



Installation, use and maintenance manual

Preassembled groups

Modular heating unit and heater/chiller

powered by gas and renewable energy



DISPOSAL

The appliance and all its accessories must be disposed of separately in accordance with the regulations in force.



Use of the WEEE symbol (Waste Electrical and Electronic Equipment) indicates that this product cannot be disposed of as household waste. Proper disposal of this product helps to prevent potential negative consequences for the environment and human health.

Revision: J

Code: D-LBR563

This Installation, use and maintenance manual has been drawn up and printed by Robur S.p.A.; whole or partial reproduction of this Installation, use and maintenance manual is prohibited.

The original is filed at Robur S.p.A.

Any use of this Installation, use and maintenance manual other than for personal consultation must be previously authorised by Robur S.p.A.

The rights of those who have legitimately filed the registered trademarks contained within this publication are not affected.

With the aim of continuously improving the quality of its products, Robur S.p.A. reserves the right to modify the data and contents of this Installation, use and maintenance manual without prior notice.

INDEX OF CONTENTS

I Introduction	p. 4	3.7	System filling.....	p. 30
I.1 Recipients.....	p. 4	3.8	Fuel gas supply.....	p. 31
I.2 Control device	p. 4	3.9	Combustion products exhaust.....	p. 32
II Symbols and definitions	p. 4	3.10	Flue gas condensate discharge.....	p. 33
II.1 Key to symbols	p. 4	3.11	Defrosting water drainage.....	p. 33
II.2 Terms and definitions	p. 4	3.12	Safety valve drain	p. 33
III Warnings	p. 4	4 Electrical installer	p. 33	
III.1 General and safety warnings.....	p. 4	4.1 Warnings.....	p. 33	
III.2 Compliance.....	p. 6	4.2 Electrical systems	p. 34	
III.3 Exclusions of liability and warranty	p. 6	4.3 Electrical power supply	p. 34	
1 Features and technical data	p. 7	4.4 Adjustment and control.....	p. 35	
1.1 Features.....	p. 7	4.5 Water circulation pumps.....	p. 39	
1.2 Circulating pumps.....	p. 7	5 First start-up	p. 40	
1.3 Coding	p. 7	5.1 Preliminary checks	p. 40	
1.4 Dimensions and weights	p. 10	5.2 Electronic adjustment on the appliance – Menus and parameters	p. 41	
1.5 Roma valve.....	p. 20	5.3 Modifying settings	p. 41	
1.6 Independent circulators selector switch settings.....	p. 21	6 Normal operation	p. 41	
1.7 Electrical specifications	p. 22	6.1 Warnings.....	p. 41	
1.8 Electronic boards.....	p. 22	6.2 Switch on and off.....	p. 41	
1.9 Operation mode	p. 22	6.3 Modifying settings	p. 42	
1.10 Controls.....	p. 22	6.4 Efficiency	p. 42	
1.11 Technical data	p. 23	7 Maintenance	p. 42	
2 Transport and positioning	p. 23	7.1 Warnings.....	p. 42	
2.1 Warnings.....	p. 23	7.2 Pre-emptive maintenance	p. 43	
2.2 Handling.....	p. 23	7.3 Scheduled routine maintenance	p. 43	
2.3 Group positioning.....	p. 23	7.4 Messages on the display.....	p. 43	
2.4 Minimum clearance distances.....	p. 24	7.5 Restarting a locked-out unit.....	p. 44	
2.5 Mounting base.....	p. 24	7.6 Circulators lockout.....	p. 44	
3 Heating engineer	p. 25	7.7 Periods of inactivity	p. 44	
3.1 Warnings.....	p. 25	8 Diagnostics	p. 45	
3.2 Hydraulic system	p. 25	8.1 Appliances/controllers	p. 45	
3.3 Hydraulic connections.....	p. 25	8.2 Circulating pumps.....	p. 45	
3.4 Antifreeze function	p. 29	9 Appendices	p. 46	
3.5 Antifreeze liquid.....	p. 29	9.1 Wiring diagrams and internal wirings.....	p. 46	
3.6 System water quality.....	p. 30	9.2 Circulating pumps.....	p. 52	

I INTRODUCTION



Installation, use and maintenance manual

This Manual is an integral part of the RT__ Link and must be handed to the end user together with the appliance.

- End user, for appropriate and safe use of the appliance.
- Qualified installer, for correct appliance installation.
- Planner, for specific information on the appliance.

I.1 RECIPIENTS

This Manual is intended for:

I.2 CONTROL DEVICE

In order to be able to work, the RT__ Link unit needs a control device (DDC, CCP/CCI), which must be connected by the installer.

II SYMBOLS AND DEFINITIONS

II.1 KEY TO SYMBOLS



DANGER



WARNING



NOTE



PROCEDURE



REFERENCE (to other document)

II.2 TERMS AND DEFINITIONS

Appliance/Module (or Units) GAHP/GA/AY = equivalent terms, both used to designate single gas-fired heat/chiller appliance (GAHP A/AR/GS/WS, or GA ACF/HR/TK absorption chiller or AY00-120 condensing boiler), part of the preassembled unit together with other modules/appliances.

TAC = Technical Assistance Centre authorised by Robur.

CCI Controller (Comfort Controller Interface) = optional Robur control device which lets you manage up to three modulating heat only GAHP units (A, WS, GS).

CCP Controller (Comfort Control Panel) = Robur control device which lets you manage in modulation mode up to three GAHP units and all system components (probes, diverter/mixing valves, circulating pumps), including any integration boiler.

DDC Control (Direct Digital Controller) = optional Robur adjustment device to control one or more Robur appliances (GAHP heat pumps, GA chillers and AY00-120 boilers) in ON/OFF mode.

RB100/RB200 Devices (Robur Box) = optional interface devices complementary to DDC, which may be used to broaden its functions (heating/cooling/DHW production service demands, and control of system components such as third party generators, adjustment valves, circulators, probes).

Heat generator = equipment (e.g. boiler, heat pump, etc..) producing heating and/or DHW.

Preassembled Group / RT__ Link = equivalent terms, both used to designate the generic heat/chiller hydronic group consisting of GAHP/GA/AY modules (see definition).

RTAR/RTCF/RTY/RTA/RTAY/RTYR/.. .Link to = initials to designate a specific heat/chiller preassembled group, consisting of a specific combination of GAHP/GA/AY (see definition).

First start-up = preassembled group commissioning operation that can only and exclusively be performed by a TAC.

III WARNINGS

III.1 GENERAL AND SAFETY WARNINGS



GAHP/GA/AY modules

As far as the individual GAHP/GA/AY appliances/modules belonging to the preassembled group are concerned, read the warnings in the respective Manuals (attached), with particular regard to the following aspects:

- Poisoning
- Moving parts
- Burn hazard

- Pressure vessels
- Water-ammonia solution
- Limescale and corrosion
- Chloride concentration
- Aggressive substances in the air
- Switching the appliances off



Installer's qualifications

Installation must exclusively be performed by a qualified firm and by qualified personnel, with specific knowledge on heating, cooling, electrical

systems and gas appliances, in compliance with the laws in force in the Country of installation.



Declaration of conformity

Upon completing installation, the installing firm shall issue to the owner/client the appliance's workmanlike conformity declaration, according to national/local regulations in force and the manufacturer's instructions/provisions.



Misuse

The preassembled group must only be used for the purposes for which it has been designed. Any other use is deemed hazardous. Incorrect use may affect operation, duration and safety of the appliance. Adhere to the manufacturer's instructions.



Hazardous situations

- Do not start the preassembled group in hazardous conditions such as: gas odor, hydraulic/electric/gas system problems, parts of the unit immersed in the water or damaged, malfunction, deactivation or exclusion of control and safety devices.
- In case of danger, request intervention by qualified personnel.
- In case of danger, switch off the electrical power and gas supplies only if this can be done in total safety.
- Do not entrust children, persons with physical, sensory or mental disabilities or persons with poor knowledge and experience with use of the preassembled appliance.



Gas component tightness

- Before performing any operation on gas ducting components, close the gas valve.
- Upon completing any procedure, perform the tightness test according to regulations in force.



Gas smell

If you smell gas:

- Do not operate electrical devices near the preassembled group (eg telephones, multimeters or other appliances that can cause sparks).
- Shut off the gas supply by turning the valve off.
- Switch off the power supply via the external disconnect switch in the power supply electrical panel.
- Ask for qualified personnel from a phone away from the preassembled group.



Electrocution hazard

Within the preassembled group (and the appliances that compose it) there are live parts.

- Disconnect the electrical power supply before any operation on appliance components.

- For electrical connections exclusively use compliant components and according to the specifications provided by the manufacturer.
- Make sure the preassembled group and the individual GAHP/GA/AY modules of the same can not be reactivated inadvertently.



Connection and disconnection

For the RT__ Link electrical connection and disconnection operations follow the procedure described in Paragraph 7.1 p. 42.



Earthing

Electrical safety depends on an effective earthing system, properly connected to the preassembled group and executed in accordance with current regulations.



Distance from combustible or flammable materials

- Do not deposit flammable materials (paper, diluents, paints, etc.) near the preassembled group.



Acid flue gas condensate

If condensing units are present in the preassembled group:

- Discharge the acid condensate of combustion flue gas, as indicated in Paragraph 3.10 p. 33, in compliance with current exhaust regulations.



Shutting down the preassembled group

Interrupting the power supply during the operation of the preassembled group may cause permanent damage to the internal components.

- Except for a hazard, do not interrupt the power supply to turn off the preassembled group, but always and exclusively use the provided control device (DDC or CCP/CCI).



In the event of failure

Operations on internal components and repairs may exclusively be carried out by a TAC, using only original spare parts.

- In the event of a failure of the preassembled group, or of one or more of the individual appliances that make it up and/or break parts of it, refrain from any repair or restoration attempt and contact the TAC immediately.



Routine maintenance

Proper maintenance ensures the efficiency and good operation of the preassembled group over time.

- Maintenance must be performed according to the manufacturer's instructions (see Chapter 7 p. 42)

and in compliance with current regulations.

- Appliance maintenance and repairs may only be entrusted to firms legally authorised to work on gas appliances and systems.
- Enter into a maintenance contract with an authorised specialised firm for routine maintenance and for servicing in case of need.
- Use only original parts.



Maintenance of GAHP/GA/AY modules

For the maintenance of the individual GAHP/GA/AY modules belonging to the preassembled group, consult their respective Manuals (attached).



Decommissioning and disposal

If the preassembled group or some of the individual GAHP/GA/AY appliances/modules are to be dismantled, please contact the manufacturer for disposal.



Keep the Manual

This Installation, use and maintenance manual, including all attached documents, must always accompany the preassembled group and must be handed to the new owner or installer in the event of sale or transfer.

III.2 COMPLIANCE

EU directives and standards

The GAHP/GA/AY modules/appliances that are part of RT__ Link, namely the GAHP series heat pumps, GA ACF series chillers, and AY00-120 condensing boilers comply with the essential requirements of the following standards and directives, each as applicable:

- ▶ Efficiency Directive 92/42/EEC and subsequent modifications and additions.
- ▶ 2016/426/EU "Gas Appliances Regulation" as amended and added.
- ▶ 2014/30/EC "Electromagnetic Compatibility Directive" as amended and added.
- ▶ 2014/35/EC "Low Voltage Directive" as amended and added.
- ▶ 2006/42/EC "Machine Directive" as amended and added.
- ▶ 2014/68/EU "Pressure Equipment Directive" as amended and added.
- ▶ 811/2013/EU "Energy-Related Products regulation" as amended and added.
- ▶ 813/2013/EU "Ecodesign requirements regulation" as amended and added.

- ▶ EN 12309 appliances for gas-fired heating and/or cooling absorption.
- ▶ EN 378 Refrigerating systems and heat pumps.

Other applicable provisions and standards

The design, installation, operation and maintenance of the systems shall be carried out in compliance with current applicable regulations, depending on the Country and location, and in accordance with the manufacturer's instructions. In particular, regulations regarding the following shall be complied with:

- ▶ Gas systems and equipment.
- ▶ Electrical systems and equipment.
- ▶ Heating and air conditioning systems, heat pumps and chillers.
- ▶ Environmental protection and combustion products exhaust.
- ▶ Fire safety and prevention.
- ▶ Any other applicable law, standard and regulation.

III.3 EXCLUSIONS OF LIABILITY AND WARRANTY



Any contractual or extra-contractual liability of the manufacturer for any damage caused by incorrect installation and/or improper use and/or failure to comply with regulations and with the manufacturer's directions/instructions shall be disclaimed.



In particular, the guarantee of the individual GAHP/GA/AY modules/units belonging to the preassembled group may be invalidated under the following conditions:

- Incorrect installation.
- Misuse.
- Failure to comply with the manufacturer's indications on installation, use and maintenance.
- Alteration or modification of the product or any part thereof.
- Extreme operational conditions or however outside of the operational ranges set forth by the manufacturer.
- Damages caused by external agents such as salts, chlorine, sulphur or other chemical substances contained in the installation water or present in the air of the installation site.
- Abnormal actions transmitted to the appliance by the system or installation (mechanical stresses, pressure, vibrations, thermal expansion, electrical surges...).
- Accidental damages or due to force majeure.

1 FEATURES AND TECHNICAL DATA

For the characteristics of the individual modules (GAHP/GA/AY units) that make up the RT__ Link, and of the control devices (DDC, CCP/CCI, ...), refer to the respective Manuals (attached).

1.1 FEATURES

Preassembled groups

The RT__ Link are gas powered (natural gas or LPG) heating/cooling sets, to supply hot and/or chilled water. Each group consists of a certain number of individual gas powered modules/heating/cooling appliances (GAHP/GA/AY units). The set of appliances and components is preassembled at the factory, forming a complete hydronic group already predisposed to be simply connected to the system.

Application

Each preassembled group according to its configuration (RTAR, RTCF, RTY, RTAY, RTYR, RTA, ... Link) is able to simultaneously or alternatively deliver heating, cooling, DHW production and heat recovery, according to the needs of each single installation, with a significantly extensive range of heating and cooling power. The various hydronic models (RTAR, RTCF, ... Link) are suitable for all heating and cooling systems operating with hot and/or chilled water, with common terminals (e.g. radiators, fan coils, radiant panels, fan heaters, air handling units, DHW production boilers, pool heat exchangers...), including process plants (industrial heat exchangers).

Manufacturing features

Each preassembled group, in addition to the gas powered GAHP/GA/AY heating/cooling modules/units, is composed of:

- delivery/return stainless steel hydraulic manifolds, insulated with rigid cups lined with aluminum sheet
- galvanized steel gas outlet manifold
- flexible connecting couplings of individual units to hydraulic and gas manifolds
- condensate discharge manifold (only if A/GS/WS/AY condensing appliances are included)
- electrical panel with protection devices (2 electrical panels with more than 5-6 modules)
- bearing structure with galvanized steel sections

Composition (GAHP/GA/AY modules)

The gas heating/cooling modules that make up a RT__ Link can be:

- GAHP units, A/AR/GS/WS versions, absorption heat pumps
- GA units, ACF/HR/TK/LB versions, absorption chillers
- AY unit, condensing boiler

distinguished in:

- aerothermal units (A, AR, ACF, HR, TK, LB)
 - hydrothermal (WS) and geothermal (GS) units
- in variable number:
- from 2 to 5 in the case of GAHP/GA only

- from 2 to 8 in the case of GAHP/GA and AY
- Groups with aerothermal units must be installed exclusively outside, while others may be installed either indoors or outdoors.

The aerothermal modules of RT__ Links may be in configuration:

- with standard fans
- with silenced fans (S or S1)

Configurations

- without circulators or with circulators (standard or oversize circulators)
- 2, 4 or 6 pipes, ie 1, 2 or 3 pairs of delivery/return hydraulic collectors/connections for hot and/or cold water, connected as needed.


1.2 CIRCULATING PUMPS

Preassembled groups without water circulation pumps

If the RT__ Link is without circulators, It must be installed on the hydraulic/primary circuit at least one circulation pump, suitably selected and rated (by the designer/installer).

Preassembled groups with water circulation pumps

In the RT__ Links already provided with circulators, each individual GAHP/GA/AY module that is part of the group has (at least) a single independent circulator.

 The circulators are installed externally to the GAHP/GA units, which have a special protection cover (Figure 1.14 p. 20), while for AY00-120 units the circulators are installed internally to the unit itself.

The available head at the hydraulic connections of the preassembled group should be considered net of internal pressure drops, in the units and in the hydraulic manifolds. Table 1.1 p. 7 provides the minimum residual head at the nominal flow in the largest configuration.

Table 1.1 Minimum residual head

	residual head [m w.c.]
Wilo Yonos 25/0,5-7	2,0
Wilo Yonos 25/0,5-10	3,5
Wilo Stratos Para 25/1-11	2,0
Wilo Stratos Para 25/1-12	5,0

See the design manual for more detailed flow, head and pressure drop data.

1.3 CODING

Each group is encoded with a series of letters and digits that distinguish its composition and configuration. In order:

1. (3 or 4 letters) = group type (eg RTAR, RTCF, RTAY, RTA,

RTY, ...), based on composing modules (GAHP A/AR/WS/GS, GA ACF/HR/TK/LB, AY00-120)

2. (2 or 3 digits) = cooling power, given by the sum of the cooling powers of the individual modules
3. (2 or 3 digits) = heat power, given by the sum of the heat powers of the individual modules
4. (_ /4 or /6) = number of pipes, i.e. delivery/return manifold pairs (1, 2 or 3)
5. (2 letters) = modules type
6. (_ S, S1) = standard or silenced fans (only for aerothermal units)
7. (MET/NAT, G25, GPL/LPG) = fuel gas (natural gas or LPG)
8. (2 or 3 letters) = country
9. (2 letters) circulators (with or without) and type (standard or oversize)
10. (1 letter) predispositions, if any

The 1.1 p. 9 table/figure exemplifies the meaning of the encoding in detail, providing the key for reading any possible composition and configuration, starting from an example.

Figure 1.1

1	2	3	4	5	6	7	8	9	10	<-- CAMPO/FIELD
RTRH	118	312	/6	HR	S	MET/NAT	ITA	VW		<-- NOME/LINK NAME
										Predisposizione
										descrizione
										NESSUNA Predisposizione
										A
										B
										C
										D
										E
										F
										G
										J
										K
										O
										OUTDOOR GS/WS
										Configurazione
										Configuration
										descrizione
										senza HR
										con HR, GS, WS
										lato C/F
										lato II°
										SC
										CV
										CW
										NN
										VN
										VV
										VW
										WN
										WV
										WW
										Paese
										ITA
										DE
										CH
										AT
										FR
										KR
										ES
										UK
										BE
										NL
										Alimentazione
										Gas supply
										descrizione
										MET/NAT
										G25
										GPL/LPG
										Ventilazione
										descrizione
										standard
										S o S1
										Versione
										Version
										descrizione
										AR, ACF STD, AY
										TK
										LB
										HR
										HT
										HT
										LT
										Tipo
										descrizione
										N° Tubi
										2 tubi
										/4
										/6
										4+2 (HR+AY)
										Calorie Caldo
										calorie
										UNIT/UNIT
										0
										72
										120
										133
										141
										120
										142
										128
										145
										Calorie Freddo
										calorie
										UNIT/UNIT
										60
										60
										58
										0
										A, GS, WS, AY
										Serie/Codice
										Serie/Code
										SERIE
										Codice
										Composizione
										RTAR
										F-GAR
										multiple di AR
										RTCF
										F-GCF
										multiple di ACF
										RTY
										F-YYC
										multiple di AY
										RTRH
										F-HRY
										HR-AR-AY
										RTAH
										F-HAR
										HR-AR
										RTRC
										F-FRY
										AR-ACF-AY
										RTRC
										F-ARC
										AR-ACF
										RTYR
										F-ARY
										AR-AY
										RTYH
										F-HFY
										HR-ACF-AY
										RTHF
										F-HCH
										HR-ACF
										RTYF
										F-GFY
										ACF-AY
										RTAY
										F-AAY
										A-AY
										...
										...
										...

1.4 DIMENSIONS AND WEIGHTS



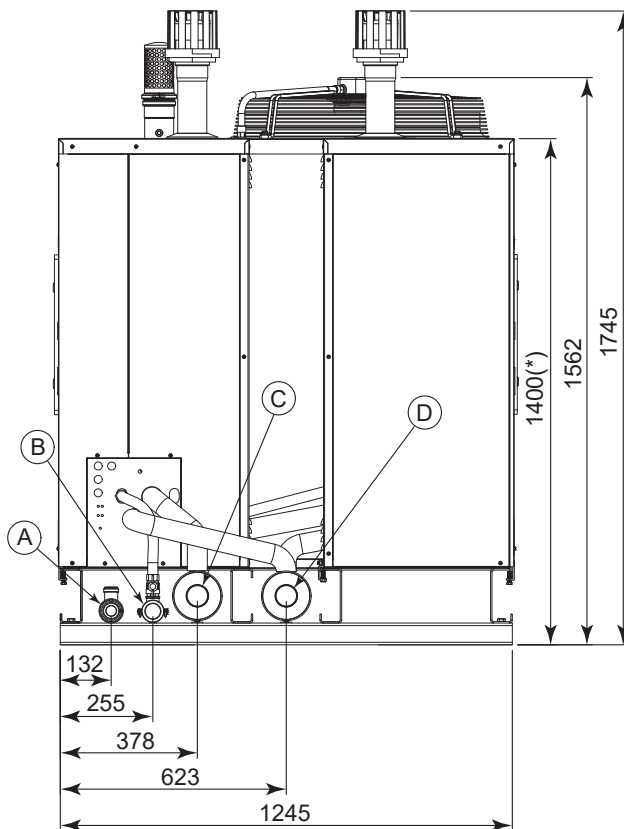
The dimensions are given for the maximum footprint configuration.



The weights are given for the maximum weight configuration.

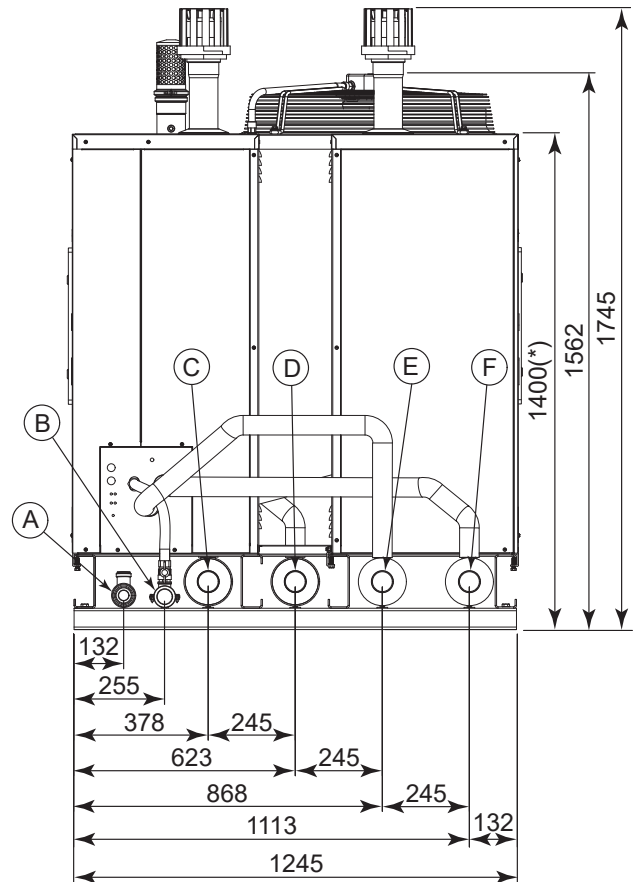
Hydraulic/gas connections

Figure 1.2 Position of water, gas and condensate discharge connections, for 2 pipes groups - Right side view



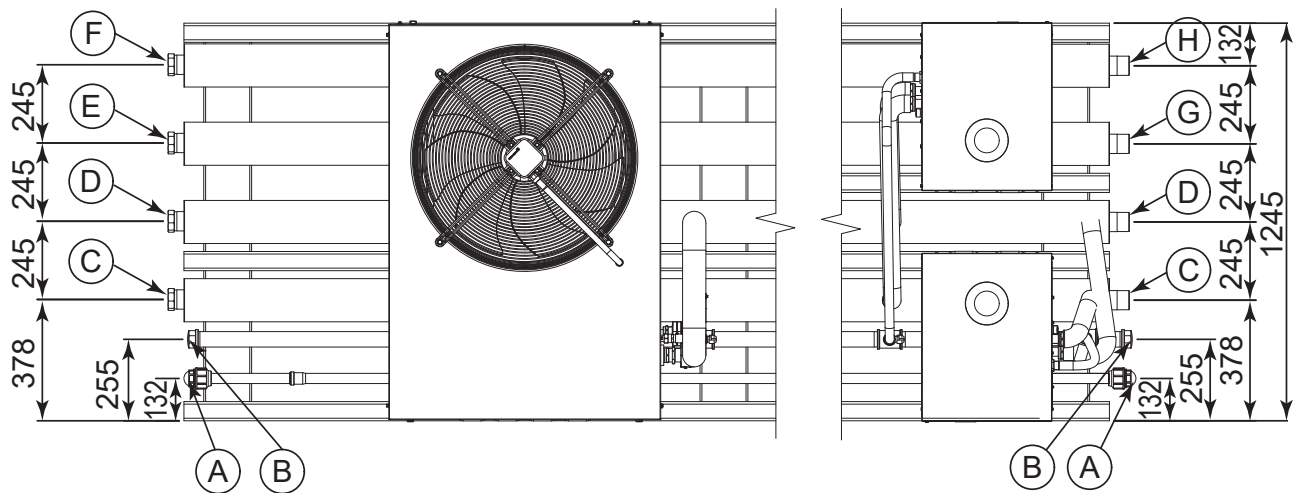
- A Condensate discharge connection [1" F] (only for groups with more than one condensing unit)
- B Gas connection [1 1/2" F]
- C Cold/hot water outlet [2" M]
- D Cold/hot water inlet [2" M]
- * The height of low-noise model is 1650 mm

Figure 1.3 Position of water, gas and condensate discharge connections, for 4 pipes groups - Right side view



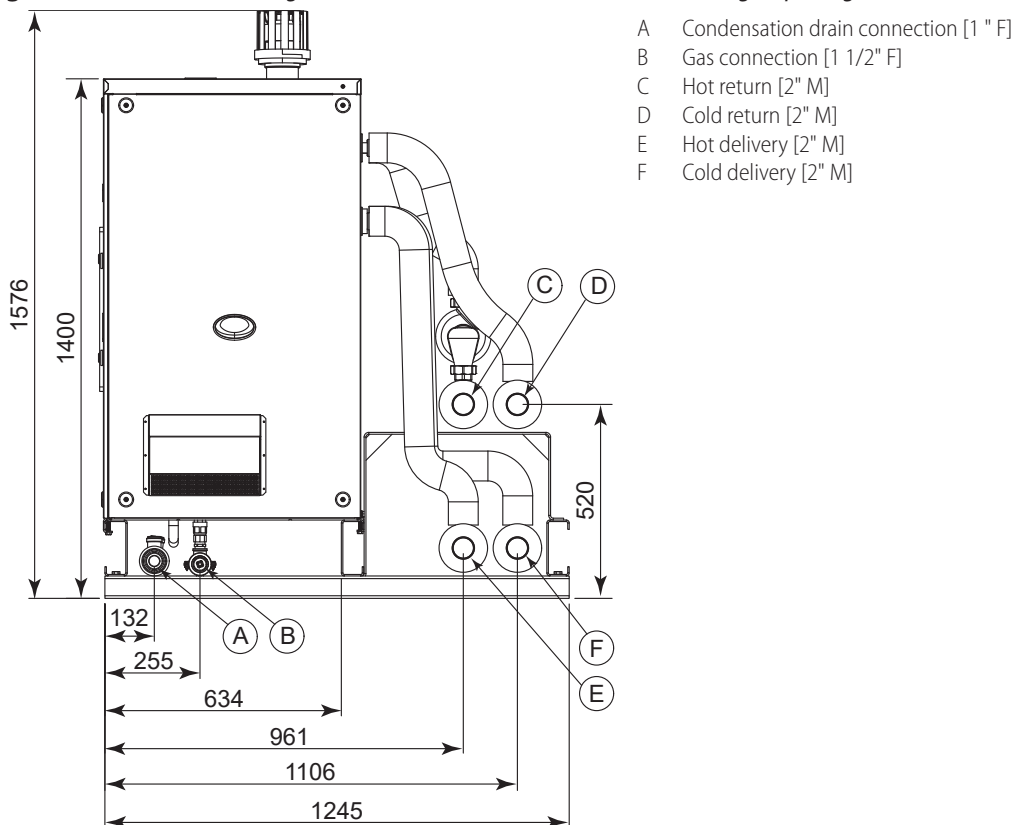
- A Condensate discharge connection [1" F] (only for groups with more than one condensing unit)
- B Gas connection [1 1/2" F]
- C Cold/hot water outlet [2" M]
- D Cold/hot water inlet [2" M]
- E Hot return [2" M]
- F Hot delivery [2" M]
- * The height of low-noise model is 1650 mm

Figure 1.4 Position of water, gas and condensate discharge connections, for 6 pipes groups - Top view



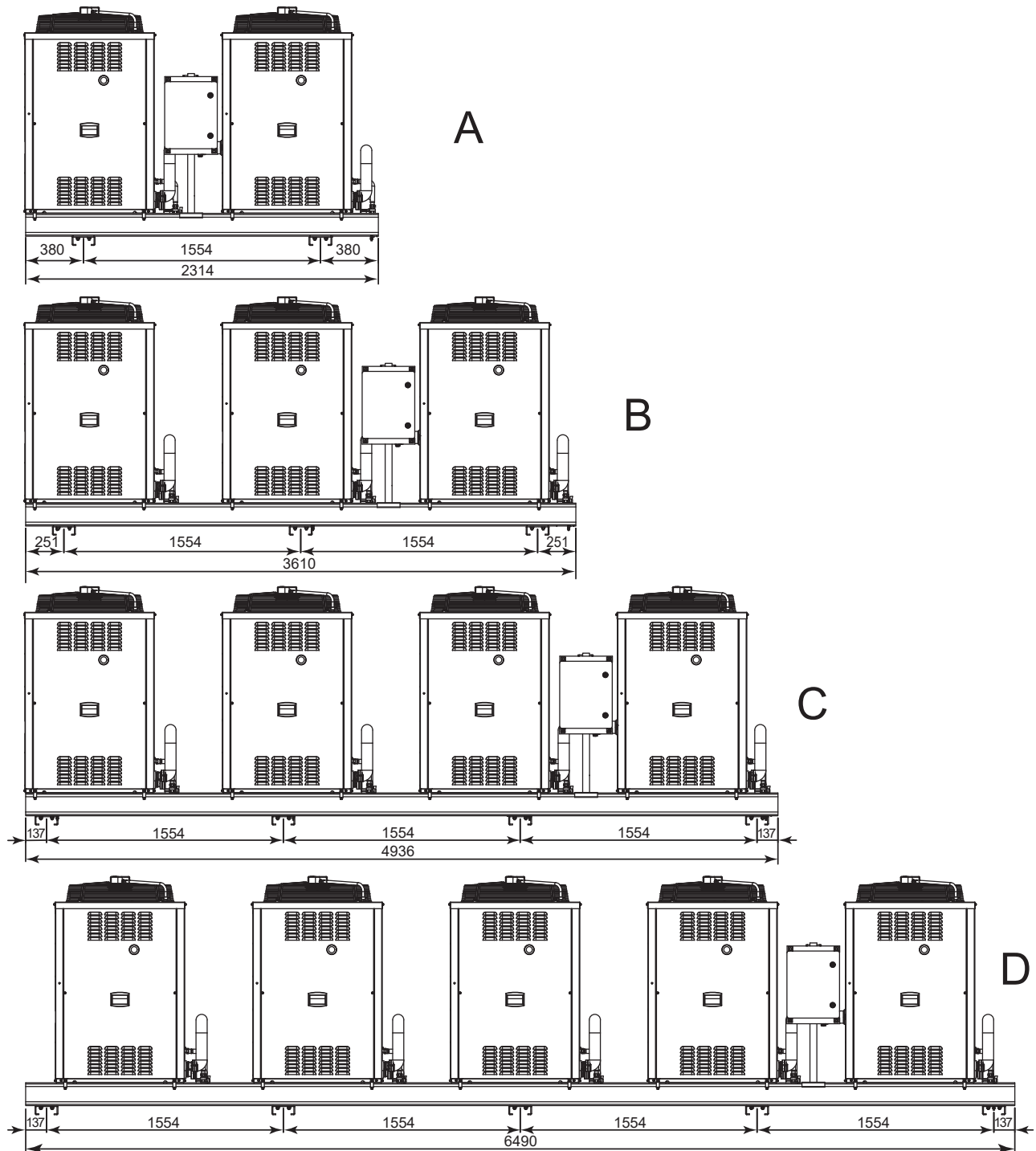
- A Condensate discharge connection [1" F] (only for groups with more than one condensing unit). Sloping manifold, strictly connect on right side
- B Gas connection [1 1/2" F]
- C Cold/hot water outlet [2" M]
- D Cold/hot water inlet [2" M]
- E ACF HR recovery hot return (only left connection) [2" M]
- F ACF HR recovery hot delivery (only left connection) [2" M]
- G Hot return (only right connection) [2" M]
- H Hot delivery (only right connection) [2" M]

Figure 1.5 Position of water, gas and condensate connections for RTGS/WS groups - Right side view



- A Condensation drain connection [1" F]
- B Gas connection [1 1/2" F]
- C Hot return [2" M]
- D Cold return [2" M]
- E Hot delivery [2" M]
- F Cold delivery [2" M]

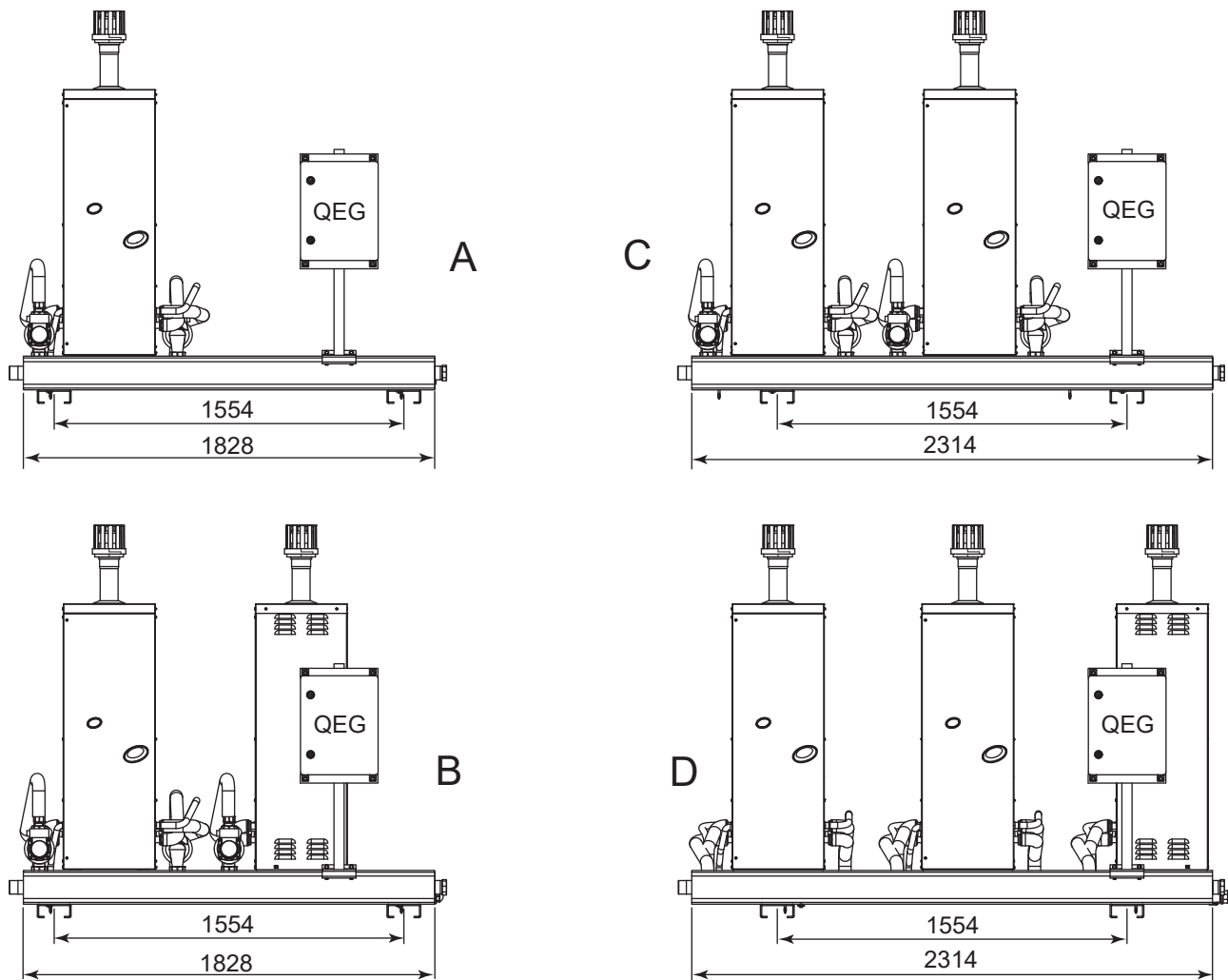
Figure 1.6 Dimensions and weights of ACF/A/AR preassembled group (with 2, 3, 4 and 5 units) - front view



A 960 kg
B 1440 kg

C 1920 kg
D 2410 kg

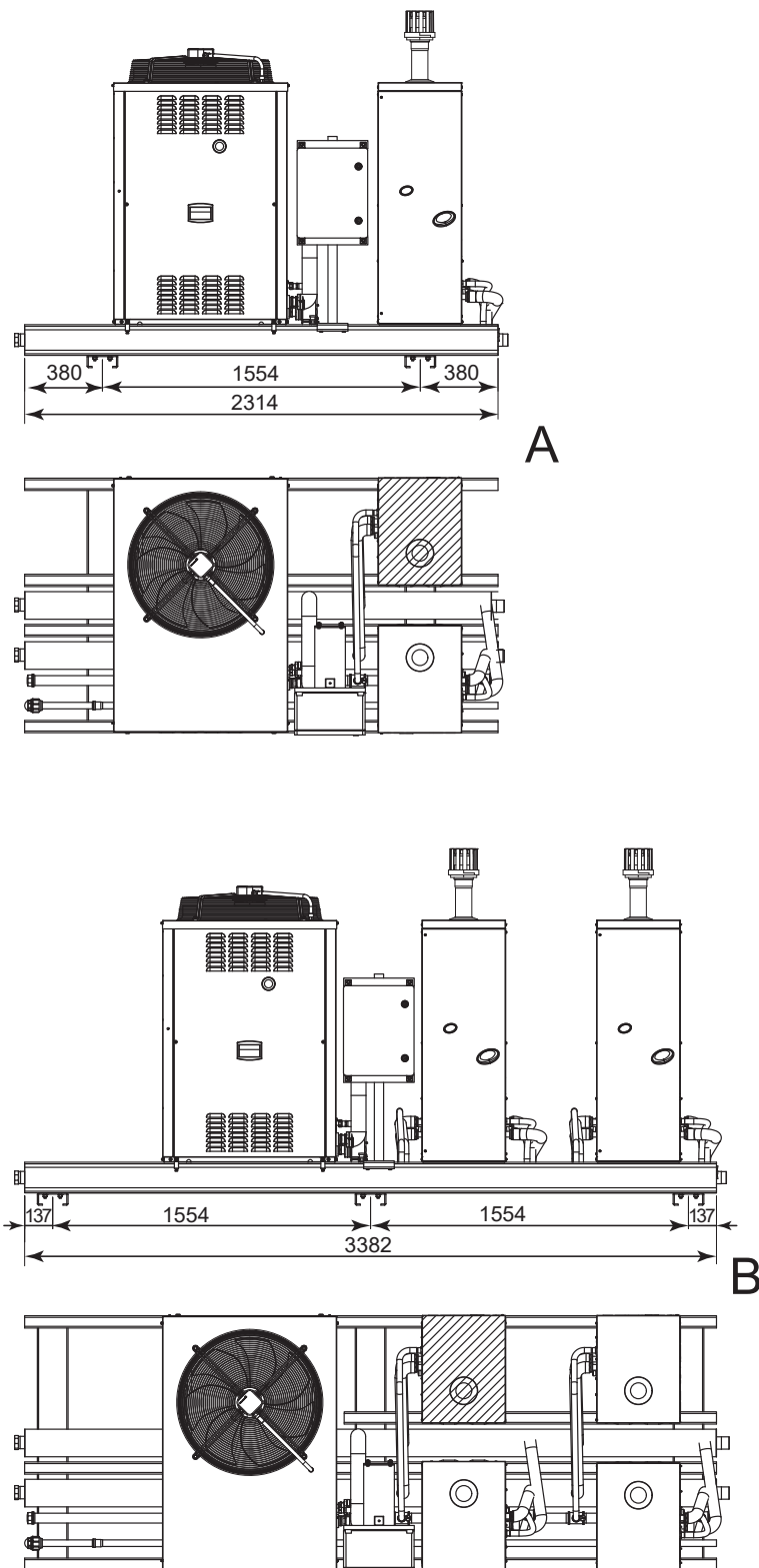
Figure 1.7 Dimensions and weights of AY preassembled group (with 2, 3, 4 and 5 units) - front view



- A 2 AY 330 kg
- B 3 AY 450 kg
- C 4 AY 580 kg
- D 5 AY 700 kg

Note: The weight refers to links configured with oversize circulators

Figure 1.8 Dimensions and weights of ACF/A/AR + AY preassembled group (with 1+1, 1+2, 1+3, 1+4 units) - front and top view



A 1+2 790 kg (*)

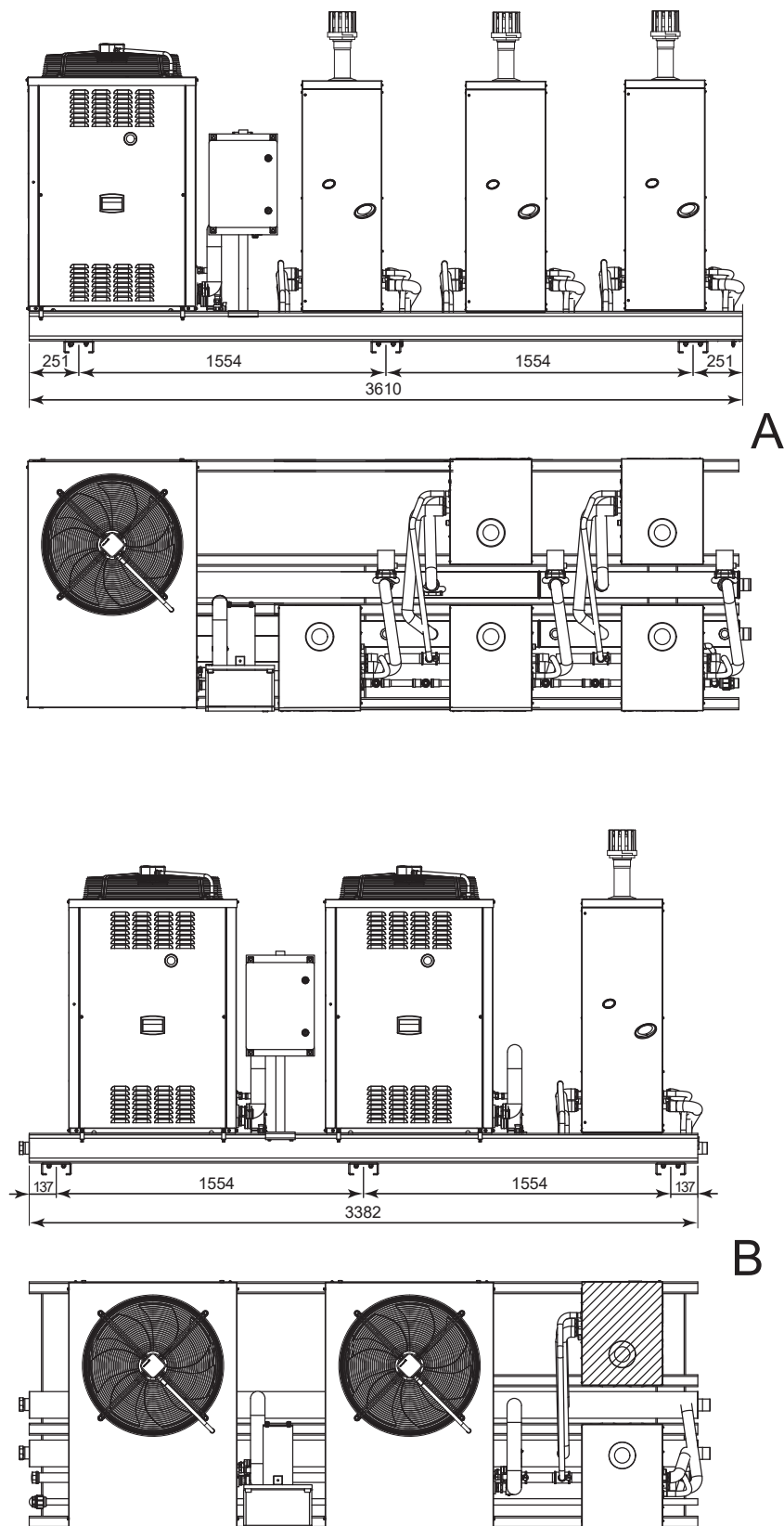
B 1+3 970 kg 1+4 1070 kg (*)

(*) The weight refers to a 2 pipe link (silent ventilation, "S"), configured with oversize circulators



The GAHP/GA + 1 AY00-120 configurations are replaced by the Gitié units.

Figure 1.9 Dimensions and weights of ACF/A/AR + AY preassembled group (with 1+5, 2+1 and 2+2 units) - front and top view



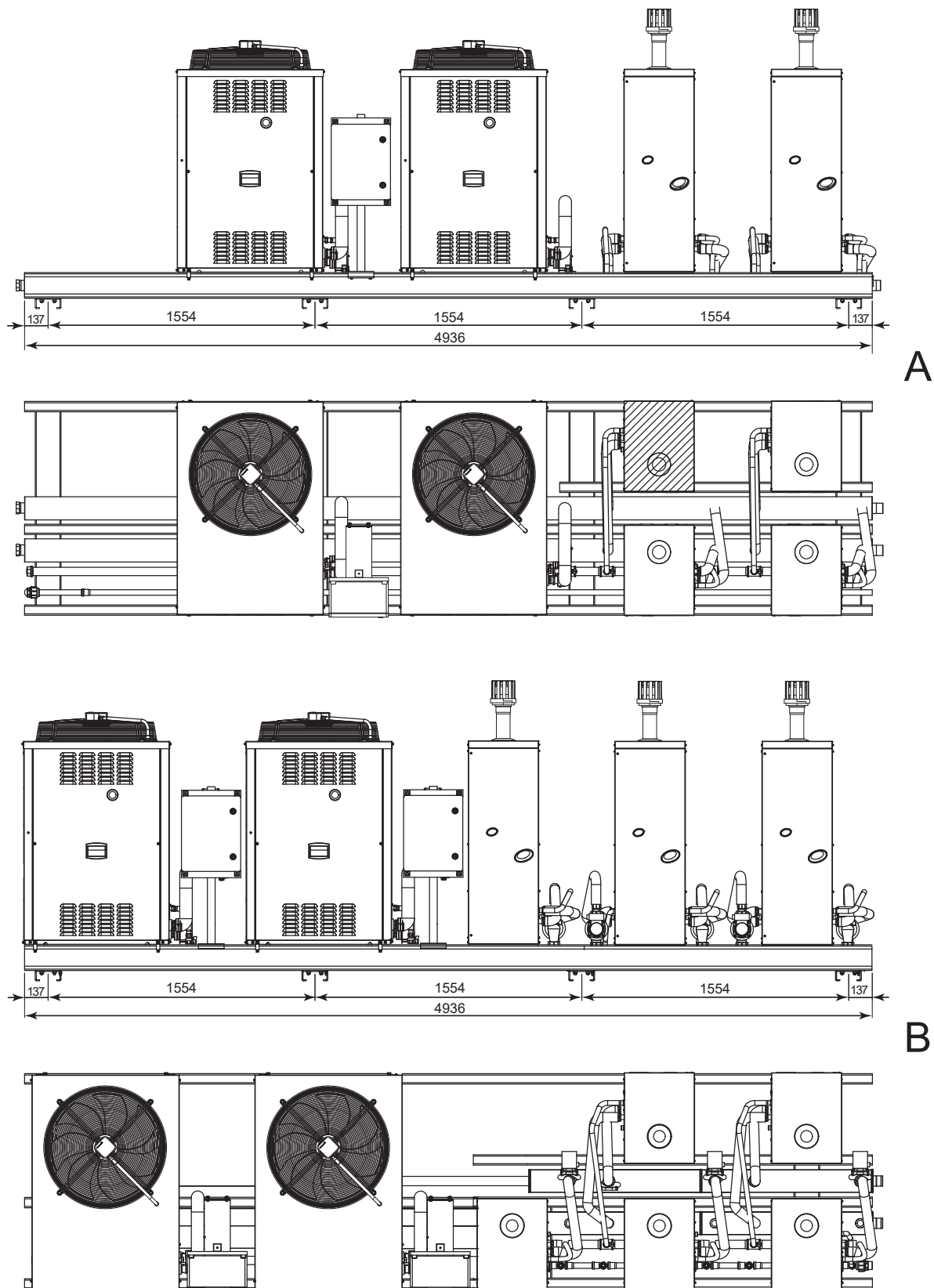
A 1+5 1210 kg (**)

B 2+1 1150 kg (*) 2+2 1270 kg (*)

(*) The weight refers to a 2 pipe link (silent ventilation, "S"), configured with oversize circulators

(**) The weight refers to a 4 pipe link (silent ventilation, "S"), configured on both circuits with oversize circulators

Figure 1.10 Dimensions and weights of ACF/A/AR + AY preassembled group (with 2+3, 2+4 and 2+5 units) - front and top view



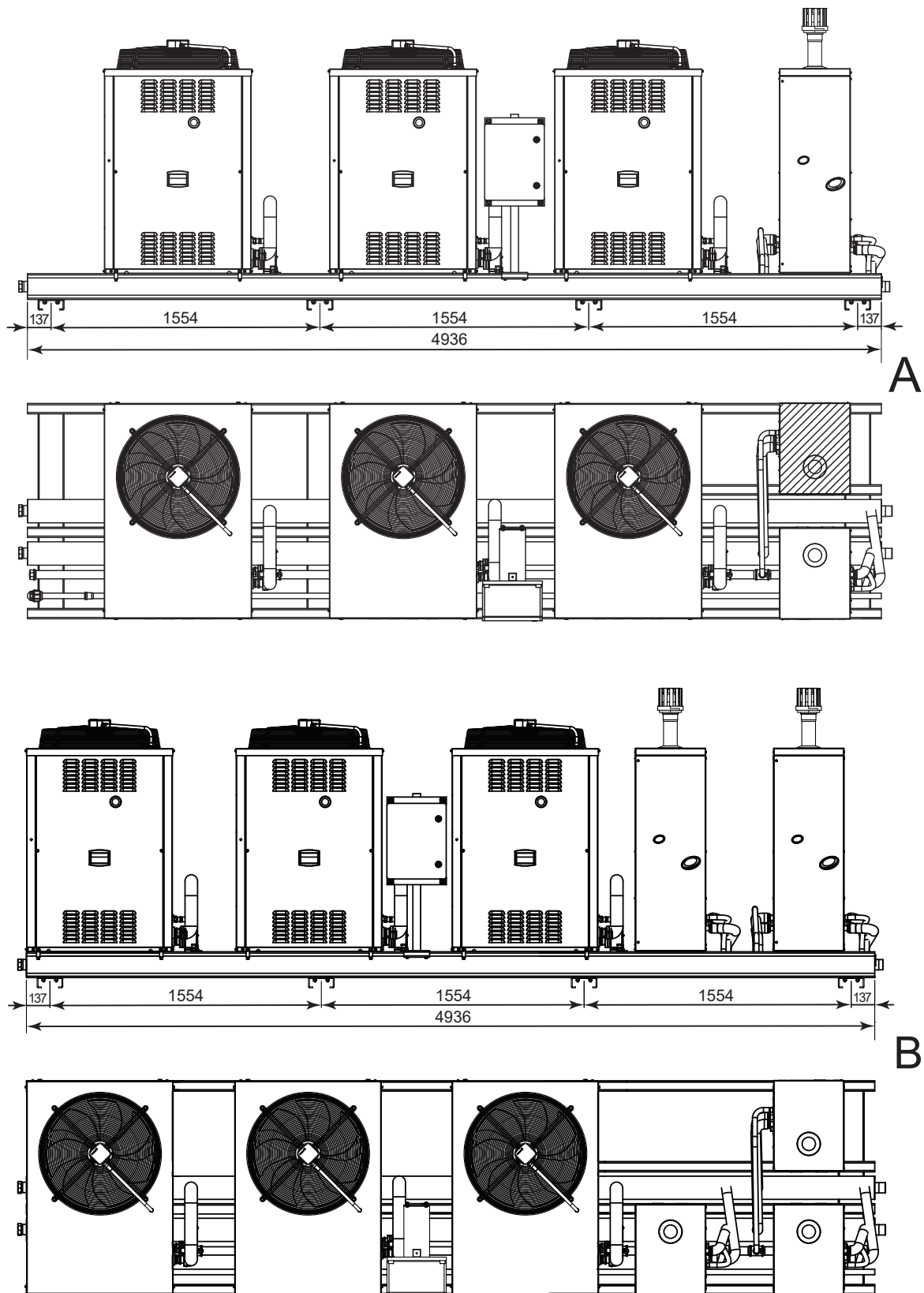
A 2+3 1460 kg (*) 2+4 1560 kg (**)

B 2+5 1700 kg (**)

(*) The weight refers to a 2 pipe link (silent ventilation, "S"), configured with oversize circulators

(**) The weight refers to a 4 pipe link (silent ventilation, "S"), configured on both circuits with oversize circulators

Figure 1.11 Dimensions and weights of ACF/A/AR + AY preassembled group (with 3+1, 3+2 and 3+3 units) - front and top view



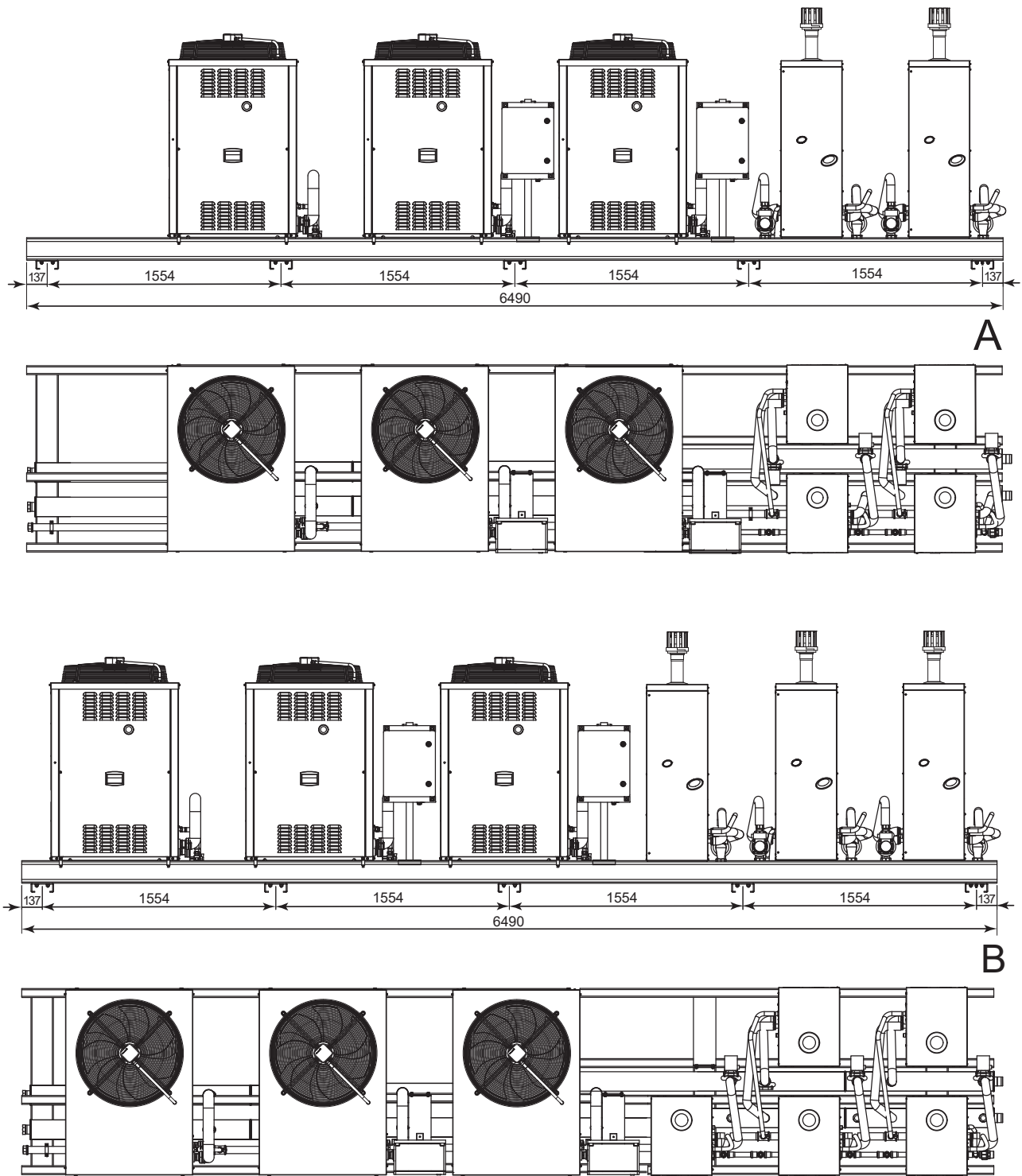
A 3+1 1630 kg (*) 3+2 1750 kg (*)

B 3+3 1880 kg (**)

(*) The weight refers to a 2 pipe link (silent ventilation, "S"), configured with oversize circulators

(**) The weight refers to a 4 pipe link (silent ventilation, "S"), configured on both circuits with oversize circulators

Figure 1.12 Dimensions and weights of ACF/A/AR + AY preassembled group (with 3+4 and 3+5 units) - front and top view

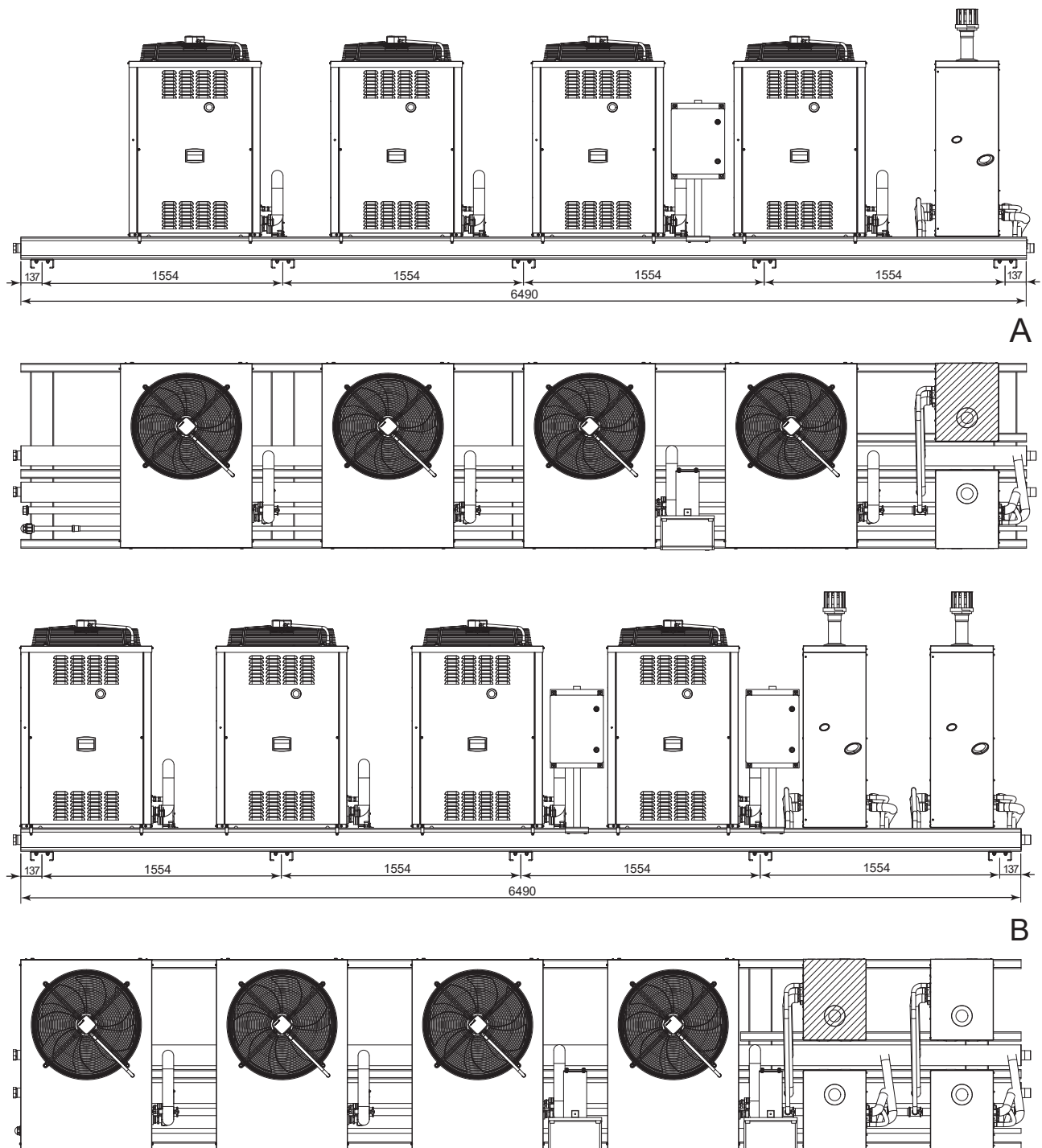


A 3+4 2060 kg (*)

B 3+5 2190 kg (*)

(*) The weight refers to a 4 pipe link (silent ventilation, "S"), configured on both circuits with oversize circulators

Figure 1.13 Dimensions and weights of ACF/A/AR + AY preassembled group (with 4+1, 4+2, 4+3 and 4+4 units) - front and top view



A 4+1 2120 kg (*) 4+2 2240 kg (**)

B 4+3 2380 kg (**) 4+4 2480 kg (**)

(*) The weight refers to a 2 pipe link (silent ventilation, "S"), configured with oversize circulators

(**) The weight refers to a 4 pipe link (silent ventilation, "S"), configured on both circuits with oversize circulators

1.5 ROMA VALVE

Preassembled groups equipped with water circulation pumps are also equipped with a check valve, mounted downstream of each water circulation pump, equipped

with air vent valves, as detailed in the following Figure 1.14 p. 20 for the GAHP/GA units and in the following Figure 1.15 p. 20 for the AY00-120 units.

Figure 1.14 Roma valve GAHP/GA units

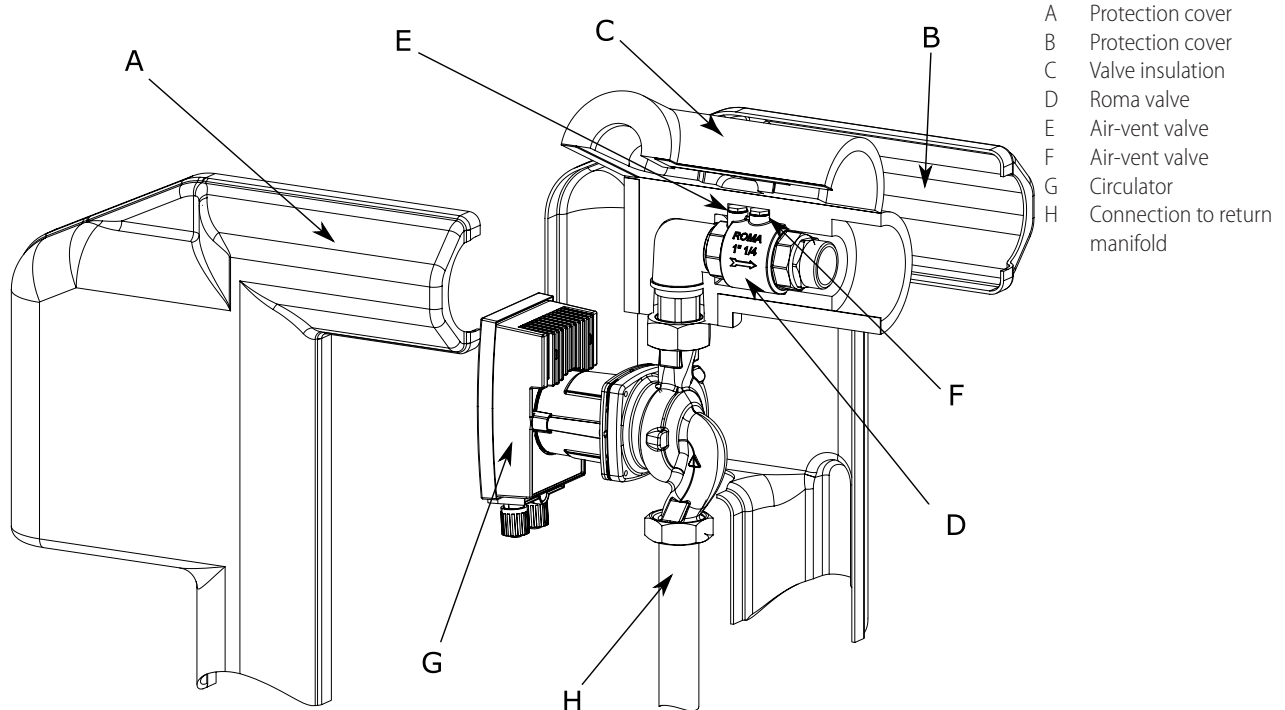
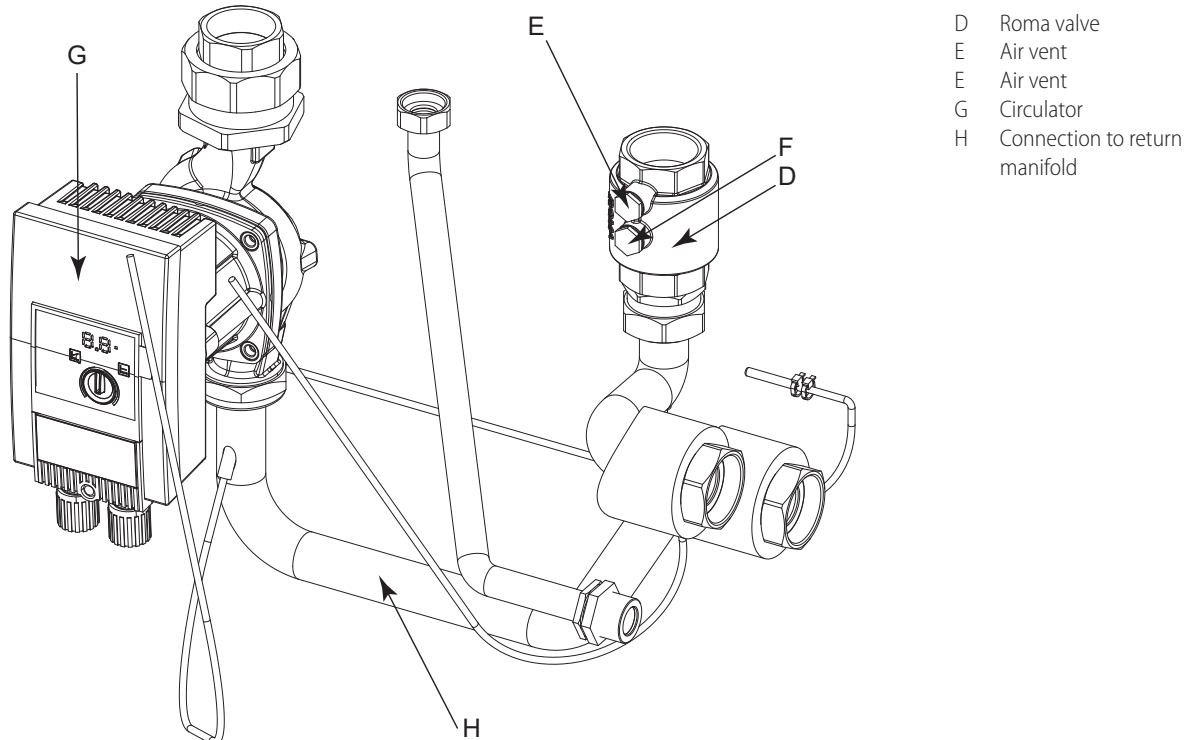


Figure 1.15 Roma valve AY00-120 units

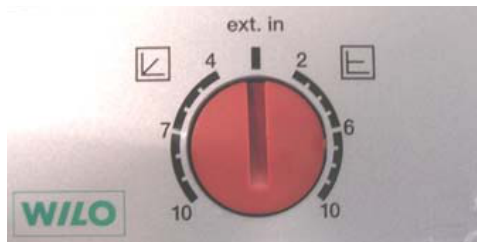


1.6 INDEPENDENT CIRCULATORS SELECTOR SWITCH SETTINGS

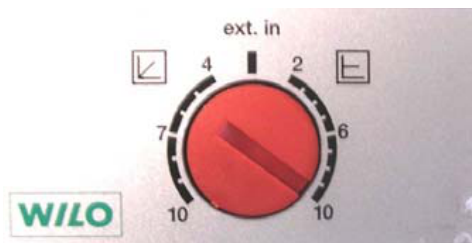
In the RT__ Links already provided with circulators, each circulator is provided with a selector switch to determine the driving mode of the circulator itself.

For Wilo Stratos Para circulators (available as optional), the selector switch is set as shown in Figure 1.16 p. 21, depending on the type of unit to which the circulator is connected.

Figure 1.16 Wilo Stratos Para circulator selector switch setting



A



B

- A GAHP A, GAHP GS/WS
B GAHP-AR, GA ACF, AY00-120

For Wilo Yonos Para circulators (standard on RT__ Links already provided with circulators) the selector switch must be set as shown in Figure 1.17 p. 21.

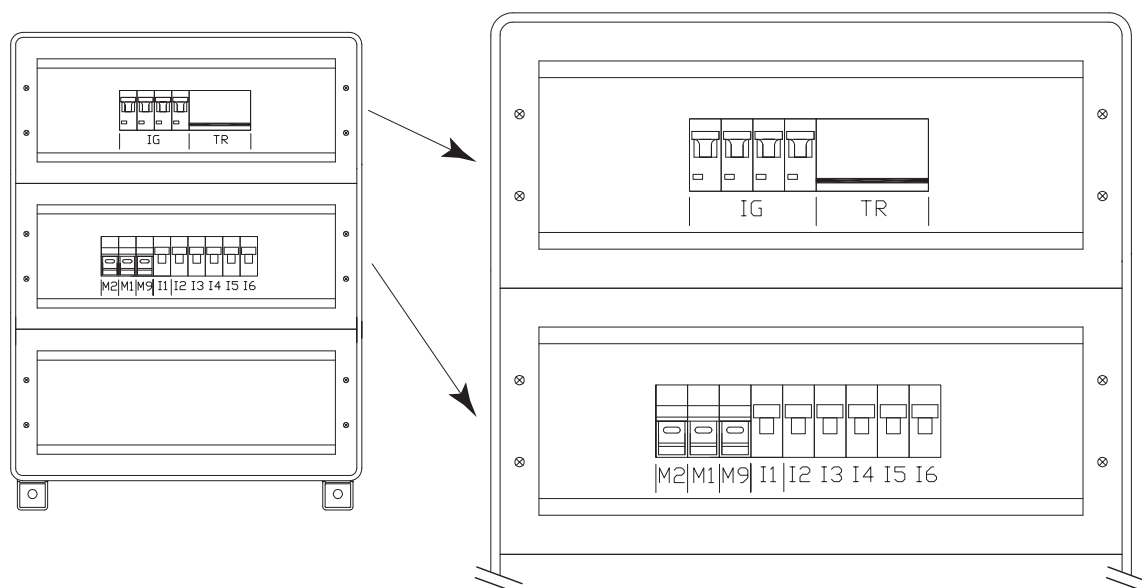
Figure 1.17 Wilo Yonos circulator selector switch setting



1.7 ELECTRICAL SPECIFICATIONS

Group electrical panel

Figure 1.18 Group electrical panel



IG Group electrical panel (QEG) switch disconnect

TR Transformer 230/24 Vac

M9 Transformer primary fuse

M2 Condensate heating resistance protection fuse

M9 Transformer secondary fuse

A Blind panel (for detail of internal terminal blocks see specific figure)

I1 "ID00" unit magnetothermic breaker

I2 "ID01" unit magnetothermic breaker

I3 "ID02" unit magnetothermic breaker

I4 "ID03" unit magnetothermic breaker

I5 "ID04" unit magnetothermic breaker

I6 "ID05" unit magnetothermic breaker

Note: the components within the QEG may have an order and/or position other than the one shown in the figure

Internal wiring diagrams

For the wiring diagrams of the internal cabling of the pre-assembled group, see the examples of some representative RT__ Link models, in the Appendix 9.1 p. 46.

Power supply

The power supply of preassembled groups is 400 V three-phase or 230 V single-phase.

Protection rating

Preassembled groups have degree of protection IP X5D.

1.8 ELECTRONIC BOARDS

Electronic boards

Each module/unit GAHP/GA/AY belonging to the group has one or more electronic boards (S61/Mod10/W10/AR11/AY10/S70) inside it. The boards are pre-wired, interconnected and connected to the electrical panel of the group via a CAN bus signal cable. For the characteristics of the boards, see the manuals of the individual GAHP/GA/AY units.

1.9 OPERATION MODE

ON/OFF or modulating operation

Depending on the types, the GAHP/GA/AY modules present on a RT__ Link can work in one of the two following ways:

- Mode (1) ON/OFF, i.e. ON (at full power) or OFF, with circulating pump at constant or variable flow.
- Mode (2) MODULATING, i.e. at variable load from 50% to 100% of heating capacity, with circulating pump at variable flow.

The GAHP A, GAHP GS/WS modules can operate both in mode (1) and mode (2).

GAHP-AR, GA ACF/HR/TK, and AY00-120 modules can only operate in mode (1).

For each mode, (1) or (2), specific control systems and devices are provided (Paragraph 1.10 p. 22).

1.10 CONTROLS

Control device

The preassembled group can only work when connected to a control device, chosen from:

1. **DDC controller** (for ON/OFF operation)
2. **CCP/CCI controller** (for modulating operation, only for A/WS/GS)

For connection the selected device to the RT__ Link electrical panel (Figure 4.4 p. 36), see Paragraph 4.4 p. 35.

1.10.1 Control system (1) with DDC (GAHP unit ON/OFF)

The DDC controller is able to control appliances, a single GAHP unit, or even several Robur GAHP/GA/AY units in cascade, only in ON/OFF mode (non modulating). For more details refer to the DDC, RB100, RB200 Manuals and the Design Manual.

DDC Controller

The main functions are:

- ▶ Adjustment and control of one (or more) Robur units of the absorption line (GAHP, GA, AY).
- ▶ Data display and parameters setting.
- ▶ Hourly programming.
- ▶ Climatic curve control.
- ▶ Diagnostics.
- ▶ Errors reset.
- ▶ Possibility to interface with a BMS.

DDC functionality may be extended with auxiliary Robur devices RB100 and RB200 (e.g. service requests, DHW production, third party generator control, probe control, system valves or circulating pumps, ...).

1.10.2 Control system (2) with CCP/CCI (modulating GAHP unit)

The CCP/CCI control is able to control up to 3 GAHP units in modulating mode (therefore GAHP A/GAHP GS/WS), plus any integration ON/OFF boiler. For further details and diagrams refer to the CCP/CCI Manual and the design manual.

CCP/CCI Control



See CCP/CCI device Manual.

1.11 TECHNICAL DATA

Refer to the technical data of the individual GAHP/GA/AY modules making up the group.

2 TRANSPORT AND POSITIONING

2.1 WARNINGS



Damage from transport or installation

The manufacturer shall not be liable for any damage during appliance transport and installation.



On-site inspection

- Upon arrival at the site, ensure there is no transport damage on packing, preassembled group, metal panels or finned coils of the appliances that make up it.
- After removing the packing materials, ensure the preassembled group is intact and complete.



Packing

- Only remove the packing after placing the preassembled group on site.
- Do not leave parts of the packing within the reach of children (plastic, polystyrene, nails...) since they are potentially dangerous.



Weight

- The crane and lifting equipment must be suitable for the load.
- Do not stand under suspended loads.



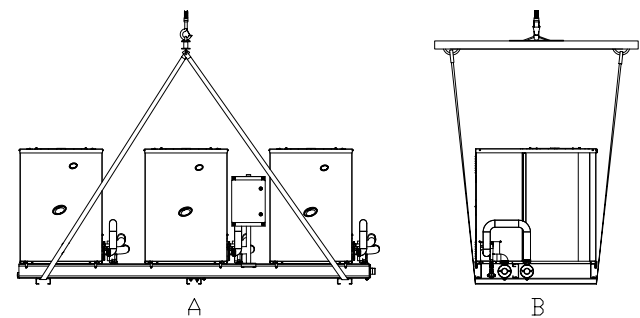
For weight, refer to Figures from 1.6 p. 12 to 1.13 p. 19.

2.2 HANDLING

Handling and lifting

- ▶ Always handle the preassembled group in its packing, as delivered by the factory.
- ▶ To lift the assembled group use straps or slings inserted in the holes of the base (Figure 2.1 p. 23).
- ▶ Use lifting beams to avoid damaging the outer panels and the finned coils (Figure 2.1 p. 23)
- ▶ Comply with safety regulations at the installation site.

Figure 2.1 Instruction for lifting



A Front view

B Side view



In the event of handling with forklift or pallet truck, comply with the handling instructions shown on the packing.

2.3 GROUP POSITIONING



Do not install the aerothermal RT__ Links inside

a room

The aerothermal RT__ Links include devices equipped with finned coils and fan, approved for outdoor installation.

- Do not install the aerothermal RT__ Links inside a room, not even if it has openings.
- In no event start the aerothermal RT__ Link inside a room.

**Ventilation of aerothermal RT__ Links**

- The aerothermal RT__ Links require a large space, ventilated and free from obstacles, to enable smooth flow of air to the finned coil and free air extraction from the fan outlet, with no air recirculation.
- Incorrect ventilation may affect efficiency and cause damage to the preassembled group.
- The manufacturer shall not be liable for any incorrect choices of the place and setting of installation.

Defrosting water drainage of RT__ aerothermal Links

In winter, in the aerothermal RT__ Links with GAHP A/AR units, frost may form on the finned coils and the aerothermal appliances perform defrosting cycles.

- To prevent overflowing and damage provide for a drainage system.

Where to install the preassembled group for outdoor versions

In general, for all RT__ Links:

- They can be installed at ground level, on a terrace or on a roof, if compatible with their dimensions and weight.
- They must be out of the dripping line from gutters or similar. They do not require protection from atmospheric agents.
- No obstruction or overhanging structure (protruding roofs, eaves, balconies, ledges, trees) shall obstruct the exhaust fumes.
- The group flue gas exhaust must not be immediately close to openings or air intakes of buildings, and must comply with environmental regulations.

In particular, for aerothermal RT__ Links:

- They must be installed outside buildings, in an area of natural air circulation.
- No obstruction or overhanging structure (e.g. protruding roofs, canopies, balconies, ledges, trees) must interfere with the air flowing out from the top of the appliances fitted with fans.
- Do not install near the exhaust of flues, chimneys or hot polluted air. In order to work correctly, aerothermal appliances require clean air.

Acoustic issues

- Pre-emptively assess the group's sound effect in connection to the site, taking into account that building corners, enclosed courtyards, restricted spaces may amplify the acoustic impact due to the reverberation

phenomenon.

Machine room requirements for hydrothermal or geothermal RT__ Links

Hydrothermal and geothermal RT__ Links (made up by GAHP GS/WS modules) and the AY00-120 boilers links as well may be installed either indoors or outdoors.

In the event of indoor installation, the installation premises must comply with the applicable local standards.



Do not install inside a room that has no aeration openings.

Please refer to the manuals of the individual units suitable for indoor installation, supplied with the links, for further important prescriptions on the technical room.

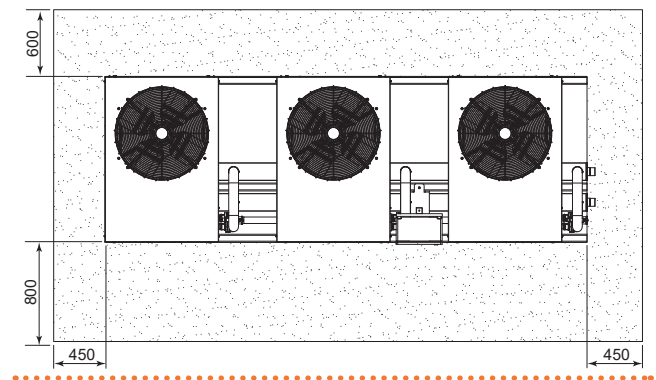
2.4 MINIMUM CLEARANCE DISTANCES**Distances from combustible or flammable materials**

- Keep the group away from combustible or flammable materials or components, in compliance with applicable regulations.

Clearances around the preassembled group

The minimum clearance distances shown in Figure 2.2 p. 24 (bar any stricter regulations) are required for safety, operation and maintenance.

Figure 2.2 Minimum clearance distances

**2.5 MOUNTING BASE****Mounting base constructive features**

- Place the preassembled group on a level flat surface made of fireproof material and able to withstand its weight.

(1) - installation at ground level

- Failing a horizontal supporting base, make a flat and level concrete base, at least 150 mm larger than the group dimensions on each side.

(2) - installation on terrace or roof

- The structure of the building must support the total weight of the group and the mounting base.
- If necessary, provide a maintenance walkway around

the preassembled group.

Anti vibration connections and mountings

Although the group vibrations are minimal, resonance

phenomena might occur in roof or terrace installations.

- Use anti-vibration mountings.
- Also provide anti-vibration joints between the preassembled group and water and gas pipes.

3 HEATING ENGINEER

3.1 WARNINGS



General warnings



Read the warnings in Chapter III.1 p. 4, providing important information on regulations and on safety.



Compliance with installation standards

Installation must comply with applicable regulations in force, based on the installation Country and site, in matters of safety, design, implementation and maintenance of:

- heating systems
- cooling systems
- gas systems
- electrical systems
- flue gas exhaust
- flue gas condensate discharge



Installation must also comply with the manufacturer's provisions.



GAHP/GA/AY modules

As far as the individual GAHP/GA/AY modules belonging to the preassembled group are concerned, read the relevant warnings and dangers in their respective Manuals (attached).

3.2 HYDRAULIC SYSTEM

Design and implementation

- The system must be designed and realized in a congruent way with the features and functionality of the RT__ Link.
- For the appropriate system design, the following must be considered: the characteristics of individual heating/cooling appliances (GAHP/GA/AY modules/units) that make up the group; the configuration of the manifolds and hydraulic connections; the endowment (or not) of circulators.
- For detailed information, please refer to the Design Manual and/or contact the Robur technical service.

Primary and secondary circuit

- In many cases it is advisable to divide the hydraulic

system into two parts, primary and secondary circuit, uncoupled by a hydraulic separator, or possibly by a tank that also acts as inertial tank/buffer.

Water flow

The preassembled group can be:

- already fitted with circulating pumps for each individual appliance/module (preferable configuration in a number of applications)

or

- without circulating pumps, in which case it is required to install at least one common circulation pump, on the primary circuit (option to be assessed carefully)

Hydraulic diagrams RT__ Links with circulating pumps

Preferable in many applications. Some examples are shown in the figures 3.1 p. 26 and 3.3 p. 28.

Hydraulic diagrams RT__ Links without circulating pumps

These applications must be evaluated with particular care. The common circulation pump is not provided with the link. Some examples are shown in the figures 3.2 p. 27 and 3.4 p. 29.

Minimum water content and buffer tank

A high thermal inertia of the system favors the efficient operation of the appliances that are part of the group. Very short ON/OFF cycles must be avoided.

- If necessary, provide for an inertial volume, to be suitably sized (see design manual).

3.3 HYDRAULIC CONNECTIONS

Plumbing fittings

The configuration of the hydraulic connections depends on the composition of the preassembled group. Refer to Paragraph p. 10.

The following Table 3.1 p. 25 shows the dimensions of the hydraulic and condensate drain connections.

Table 3.1 Fittings diameter

Installation data	
Gas fitting diameter	1 1/2" F
Water fittings diameter (inlet/outlet)	2" M
Condensation discharge fitting diameter	1" F

The hydraulic connections are arranged on the right side of the preassembled unit but can be moved to the left side by moving the blind plugs (unscrew and screw back on the opposite side), except for the connection for the

condensation discharge which is sloping and therefore can only be made from the right side.
(Figures 1.2 p. 10, 1.3 p. 10, 1.4 p. 11, 1.5 p. 11).

Hydraulic pipes, materials and features

- Use pipes for heating/cooling installations, protected from weathering, insulated for thermal losses, with vapour barrier to prevent condensation.



Pipe cleaning

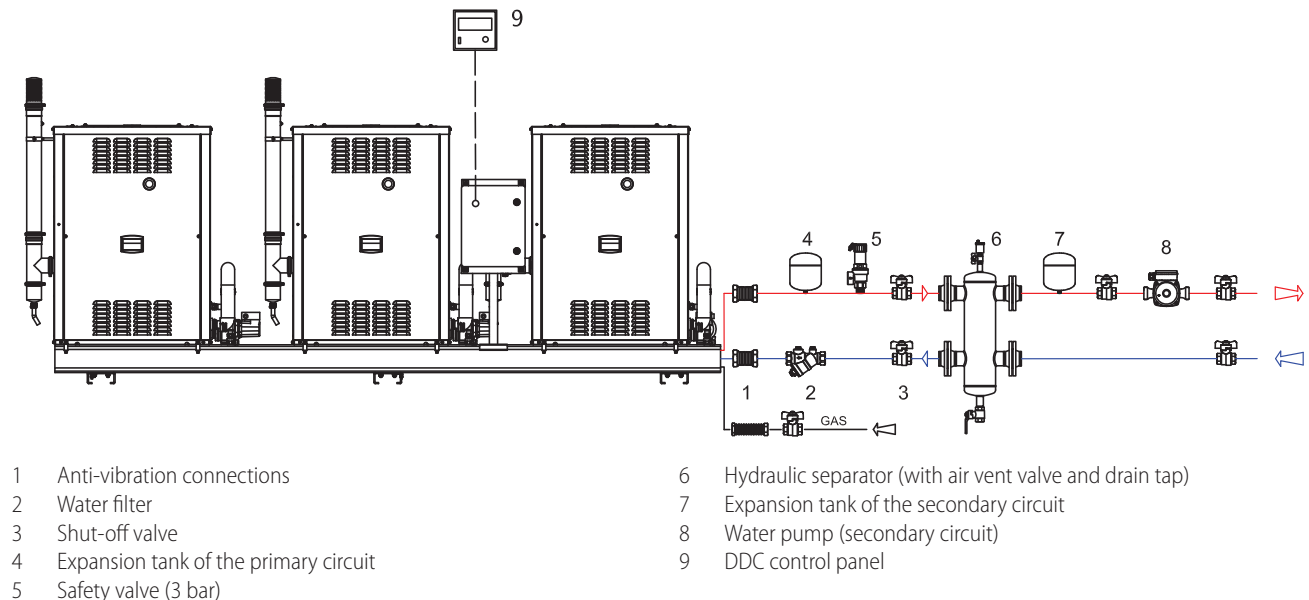
- Before connecting the preassembled group, accurately wash the water and gas piping and any other system component, removing any residue.

Minimum components of primary plumbing circuit

Always provide, near the hydraulic connections of the

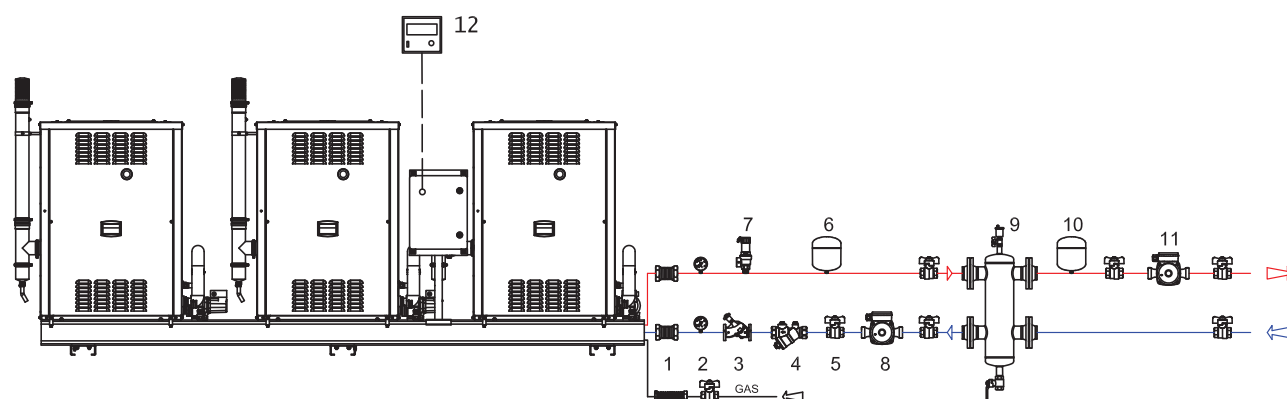
Hydraulic diagrams

Figure 3.1 Example of hydraulic system diagram for connection of 1 RTCR, version with circulating pumps



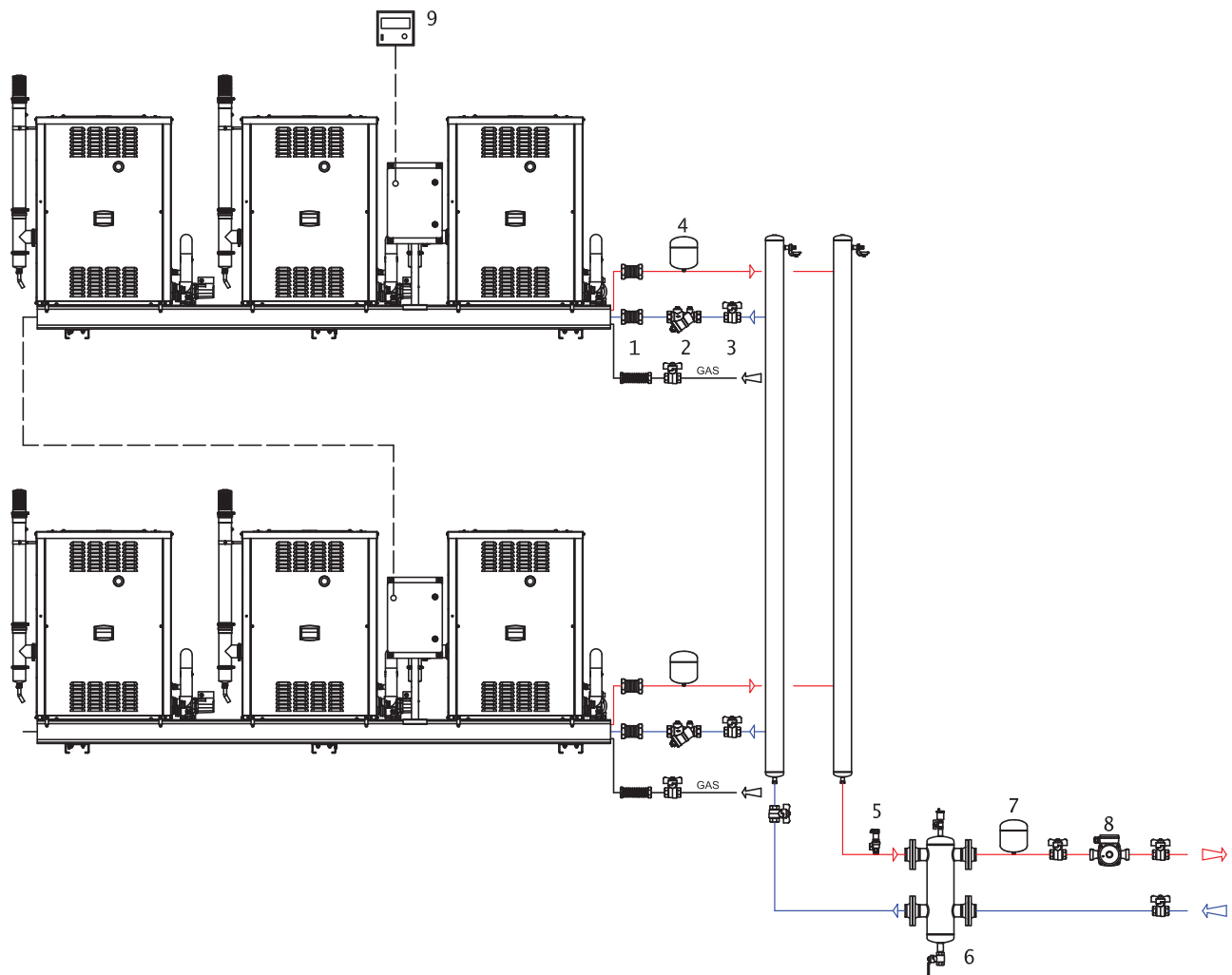
For the maximum available pressure head see Table 1.1 p. 7.

Figure 3.2 Example of hydraulic system diagram for connection of 1 RTCR, version without circulating pumps



- | | |
|---|---|
| 1 Anti-vibration connections | 7 Safety valve (3 bar) |
| 2 Pressure gauge | 8 Water pump (primary circuit) |
| 3 Flow regulator valve | 9 Hydraulic separator (with air vent valve and drain tap) |
| 4 Water filter | 10 Expansion tank of the secondary circuit |
| 5 Shut-off valve | 11 Water pump (secondary circuit) |
| 6 Expansion tank of the primary circuit | 12 DDC control panel |

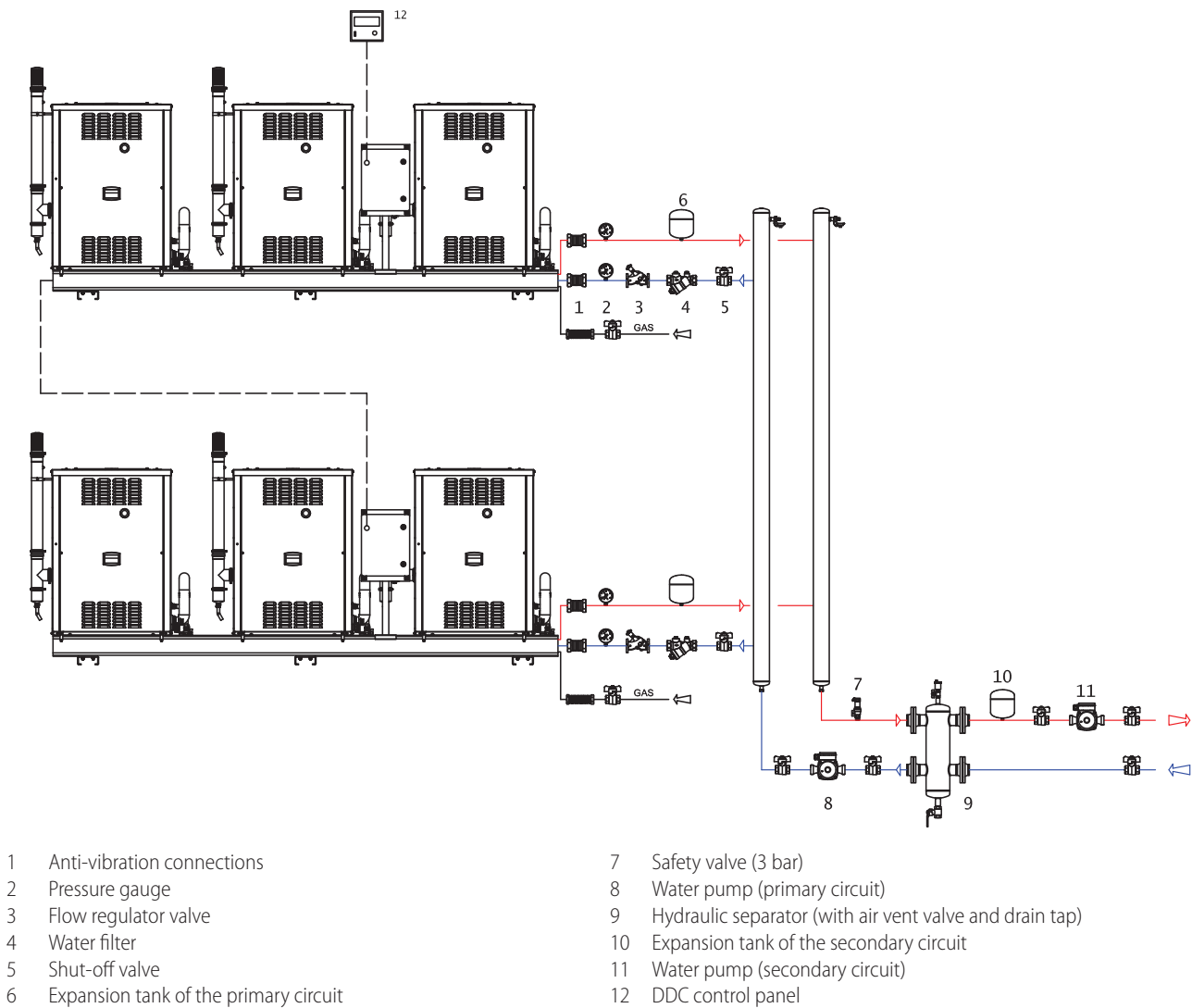
Figure 3.3 Example of hydraulic system diagram for connection of 2 RTCR, version with circulating pumps



- | | |
|---|---|
| 1 Anti-vibration connections | 6 Hydraulic separator (with air vent valve and drain tap) |
| 2 Water filter | 7 Expansion tank of the secondary circuit |
| 3 Shut-off valve | 8 Water pump (secondary circuit) |
| 4 Expansion tank of the primary circuit | 9 DDC control panel |
| 5 Safety valve (3 bar) | |

For the maximum available pressure head see Table 1.1 p. 7.

Figure 3.4 Example of hydraulic system diagram for connection of 2 RTCR, version without circulating pumps



3.4 ANTIFREEZE FUNCTION

Active antifreeze self-protection

The appliances (GAHP/GA/AY modules/units) that make up a preassembled group are equipped with an antifreeze active self-protection system to prevent freezing. The antifreeze function automatically starts the primary circulation pumps, and if necessary also the burners (heat pumps and boilers only), when the outside temperature approaches zero. Antifreeze function is enabled by default for hot units and deactivated for cold units.



Electrical and gas continuity

The active antifreeze self-protection is only effective if the power and gas supplies are assured. Otherwise, antifreeze liquid might be required.

The manufacturer disclaims any liability for any damage caused by improper glycol use.

- Always check product suitability and its expiry date with the glycol supplier. Periodically check the product's preservation state.
- Do not use car-grade antifreeze liquid (without inhibitors), nor zinc-coated piping and fittings (incompatible with glycol).
- Glycol modifies the physical properties of water (density, viscosity, specific heat...). Size the piping, circulation pump and thermal generators accordingly.
- With automatic system water filling, a periodic check of the glycol content is required.



With high glycol percentage (> 20...30%)

If the glycol percentage is $\geq 30\%$ (for ethylene glycol) or $\geq 20\%$ (for propylene glycol) the TAC must be alerted before first start-up.



Precautions with glycol



When producing DHW by DHW buffer tank, use

propylene glycol only.

Type of antifreeze glycol

Inhibited type glycol is recommended to prevent

oxidation phenomena.

Glycol effects

The Table 3.2 p. 30 shows, indicatively, the effects of using a glycol depending on its %.

Table 3.2 Technical data for filling the hydraulic circuit

Glycol %	Water-glycol mixture freezing temperature	Percentage of increase in pressure drops	Loss of efficiency of unit
10	-3 °C	-	-
15	-5 °C	6,0%	0,5%
20	-8 °C	8,0%	1,0%
25	-12 °C	10,0%	2,0%
30	-15 °C	12,0%	2,5%
35	-20 °C	14,0%	3,0%
40	-25 °C	16,0%	4,0%

3.6 SYSTEM WATER QUALITY

Responsibility of the user/operator/installer

The installer, the operator and the user must assure system water quality of the plant water (Table 3.3 p. 30). Failure to observe the manufacturer's instructions may compromise the operation, integrity and durability of the appliances (GAHP/GA/AY modules/units) that make up the group, invalidating the warranty.

System water characteristics

Free chlorine or water hardness may damage the preassembled group.

Adhere to the chemical-physical parameters in Table 3.3 p. 30 and the regulations on water treatment for residential and industrial heating systems.

Table 3.3 Chemical and physical parameters of water

Chemical and physical parameters of water in heating/cooling systems		
Parameter	Measurement unit	Required value
pH	/	> 7 (1)
Chlorides	mg/l	< 125 (2)
Total hardness	°f	< 15
(CaCO ₃)	°d	< 8,4
Iron	mg/kg	< 0,5 (3)
Copper	mg/kg	< 0,1 (3)
Aluminium	mg/l	< 1
Langelier's index	/	0-0,4
Harmful substances		
Free chlorine	mg/l	< 0,2 (3)
Fluorides	mg/l	< 1
Sulphides		ABSENT

1 With aluminium or light alloys radiators, pH must also be lower than 8 (in compliance with applicable rules)

2 Value referred to the maximum water temperature of 80 °C

3 In compliance with applicable rules

Water topping up

The chemical-physical properties of the system's water may alter over time, resulting in poor operation or excessive topping up.

- Ensure there are no leaks in the installation.
- Periodically check the chemical-physical parameters

of the water, particularly in case of automatic topping up.

Chemical conditioning and washing

Water treatment/conditioning or system washing carried out carelessly may result in risks for the preassembled group, the system, the environment and health.

- Contact specialised firms or professionals for water treatment or system washing.
- Check compatibility of treatment or washing products with operating conditions.
- Do not use aggressive substances for stainless steel.
- Do not leave washing residues.

3.7 SYSTEM FILLING

How to fill up the system

After completing all water, electrical and gas connections:

1. Pressurise (at least 1,5 bar) and vent the hydraulic circuit.
2. In links with circulators vent the circulators through the vent valves in the body of the respective check valves (see procedure below).
3. Let water flow (with appliances off).
4. Check and clean the filter(s) on the inlet pipe.
5. Repeat items 1, 2, 3 and 4 until the pressure has stabilised (at least 1,5 bar).

How to vent the GAHP/GA unit circulators (for links with independent circulators)

1. Turn off the system by means of specially provided control devices (DDC or CCP/CCI) and wait for the circulators to stop.
2. Remove the pump group protection cover (Figure 1.14 p. 20, details A and B).
3. Open the insulation (Figure 1.14 p. 20, detail C).
4. Close the sectioning valve on the delivery of the

preassembled group and open the first vent valve (Figure 1.14 p. 20, detail E).

5. Close the first vent valve and open the sectioning valve on the delivery of the preassembled group.
6. Close the sectioning valve on the return of the preassembled group and open the second vent valve (Figure 1.14 p. 20, detail F).
7. Close the second vent valve and open the sectioning valve on the return of the preassembled group.
8. Reactivate the system and let water flow (with switched off appliances).
9. If the air vent has been properly completed, close the insulation and reassemble the protective covers. If not, repeat the procedure from step 4.



How to vent the AY unit circulators (for links with independent circulators)

1. Turn off the system by means of specially provided control devices (DDC or CCP/CCI) and wait for the circulators to stop.
2. Disassemble the front panel of the unit.
3. Close the sectioning valve on the delivery of the preassembled group and open the first vent valve (Figure 1.15 p. 20, detail E).
4. Close the first vent valve and open the sectioning valve on the delivery of the preassembled group.
5. Close the sectioning valve on the return of the preassembled group and open the second vent valve (Figure 1.15 p. 20, detail F).
6. Close the second vent valve and open the sectioning valve on the return of the preassembled group.
7. Reactivate the system and let water flow (with switched off appliances).
8. If the air vent has been properly completed, reassemble the front panel of the unit. If not, repeat the procedure from step 4.



The correct filling and air venting of the hydraulic system are fundamental to ensure reliability over time of the mechanical components, in particular the circulation pumps.

3.8 FUEL GAS SUPPLY

Gas connection

- 1"1/2 F on the right, at the bottom (Paragraph p. 10). It can be moved to the left side by moving the blind cap (unscrew and retighten).
- Install an anti-vibration connection between the preassembled group and the gas supply piping.

Mandatory shut-off valve

- Provide a gas shut-off valve (manual) on the gas supply line, next to the preassembled group, to isolate it when required.
- Perform connection in compliance with applicable regulations.

Gas pipes sizing

The gas pipes must not cause excessive pressure drops and, consequently, insufficient gas pressure for the appliances of the group.

Supply gas pressure



This appliance is equipped for a maximum gas supply pressure of 50 mbar.

The preassembled group appliances gas supply pressure, both static and dynamic, must comply with Table 3.4 p. 32, with tolerance $\pm 15\%$.



Non compliant gas pressure (Table 3.4 p. 32) may damage the appliances and be hazardous.

Table 3.4 Network gas pressure

Product category	Countries of destination	Gas supply pressure							
		G20 [mbar]	G25 [mbar]	G30 [mbar]	G31 [mbar]	G25.1 [mbar]	G25.3 [mbar]	G27 [mbar]	G2,350 [mbar]
II _{2H3B/P}	AL, BG, CY, CZ, DK, EE, FI, GR, HR, IT, LT, MK, NO, RO, SE, SI, SK, TR	20		30	30				
	AT, CH	20		50	50				
II _{2H3P}	BG, CH, CZ, ES, GB, HR, IE, IT, LT, MK, PT, SI, SK, TR	20			37				
	RO	20			30				
	AT	20			50				
II _{2ELL3B/P}	DE	20	20	50	50				
II _{2Esi3P} , II _{2Er3P}	FR	20	25		37				
II _{2HS3B/P}	HU	25		30	30	25 (1) (2)			
II _{2E3P}	LU	20			50				
II _{2L3B/P}	NL		25	30	30				
II _{2EK3B/P}	NL	20		30	30		25 (1) (2)		
II _{2E3B/P}	PL	20		37	37				
II _{2ELwLs3B/P}		20		37	37			20 (2)	13 (2)
II _{2ELwLs3P}		20			37			20 (2)	13 (2)
I _{2E(S)} , I _{3P}	BE	20	25		37				
I _{3P}	IS				30				
I _{2H}	LV	20							
I _{3B/P}	MT			30	30				
I _{3B}				30					

(1) GAHP-AR not approved for G25.1, G25.3 gases.

(2) GA ACF not approved for G25.1, G27, G2,350, G25.3 gases.

Vertical pipes and condensate

- Vertical gas pipes must be fitted with siphon and discharge of the condensate that may form inside the pipe.
- If needed, insulate the piping.

LPG pressure reducers

With LPG the following must be installed:

- A first stage pressure reducer, close to the liquid gas tank.
- A second stage pressure reducer, close to the group.

3.9 COMBUSTION PRODUCTS EXHAUST



Compliance with standards

The appliances that make up a preassembled group (GAHP/AY modules/units) are approved for connection to a discharge duct of combustion products.

Flue gas exhaust connection

The diameters (mm) of the connections, the residual head (Pa), the flow rate (kg/h), the temperature (°C) and other smoke discharge properties of the individual GAHP/AY units belonging to the group are indicated in their respective manuals (attached).

For further informations, see also the design manual.

Flue gas exhaust kit

GAHP/AY units that are part of the group are equipped as standard with smoke exhaust kits, already assembled or

to be assembled by the installer, which generally includes:

- 1 pipe complete with terminal and socket for fuel gas analysis
- 1 support collar
- 1 possible 90° elbow
- 1 rain cover



How to install the flue gas kit

See the relevant instructions in the respective Manuals of each GAHP/GA/AY appliance.

Possible flue

If necessary, the preassembled group can be connected to one or more flue(s).

- To size the flue(s) refer to the data and information in the GAHP/GA/AY individual manuals and in the design manual.
- GAHP/GA/AY modules with different types of smoke exhaust can not be connected to the same flue, but must be connected to separate flue.
- If several appliances are connected to a single flue, a clapet valve is required on each outlet, with the exception of AR modules whose residual head is used up at the outlet of the chimney supplied.
- The flues must be designed, sized, verified and realized by a qualified firm, with materials and components in accordance with regulations in force in the country of installation.
- Always provide the necessary sockets for smoke analysis in an accessible position.



To avoid corrosion, convey the acid condensate drain to the base of the flue gas exhaust duct.

3.10 FLUE GAS CONDENSATE DISCHARGE

If the preassembled group include GAHP A, GAHP GS/WS and AY00-120 condensing appliances, condensation water is produced from combustion fumes, which must be evacuated in compliance with current regulations.



Condensate acidity and exhaust regulations

The flue gas condensate contains aggressive acid substances. Refer to applicable regulations in force for condensate exhaust and disposal.

- If required, install an acidity neutraliser of adequate capacity.



Do not use gutters to discharge the condensate.

Do not discharge the flue condensate in gutters, due to the risk of materials corrosion and ice formation.

Flue gas condensate connection

The fitting for flue gas condensate discharge is located on the right side of the preassembled group (condensate discharge manifold below Figures 1.2 p. 10, 1.3 p. 10, 1.4 p. 11, 1.5 p. 11).



The condensate drain cap can not be moved on the opposite side as the condensate manifold is sloping towards the right side.

Flue gas condensate evacuation

To make the condensate evacuation duct:

- ▶ Size the ducts for maximum condensation flow rate (kg/h), equal to the sum of the flow rates of the individual GAHP/AY appliances/modules (see Manuals of the individual GAHP/AY units attached).
- ▶ Use plastic materials resistant to acidity pH 3-5.
- ▶ Provide for min. 1% slope, i.e. 1 cm for each m of the length (otherwise a booster pump is required).
- ▶ Prevent freezing.

- ▶ Dilute, if possible, with domestic waste water (bathrooms, washing machines, dish washers...), basic and neutralising.

Charging the siphon

Robur uses condensate collection siphons with float, which blocks the passage of fumes and odours deriving therefrom in case the equipment remains turned off for a long time and the liquid contained in the siphon evaporates or in case of commissioning.

Thanks to this system, it is not necessary to fill the siphon at commissioning.

3.11 DEFROSTING WATER DRAINAGE



Aerothermal units defrosting

In winter, in the aerothermal RT__ Links with GAHP A/AR units, frost may form on the finned coils and the aerothermal appliances perform defrosting cycles.

Collection basin and drainage system

- ▶ Provide for a collection basin or containment rim and a discharge system of the defrosting water, to avoid overflowing, freezing and damage.

3.12 SAFETY VALVE DRAIN

In the event of indoor installation, arrange for external piping of the safety valve drainage, proceeding as described in the relative paragraph of the manuals supplied with the individual units.



The safety valve drain must be mandatorily ducted outside. Failure to comply with this provision jeopardizes first start-up.



Do not install any shut off device on the drain duct between the safety valve and the outside vent.

4 ELECTRICAL INSTALLER

4.1 WARNINGS



General warnings

Read the warnings in Chapter III.1 p. 4, providing important information on regulations and on safety.



Compliance with installation standards

Installation must comply with applicable regulations in force, based on the installation Country and site, in matters of safety, design, implementation

and maintenance of electrical systems.



Installation must also comply with the manufacturer's provisions.



Live components

- After placing the preassembled group in the final position, and prior to making electrical connections, ensure not to work on live components.



Earthing

- The preassembled group must be connected to an effective earthing system, installed in compliance with regulations in force.
- It is forbidden to use gas pipes as earthing.



Cable segregation

Keep power cables physically separate from signal ones.



Do not use the power supply switch to turn the preassembled group on/off

- Never use the external switch to turn the preassembled group on and off, as it may cause damage to the appliances and the system (occasional blackouts are tolerated).
- To turn the preassembled group on and off, exclusively use the suitably provided control device (DDC or CCP/CCI).



Control of water pump

In the case of RT__ Links without circulators:

- The common hydraulic/primary circuit water pump must be controlled by the electrical panel of the preassembled group (terminals KK, PP, 12).
- Circulator start/stop is not allowed without the

request of the preassembled group.



GAHP/GA/AY modules

As far as the individual GAHP/GA/AY modules belonging to the preassembled group are concerned, read the relevant warnings and dangers in their respective Manuals (attached).

4.2 ELECTRICAL SYSTEMS

Electrical connections must provide:

- (a) power supply line (three-phase or single-phase)
- (b) control system

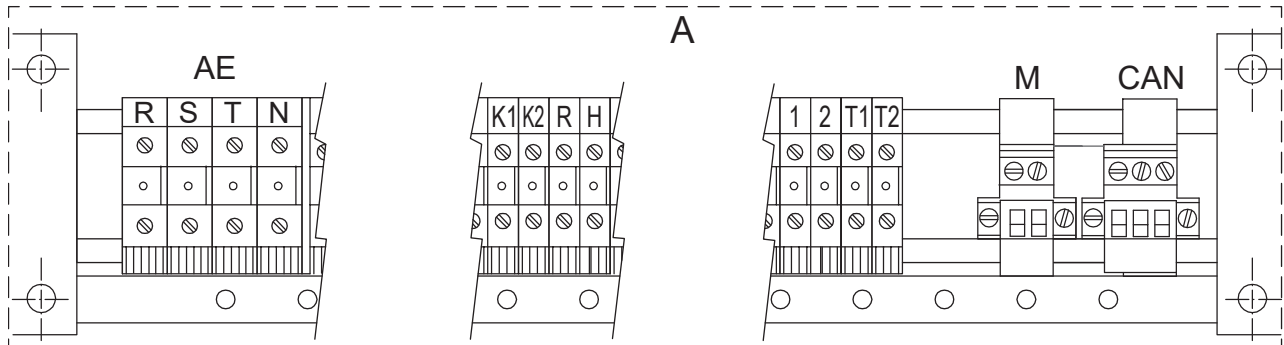


How to make connections

All electrical connections must be made in the preassembled group electric panel (QEG) (Figures 1.18 p. 22 and 4.1 p. 34):

1. Ensure the group electrical panel is not live.
2. Open the electric panel with the appropriate key and remove the lower blind panel to access the terminal blocks.
3. Insert the wires through the suitable holes.
4. Make the connections.
5. Made the connections, reposition the blind panel and reclose the electrical panel.

Figure 4.1 Blind panel: detail of internal terminal blocks on DIN rail



A QEG blind panel

AE Power supply input terminals

K1-K2 24 V coil terminals for circulator request (hot/cold circuit side)

R-H Condensate heating resistor terminals

1-2 24 V coil terminals for circulating pump request (HR recovery circuit

side)

T1-T2 DHW tank thermostat terminals (HR recovery circuit side)

M 2-pole 24 Vac connector for service use

CAN 3-pole connector for CAN bus network connection

4.3 ELECTRICAL POWER SUPPLY



Electrical protection

A 4-pole (three-phase) disconnecter GS Figure 4.2 p. 35 or bipolar (single-phase) IR+Id Figure 4.3 p. 35 must be provided by the installer in the external power supply electrical panel, with fuses suitable for phases, minimum contact opening 3 mm. No fuse on the neutral is allowed. Indirect contact protection by means of differential switch and overload must be guaranteed by

means of a sufficiently dimensioned automatic switch or fuse.



Do not modify the RT__ Link electric panel, or add components inside it (relays, ...).

Power supply line (three-phase or single-phase)

Provide a protected line (by the installer), which may be:

- three phase 400 V 3N - 50 Hz (Figure 4.2 p. 35)
- or as an alternative,
- single phase 230 V 1N - 50 Hz (Figure 4.3 p. 35)



How to connect the power supply

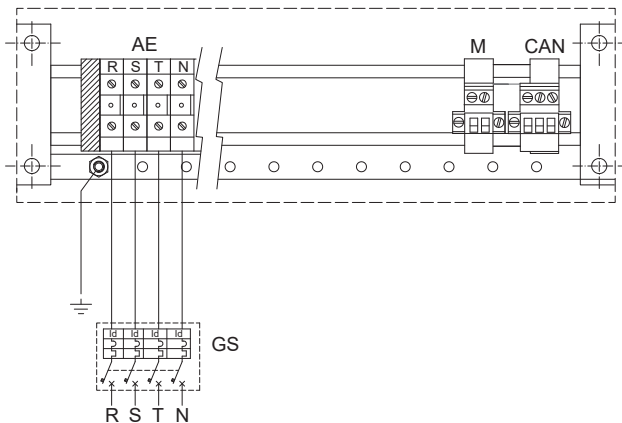
To connect the multipole power cable (Figures 4.2 p. 35 and 4.3 p. 35):

1. Access the terminal blocks in the electrical panel of the group (Paragraph 4.2 p. 34).
2. Locate the "AE" terminal block; with the "R-S-T-N" terminals.
3. Connect the conductors (five/three-phase or three/single-phase), providing the longest for the grounding (last to break in case of accidental traction), to R-S-T-N three-phase 400 V 3N - 50 Hz terminals, Figure 4.2 p. 35, or to (RST)-N terminals (phase L connected to all R,S,T terminals) for single phase 230 V 1N - 50 Hz, Figure 4.3 p. 35.
4. Made the connections, reposition the blind panel and reclose the electrical panel.



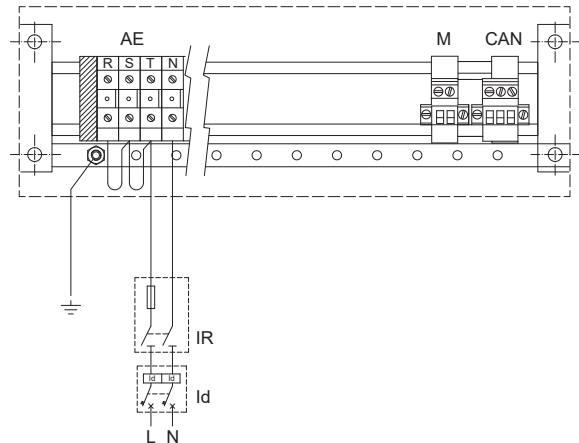
A cabling error, as well as affecting the operation, could also damage the electrical components of the preassembled group. In particular, in case of three-phase power supply, be sure not to connect one of the phases to terminal N.

Figure 4.2 Three phase power supply electrical connection 400 V 3N - 50 Hz



AE Power supply input terminals
GS Three-phase magnetothermic switch
RSTN Phases/neutral

Figure 4.3 Single phase power supply electrical connection 230 V 1N - 50 Hz



AE Power supply input terminals
IR Bipolar disconnector with suitable fuse and minimum contact opening of 3 mm
LN Phase/neutral

4.4 ADJUSTMENT AND CONTROL

Electronic boards S61/Mod10/W10/AR11/AY10/S70

The RT__ Link electronics consists of the S61/Mod10/W10/AR11/AY10/S70 electronic boards of the individual GAHP/GA/AY modules forming the group, that are interconnected (pre-wired) by the CAN bus cable.

For information on S61/Mod10/W10/AR11/AY10/S70 electronic boards, see the manuals for the single GAHP/GA/AY unit (attached).

Control systems, options (1) or (2)

Two separate control systems are provided for RT__ Links, (1) and (2), each with specific features, components and diagrams:

- DDC control (with CAN bus connection).
- CCP/CCI control (with CAN bus connection).

For electrical connections and hookup Figure 4.4 p. 36.

CAN bus communication network

See GAHP/GA/AY units or DDC/RB100/RB200 control devices manuals.

CAN bus signal cable

The DDC or CCP/CCI controllers are connected to the RT__ Link through the CAN bus signal cable, shielded, compliant to Table 4.1 p. 36 (admissible types and maximum distances).

For lengths ≤200 m and up to 4 nodes (e.g. 1 DDC + 3 GAHP), a simple 3x0,75 mm² shielded cable may be used.

Table 4.1 CAN bus cables type

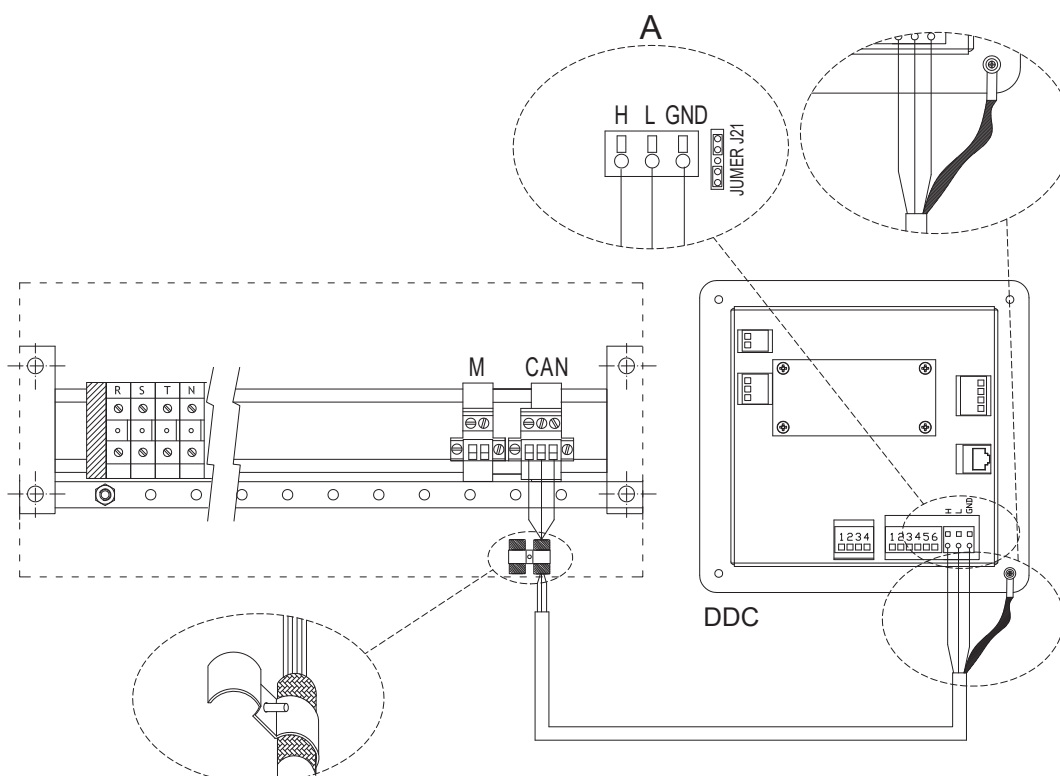
Cable name	Signals / Color			Maximum length	Note
Robur					Optional code OCVO008
ROBUR NETBUS	H = BLACK	L = WHITE	GND = BROWN	450 m	
Honeywell SDS 1620					In all cases the fourth conductor should not be used
BELDEN 3086A	H = BLACK	L = WHITE	GND = BROWN	450 m	
TURCK type 530					
DeviceNet Mid Cable					
TURCK type 5711	H = BLUE	L = WHITE	GND = BLACK	450 m	
Honeywell SDS 2022					
TURCK type 531	H = BLACK	L = WHITE	GND = BROWN	200 m	



How to connect the CAN bus cable to the RT__ Link

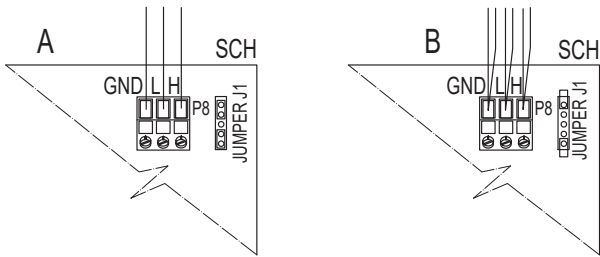
To connect the CAN bus cable to the preassembled group electrical panel, hence to the pre-wired S61/AY10 boards of the appliances it consists of (Figure 4.4 p. 36):

1. Access the terminal blocks in the electrical panel of the group (Paragraph 4.2 p. 34).
2. Locate the "CAN" terminal block with the "GND-L-H" terminals.
3. Connect the CAN bus cable to the GND (shielding/ earthing) + L and H terminals (two signal wires).
4. Block the cable with the earthing terminal located behind the DIN bar, ensuring a good electrical contact is made with the shielding braid and the bare conductor (if any); see detail in Figure 4.4 p. 36.
5. Position the J1 jumpers of the board of the last appliance on the left of the RT__ Link closed if the node is terminal (case of one RT__ Link only) or open if the node is intermediate (case of several RT__ Links in the same system) Figure 4.8 p. 38.
6. Connect the CCI or the DDC (and possibly the RB100 or the RB200) via the CAN bus cable according to the instructions in the relevant device manuals.
7. Made the connections, reposition the blind panel and reclose the electrical panel.

Figure 4.4 Connection with CAN bus cable between 1 CCI/DDC and the electrical panel of the preassembled group

CAN 3-pole connector for CAN bus network connection
DDC CCI/DDC (rear view)

Figure 4.5 Connection of the CAN bus cable to the electronic board



SCH Electronic board

GND Common data

L Data signal LOW

H Data signal HIGH

J1 Onboard CAN bus jumper

A Detail of "terminal node" case (3 wires; J1 = jumper "closed")

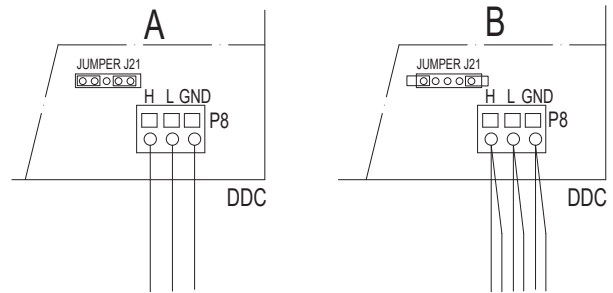
B Detail of "intermediate node" case (6 wires; J1 = jumper "open")

P8 CAN port/connector

Place the **CLOSED J21 Jumpers (Detail A)** if the node is **terminal** (one connected CAN bus cable section only), or **OPEN (Detail B)** if the node is **intermediate** (two connected

CAN bus cable sections).

Figure 4.6 Connection of the CAN bus cable to the control panel



DDC Direct Digital Controller

GND Common data

L Data signal LOW

H Data signal HIGH

J21 CAN bus jumper on DDC board

A Detail of "terminal node" case (3 wires; J21 = jumper "closed")

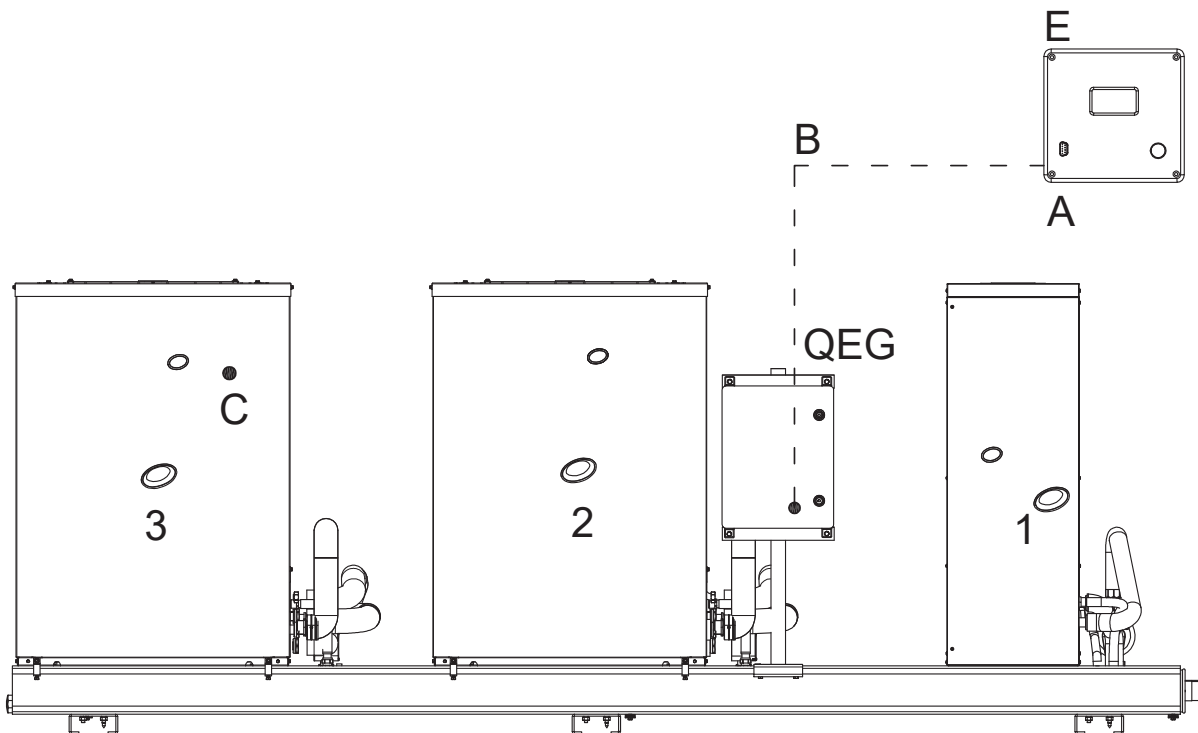
B Detail of "intermediate node" case (6 wires; J21 = jumper "closed")

P8 CAN port/connector

1 RT__ Link + DDC/CCI configuration

Refer to Figure 4.4 p. 36 for the connection diagram of the CAN bus cable.

Figure 4.7 CAN bus connection for systems with one unit



A Terminal node connection to CCI/DDC

B CAN bus cable (not supplied - see table)

C Terminal node on last unit (pre-wired)

QEG Group electrical panel

E CCI/DDC

3 Last unit of appliances (with "ID00")

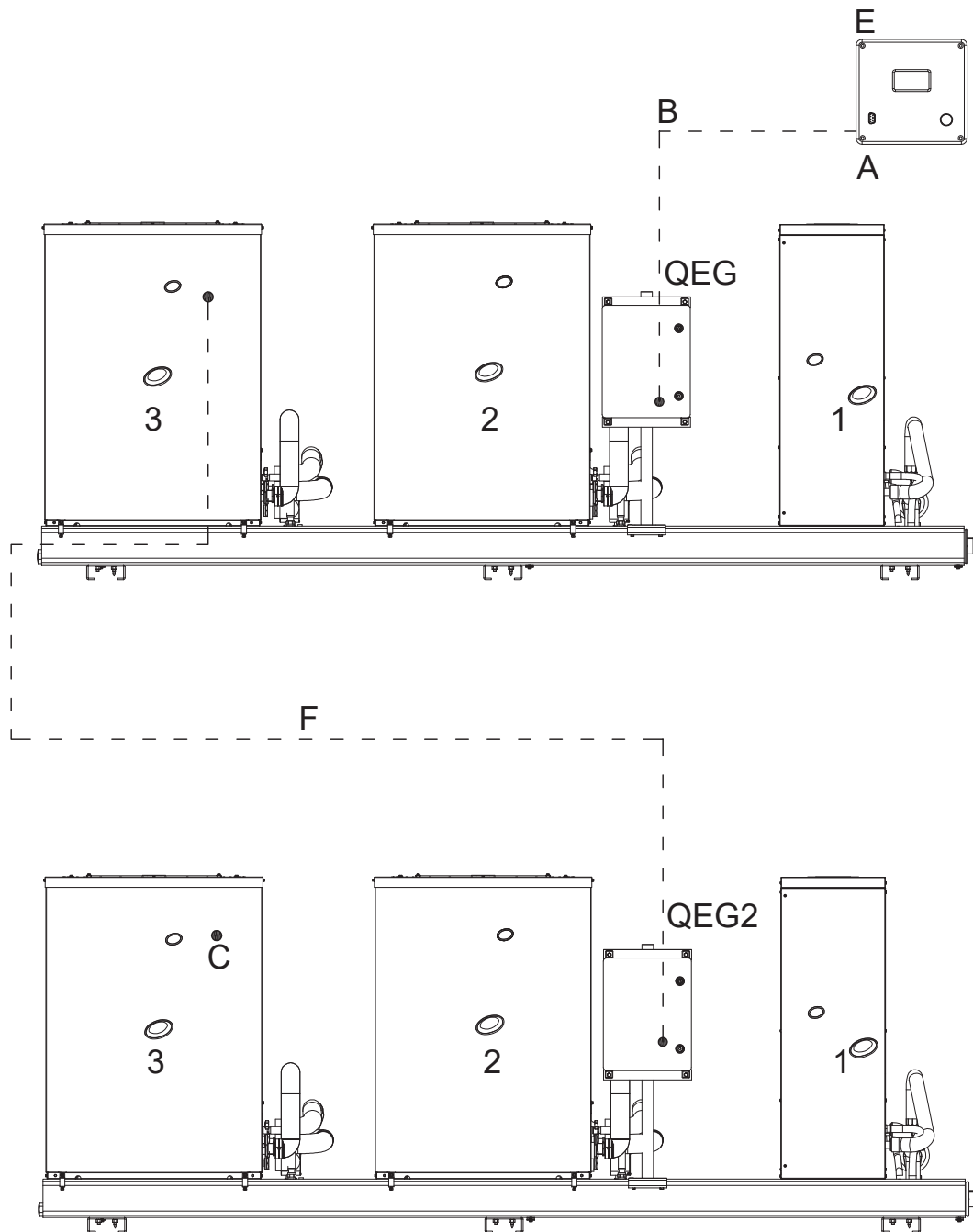
2 RT__ Links + DDC/CCI configuration

The DDC panel is connected to the first link as a terminal node (connection diagram in Figure 4.4 p. 36).

In the last unit of the first link (which must be connected to the electrical panel of the next link) the jumpers J1

must be open, as shown in detail B of Figure 4.5 p. 37.

Figure 4.8 Example of CAN network with 7 nodes (1 DDC + 2 appliances connected on a single hydraulic circuit)



- A Terminal node connection to DDC
- B CAN bus cable (not supplied - see table)
- C Terminal node on last unit (pre-wired)
- QEG1 First appliance group electrical panel

- QEG2 Second appliance group electrical panel
- E DDC
- F CAN bus cable (not supplied - see table)
- 3 Last unit of appliances (with "ID00")

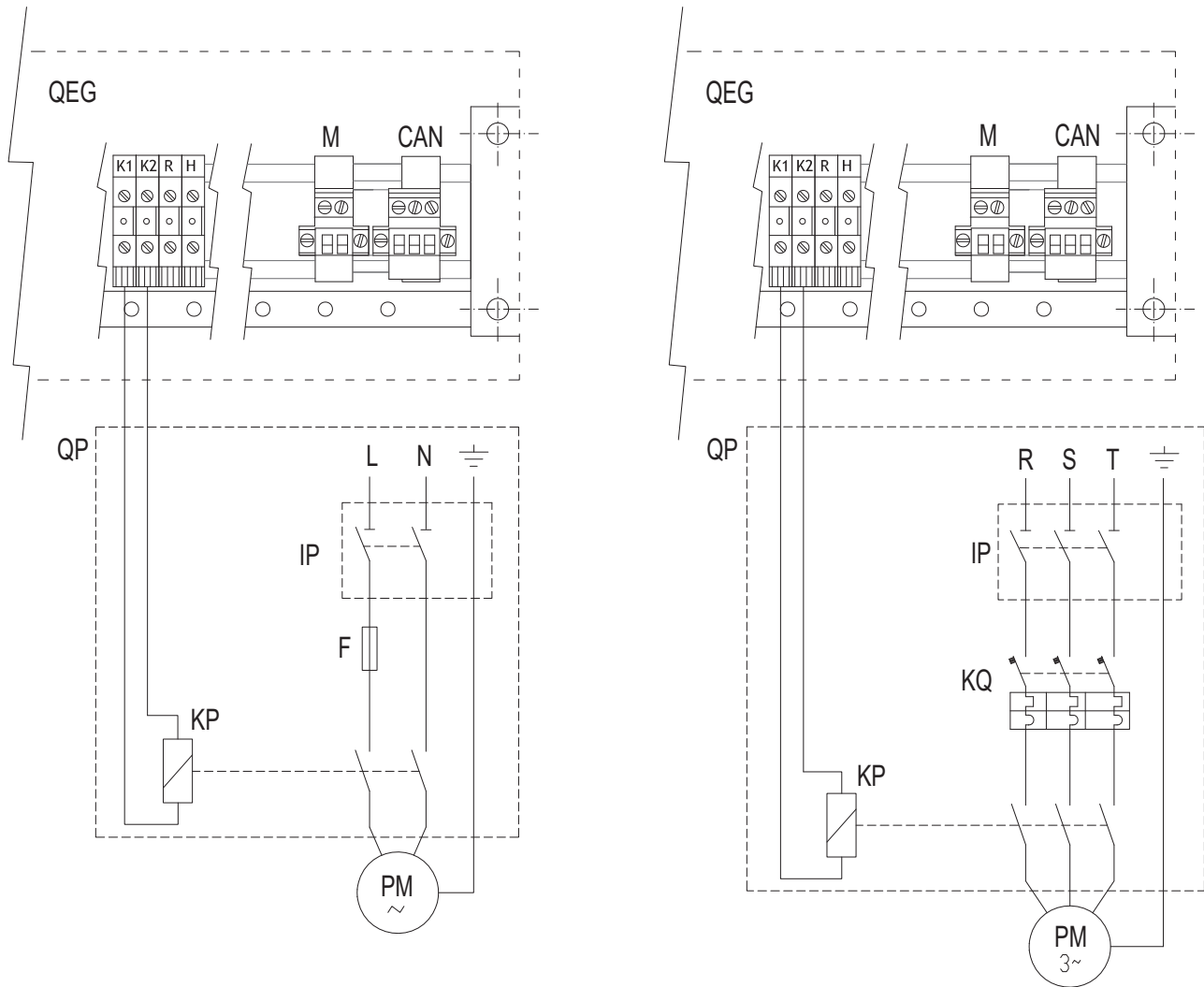
4.5 WATER CIRCULATION PUMPS

In RT__ Links with circulating pumps, the individual independent circulating pumps (1 or 2 for each GAHP/GA/AY module) are already mounted and pre-wired on the pre-assembled group.

In RT__ Link without circulating pumps, electrical connections must be made (both for power supply and control) of the common water circulation pump of the primary water circuit, as shown in the diagrams in Figures 4.9 p. 39, 4.10 p. 40.

Common circulation pump of a RT__ Link SC

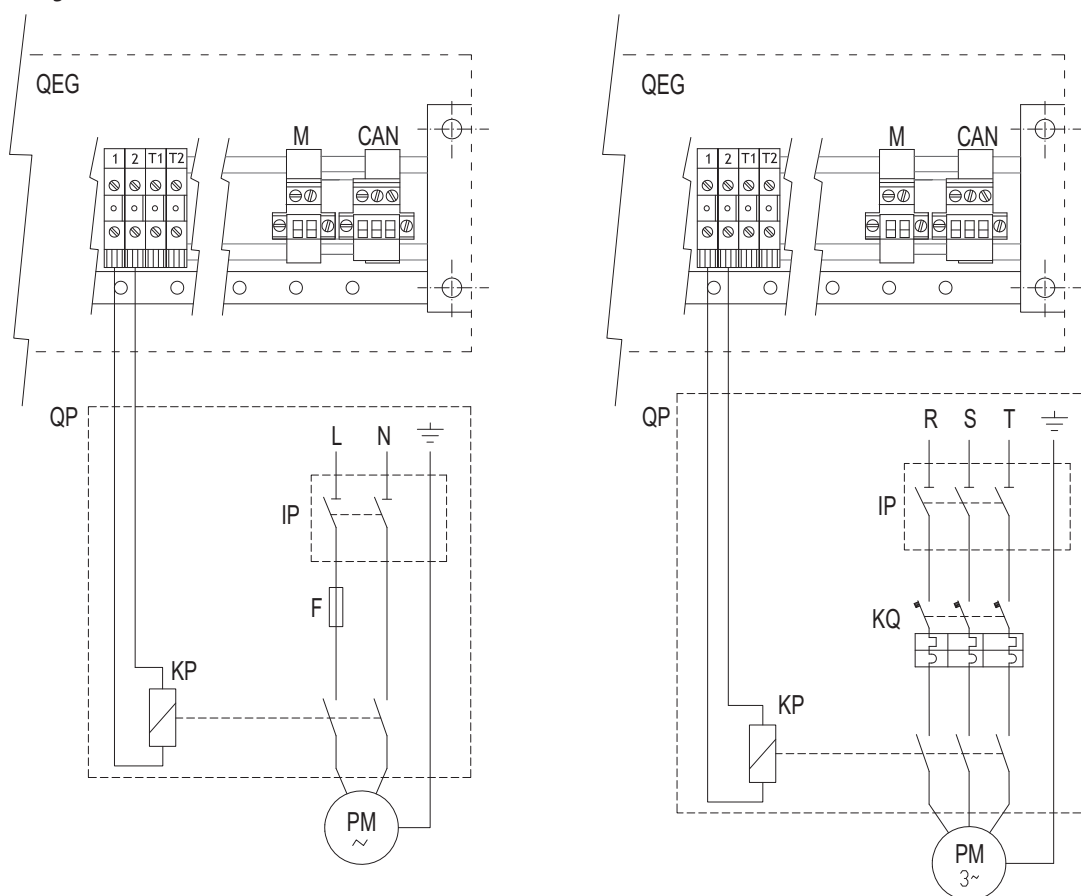
Figure 4.9 Electrical connection of single- or three-phase circulator directly controlled by the group (configurations "without circulators")



PM Primary system water circulator (not supplied)
 QP Circulator electrical panel (external)
 QEG Preassembled group electrical panel
 N/L Neutral/phase single-phase circulation pump power supply
 RST Three-phase circulator power supply phases
 IP Circulation pump disconnect (not supplied)

F Appropriate fuse for protecting the circulation pump used
 KQ Appropriate motor protection switch for the circulation pump used
 KP NO relay for controlling the circulating pump (not supplied)
 K1-K2 24 Vac coil terminals for the common circulation pump request of the hot/cold link circuit

Figure 4.10 Heat recovery exchanger: electrical connection of single- or three-phase circulator directly controlled by the group (configurations "without circulators")



PM Primary system water circulator (not supplied)
 QP Circulator electrical panel (external)
 QEG Preassembled group electrical panel
 N/L Neutral/phase single-phase circulation pump power supply
 RST Three-phase circulator power supply phases
 IP Circulation pump disconnecter (not supplied)

F Appropriate fuse for protecting the circulation pump used
 KQ Appropriate motor protection switch for the circulation pump used
 KP NO relay for controlling the circulating pump (not supplied)
 1-2 24 Vac coil terminals for the common circulation pump request of the heat recovery circuit of a link with HR



How to connect the common circulation pump

To connect the common circulation pump (single-phase or three-phase) of a RT__ Link without any circulating pumps fitted on (Figure 4.9 p. 39 or 4.10 p. 40)

1. Access the terminal blocks in the electrical panel of the group (Paragraph 4.2 p. 34).
2. Connect the two enable conductors to the appropriate terminals K1-K2 or 1-2.
3. Made the connections, reposition the blind panel and reclose the electrical panel.

5 FIRST START-UP



First start-up entails checking/setting up the combustion parameters and may exclusively be carried out by a Robur TAC. NEITHER the user NOR the installation technician is authorised to perform such operations, under penalty of voiding the warranty.

5.1 PRELIMINARY CHECKS

Preliminary checks for first start-up

Upon completing installation, before contacting the TAC

the installer must check:

- ▶ Water, electrical and gas systems suitable for the required capacities and equipped with all safety and control devices required by the regulations in force.
- ▶ Absence of leaks in the water and gas systems.
- ▶ Type of gas for which the preassembled group is designed (natural gas or LPG).
- ▶ Supply gas pressure complying with the values of Table 3.4 p. 32, with max tolerance $\pm 15\%$.
- ▶ Correct operation of the flue exhaust duct.
- ▶ Power supply mains corresponding to group

nameplate data.

- ▶ Appliance correctly installed, according to the manufacturer's provisions.
- ▶ System installed in a workmanlike manner, according to national and local regulations.

Abnormal or hazardous installation situations

If abnormal or hazardous planting situations are found, the TAC will not run the first start-up and the preassembled group shall not be commissioned.

These situations may be:

- ▶ Outdoor aerothermal RT__ Link installed within a room.
- ▶ Failed compliance with minimum clearances.
- ▶ Insufficient distance from combustible or flammable materials.
- ▶ Conditions that do not warrant access and maintenance operations in safety.
- ▶ Starting/stopping the group with the main switch, rather than with the provided control device (DDC or CCP/CCI).
- ▶ Defects or faults in the preassembled group caused during transport or installation.
- ▶ Gas smell.
- ▶ Non-compliant mains gas pressure.
- ▶ Non-compliant flue gas exhaust.
- ▶ All situations that may involve operation abnormalities or are potentially hazardous.

Non-compliant system and corrective actions

Should the TAC find any non conformities, the user/installer is bound to perform any corrective procedures required

by the TAC.

After performing the remedial actions (the installer's responsibility), if the TAC deems that safety and conformity conditions are in place, first start-up may be effected.

5.2 ELECTRONIC ADJUSTMENT ON THE APPLIANCE – MENUS AND PARAMETERS

Electronic boards on the appliances



For the instructions on the S61/AY10 electronic boards on the individual GAHP/GA/AY making up the group, refer to the respective GAHP/GA/AY Manuals (attached).

DDC or CCP/CCI control devices



For information on DDC or CCP/CCI control devices, see the respective manuals.

5.3 MODIFYING SETTINGS

Modify the settings through the DDC or CCP/CCI



To change the RT__ Link settings, use the connected control device (DDC or CCP/CCI). For instructions, see the control device Manual.

Modify the settings of circulators

See Appendix 9.2 p. 52.

6 NORMAL OPERATION



This section is for the end user.

6.1 WARNINGS



General warnings

Prior to using the preassembled group carefully read the warnings in Chapter III.1 p. 4, providing important information on regulations and on safety.



First startup by TAC

First start-up may exclusively be carried out by a Robur TAC (Chapter 5 p. 40).



Never power the appliance off while it is running

NEVER power the appliance off while it is running (except in the event of danger, Chapter III.1 p. 4), since the appliances or system might be damaged.

6.2 SWITCH ON AND OFF



Routine switching on/off

The appliance may exclusively be switched on/off by means of the suitably provided control device (DDC or CCP/CCI).



Do not switch on/off with the power supply switch

Do not turn the preassembled group on/off with the power switch. It may be harmful and dangerous for group appliances and system components. If you need to connect/disconnect the power supply, see Paragraph 7.1 p. 42.



Checks before switching on

- Before turning on the preassembled group check:
- gas valve open
 - preassembled group electrical power (main switch (GS) ON)

- DDC or CCI power supply (through transformer)
- water circuit ready

How to switch on/off



To turn on/off the RT__ Link see the Manual of the connected control device (DDC or CCP/CCI).

Once switched on with the control device (DDC or CCP/CCI), under normal operating conditions, the group appliances start/stop automatically according to the heating and/or cooling requirements, providing hot/chilled water at the programmed temperature.



It is not said that group appliances will activate immediately, but will only start when there are actual heat or cool demands.

6.3 MODIFYING SETTINGS



To change the RT__ Link settings, use the

connected control device (DDC or CCP/CCI). For instructions, see the control device Manual.



Do not modify complex settings

Specific technical and system knowledge is required for complex settings. Contact a TAC.

6.4 EFFICIENCY

For increased appliance efficiency:

- Keep the finned coil of the aerothermal appliances clean.
- Set water temperature to the actual system requirement.
- Reduce repeated switch-ons to the minimum (low loads).
- Program appliance activation for actual periods of use.
- Keep water and air filters on plumbing and ventilation systems clean.

7 MAINTENANCE

7.1 WARNINGS



Correct maintenance prevents problems, assures efficiency and keeps running costs low.



Maintenance operations described herein may exclusively be performed by the TAC or skilled maintenance technician.



Any operation on the internal components of the GAHP/GA/AY modules that make up the RT__ Link may exclusively be performed by the TAC.



Before performing any operation: turn off the pre-assembled unit by means of the control device (DDC or CCP/CCI) and wait for the end of the shut-down cycle of all the unit, then stop the gas supply by acting on its tap. Finally disconnect the power supply as described in Paragraph *p. 42*.



Environmental or operational heavy conditions

In environmental or operational conditions particularly heavy (for example: heavy-duty use of the appliance, salty environment, etc.), maintenance and cleaning operations must be more frequent.

Preassembled group electrical connection and disconnection operations

A) Electrical connection

The electrical connection must take place by doing the

following sequence of operations:

1. Insert any switches/disconnectors located upstream of the three-phase supply line of the preassembled group.
2. Insert the 4-pole switch in the preassembled group electrical panel.
3. Insert the single-phase (magnetothermic) breakers of each unit, located in the preassembled group electrical panel.



In the case of commissioning (first start-up), replace step 3 with the following steps:

1. (3') Insert ONLY ONE of the single-phase automatic (magnetothermic) breakers of the units located in the preassembled group electrical panel, and verify that the corresponding unit is actually powered; otherwise, investigate and resolve the problem before going to the next step.
2. (4') Insert the remaining single-phase automatic breakers of the units.

B) Electrical disconnection

The electrical disconnection must take place by doing the following sequence of operations:

1. Open the single-phase automatic (magnetothermic) breakers of each unit, located in the preassembled group electrical panel.
2. Open the 4-pole switch in the preassembled group electrical panel.
3. If required, open any switches/disconnectors located upstream of the three-phase supply line of the preassembled group.



For the maintenance of the individual GAHP/GA/

AY modules belonging to the preassembled group,

consult their respective Manuals (attached).

7.2 PRE-EMPTIVE MAINTENANCE

For pre-emptive maintenance, comply with the recommendations in Table 7.1 p. 43.

Table 7.1

		GAHP A	GAHP GS/WS	AY00-120	GA ACF	GAHP-AR
Guidelines for the preventive maintenance operations						
Check of the unit	visually check of the general condition of the unit and of its finned coil	√ (1)	-	-	√ (1)	√ (1)
	check the correct operation of the device used for monitoring the water flow	√	√	√	√	√
	check the % value of CO ₂	√	√	√	-	-
	check gas pressure to the burners	-	-	-	√	√
	check that the condensate discharge is clean (If necessary, frequency of the maintenance operation must be increased)	√	√	√	-	-
	replace the belts after 6 years or 12000 hours of operation	√	√	-	√	√
	check/restore the pressure of the primary hydronic circuit	-	-	√	-	-
	check/restore the air pressure inside of the expansion vessel of the primary hydronic circuit	-	-	√	-	-
	replace the oil pump motor condenser every 3 years or every 10000 operating hours or whenever the condenser capacity is less than 95% of the nominal value	√	√	-	√	√
Check for every DDC or CCI	check that the plant is able to achieve the setpoint temperature	√	√	√	√	√
	download the event history	√	√	√	√	√

(1) It is suggested to clean the finned coil once every 4 years (optimal frequency of the cleaning operation is in any case strongly affected by the installation site). Avoid excessively aggressive cleaning of the finned coil (e.g. high-pressure washer).

7.3 SCHEDULED ROUTINE MAINTENANCE

For scheduled routine maintenance, perform the operations in Table 7.2 p. 43, at least once every 2 years.

Table 7.2

		GAHP A	GAHP GS/WS	AY00-120	GA ACF	GAHP-AR
Ordinary scheduled maintenance						
Check of the unit	clean the combustion chamber	√ (1)	√ (1)	√	√	√ (1)
	clean the burner	√ (1)	√ (1)	√	√	√ (1)
	clean the ignition and flame sensor electrodes	√	√	√	√	√
	check that the condensate discharge is clean	√	√	√	-	-
	replace the silicone gasket between the front plate and the exchanger	-	-	√	-	-

(1) Only in case the analysis of combustion products is non-compliant.

7.4 MESSAGES ON THE DISPLAY

4 digit display on GAHP/GA/AY modules

The S61/AY10 electronic boards on the GAHP/GA/AY modules, which are part of the group, are equipped with a 4-digit display, visible through the front panel of the respective appliances.

Signals in normal operation

On the display of each appliance of the group:

- When supplying voltage to the group all the LED light up for 3 sec, then the name of the S61/AY10 electronic board appears. After about 15 sec. the group appliances are ready to operate.
- During normal operation, water temperature values

alternate on the display: output, input and the difference between the two.

Signals in the event of fault

In case of anomaly to one (or more) appliance(s), the relative display(s) flashes indicating an operating code (first letter on the display: "E" = error, or "U" = warning). Simultaneously, the relative display of the connected command flashes (DDC or CCI).

The display rotates after the values of the outlet water temperature, the inlet and the difference between them. If multiple events are active, they are shown in sequence, ordered by increasing code number.

If warning or error events are active, the left green symbol, shown together with water temperature data, blinks.

If it is a permanent error or warning the appliance stops.



Refer to the operating codes tables in the Manuals of the individual units or in the DDC/CCI/CCP controls Manuals (attachments) for diagnostic.

7.5 RESTARTING A LOCKED-OUT UNIT

Fault signals on the displays

If one (or more) appliance(s) is/are blocked, an operating code flashes on its/their respective display(s) (first green digit on the left, letter "U" = warning or "E" = error) , and the display of the connected control device (DDC or CCP/CCI) flashes too

- To restart the appliance(s) you need to know and perform the procedure for the problem reported and identified by the code.
- Only act if you are familiar with the issue and with the procedure (technical expertise and professional qualifications might be required).
- If you do not know the code, the problem, or the procedure, or you do not have sufficient skills, and in any case of doubt, contact the TAC.



Refer to the operating codes tables in the Manuals of the individual units or in the DDC/CCI/CCP controls Manuals (attachments) for diagnostic.

Locked-out appliance

An external intervention (reset or repair) is required due to an appliance fault or problem with the system.

- A reset may be enough for a temporary and provisional fault.
- For a fault or breakdown, alert the maintenance technician or TAC.

Reset

There are two options for resetting a fault:

1. If the appliance is connected to a DDC you may act through the control device, as described in the relevant manual.
2. It can be operated directly from the board of the individual appliance, as described in the manual of the appliance itself.

7.6 CIRCULATORS LOCKOUT

See Appendix 9.2 p. 52.

7.7 PERIODS OF INACTIVITY



Avoid emptying the installation

Emptying the system can cause damage to the hydraulic pipes, for oxidation or corrosion.



Deactivate the group in winter

If you intend to stop the preassembled group during the

winter, ensure at least one of the following two conditions:

1. antifreeze function active (Paragraph 3.4 p. 29)
2. sufficient antifreeze glycol (Paragraph 3.5 p. 29)

Prolonged periods of inactivity

- If you plan to leave the preassembled group idle for a long time, disconnect it from the electrical and gas supply mains. These operations must be performed by qualified personnel.



How to disable the group for long periods

1. Turn off the group using the connected (DDC or CCP/CCI) control device (Paragraph 6.2 p. 41).
2. Only when all the appliances of the group are completely powered off, disconnect the power supply as described in Paragraph 7.1 p. 42.
3. Close the gas valve.



How to reactivate the group after long periods of inactivity

Prior to reactivating the group, the manager/maintainer of the system must first:

- Check whether any maintenance operations are required (contact the TAC; see Paragraphs 7.2 p. 43 and 7.3 p. 43).
 - Check content and quality of the water in the system, and if necessary top it up (Paragraphs 3.7 p. 30, 3.6 p. 30 and 3.5 p. 29).
 - Ensure the flue gas exhaust duct is not obstructed, and that the condensate drain is clean.
- After completing the above checks:
1. Open the gas valve and ensure there are no leaks; should gas smell be noticed, close the gas valve again, do not switch any electrical devices on and request intervention by qualified personnel.
 2. Connect the electrical power supply as described in Paragraph 7.1 p. 42.
 3. Turn on the preassembled group using the provided control device (DDC or CCP/CCI, Paragraph 4.4 p. 35).

8 DIAGNOSTICS

8.1 APPLIANCES/CONTROLLERS



Refer to the operating codes tables in the Manuals of the individual units or in the DDC/CCI/CCP controls Manuals (attachments) for diagnostic.

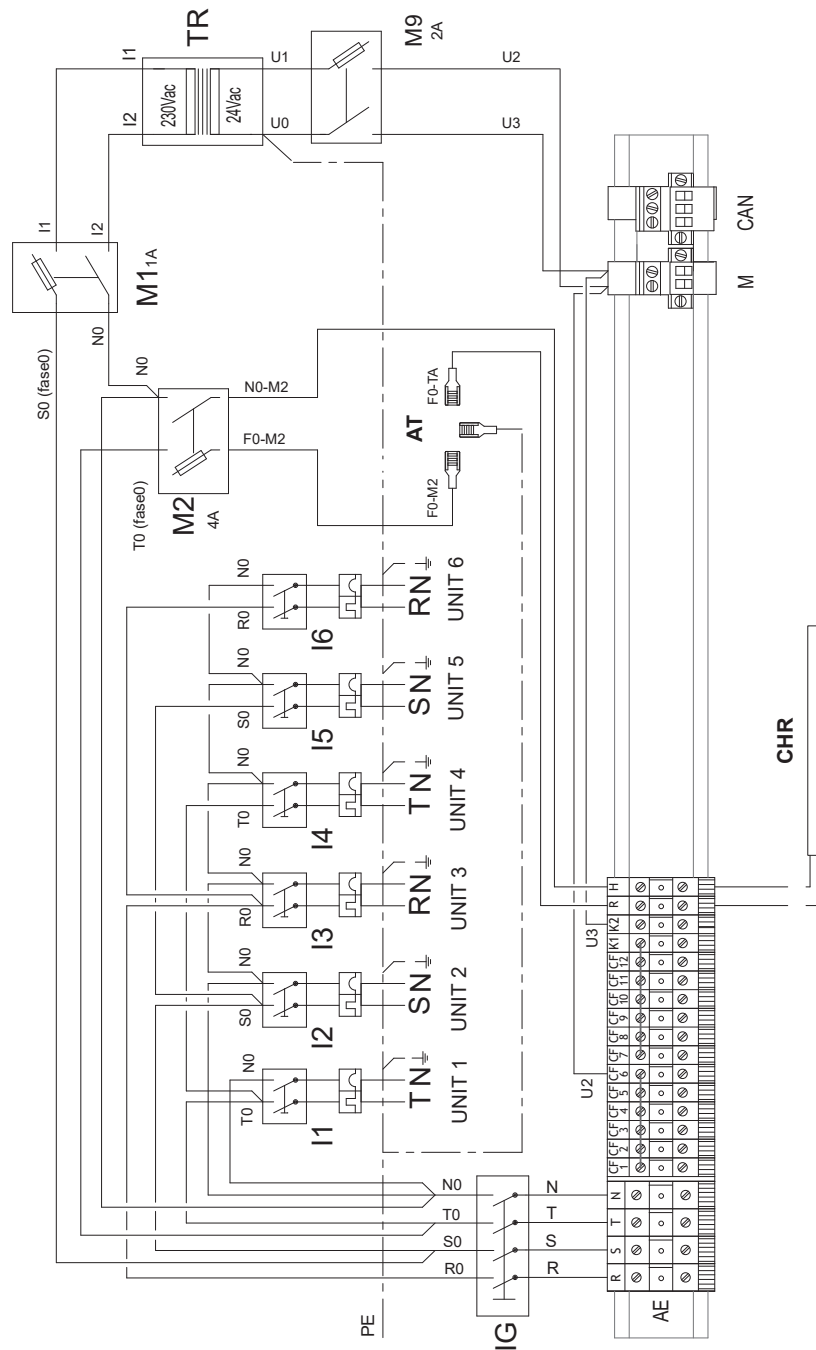
8.2 CIRCULATING PUMPS

See Appendix 9.2 *p. 52*.

9 APPENDICES

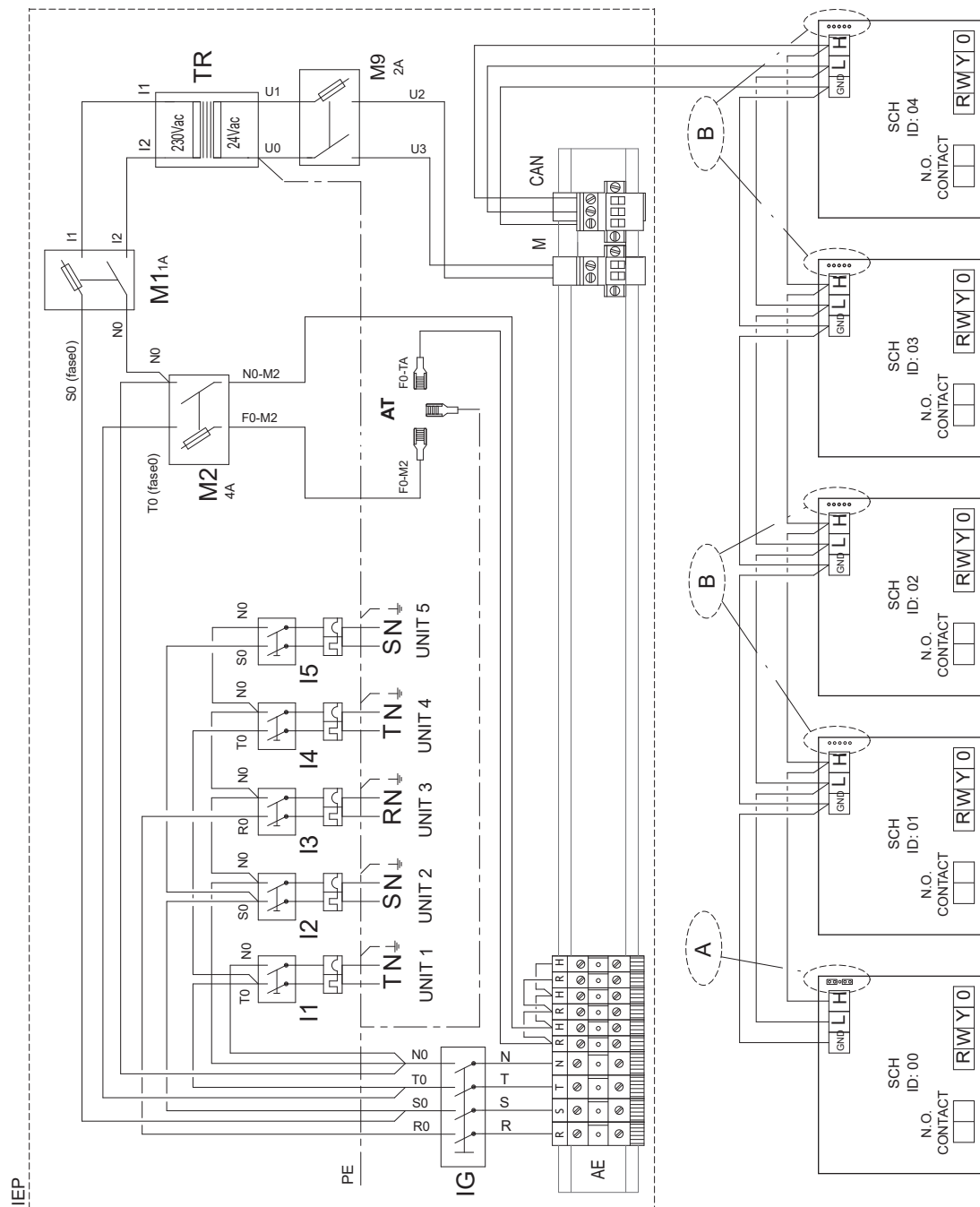
9.1 WIRING DIAGRAMS AND INTERNAL WIRINGS

Figure 9.1 Diagram 1



- | | | | |
|-----|---|----|--|
| AE | Power supply input terminals | I6 | "ID05" unit magnetothermic breaker |
| AT | Antifreeze thermostat | IG | Group electrical panel (QEG) switch disconnector |
| CAN | 3-pole connector for CAN bus network connection | M | 2-pole 24 Vac connector for service use |
| CHR | Condensation heating resistance | M9 | Transformer primary fuse |
| I1 | "ID00" unit magnetothermic breaker | M2 | Condensate heating resistance protection fuse |
| I2 | "ID01" unit magnetothermic breaker | M9 | Transformer secondary fuse |
| I3 | "ID02" unit magnetothermic breaker | PE | Earth conductor |
| I4 | "ID03" unit magnetothermic breaker | TR | Transformer 230/24 Vac |
| I5 | "ID04" unit magnetothermic breaker | | |

Figure 9.2 Diagram 2



See the Figure 9.1 p. 46 legend.

IEP Interior of the electrical panel

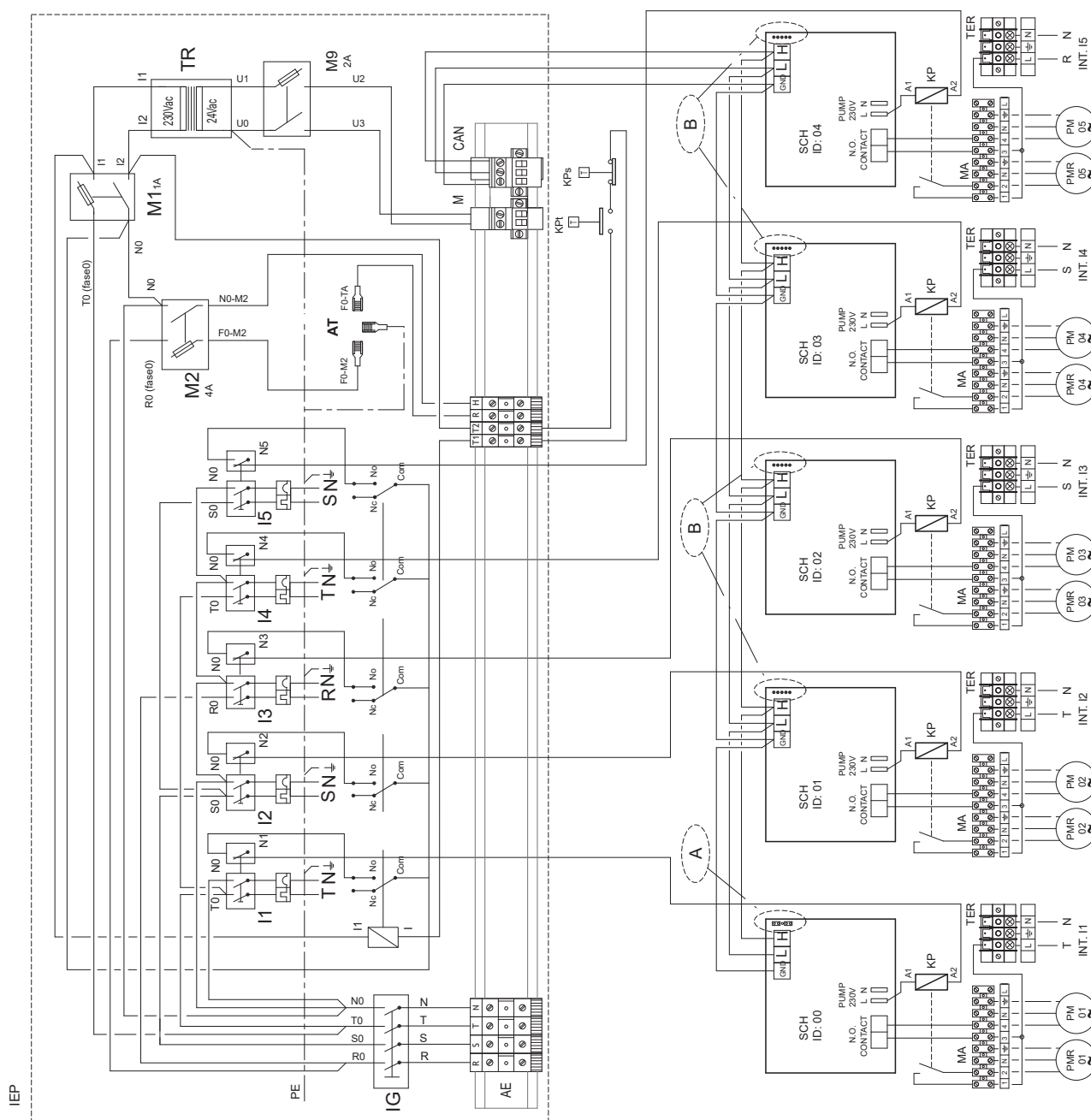
A CLOSED jumpers (from factory): keep CLOSED only if ID00 is a TERMINAL node on the CAN network

B Open Jumpers (from factory): not to touch
Note on the position of jumpers A:

- If ID00 is an intermediate node:
- the electric installer must OPEN ID00 unit jumpers

- the TAC must reset from the board, to progression, the enumeration of the board ID of all units;
- on appliances with 2 units, only ID00 + ID01 units will be present (with jumpers predefined as in the example)
- on appliances with 3 units, only ID00 + ID01 + ID02 units will be present (with jumpers predefined as in the example)
- on appliances with 4 units, only ID00 + ID01 + ID02 + ID03 units will be present (with jumpers predefined as in the example)

Figure 9.3 Diagram 3



See the Figure 9.2 p. 47 legend.

KPt Thermostat with setpoint calibration of DHW tank (not supplied)
 KPs Thermostat calibrated at 35 °C with capillary tube in the lower part of the DHW tank (not supplied) [to be provided in the event the water flow rate on the recovery circuit exceeds the nominal value of 1000 l/h]

MA Appliance terminal block

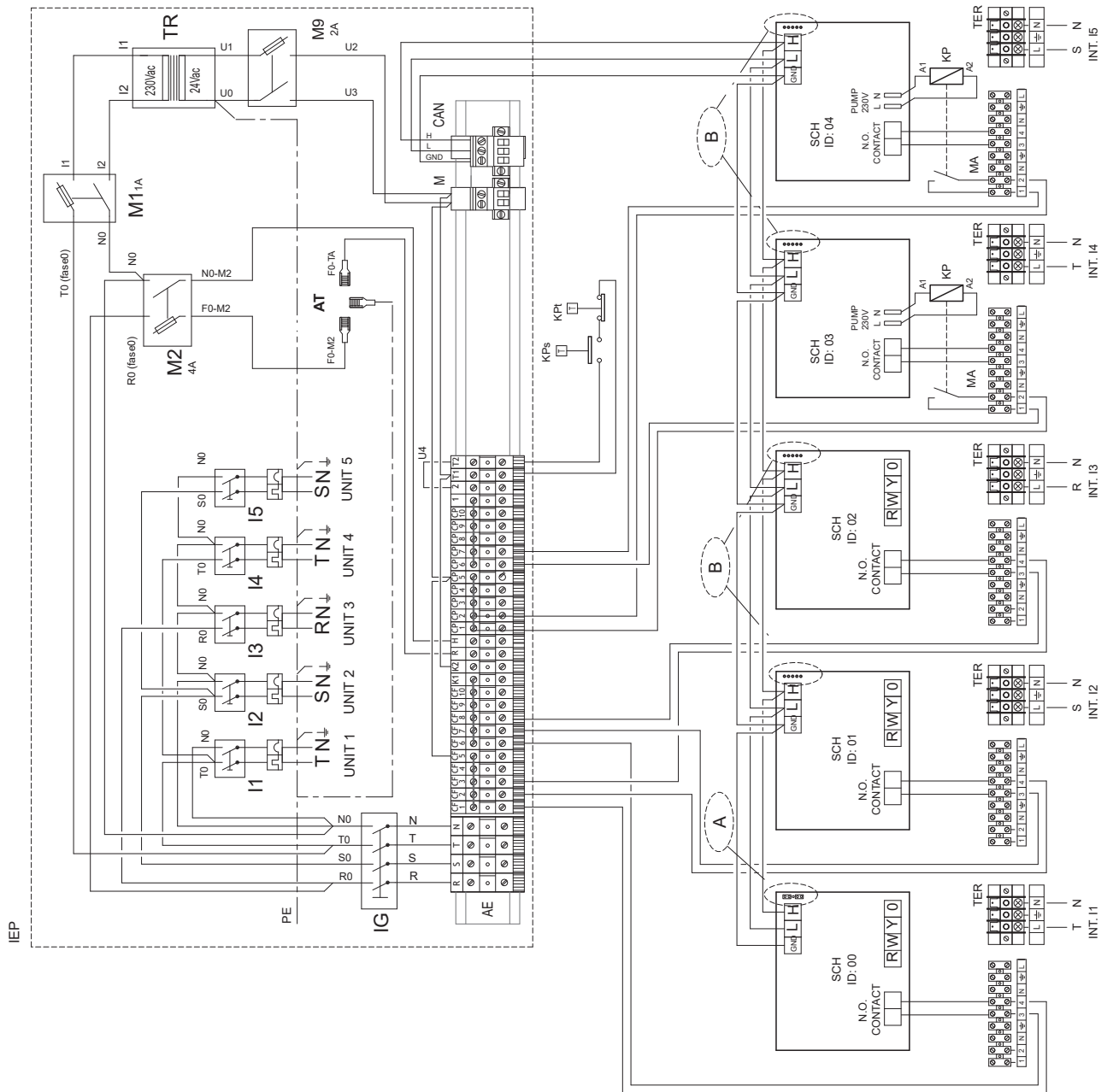
PM Water pump < 700 W

PMR Recovery exchanger pump

TER Power supply terminal block 230 Vac

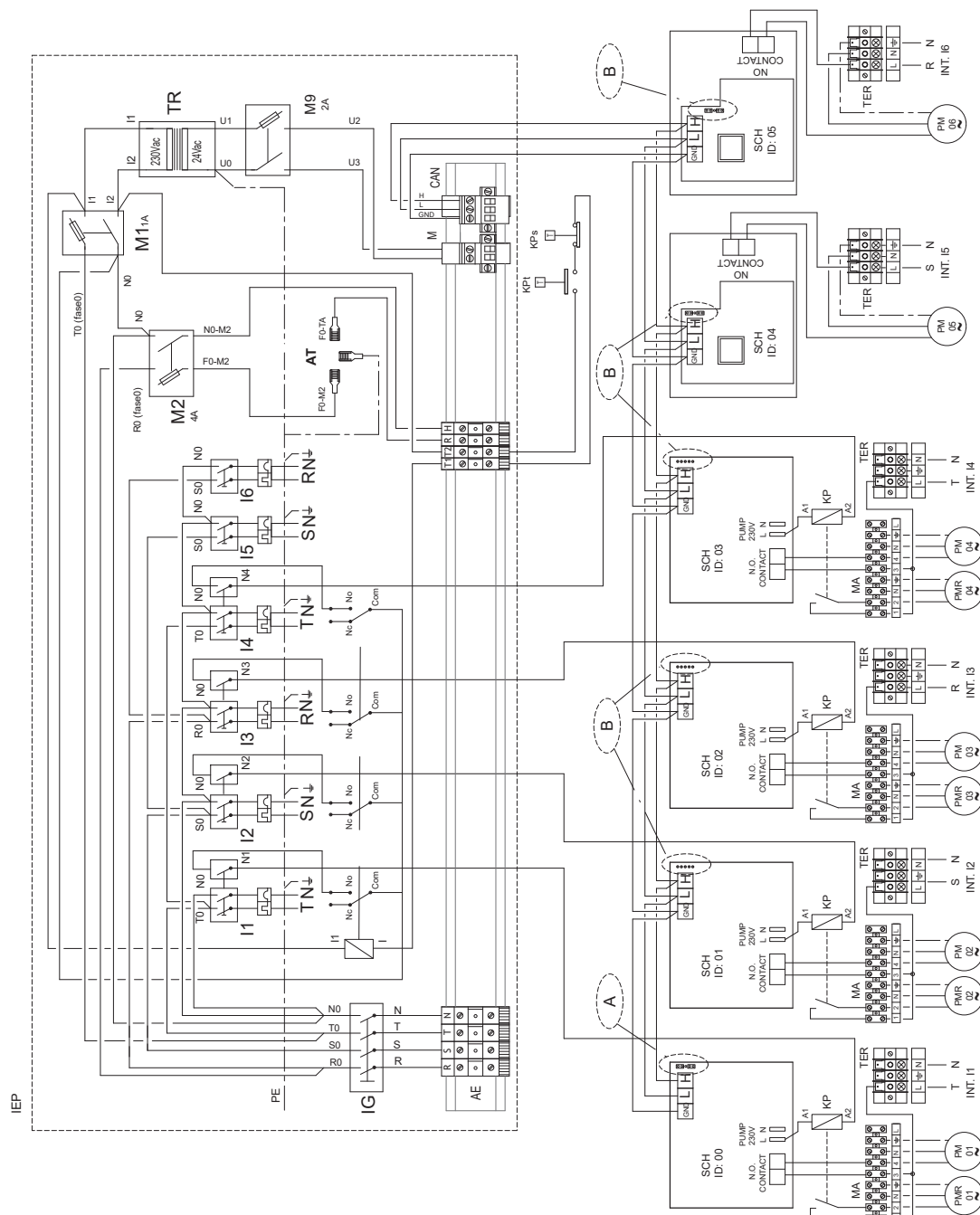
NOTE if there are no ACF 60-00 HR units in the preassembled group, the T1-T2 terminals must be jumpered.

Figure 9.4 Diagram 4



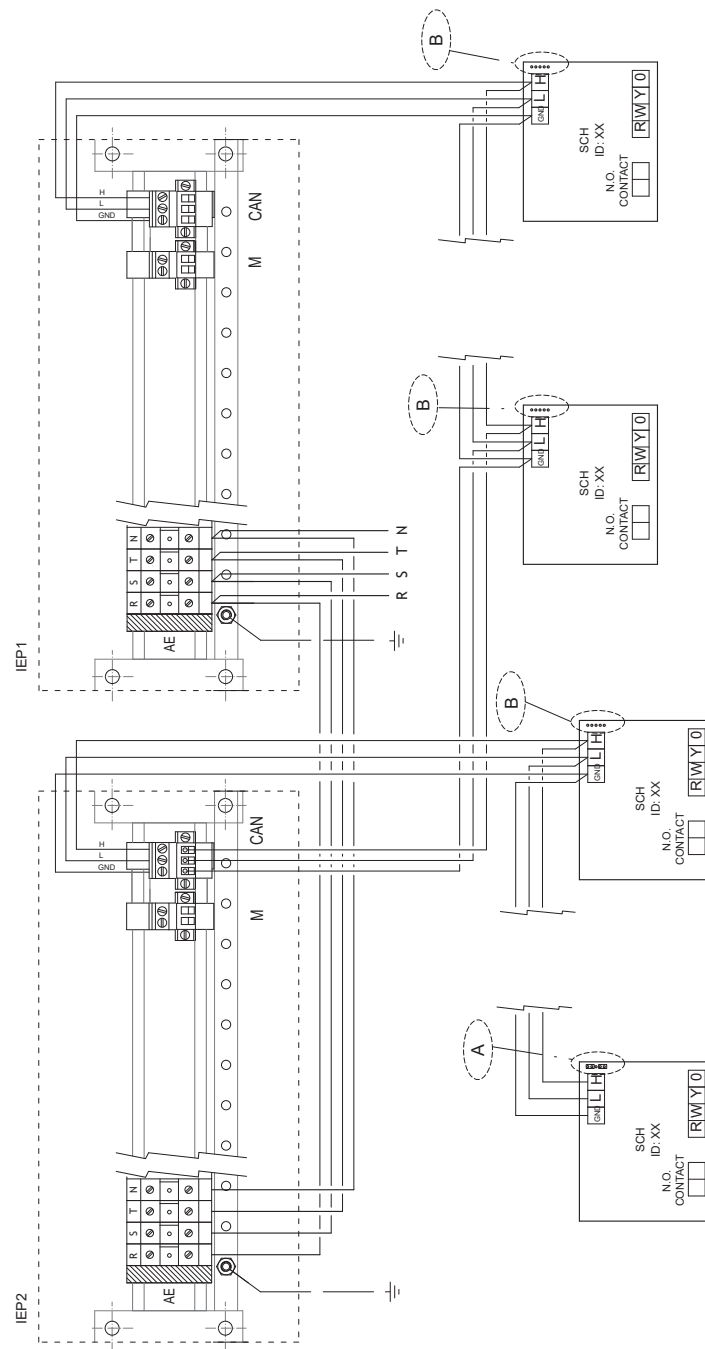
See the Figure 9.3 p. 48 legend.

Figure 9.5 Diagram 5



See the Figure 9.3 p. 48 legend.

Figure 9.6 Diagram 6



See the Figure 9.2 p. 47 legend.

IEP Interior of the electrical panel
RSTN Phases/neutral

9.2 CIRCULATING PUMPS

To access the circulating pumps, remove the plastic cover (for GAHP/GA, Figure 1.14 p. 20), or remove the front panel of the AY00-120 units (Figure 1.15 p. 20).

Table 9.1 Wilo Yonos pump block signalings

Code	Fault	Cause	Remedial action
E04	Insufficient mains voltage	Supply voltage too low on the mains side	Check that power supply voltage is correct.
E05	Excessive mains voltage	Supply voltage too high on the mains side	Check that power supply voltage is correct.
E09 (1)	Turbine operation	The pump is driven backwards (pump flow from the delivery side to the suction side)	Check the flow rate. If necessary, fit the check valves.
E10	Locking	The rotor is locked	Ask for TAC intervention.
E21 (2)	Overload	The motor runs with difficulty	Ask for TAC intervention.
E23	Short circuit	Motor current too high	Ask for TAC intervention.
E25	Contact/winding	Defective motor winding	Ask for TAC intervention.
E30	Over temperature of the module	Module inside vane too hot	Improve ventilation of the environment, check the conditions of use. If necessary, ask for TAC intervention.
E31	Power module overtemperature	Ambient temperature too high	Improve ventilation of the environment, check the conditions of use. If necessary, ask for TAC intervention.
E36	Electronic system error	Defective electronic system	Ask for TAC intervention.

1 Only for pumps with $P1 \geq 200$ W.

2 In addition to the LED indicator, the fault LED turns red with fixed light. See also message E21.

Table 9.2 Wilo Yonos pump warning messages

Code	Fault	Cause	Remedies
E07	Turbine operation	With the pump off the impeller remains in operation	Check the flow rate. If necessary, fit the check valves.
E11	Dry operation	Air in the pump	Check the amount/pressure of the water.
E21 (1)	Overload	The motor runs with difficulty	Ask for TAC intervention.

1 See also blocking signal E21.

Robur mission

Robur is dedicated to dynamic progression
in research, development and promotion
of safe, environmentally-friendly, energy-efficiency products,
through the commitment and caring
of its employees and partners.



Robur S.p.A.
advanced technologies
for air conditioning
via Parigi 4/6
24040 Verdellino/Zingonia (BG) Italy
+39 035 888111 - F +39 035 884165
www.robur.it robur@robur.it

