. Check that the appliance is properly set in COOL, HEAT or FAN mode.
4. Check the condition of the fuse or the mains power supply. Check the compressor and fan wiring.
5. Check for any loose or broken wiring and tighten or replace as required.
6. The mains supply voltage is too low. If this is the case, check the supply conditions with the electricity provider.

18.2.2. VENTILATION (FAN) MODE OPERATES BUT THE COMPRESSOR DOES NOT OPERATE

1. For Single Phase versions, check the current available and the wiring.
2. Check for any loose or broken wiring and tighten or replace as required.
3. Check that the machine is not in alarm mode. Refer to the § **ALARM CODES**, page 31 for diagnosis.
4. Check the thermostat's set temperature point.
5. The compressor may be grounded, in which case replace the compressor.
6. The internal compressor circuit is open circuit, perform a continuity test with an Ohmmeter. If the circuit is open circuit, replace the compressor.

18.2.3. INSUFFICIENT COOLING OR HEATING PRODUCTION

1. Check that the thermostat is properly located in the zone to be heated or cooled and that it is not near to a source of cold or heat that may influence the reading.
2. Check the proper operation of the Return Air Temperature (RT) sensor, located on the fin exchanger.
3. Airflow is insufficient. Check for clogged filters. Clean and replace as required.
4. The cycle inversion valve may be defective and be creating a refrigerant by-pass. If the unit does not produce heat, check the wiring of the inversion valve coil.
5. Check the proper operation of the pressure relief valve.
6. Measure the water flow on the water loop.
7. Check the configuration of the appliance.

18.2.4. INSUFFICIENT WATER FLOW AT THE LEVEL OF THE COAXIAL EXCHANGER.

1. Check for proper water circulation at the level of the water circulation pump.
2. If a valve is fitted to the water loop, check that it is open.
3. Check that air is not being sucked into the hydraulic system. Bleed the system if required.

18.2.5. APPEARANCE OF WATER DROPLETS IN THE APPLIANCE

1. Check that the condensates drainage pipe is not blocked and that water drains away normally.
2. Check the correct operation of the condensates tray anti-overflow float (Refer to the § **ALARM CODES**, page 31).
3. Check that the float moves freely on its rod. If this is not the case, clean the tray and the float.
4. Check the cleanliness of the filters.

18.2.6. APPEARANCE OF ABNORMAL NOISES AND VIBRATIONS IN THE CASING

1. Check that the turbine is not rubbing against the scroll and that the latter is not damaged. Replace as required.
2. Check that the turbine has not worked loose on its shaft. Centre the turbine and tighten it as required.
3. Check that the compressor is mounted correctly on its shock pads.
4. Check that no part of the turbine rubs against the compressor or any other surface. Reposition slightly as required.
5. Check that all the attachment screws are tightened properly.
6. Check that air is not being sucked into the hydraulic system.
7. Test that the relays open and close correctly. Replace as required.

18.3. ALARM CODES

Code	Type	Message
0	alarm	HP pressure switch
		LP pressure switch
		water min. temperature cool mode
		water max. temperature cool mode
		water min. temperature heat mode
		water max. temperature heat mode
1	alarm	RAT sensor defective
2	alarm	ICT sensor defective
3	alarm	LWT sensor defective
4	alarm	hot air/coolant battery
5	alarm	fan off
		fan lock-out
6	alarm	cool air/coolant battery
7	lock-out	HP pressure switch
8	lock-out	LP pressure switch
9	lock-out	water min. temperature cool mode
10	lock-out	water max. temperature cool mode
11	lock-out	water min. temperature heat mode
12	lock-out	water max. temperature heat mode
13	alarm	flowswitch/condensate
		flowswitch/condensate lock-out

19. WARRANTY CLAIM - MATERIAL RETURN PROCEDURE

Equipment must not be returned without the permission of our After Sales Department.

To return the equipment, contact your nearest sales office (Refer to the § **TECHNICAL SUPPORT AND AFTER-SALES SERVICE HOTLINE**, page 5) and ask for a "return form". The return form shall be sent with the returned equipment and shall contain all necessary information concerning the problem encountered.

A part return does not constitute a replacement order. Therefore, a purchase order must be submitted through your nearest distributor or regional sales office. The order should include the part name, part number, model number and serial number of the unit involved.

Following our personal inspection of the returned part, if it is determined that the failure is due to faulty equipment or workmanship, and the part is still under warranty, credit will be applied to the customer's purchase order. All parts shall be returned to our factory, transportation charges prepaid.

20. ORDERING SERVICE AND SPARE PARTS ORDER

The part number, the order confirmation and the unit serial number indicated on the name plate must be provided whenever services or spare parts are ordered.

For any spare part order, indicate the date of unit installation and date of failure. Use the part number provided by our spare parts department. If the part number is not available, provide a full description of the part required.

21. DISPOSAL

The disposal of refrigerating systems and their component parts must be carried out in accordance with applicable local and national regulations.

Used refrigerant which is not going to be reutilized must be treated as a waste material requiring safe disposal.

The discharge of refrigerants is only permissible when there will be no harm to persons, property or the environment, and provided it is in accordance with legal requirements.

Used oil that cannot be reprocessed must be stored in a suitable separate container and must be treated as a waste material requiring safe disposal.

Other components of the refrigerating system which contain refrigerant and oil must also be disposed of in an appropriate manner.

If necessary, you should seek the advice of a competent person on the disposal of waste refrigerant and oil products.

Information

For additional information on the recovery, reutilization and disposal of refrigerating systems, please see NF EN 378-4, sect. 6.

APPENDIX
ANNEXE
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ALLEGATO
ANEXO

APPENDIX

ANNEXE

ANLAGE

ALLEGATO

ANEXO

DIMENSIONS
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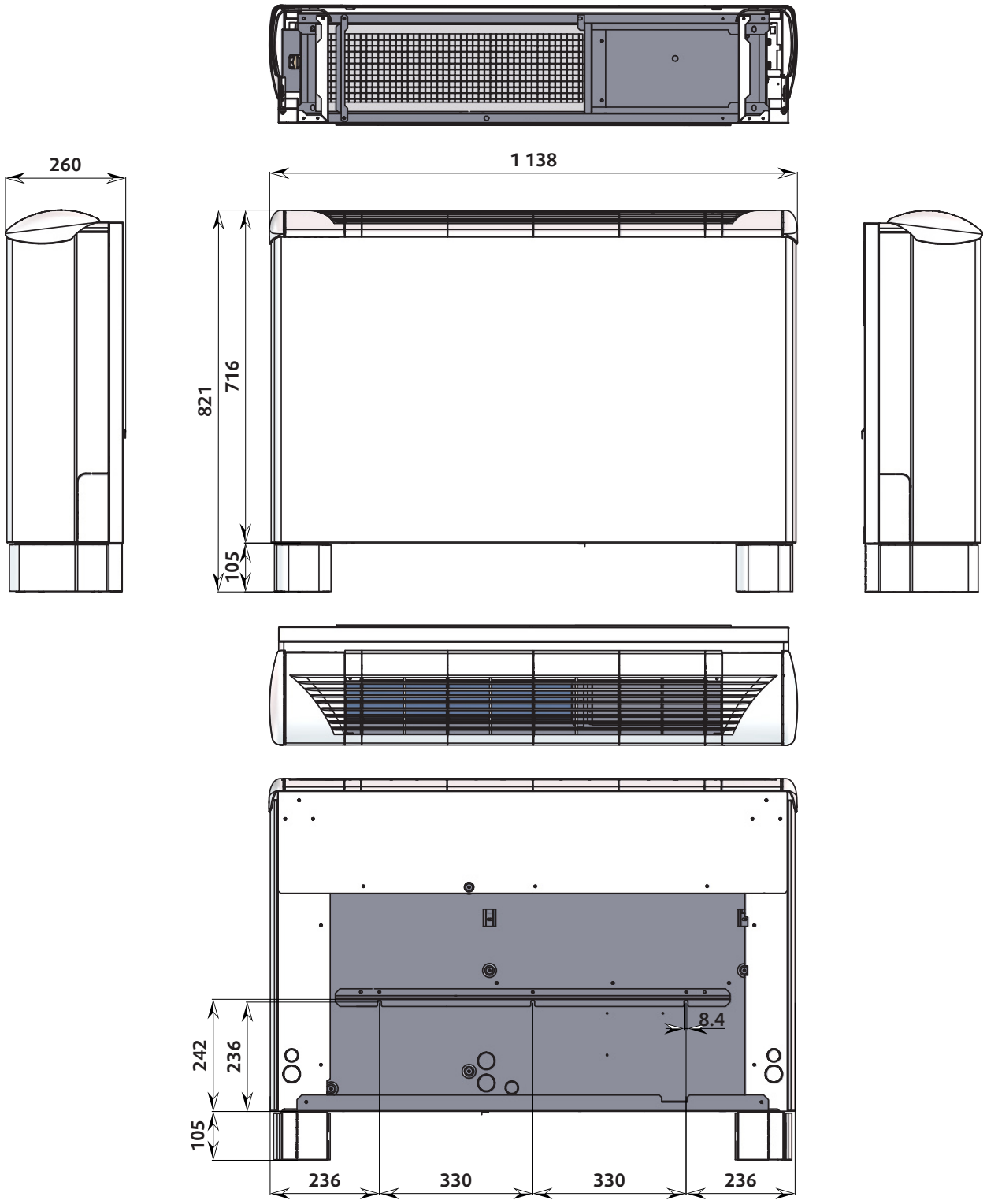
DIMENSIONES

SYSCW-AR R513A VC BA



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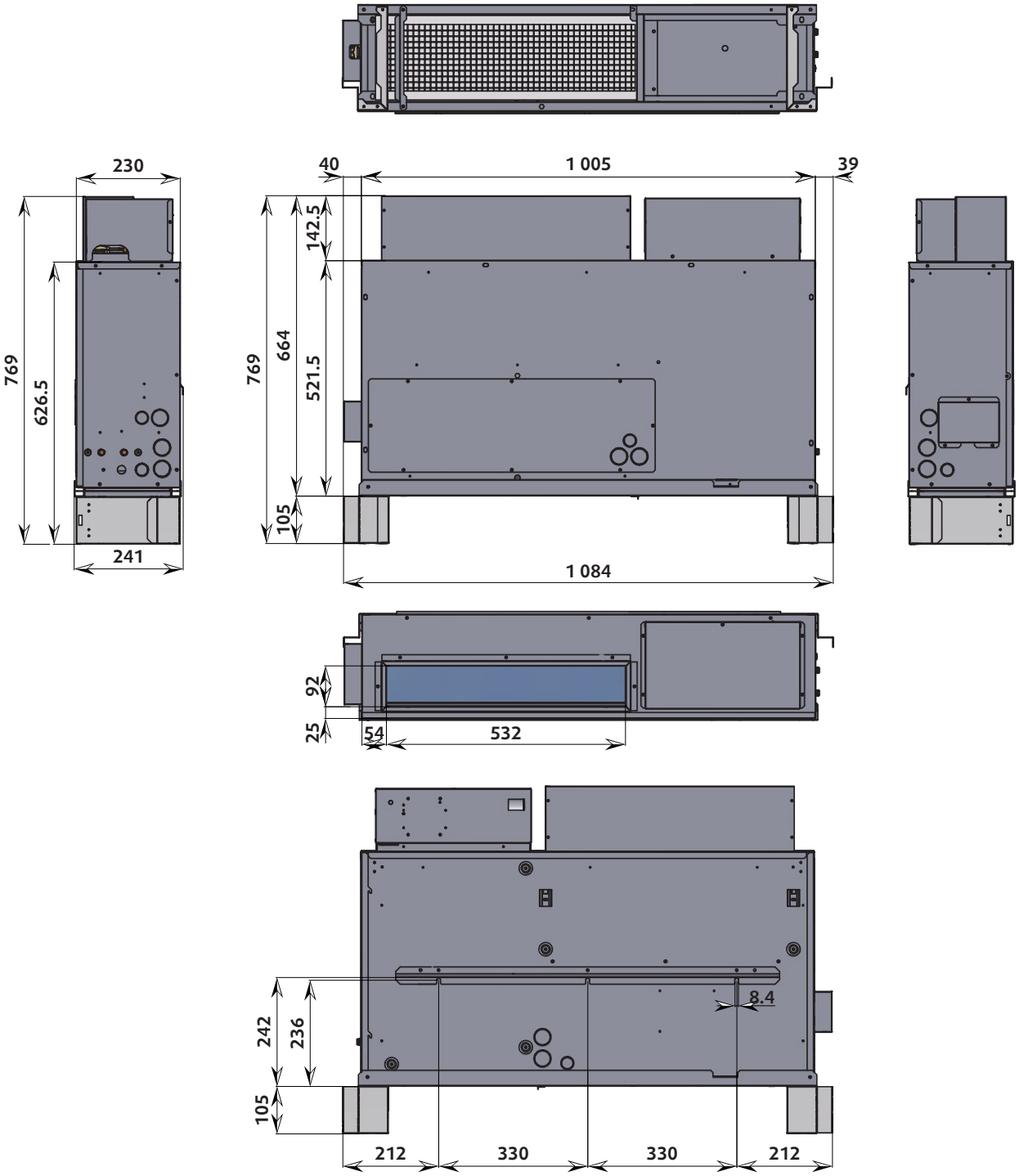

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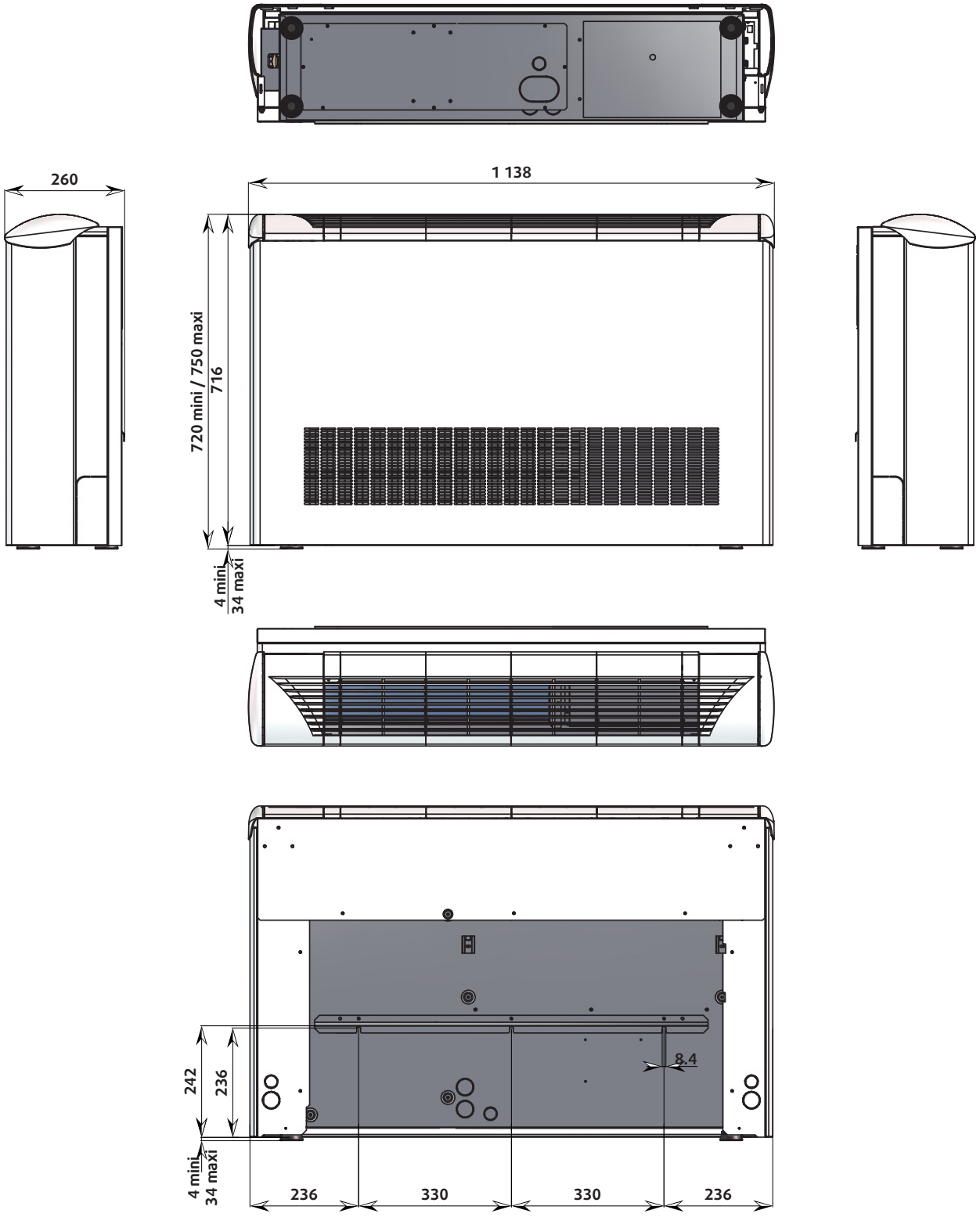

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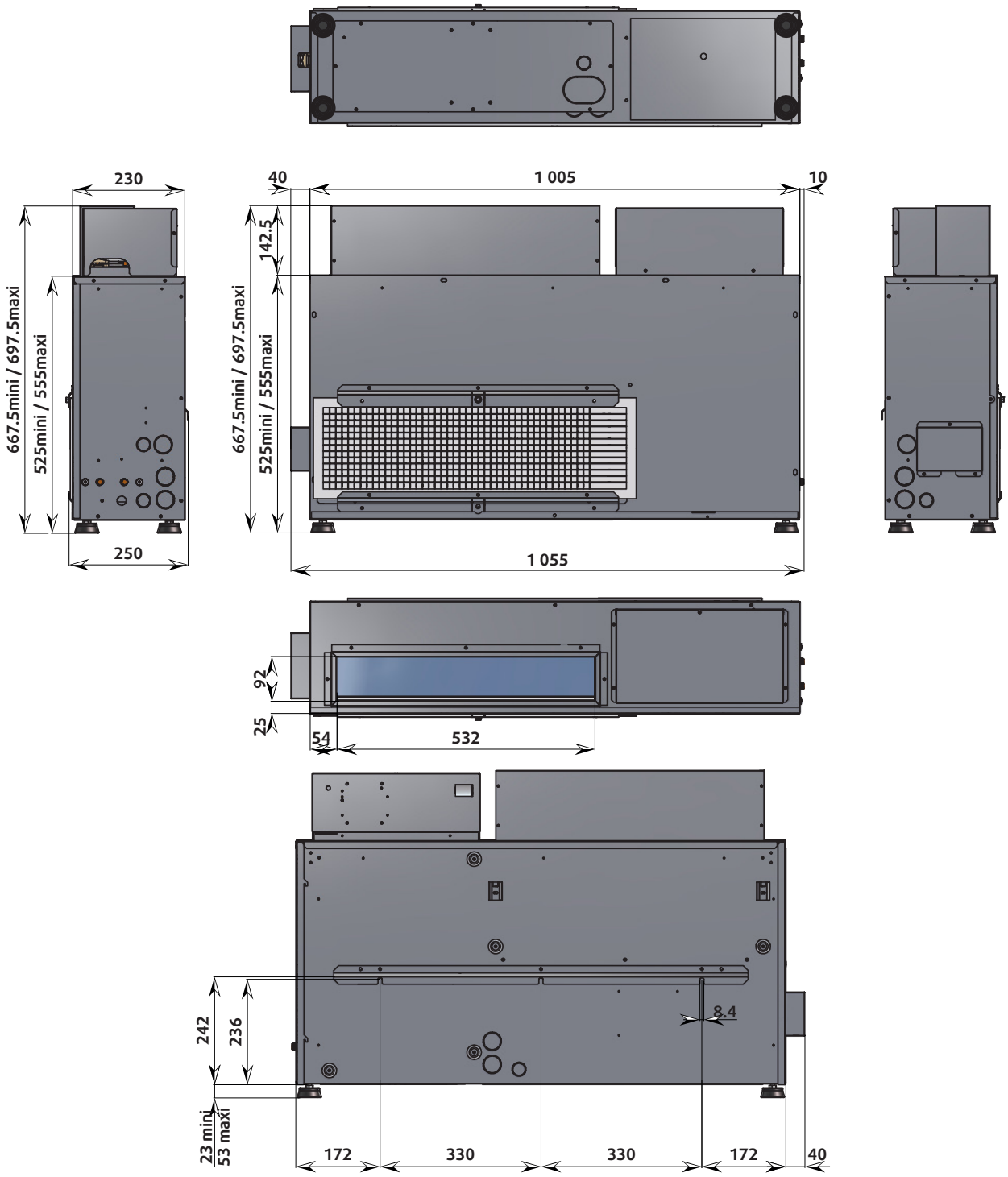

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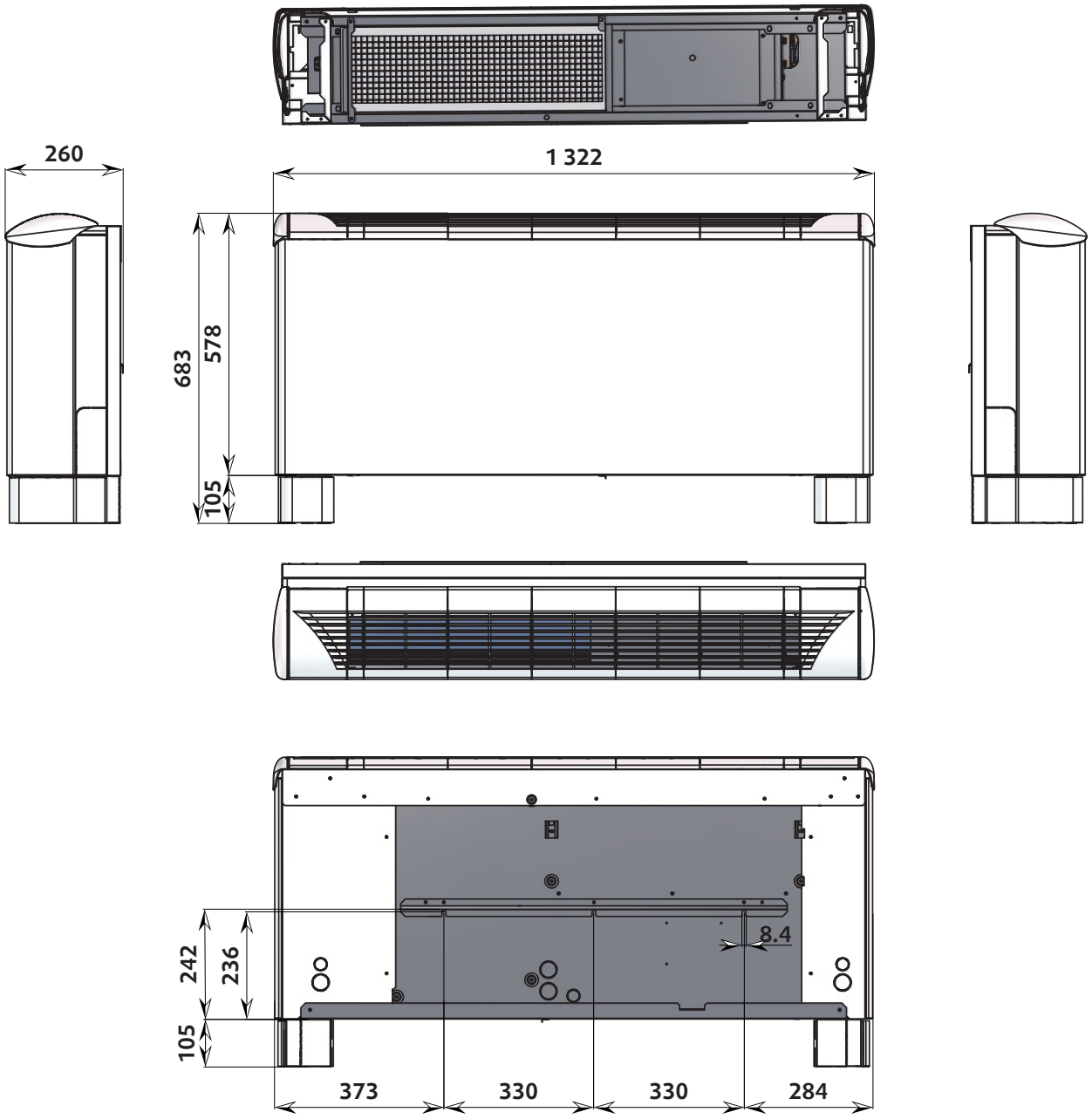

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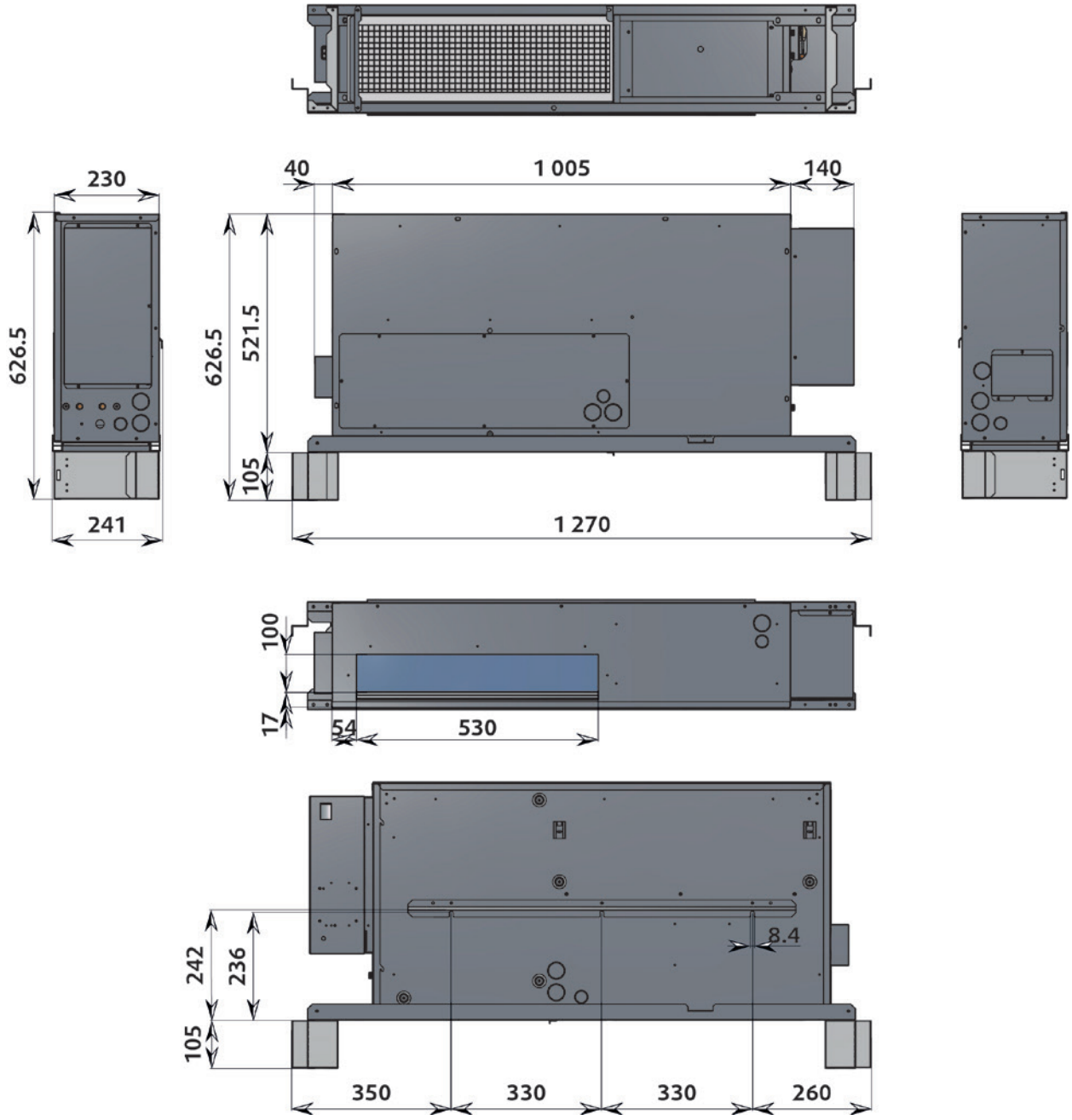

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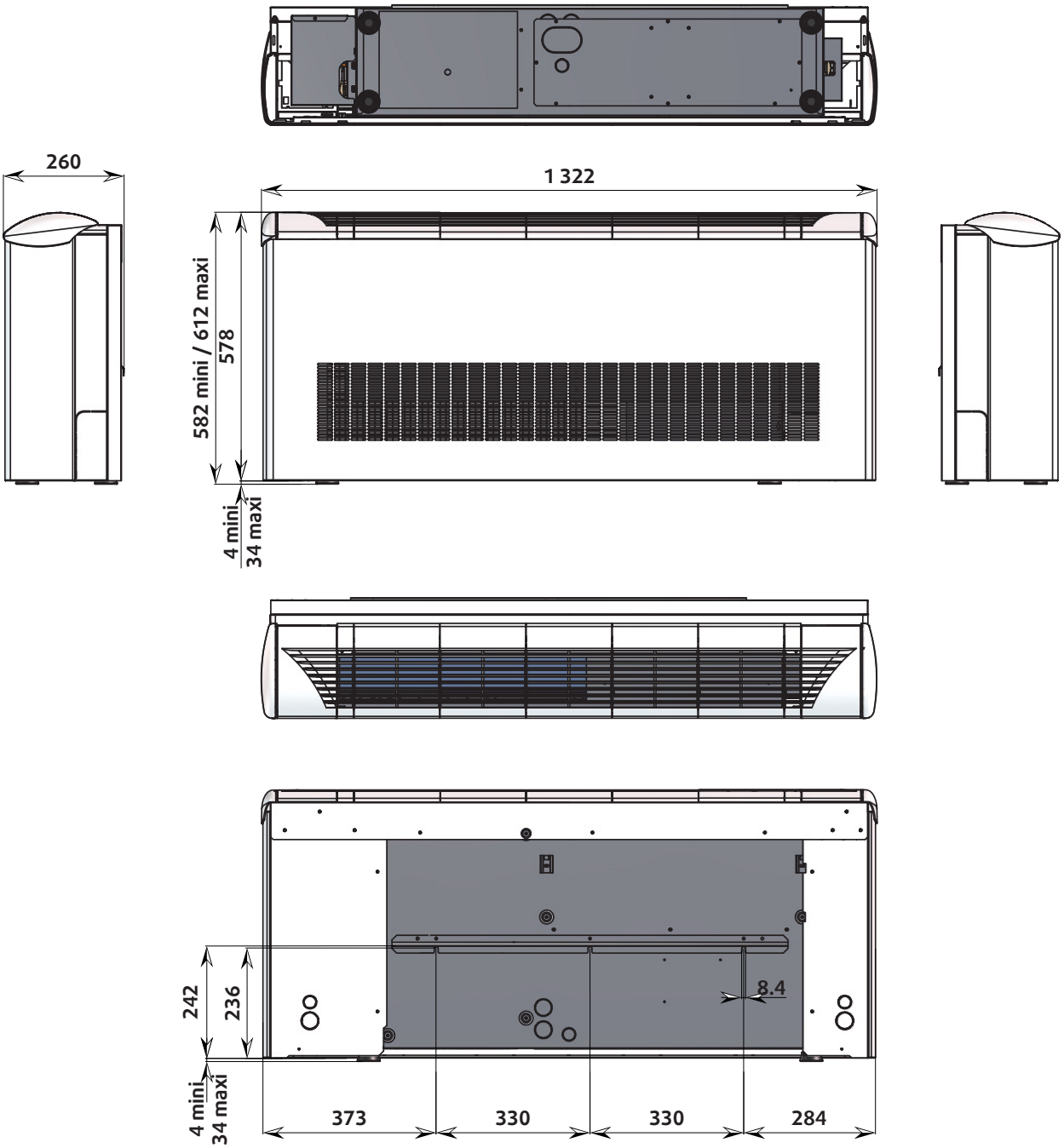

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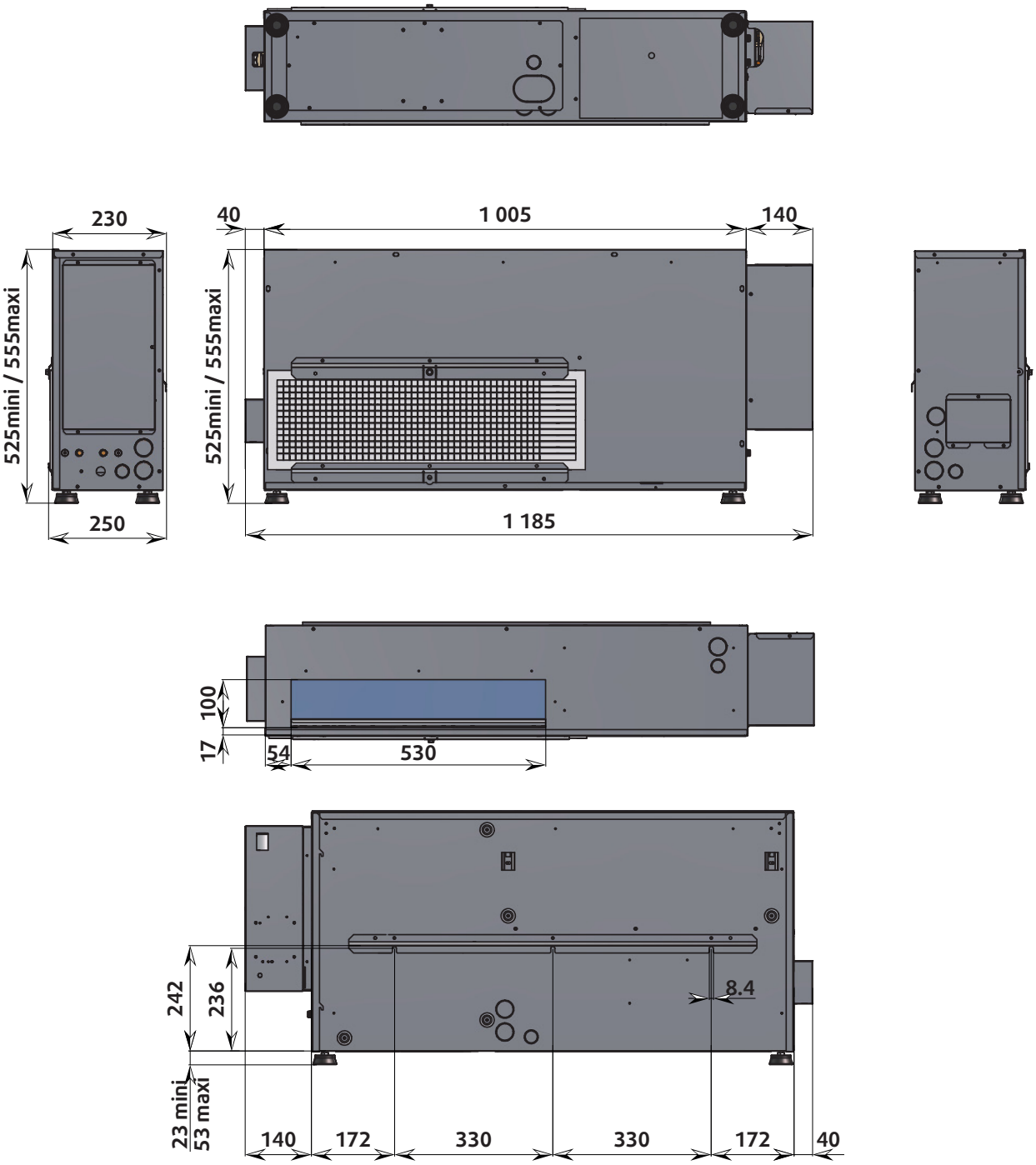
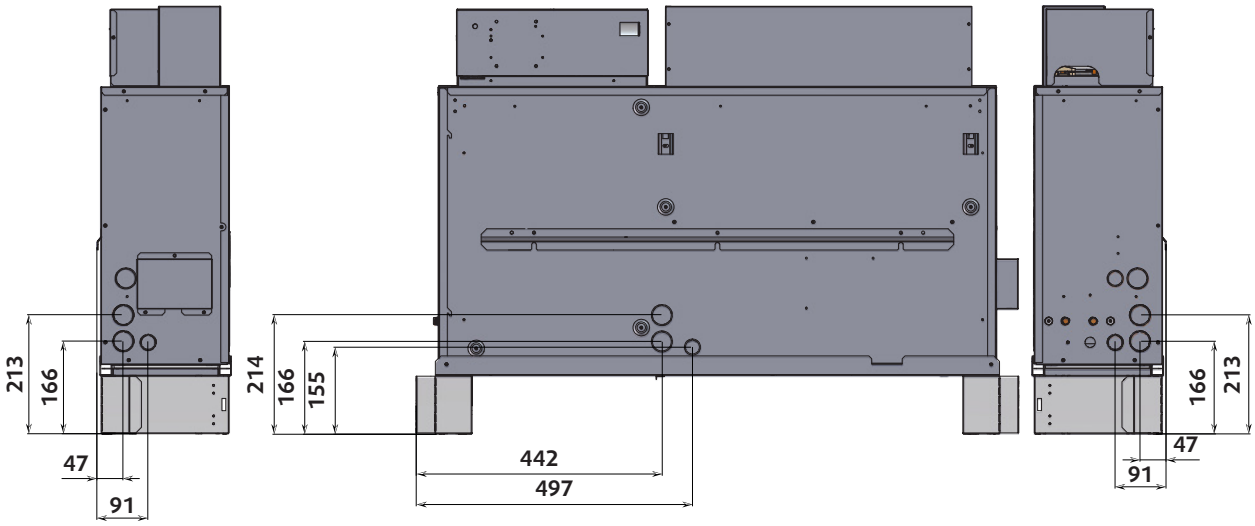


HYDRAULIC CONNECTIONS

SYSCW-AR R513A VC BA / SYSCW-AR R513A VN BA



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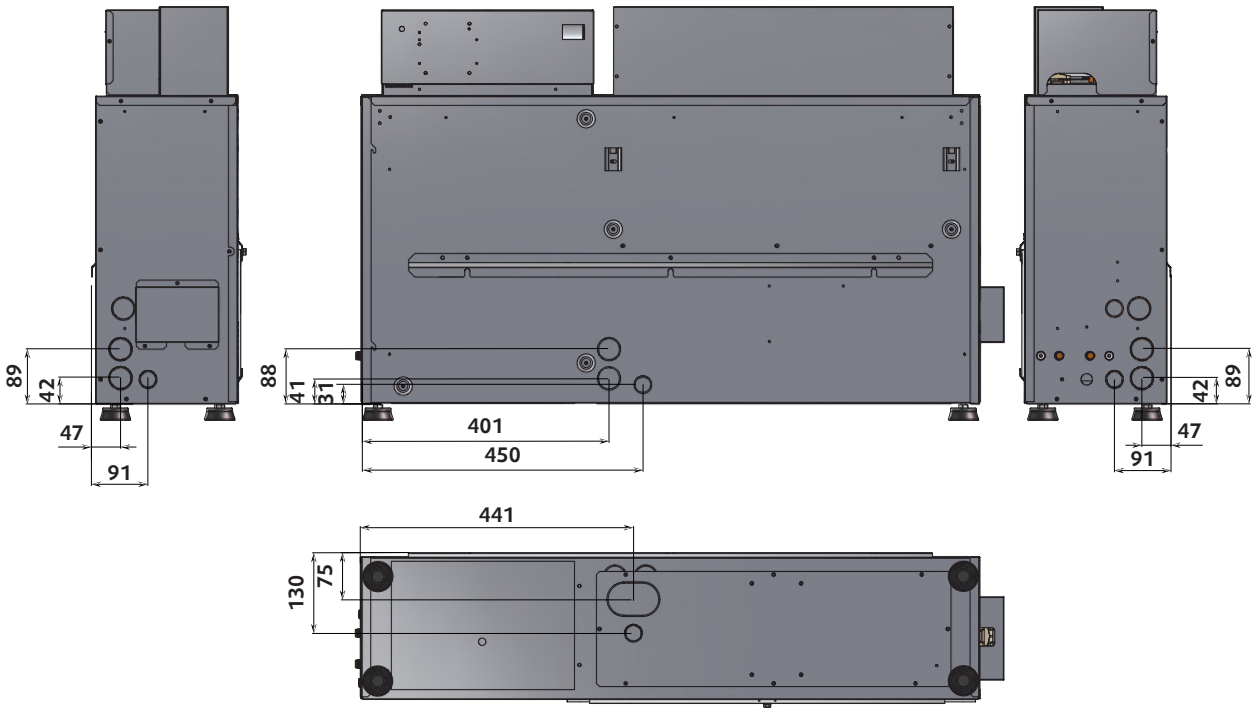

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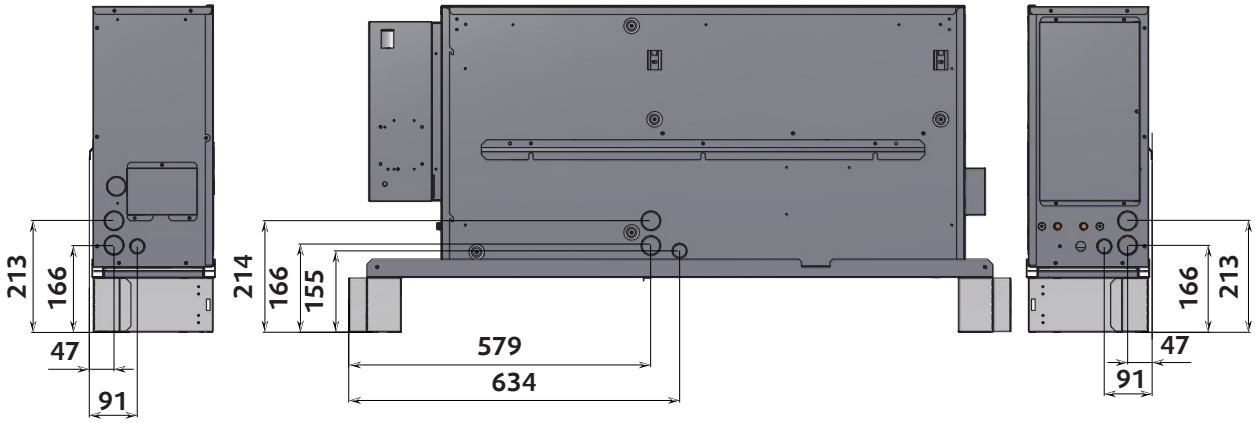
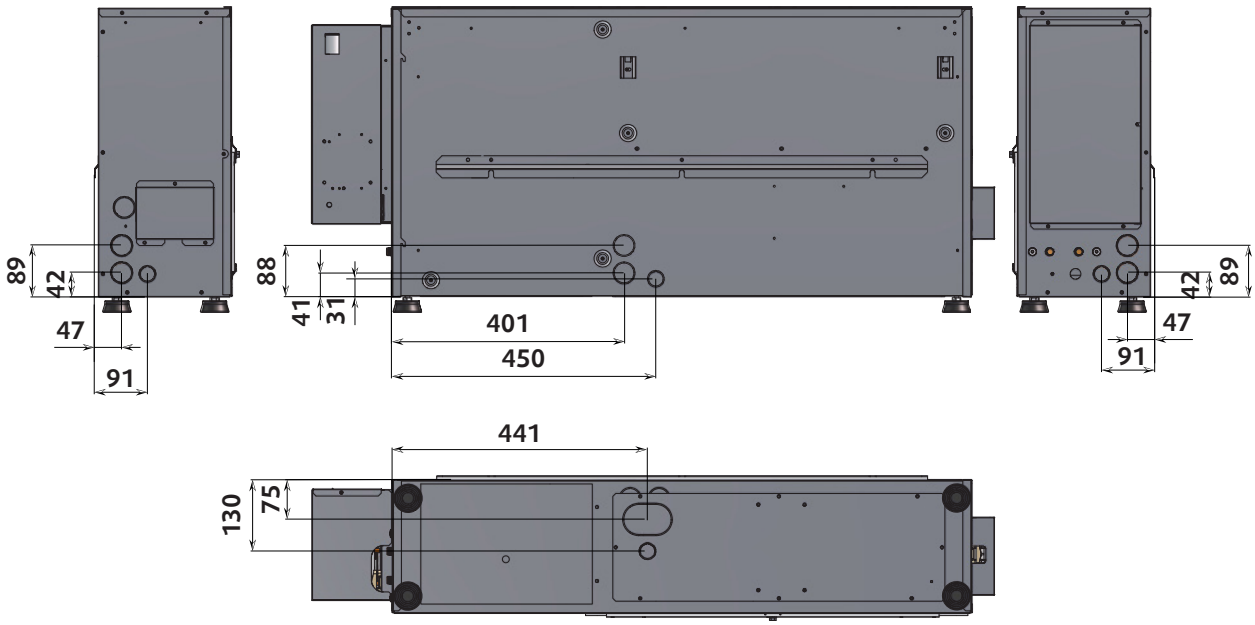


SYSCW-AR R513A VCL FA / SYSCW-AR R513A VNL FA



REFRIGERANT CIRCUIT DIAGRAM
SCHEMA DU CIRCUIT FRIGORIFIQUE
KÄLTEKREISLAUFDIAGRAMM
SCHEMA DEL CIRCUITO REFRIGERANTE
ESQUEMA DEL CIRCUITO FRIGORIFÍCO

English

C1 : Compressor
RV : Cycle reversal valve
E1 : Plate heat exchanger
LR1 : Liquid reservoir
CAP : Expansion device
E2 : Finned coil
IF : Fan motor
⏚ : Schrader valve
HP : High pressure switch
LP : Low pressure switch
RT : Air temperature sensor
ICT : Anti-freezing protection sensor
LWT : Outlet water temperature sensor
FS : Flow switch
Y1 : Water circuit by-pass valve

Français

C1 : Compresseur
RV : Vanne inversion de cycle
E1 : Echangeur à plaques
LR1 : Bouteille accumulation liquide
CAP : Dispositif de détente
E2 : Echangeur à ailettes
IF Moteur de la ventilation
⏚ : Valve Schrader'
HP : Pressostat haute pression
LP : Pressostat basse pression
RT : Sonde température air
ICT : Sonde anti-givre
LWT : Sonde de température de sortie d'eau
FS : Flow switch
Y1 : Vanne by-pass circuit d'eau

Deutsch

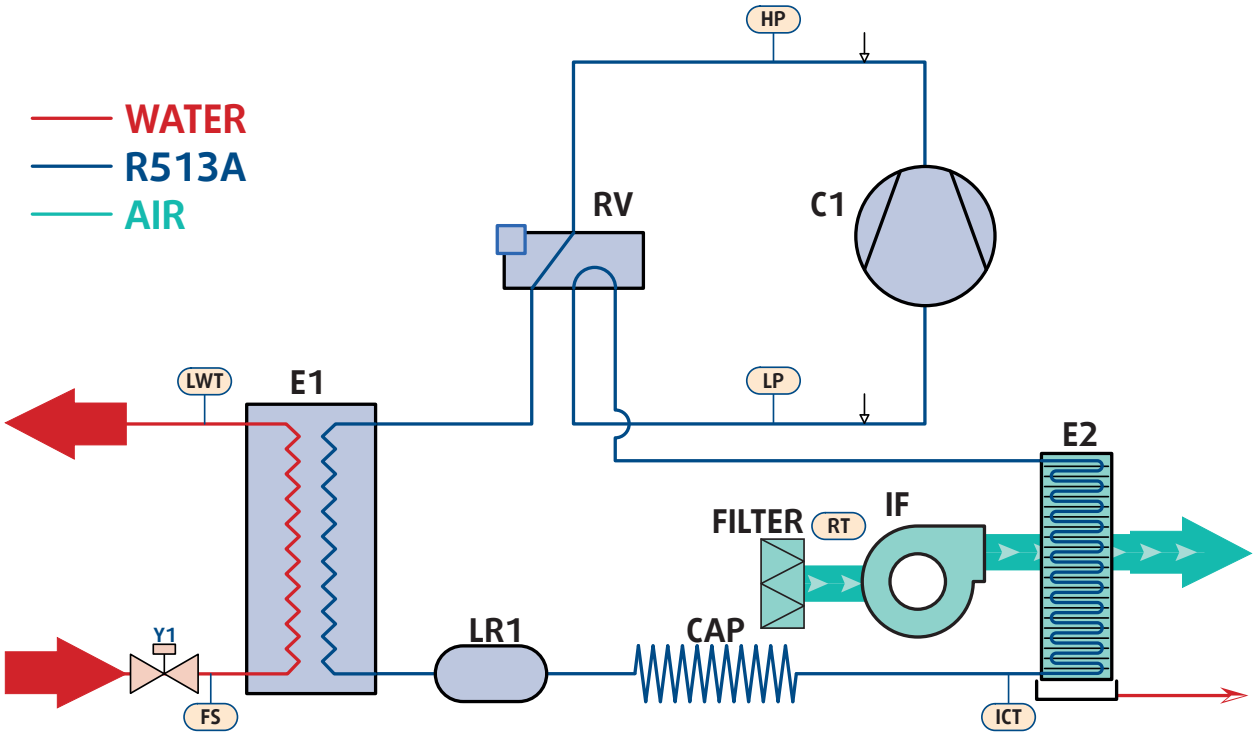
C1 : Verdichter 1
RV : Umkehrzyklusventil
E1 : Plattenverdampfer
LR1 : Sammler
CAP : Expansionsvorrichtung
E2 : Rippenwärmetauscher
IF : Motor der Lüftung
⏚ : Valve Schrader
HP : Überdruckschalter
LP : Niederdruckschalter
RT : Lufttemperaturfühler
ICT : Frostschutztemperaturfühler
LWT : Wasseraustrittstemperaturfühler
FS : Strömungsschalter
Y1 : Bypass-Ventil Wasserkreislauf

Italiano

C1 : Compressore 1
RV : Valvola di inversione ciclo
E1 : Evaporatore a piastre
LR1 : Accumulatore di liquido
CAP : Dispositivo di riduzione
E2 : Batteria alettata
IF : Motore della ventilazione
⏚ : Valvola Schrader
HP : Pressostato di alta pressione
LP : Pressostato di bassa pressione
RT : Sonda di temperatura d'arie
ICT : Sonda antibrina
LWT : Sonda di temperatura d'uscita d'acqua
FS : Flussostato
Y1 : Valvola by-pass circuito dell'acqua

Español

C1 : Compresore 1
RV : Válvula de inversión de ciclo
E1 : Evaporador de placas
LR1 : Botella de acumulación de líquido
CAP : Dispositivo de descarga
E2 : Intercambiador con aletas
IF : Motor de la ventilación
⏚ : Válvula Schrader
HP : Presóstato de alta presión
LP : Presóstato de baja presión
RT : Sonda de temperatura de aire
ICT : Sonda antiescarcha
LWT : Sonda de temperatura de salida de agua
FS : Conmutador de flujo
Y1 : Válvula by-pass del circuito de agua


WATER
R513A
AIR
HP
RV
C1
LWT
E1
LP
E2
FILTER
RT
IF
Y1
LR1
CAP
FS
ICT

WIRING DIAGRAM
SCHEMAS ELECTRIQUES
STROMLAUFPLANS
SCHEMA ELETRICO
ESQUEMA ELECTRICO

TAKE CARE!

These wiring diagrams are correct at the time of publication. Manufacturing changes can lead to modifications. Always refer to the diagram supplied with the product.

ATTENTION

Ces schémas sont corrects au moment de la publication. Les variantes en fabrication peuvent entraîner des modifications. Reportez-vous toujours au schéma livré avec le produit.

ACHTUNG!

Diese Stromlaufplans sind zum Zeitpunkt der Veröffentlichung gültig. In Herstellung befindliche Varianten können Änderungen mit sich bringen. In jedem Fall den mit dem Produkt gelieferten Stromlaufplan hinzuziehen.

ATTENZIONE !

Questi schemi sono corretti al momento della pubblicazione. Le varianti apportate nel corso della fabbricazione possono comportare modifiche. Far sempre riferimento allo schema fornito con il prodotto.

ATENCIÓN !

Esto esquemas son correctos en el momento de la publicación. Pero las variantes en la fabricación pueden ser motivo de modificaciones. Remítase siempre al esquema entregado con el producto.

POWER SUPPLY MUST BE SWITCHED OFF BEFORE STARTING TO WORK IN THE ELECTRIC CONTROL BOXES!

MISE HORS TENSION OBLIGATOIRE AVANT TOUTE INTERVENTION DANS LES BOITIERS ELECTRIQUES.

VOR JEDEM EINGRIFF AN DEN ANSCHLUßKÄSTEN UNBEDINGT DAS GERÄT ABSCHALTEN!

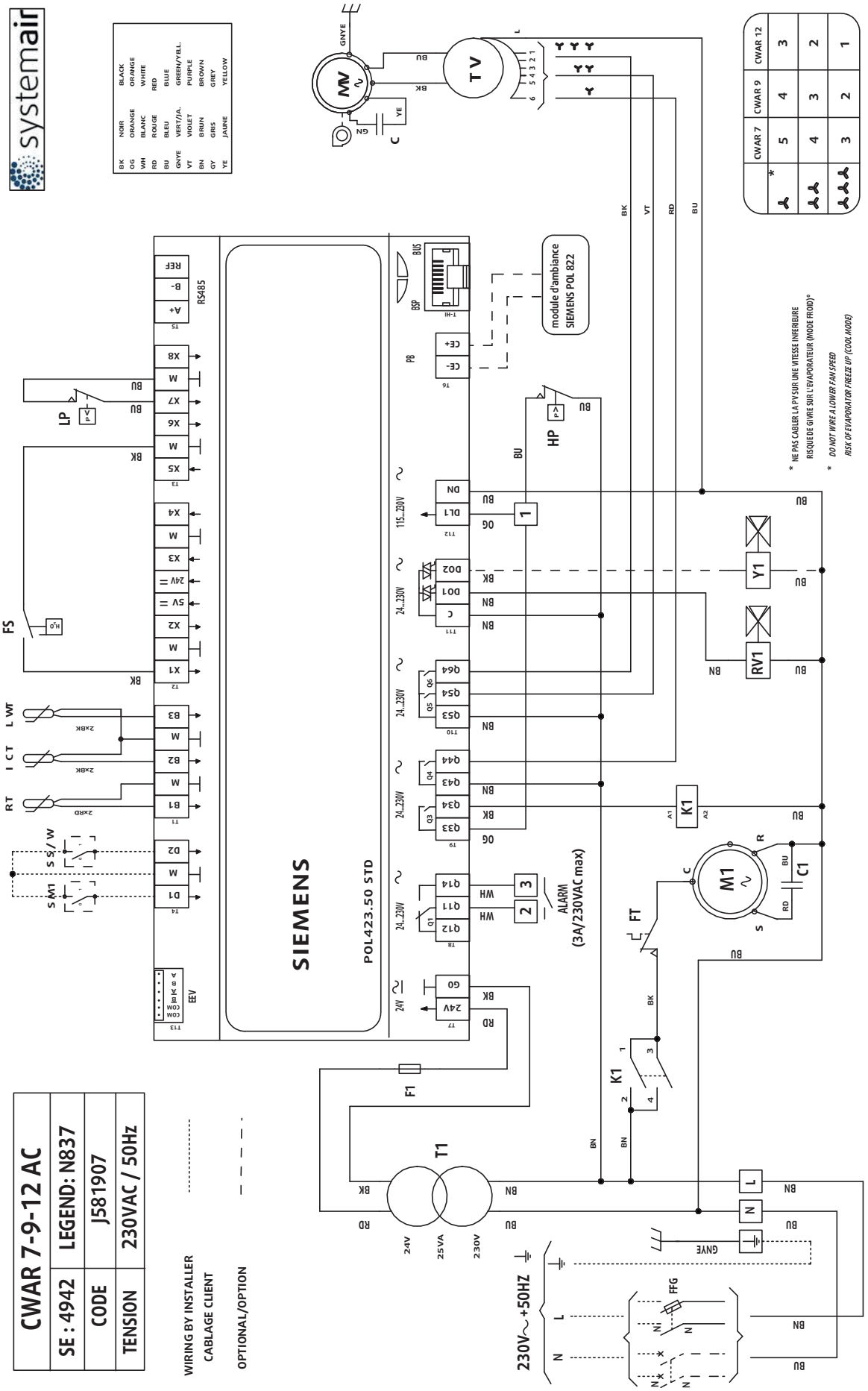
PRIMA DI OGNI INTERVENTO SULLE CASSETTE ELETTRICHE ESCLUDERE TASSATIVAMENTE L'ALIMENTAZIONE !

PUESTA FUERA DE TNESIÓN OBLIGATORIA ANTES DE CUALQUIER INTERVENCIÓN EN LAS CAJAS ELÉCTRICAS!

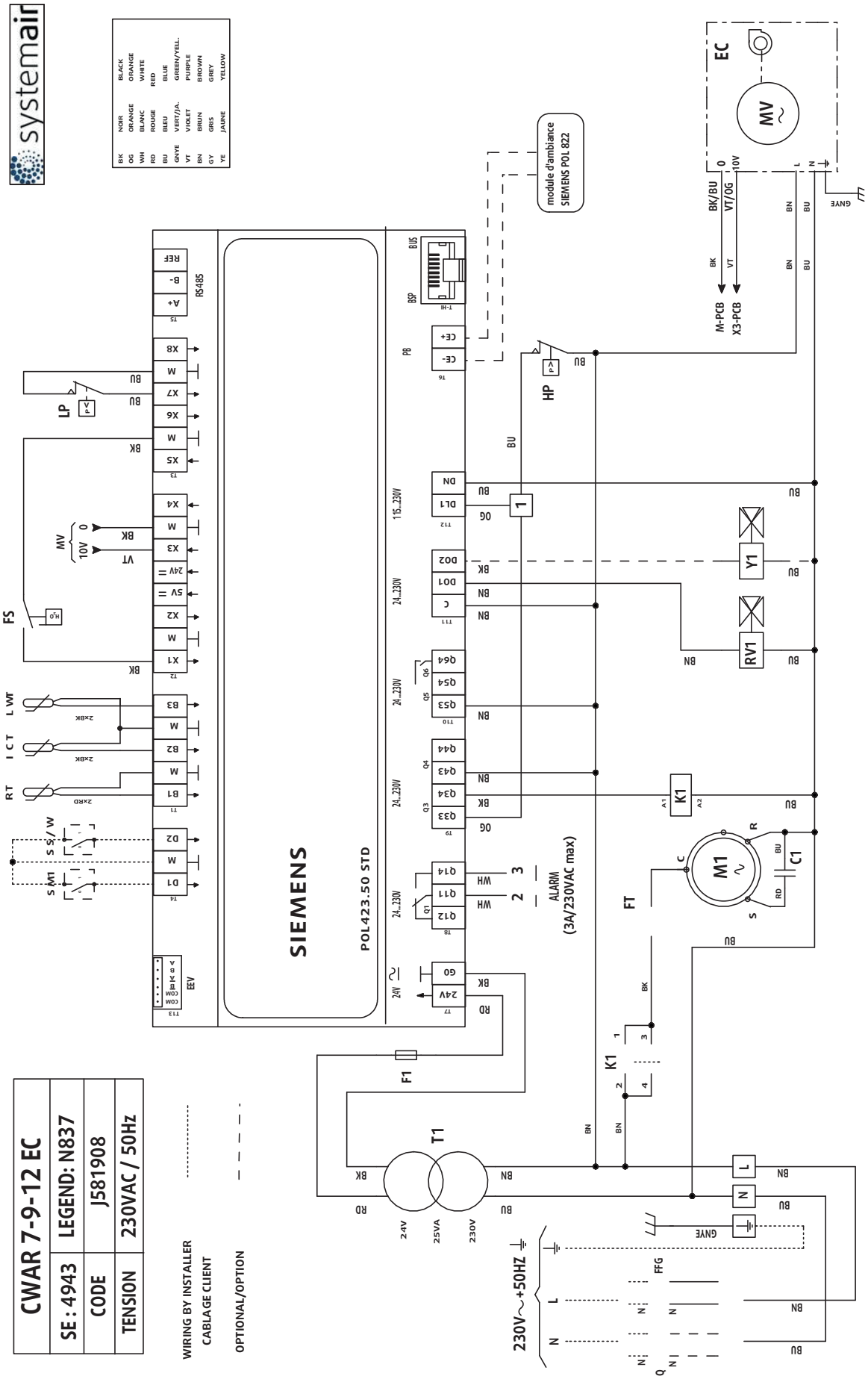
LEGEND

	English	Français	Deutsch	Italiano	Español
	DESCRIPTION	DESIGNATION	BEZEICHNUNG	DENOMINAZIONE	DESCRIPCIÓN
FFG	Fuse terminal + Fuses (not supplied or option)	Porte-fusibles + fusibles (non fourni ou option)	Sicherungshalter + Schmelzsicherungen (nicht geliefert oder Option)	portafusibili + Fusibili (non forniti o opzione)	portafusibles + Fusibles (no incluidos u opción)
QG	Circuit breaker (not supplied or option)	Disjoncteur (non-fourni ou option)	Ofenschalter (nicht geliefert oder Option)	Interruttore forno (non forniti o opzione)	Disyuntor (no incluidos u opción)
K1	Refrigeration compressor contactor	Contacteur compresseur frigorifique	Schütz der Kältemittelkompressor	Contattore del compressore frigorifero	Contactor de los compresor frigorífico
M1	Refrigeration compressor	Compresseur frigorifique	Kältemittelkompressor	Compressore frigorifero	Compresor frigorífico
FT	External safety compressor	Sécurité externe compresseur	Extern Sicherheitsvorrichtungen von Kompressor	Sicurezza esterna del compressore	Seguridad externa del compresor
LP	Automatic reset Low Pressure pressostat	Pressostat basse pression à réarmement automatique	Niederdruckpressostat mit selbsttätiger Wiedereinschaltung	Pressostato bassa pressione con riarmo automatico	Presostato de baja presión con rearme automático
HP	Automatic reset High Pressure pressostat	Pressostat haute pression à réarmement automatique	Hochdruckpressostat mit selbsttätiger Wiedereinschaltung	Pressostato alta pressione con riarmo automatico	Presostato de alta presión con rearme automático
C1	M1 compressor condenser (single phase models)	Condensateur du compresseur M1 (modèles monophasés)	Kondensator von Kompressor M1 (Einphasenmodelle)	Condensatore del compressore M1 (modelli monofase)	Condensador del compresor M1 (modelos monofásicos)
RV	4 way valve for cycle inversion	Vanne 4 voies d'inversion de cycle	4-Wege-Umkehrventil für thermodynamisches Heizen	Valvola 4 vie di inversione di ciclo	Válvula de 4 vías de inversión de ciclo
MV	Treated air fan motor	Moteur de ventilation air traité	Lüftermotor Zuluft	Motore di ventilazione aria trattata	Motor de ventilación aire tratado
TV	Auto-transformer	Autotransformateur moteur MV	Autotransformator des Motors MV	Autotrasformatore	Autotransformador del motor MV
FV	MV motor internal safety device	Sécurité interne du moteur MV	Wicklungsschutz des Motors MV	Sicurezza interna del motore MV	Seguridad interna del motor MV
C	MV motor condenser	Condensateur du moteur MV	Kondensator des Motors MV	Condensatore del motore MV	Condensador del motor MV
Y1	Water circuit by-pass valve (not supplied)	Vanne by-pass circuit d'eau (non fournie)	Bypass-Ventil Wasserkreislauf (nicht geliefert)	Valvola by-pass circuito dell'acqua (non fornita)	Válvula by-pass del circuito de agua (no incluida)
FS	Flow switch (option)	Flow switch (option)	Strömungsschalter (Option)	Flussostato (opzione)	Conmutador de flujo (opción)
SM1	ON/OFF switch	Interrupteur marche/arrêt	Ein / Aus – Schalter	Interruttore On/Off	Interruptor de marcha/parada
SS/W	Summer/winer switch (closed in winter) (not supplied)	Interrupteur été/hiver (fermé en hiver) (non fourni)	Winter/Sommer-Schalter (im Winter geschlossen) (nicht geliefert)	Interruttore estate/inverno (chiuso in inverno) (non fornita)	Interruptor de invierno/verano (cerrado en invierno) (no incluida)
CW/OCC	Window contact switch	Contact de fenêtre	Fensterkontakt	Contatto di finestra	Contacto de ventana
T1	Transformer 230V/24V	Transformateur 230V/24V	Transformator 230V/24V	Trasformatore 230V/24V	Transformador 230V/24V
F1	Fuse terminal + fuse 1A	Porte-fusible + fusible 1A	Sicherungsklemme + Sicherung 1A	Portafusibile + fusibile 1A	Terminal de fusible + fusible 1A
POL 423	Regulation Siemens POL 423	Régulation Siemens POL 423	Regelung Siemens POL 423	Regolazione Siemens POL 423	Regulación Siemens POL 423
POL 636	Regulation Siemens POL 636	Régulation Siemens POL 636	Regelung Siemens POL 636	Regolazione Siemens POL 636	Regulación Siemens POL 636
POL822	Local control module (RCS)	Rappel de commande local (RCS)	Fernbedienung mit Thermostat (RCS)	Richiamo di comando locale (RCS)	Mando secundario local
ICT	Anti-freezing protection sensor	Sonde anti-givre	Frostschutztemperaturfühler	Sonda antibrina	Sonda antiescarcha
RT	Air temperature sensor	Sonde de température d'air	Lufttemperaturfühler	Sonda di temperatura dell'aria	Sonda de temperatura de aire
LWT	Outlet water temperature sensor	Sonde de température de sortie d'eau	Wasseraustrittstemperaturfühler	Sonda di temperatura d'uscita d'acqua	Sonda de temperatura de salida de agua
KHP	HP Security Relay	Relai de sécurité HP	HD Relai für Sicherheit	Relai di sicurezza AP	Relé de seguridad AP

SYSCW-AR - AC MOTOR -CONTROL SIEMENS POL423



SYSCW-AR - EC MOTOR -CONTROL SIEMENS POL423

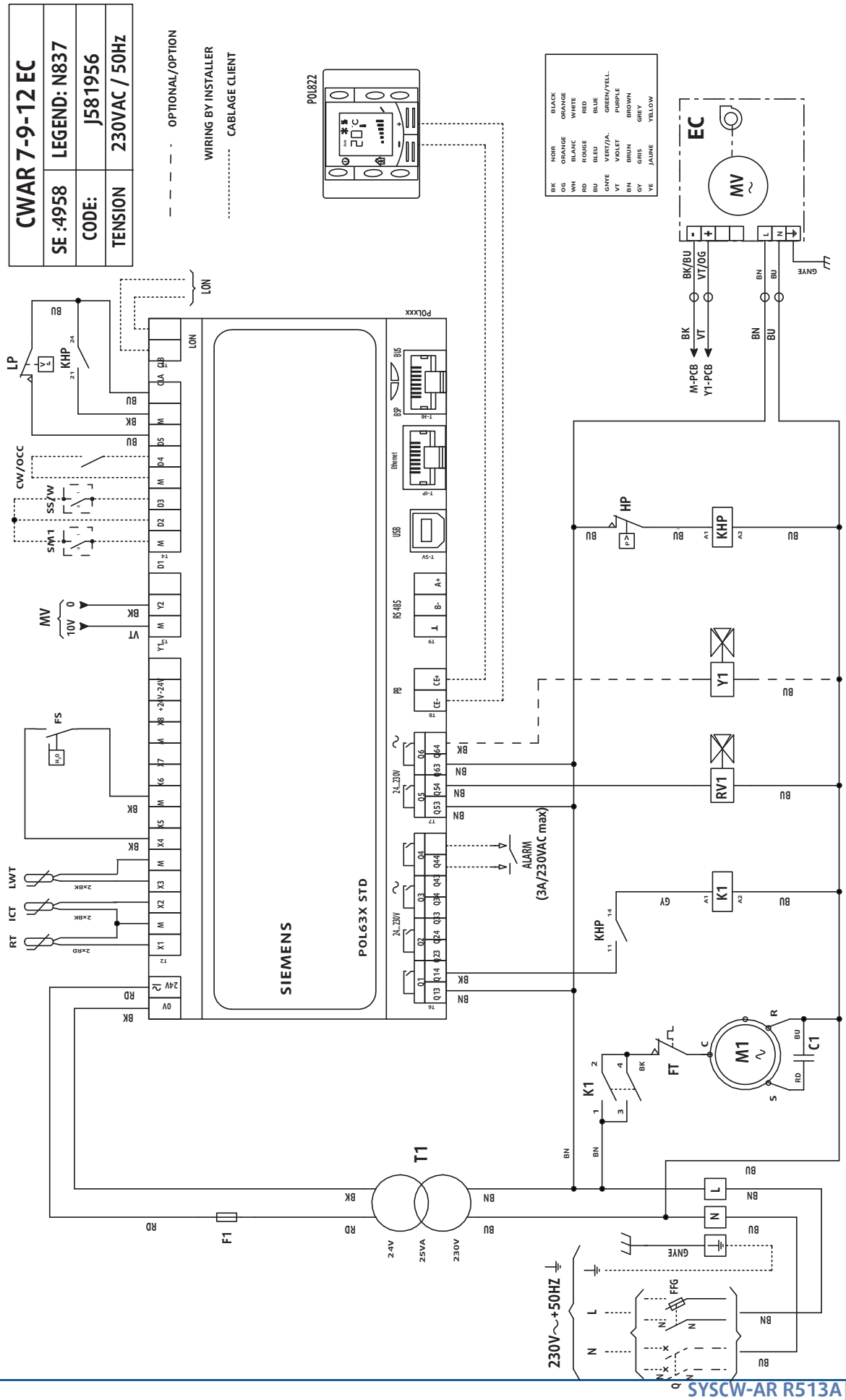


CWAR 7-9-12 EC	
SE : 4943	LEGEND: N837
CODE	J581908
TENSION	230VAC / 50Hz

WIRING BY INSTALLER ..... CABLAGE CLIENT

OPTIONAL/OPTION — — — —

SYSCW-AR - EC MOTOR -CONTROL SIEMENS POL636



As part of our ongoing product improvement programme, our products are subject to change without prior notice. Non contractual photos.

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IOM CWAR 02-N-1GB
Part number : **J581958GB**
Supersedes : **None**