

Application manual

Roburbox100

Plant Control Interface



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FOREWORD

This "RB100 applications manual" gives a few examples of installations which use the (Robur Box) RB100 interface device.



To consult this manual you need to know Robur products and some indications contained in each specific product manual this documentation refers to.

This manual is specifically intended for:

- designers for the design of systems which use the RB100 interface;
- installation technicians (hydraulic and electrical) for the carrying out of a correct installation of Robur appliances;
- installation technicians and Robur Authorised Technical Assistance Centres (TACs) for the correct configuration.

The descriptions provided in this manual refer to:

- the RB100 interface device, version 1.000;
- Robur units with version 3.000 or higher;
- the Direct Digital Controller (DDC) with version 4.000 or higher.

Summary

The manual is divided into 4 sections:

The SEZIONE 1 provides some information about the functions of the Robur devices in particular applications.

The SEZIONE 2 provides some examples of installations which use the RB100 interface to manage the domestic hot water. In the section you can find the wiring diagram and the configuration of the plant shown.

The SEZIONE 3 provides some examples of installations which use the RB100 interface to manage heating and air conditioning without DHW (DHW: Domestic hot water). In the section you can find the wiring diagram and the configuration of the plant shown.

The SEZIONE 4 provides some examples of installations called "special" which exploit the functions of the Robur machines.

References

For needs other than those represented in this manual, it may be necessary to configure both the RB100 device and the Direct Digital Controller (DDC) in a way different from that shown. In this case refer to the following documentation:



Direct Digital Controller: DDC installation manual (D-LBR273)
(for installation and service technicians);



Direct Digital Controller: DDC user and programming manual (D-LBR249)
(for the user of the DDC).



RB100: Installation and user manual - D-LBR468)
(for installation and service technicians);

Meaning of terminology and icons

DHW: (Domestic hot water) which is used to indicate the relevant DHW0 and DHW1 services.

Basic Group: by this term we mean to indicate the portion of plant including all units, except for those which can be separated from the installation itself.

Separable Group: by this term we mean to indicate the portion of plant which can separate from the basic installation and work stand-alone.

Basic DHW: domestic hot water service obtained with the basic group.

Separable DHW: domestic hot water service obtained with the separable group.

Separate DHW: domestic hot water service obtained with the separable group of units, which is physically “separate” from the rest of the plant and cannot be included in the basic group to contribute to heating.

The icons shown in the margin of this manual have the following meanings:






	Danger signal
	Warning
	Note
	Start of operating procedure
	Reference to another part of the manual or to another manual/book

Table 1 Descriptive Icons





	"GENERAL INFORMATION" section
	"PLANTS WITH DHW" section
	"PLANTS WITHOUT DHW" section
	"SPECIAL PLANTS" section

Table 2 Section Icons

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SEZIONE 1 GENERAL INFORMATION

In this section some specific situations, which can usually be found in plants, are analyzed and an application solution is suggested.



The hydraulic circuits shown cannot be used for execution purposes.

1.1 Only Digital Input for hot/cold services

If you need to manage an installation with only digital inputs to check cold/hot requests, it is advisable to use such input on the RB100 for the only DHW services (if any) and to use the DDC external contacts for the management of cold/hot requests. This is necessary because currently cold and hot requests from the RB100 do not allow to switch an installation from the cooling to the heating mode and vice versa, but you need to interact on the DDC by selecting, with the aid of the relevant snow/sun icon, the desired operating mode. By means of the “External Permissions” option you can switch to the desired operating mode by closing the concerned contact (RY/RW).

Moreover, if you have an only hot/only cold type installation without DHW or a 2-4 pipe cold/hot plant, you are advised to use the RB100 only if you have to manage setpoint requests of analog type, since the DDC already supports a “digital” control of this kind.

As clearly described in the DDC manual (D-LBR273 and D-LBR249) you can manage installations of this type by using the DDC “External Contacts”: RYWm and RYWa.

RYWm

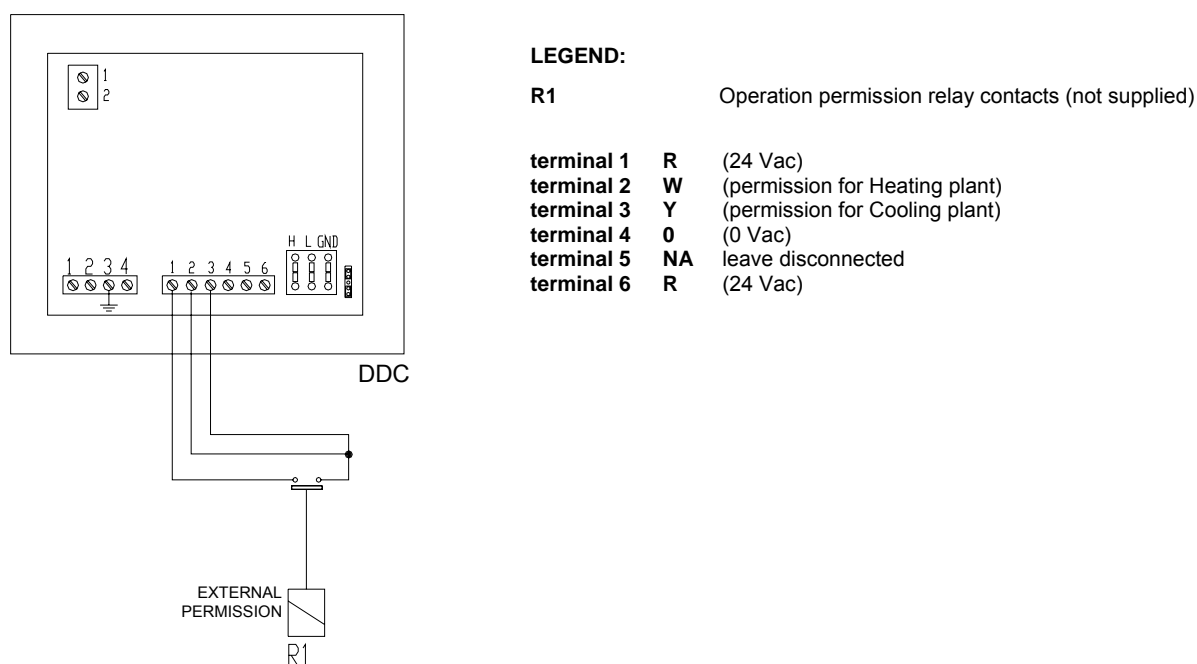


Figure 1 Example of connection for RYWm mode

In this configuration the switching from cooling to heating and vice versa is obtained by pressing the appropriate DDC heating/cooling push-button.



For setting, refer to the DDC user and programming manual.

RYWa

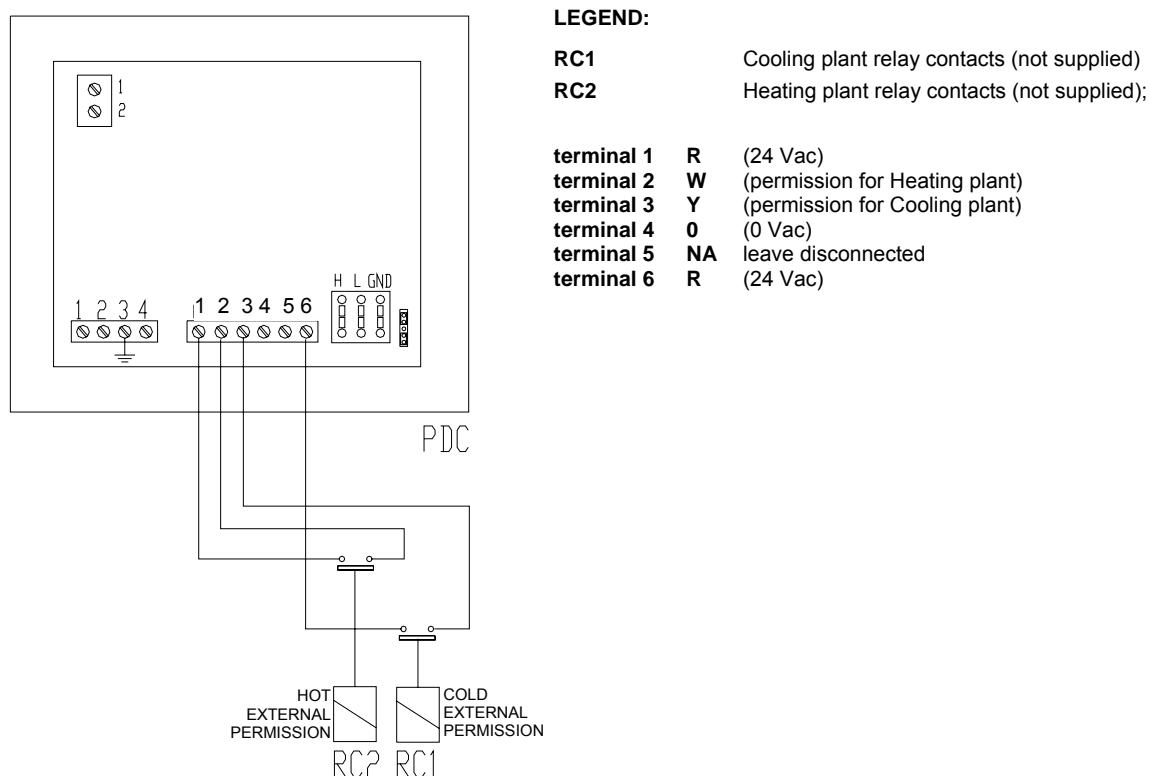


Figure 2 Example of connection for RYWa mode

In this configuration the switching from cooling to heating and vice versa is obtained automatically by closing the desired approval contact.



For setting, refer to the DDC user and programming manual.



If you use one of the two applications suggested remember to set the following values:

- Default setpoint.
- Differential.
- Number of steps.
- General (and/or Partial) water ranges, if necessary.



1.2 Switching from hot to cold (and vice versa) if an analog input is available

If you need to manage an installation with analog-type cold and hot inputs, given that it is not possible to reverse the operating mode of the plant with request from the RB100, you can make a connection of the type shown in Figure 3, which allows the switching from hot to cold (and vice versa) by acting only on the S1 selector. The RB100 receives only analog inputs to send the operating setpoint to the DDC.

That is:

- 1-3 contact closure: cooling operation mode (R-Y);
- 1-2 contact closure: heating operation mode (R-W).

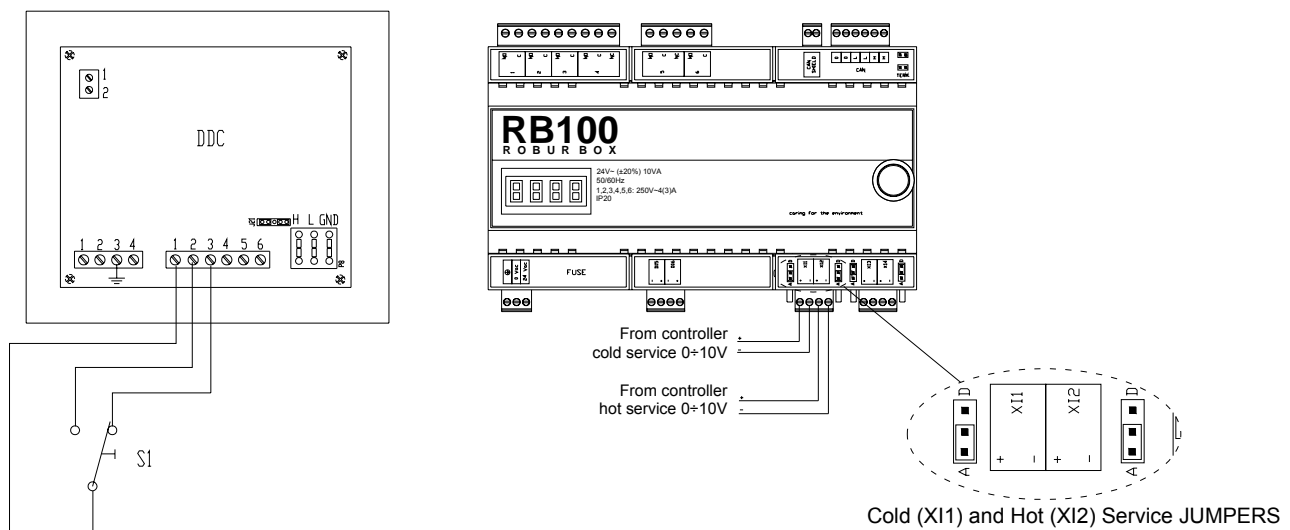


Figure 3 Example of connection to the DDC for plant switching in case of analog input from RB100

For this kind of application you need to set the “External permissions” operating mode on the DDC and configure the cold and hot services on the RB100 as analog inputs, by placing correctly the jumper corresponding to each individual service (see APPENDIX on page 53).



You can use simultaneously this application and the DHW services.

For example: on a plant of the type shown in Figure 10 on page 25 you can configure the cold and hot (cooling/heating) services as suggested above (Figure 3) and the DHW services of digital type (not necessarily of analog type).

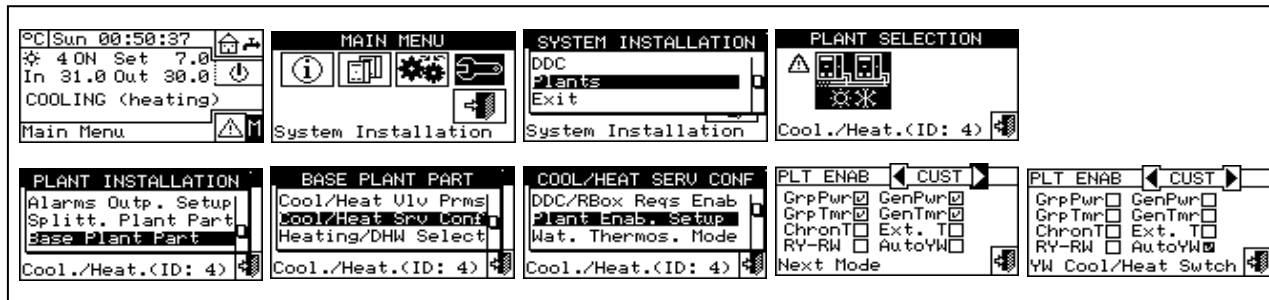


For setting, refer to the RB100 interface user's manual.

Configuring DDC

To allow the management of the DDC external contacts (RYW) only for switching from cooling to heating (and vice versa), preventing the machines from being turned on as a result of the closure of the S1 contact, you need to set the DDC “External Permissions” option in CUSTOM mode, by enabling only YWAUTO.

Follow the indications given below to configure permissions properly:



- Main Menu → System Installation → Plants → Plant Selection → Base Plant Part → Cool/Heat Srv Conf → Plant Enab. Setup
- With the right arrow key scroll until the CUSTOM (CUST) mode is reached.

Once the last screen has been opened:

- disable: GrpPwr; GenPwr; GrpTmr, GenTmr;
- enable ONLY: AutoYW;
- Exit and come back to the main screen.



If necessary, for setting, refer to the DDC user and programming manual.

1.3 Characteristics of Diverter Valves

During switching, the installed valves must ensure a minimum flow rate indicated in Table 3.

WATER FLOW	OPERATING MODE		TYPE OF ROBUR UNIT					
			ACF 60-00	AY00-119	GAHP-AR	GAHP-A	GAHP-W	GAHP-W LB
			l/h	l/h	l/h	l/h	l/h	l/h
	HEATING	MINIMUM		1500	1400	1400	1400	1400
		MAXIMUM		3200	5000	5000	5000	5000
	COOLING	MINIMUM	2500		2500		2300	2000
		MAXIMUM	3200		3200		4700	4000

Table 3 Water flow values to ensure to Robur units during switching



SEZIONE 2 PLANTS WITH DHW

In this section, intended for designers, hydraulic and electrical installation technicians and Robur Authorised Technical Assistance Centres (TACs), you will find some examples of plants with DHW which can be controlled by means of the RB100 interface. For each below-listed installation the hydraulic circuit is provided, the relevant parameter setting for RB100, DDC and Robur units as well as the wiring diagram of the main connections to the Robur Box.

2.1 PLANT 1: Heating with only Basic DHW

The plant allows the production of hot water to satisfy the heating needs and, at the same time, it enables the production of domestic hot water (Basic DHW) by using the same units employed for heating.

Hydraulic connection diagram

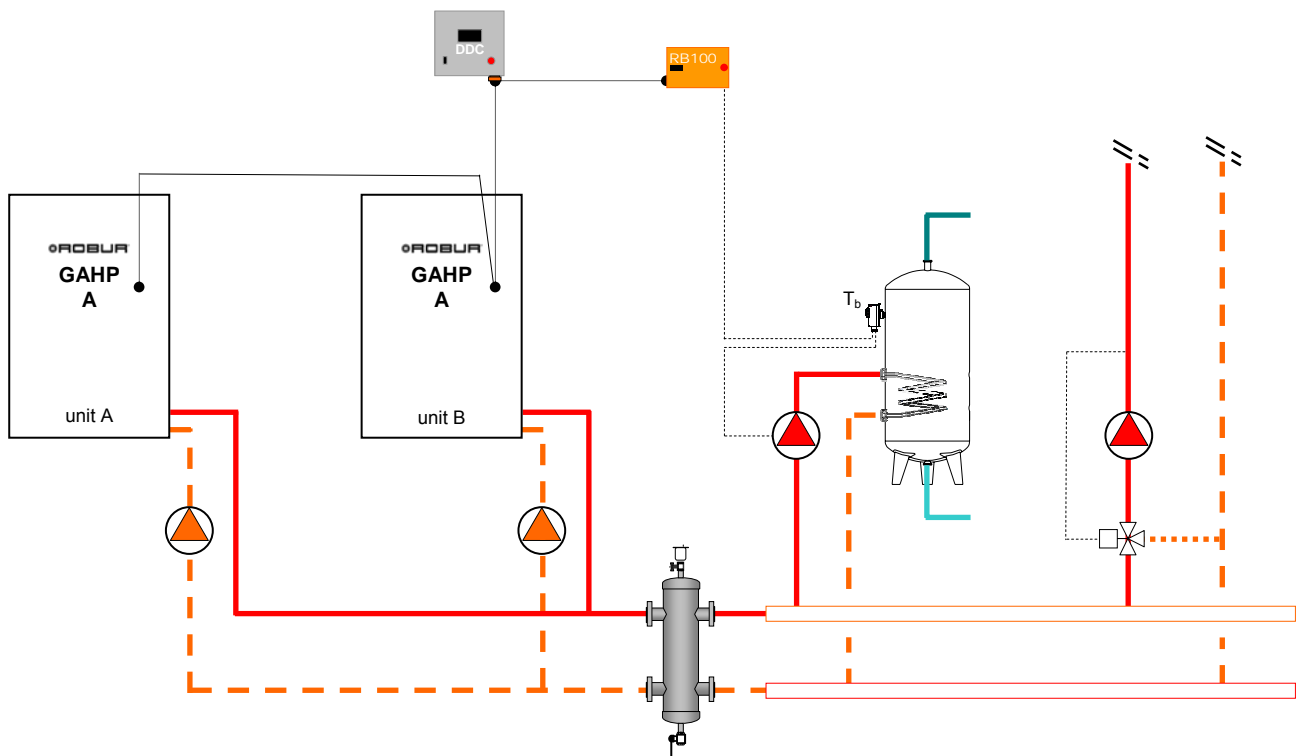


Figure 4 Hydraulic Connection Diagram



In a plant of this type you can introduce one or more ACF units which work on a stand-alone installation. In this case the plant will be supplied with 4 pipes (also the cold service shall be configured).



For the **electrical connections** to make on the RB100 refer to Paragraph 2.12 on page 39.

Configuring unit cards

PARAMETERS TO SET FOR THE PLANT SHOWN IN FIGURE 4				
S60 PARAMETERS SETUP				
UNIT	40 CARD CODE (COMMUNICATION WITH DDC)	60 COLD PLANT ID	150 HOT PLANT ID	172 BELONGING GROUP (0:BASIC//1:SEPARABLE)
A	000	---	0	0
B	001	---	0	0



For setting, refer to the unit user's manual.

Configuring the RB100 interface

PARAMETERS COMMON TO ALL SERVICES		
PARAMETER	PARAMETER DESCRIPTION	VALUE TO ENTER
40	CARD CODE (COMMUNICATION WITH DDC)	471

PARAMETERS RELATIVE TO THE VALVE SERVICE		
PARAMETER	PARAMETER DESCRIPTION	VALUE TO ENTER
150	PLANT CODE	---
151	TYPE OF USE OF THE VALVE	0

PARAMETERS FOR INDIVIDUAL SERVICE				
PAR.	PARAMETER DESCRIPTION	VALUE TO ENTER		
60	COLD SERVICE	0→inactive		
80	HOT SERVICE	1→active		
81	ID OF THE DDC TO WHICH THE REQUEST IS SENT	960		
83	TYPE OF SETPOINT INPUT	0→analog	1→DDC ⁽¹⁾ setpoint digital	2→RB100 setpoint digital
84	TEMP. CORRESPONDING TO THE MIN. SETPOINT	set [°C]	---	---
85	TEMP. CORRESPONDING TO THE MAX. SETPOINT	set [°C]	---	---
86	MAX. TEMP. CORRESPONDING TO OFF REQUEST	set [°C]	---	---
87	SETPOINT RESOLUTION	set [°C]	---	---
88	LOCAL SETPOINT FOR DIGITAL INPUT	---	---	set [°C]
100	DHW0 SERVICE	1→active		
101	ID OF THE DDC TO WHICH THE REQUEST IS SENT	960		
102	TYPE OF GROUP FROM WHICH THE REQUEST IS RECEIVED	0→basic		
103	TYPE OF SETPOINT INPUT	0→analog	1→DDC ⁽¹⁾ setpoint digital	2→RB100 setpoint digital
104	TEMP. CORRESPONDING TO THE MIN. SETPOINT	set [°C]	---	---
105	TEMP. CORRESPONDING TO THE MAX. SETPOINT	set [°C]	---	---
106	MAX. TEMP. CORRESPONDING TO OFF REQUEST	set [°C]	---	---
107	SETPOINT RESOLUTION	set [°C]	---	---
108	LOCAL SETPOINT FOR DIGITAL INPUT	---	---	set [°C]
120	DHW1 SERVICE	0→inactive		

NOTES

(1) FOR PROGRAMMING, REFER TO THE DIRECT DIGITAL CONTROLLER (DDC) MANUAL

set[°C] → SET THE DESIRED TEMPERATURE VALUE



For setting, refer to the RB100 interface user's manual.



For setting the "DDC digital setpoint" refer to the Direct Digital Controller (DDC) user and programming manual.

Configuring the Direct Digital Controller (DDC) Id: 960

- Configuring the machines on the DDC: "Units-DDC Binding";
 - Main Menu → System Installation → DDC → Units-DDC Binding
- Configuring the Basic plant portion: "Heating and DHW (Simultan. Service)";
 - Main Menu → System Installation → Plants → Base Plant Part → Heat/DHW Setp Prio

At this point the plant is working.



For setting the operating parameters (setpoint, differential, steps, etc.) refer to the Direct Digital Controller (DDC) user and programming manual.

2.2 PLANT 2: Heating Plant with only Separable DHW

The plant allows the production of hot water to satisfy the heating needs and the production of domestic hot water (Separable DHW). In this type of plant part of the units employed for heating (units belonging to the “Separable Group”) are separated from the plant (by means of motorized three-way valves) to be dedicated to the production of domestic hot water. The system allows to integrate the heating units with the Separable Group if there is no demand for Domestic hot water (DHW).

2.2.1 Hydraulic connection diagram

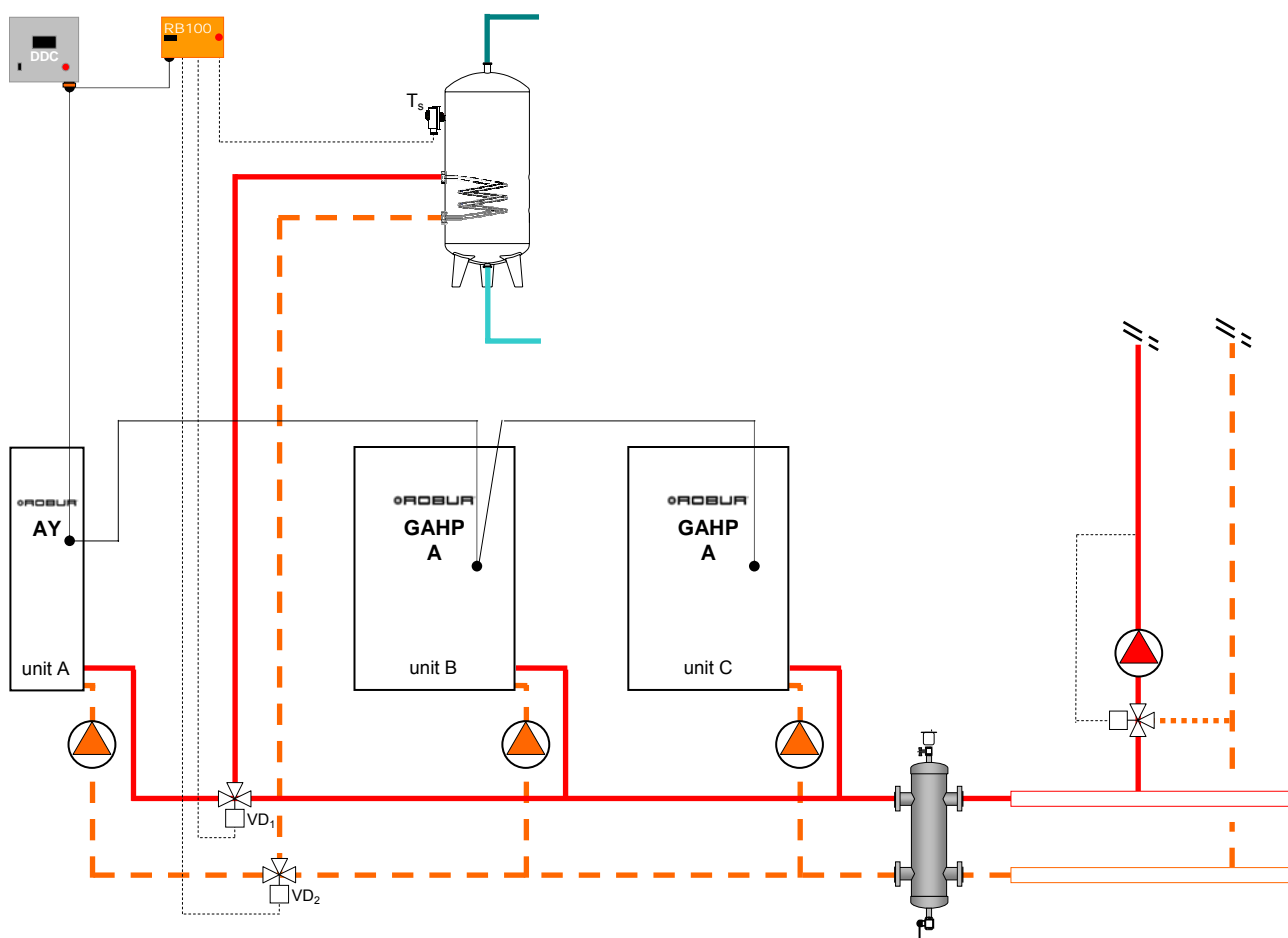


Figure 5 Hydraulic connection diagram



In a plant of this type you can introduce one or more ACF units which work on a stand-alone installation. In this case the plant will be supplied with 4 pipes (also the cold service shall be configured).



For the characteristics of the diverter valves refer to what described in Paragraph 1.3 on page 6.



For the **electrical connections** to make on the RB100 refer to Paragraph 2.12 on page 39.



2.2.2 Configuring unit cards

PARAMETERS TO SET FOR THE PLANT SHOWN IN FIGURE 5				
S60 PARAMETERS SETUP				
UNIT	40 CARD CODE (COMMUNICATION WITH DDC)	60 COLD PLANT ID	150 HOT PLANT ID	172 BELONGING GROUP (0:BASIC // 1:SEPARABLE)
A	000	---	0	1
B	001	---	0	0
C	002	---	0	0



For setting, refer to the unit user's manual.

2.2.3 Configuring the RB100 interface

PARAMETERS COMMON TO ALL SERVICES		
PARAMETER	PARAMETER DESCRIPTION	VALUE TO ENTER
40	CARD CODE (COMMUNICATION WITH DDC)	471

PARAMETERS RELATIVE TO THE VALVE SERVICE		
PARAMETER	PARAMETER DESCRIPTION	VALUE TO ENTER
150	PLANT CODE	0
151	TYPE OF USE OF THE VALVE	1 ⁽¹⁾

NOTES

(1) SEPARATION VALVE FOR DHW WITHOUT LIMIT SWITCH. IF YOU HAVE A VALVE WITH LIMIT SWITCH SET THE "2" VALUE

PARAMETERS FOR INDIVIDUAL SERVICE				
PAR.	PARAMETER DESCRIPTION	VALUE TO ENTER		
60	COLD SERVICE	0→inactive		
80	HOT SERVICE	1→active		
81	ID OF THE DDC TO WHICH THE REQUEST IS SENT	960		
83	TYPE OF SETPOINT INPUT	0→analog	1→DDC ⁽¹⁾ setpoint digital	2→RB100 setpoint digital
84	TEMP. CORRESPONDING TO THE MIN. SETPOINT	set [°C]	---	---
85	TEMP. CORRESPONDING TO THE MAX. SETPOINT	set [°C]	---	---
86	MAX. TEMP. CORRESPONDING TO OFF REQUEST	set [°C]	---	---
87	SETPOINT RESOLUTION	set [°C]	---	---
88	LOCAL SETPOINT FOR DIGITAL INPUT	---	---	set [°C]
100	DHW0 SERVICE	0→inactive		
120	DHW1 SERVICE	1→active		
121	ID OF THE DDC TO WHICH THE REQUEST IS SENT	960		
122	TYPE OF GROUP FROM WHICH THE REQUEST IS RECEIVED	1→separable		
123	TYPE OF SETPOINT INPUT	0→analog	1→DDC ⁽¹⁾ setpoint digital	2→RB100 setpoint digital
124	TEMP. CORRESPONDING TO THE MIN. SETPOINT	set [°C]	---	---
125	TEMP. CORRESPONDING TO THE MAX. SETPOINT	set [°C]	---	---
126	MAX. TEMP. CORRESPONDING TO OFF REQUEST	set [°C]	---	---
127	SETPOINT RESOLUTION	set [°C]	---	---
128	LOCAL SETPOINT FOR DIGITAL INPUT	---	---	set [°C]

NOTES

(1) FOR PROGRAMMING, REFER TO THE DIRECT DIGITAL CONTROLLER (DDC) MANUAL

set[°C] → SET THE DESIRED TEMPERATURE VALUE




For setting, refer to the RB100 interface user's manual.



For setting the "DDC digital setpoint" refer to the Direct Digital Controller (DDC) user and programming manual.

2.2.4 Configuring the Direct Digital Controller (DDC) Id: 960

- Configuring both the machines and the DHW valves on the DDC: "Units-DDC Binding";
 - Main Menu → System Installation → DDC → Units-DDC Binding
( on the units and on the DHW valves)
- Configuring the Basic plant Portion: "Heating Only";
 - Main Menu → System Installation → Plants → Base Plant Part → Heat/DHW Setp Prio
- Configuring the Separable plant Portion: "Heating and DHW (Alternate Service)";
 - Main Menu → System Installation → Plants → Splitt. Plant Part → Heating/DHW Select

At this point the plant is working.



For setting the operating parameters (setpoint, differential, steps, DHW valve parameters, switching time delay, etc.) refer to the Direct Digital Controller (DDC) user and programming manual.

The system allows both the pre-heating of the domestic hot water (Basic DHW) by using the same units employed for heating and the integration of the heating units and the Separable Group if there is no demand for Separable DHW.

The schematic illustrates a water heating system configuration. At the top left, there is a control unit labeled "DDC" connected to a sensor "RB100". The system includes two vertical storage tanks. The first tank has a temperature sensor T_s and is supplied by "D.H.W." (Domestic Hot Water). The second tank has a temperature sensor T_b . A red line representing the "WATER SYSTEM" flows from the second tank through a "PRE-HEATING" section and a pump. This line then branches out to supply three units: "unit A", "unit B", and "unit C". Each unit contains a "GAHP A" (Gas Absorption Heat Pump) and is equipped with its own pump. Unit A also features a valve labeled "VD₁". The return lines from all three units converge at a central point where a valve labeled "VD₂" is located. The return line then leads back to the first tank. The entire system is enclosed within a dashed orange boundary.



ROBUR

2.3.2 Configuring unit cards

PARAMETERS TO SET FOR THE PLANT SHOWN IN FIGURE 6				
S60 PARAMETERS SETUP				
UNIT	40 CARD CODE (COMMUNICATION WITH DDC)	60 COLD PLANT ID	150 HOT PLANT ID	172 BELONGING GROUP (0:BASIC// 1:SEPARABLE)
A	000	---	0	1
B	001	---	0	0
C	002	---	0	0



For setting, refer to the unit user's manual.

2.3.3 Configuring the RB100 interface

PARAMETERS COMMON TO ALL SERVICES		
PARAMETER	PARAMETER DESCRIPTION	VALUE TO ENTER
40	CARD CODE (COMMUNICATION WITH DDC)	471

PARAMETERS RELATIVE TO THE VALVE SERVICE		
PARAMETER	PARAMETER DESCRIPTION	VALUE TO ENTER
150	PLANT CODE	0
151	TYPE OF USE OF THE VALVE	1 ⁽¹⁾

NOTES

(1) SEPARATION VALVE FOR DHW WITHOUT LIMIT SWITCH. IF YOU HAVE A VALVE WITH LIMIT SWITCH SET THE "2" VALUE

PARAMETERS FOR INDIVIDUAL SERVICE				
PAR.	PARAMETER DESCRIPTION	VALUE TO ENTER		
60	COLD SERVICE	0→inactive		
80	HOT SERVICE	1→active		
81	ID OF THE DDC TO WHICH THE REQUEST IS SENT	960		
83	TYPE OF SETPOINT INPUT	0→analog	1→DDC ⁽¹⁾ setpoint digital	2→RB100 setpoint digital
84	TEMP. CORRESPONDING TO THE MIN. SETPOINT	set [°C]	---	---
85	TEMP. CORRESPONDING TO THE MAX. SETPOINT	set [°C]	---	---
86	MAX. TEMP. CORRESPONDING TO OFF REQUEST	set [°C]	---	---
87	SETPOINT RESOLUTION	set [°C]	---	---
88	LOCAL SETPOINT FOR DIGITAL INPUT	---	---	set [°C]
100	DHW0 SERVICE	1→active		
101	ID OF THE DDC TO WHICH THE REQUEST IS SENT	960		
102	TYPE OF GROUP FROM WHICH THE REQUEST IS RECEIVED	0→basic		
103	TYPE OF SETPOINT INPUT	0→analog	1→DDC ⁽¹⁾ setpoint digital	2→RB100 setpoint digital
104	TEMP. CORRESPONDING TO THE MIN. SETPOINT	set [°C]	---	---
105	TEMP. CORRESPONDING TO THE MAX. SETPOINT	set [°C]	---	---
106	MAX. TEMP. CORRESPONDING TO OFF REQUEST	set [°C]	---	---
107	SETPOINT RESOLUTION	set [°C]	---	---
108	LOCAL SETPOINT FOR DIGITAL INPUT	---	---	set [°C]
120	DHW1 SERVICE	1→active		



121	ID OF THE DDC TO WHICH THE REQUEST IS SENT	960		
122	TYPE OF GROUP FROM WHICH THE REQUEST IS RECEIVED	1→separable		
123	TYPE OF SETPOINT INPUT	0→analog	1→DDC ⁽¹⁾ setpoint digital	2→RB100 setpoint digital
124	TEMP. CORRESPONDING TO THE MIN. SETPOINT	set [°C]	---	---
125	TEMP. CORRESPONDING TO THE MAX. SETPOINT	set [°C]	---	---
126	MAX. TEMP. CORRESPONDING TO OFF REQUEST	set [°C]	---	---
127	SETPOINT RESOLUTION	set [°C]	---	---
128	LOCAL SETPOINT FOR DIGITAL INPUT	---	---	set [°C]

NOTES


(1) FOR PROGRAMMING, REFER TO THE DIRECT DIGITAL CONTROLLER (DDC) MANUAL

set[°C] → SET THE DESIRED TEMPERATURE VALUE



For setting, refer to the RB100 interface user's manual.

2.3.4 Configuring the Direct Digital Controller (DDC) Id: 960

- Configuring both the machines and the DHW valves on the DDC: "Units-DDC Binding";
 - Main Menu → System Installation → DDC → Units-DDC Binding
( on the units and on the DHW valves)
- Configuring the Basic plant portion: "Heating and DHW (Simultan. Service)";
 - Main Menu → System Installation → Plants → Base Plant Part → Heat/DHW Setp Prio
- Configuring the Separable plant Portion: "Heating and DHW (Alternate Service)";
 - Main Menu → System Installation → Plants → Splitt. Plant Part → Heating/DHW Select

At this point the plant is working.



For setting the operating parameters (setpoint, differential, steps, DHW valve parameters, switching time delay, etc.) refer to the Direct Digital Controller (DDC) user and programming manual.

2.4 PLANT 4: Heating with separate DHW

The plant allows the production of hot water to satisfy the heating needs and the production of domestic hot water (Separate DHW). In this type plants are physically separated and each one works independently based on the requests received.

2.4.1 Hydraulic connection diagram

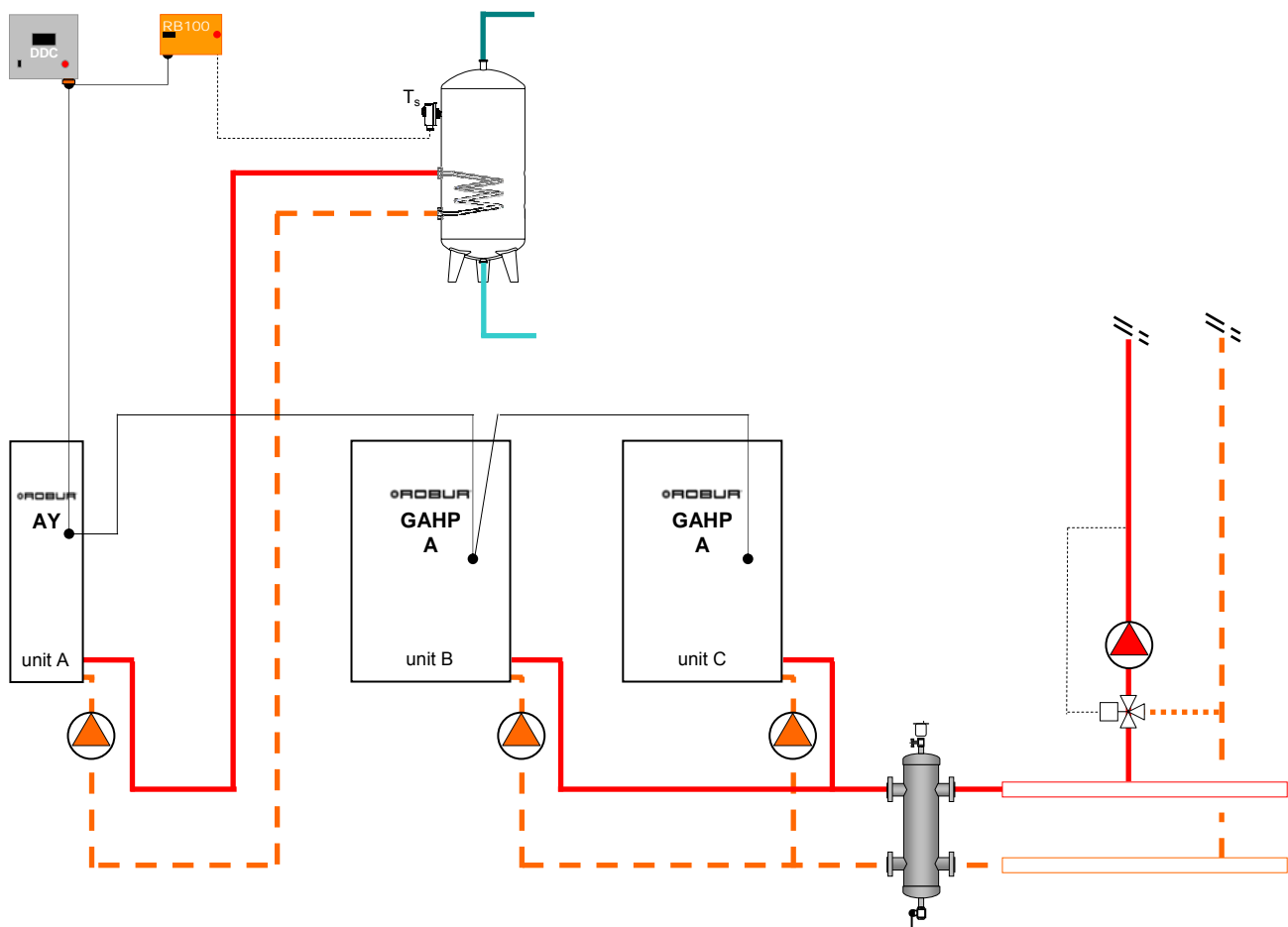


Figure 7 Hydraulic Connection Diagram



In a plant of this type you can introduce one or more ACF units which work on a stand-alone installation. In this case the plant will be supplied with 4 pipes (also the cold service shall be configured).



For the **electrical connections** to make on the RB100 refer to Paragraph 2.12 on page 39.



2.4.2 Configuring Unit Cards

PARAMETERS TO SET FOR THE PLANT SHOWN IN FIGURE 7				
S60 PARAMETERS SETUP				
UNIT	40 CARD CODE (COMMUNICATION WITH DDC)	60 COLD PLANT ID	150 HOT PLANT ID	172 BELONGING GROUP (0:BASIC // 1:SEPARABLE)
A	000	---	0	1
B	001	---	0	0
C	002	---	0	0



For setting, refer to the unit user's manual.

2.4.3 Configuring the RB100 interface

PARAMETERS COMMON TO ALL SERVICES		
PARAMETER	PARAMETER DESCRIPTION	VALUE TO ENTER
40	CARD CODE (COMMUNICATION WITH DDC)	471

PARAMETERS RELATIVE TO THE VALVE SERVICE		
PARAMETER	PARAMETER DESCRIPTION	VALUE TO ENTER
150	PLANT CODE	---
151	TYPE OF USE OF THE VALVE	0

PARAMETERS FOR INDIVIDUAL SERVICE				
PAR.	PARAMETER DESCRIPTION	VALUE TO ENTER		
60	COLD SERVICE	0→inactive		
80	HOT SERVICE	1→active		
81	ID OF THE DDC TO WHICH THE REQUEST IS SENT	960		
83	TYPE OF SETPOINT INPUT	0→analog	1→DDC ⁽¹⁾ setpoint digital	2→RB100 setpoint digital
84	TEMP. CORRESPONDING TO THE MIN. SETPOINT	set [°C]	---	---
85	TEMP. CORRESPONDING TO THE MAX. SETPOINT	set [°C]	---	---
86	MAX. TEMP. CORRESPONDING TO OFF REQUEST	set [°C]	---	---
87	SETPOINT RESOLUTION	set [°C]	---	---
88	LOCAL SETPOINT FOR DIGITAL INPUT	---	---	set [°C]
100	DHW0 SERVICE	0→inactive		
120	DHW1 SERVICE	1→active		
121	ID OF THE DDC TO WHICH THE REQUEST IS SENT	960		
122	TYPE OF GROUP FROM WHICH THE REQUEST IS RECEIVED	1→separate		
123	TYPE OF SETPOINT INPUT	0→analog	1→DDC ⁽¹⁾ setpoint digital	2→RB100 setpoint digital
124	TEMP. CORRESPONDING TO THE MIN. SETPOINT	set [°C]	---	---
125	TEMP. CORRESPONDING TO THE MAX. SETPOINT	set [°C]	---	---
126	MAX. TEMP. CORRESPONDING TO OFF REQUEST	set [°C]	---	---
127	SETPOINT RESOLUTION	set [°C]	---	---
128	LOCAL SETPOINT FOR DIGITAL INPUT	---	---	set [°C]

NOTES

(1) FOR PROGRAMMING, REFER TO THE DIRECT DIGITAL CONTROLLER (DDC) MANUAL

set[°C] → SET THE DESIRED TEMPERATURE VALUE



For setting, refer to the RB100 interface user's manual.

2.4.4 Configuring the Direct Digital Controller (DDC) Id: 960

- Configuring the machines on the DDC: "Units-DDC Binding";
 - Main Menu → System Installation → DDC → Units-DDC Binding
- Configuring the Basic plant Portion: "Heating Only";
 - Main Menu → System Installation → Plants → Base Plant Part → Heat/DHW Setp Prio
- Configuring the Separable plant Portion: "DHW Only";
 - Main Menu → System Installation → Plants → Splitt. Plant Part → Heating/DHW Select

At this point the plant is working.



For setting the operating parameters (setpoint, differential, steps, etc.) refer to the Direct Digital Controller (DDC) user and programming manual.



2.5 PLANT 5: Heating with Basic DHW and Separate DHW

The plant allows: the production of hot water to satisfy the heating needs; the production of domestic hot water by using the same units employed for heating (Basic DHW); the production of domestic hot water (Separate DHW). The system allows the pre-heating of the domestic hot water (Basic DHW) by using the same units employed for heating. In this type the “Separate DHW” system is physically separated from the rest of the plant and works independently based on the requests received.

2.5.1 Hydraulic connection diagram

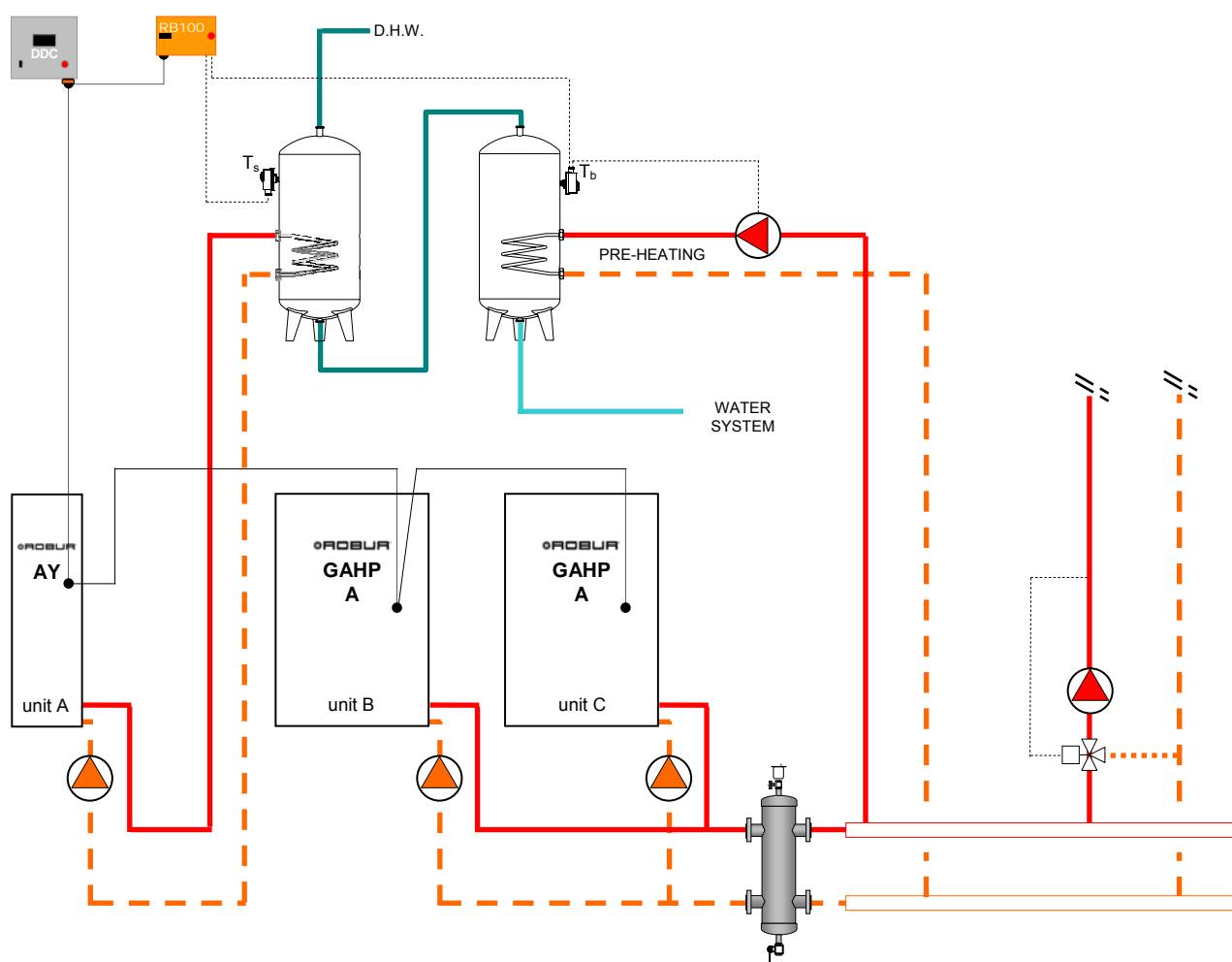


Figure 8 Hydraulic Connection Diagram



In a plant of this type you can introduce one or more ACF units which work on a stand-alone installation. In this case the plant will be supplied with 4 pipes (also the cold service shall be configured).



For the **electrical connections** to make on the RB100 refer to Paragraph 2.12 on page 39.

2.5.2 Configuring unit cards

PARAMETERS TO SET FOR THE PLANT SHOWN IN FIGURE 8				
S60 PARAMETERS SETUP				
UNIT	40 CARD CODE (COMMUNICATION WITH DDC)	60 COLD PLANT ID	150 HOT PLANT ID	172 BELONGING GROUP (0:BASIC // 1:SEPARABLE)
A	000	---	0	1
B	001	---	0	0
C	002	---	0	0



For setting, refer to the unit user's manual.

2.5.3 Configuring the RB100 interface

PARAMETERS COMMON TO ALL SERVICES		
PARAMETER	PARAMETER DESCRIPTION	VALUE TO ENTER
40	CARD CODE (COMMUNICATION WITH DDC)	471

PARAMETERS RELATIVE TO THE VALVE SERVICE		
PARAMETER	PARAMETER DESCRIPTION	VALUE TO ENTER
150	PLANT CODE	---
151	TYPE OF USE OF THE VALVE	0

PARAMETERS FOR INDIVIDUAL SERVICE				
PAR.	PARAMETER DESCRIPTION	VALUE TO ENTER		
60	COLD SERVICE	0→inactive		
80	HOT SERVICE	1→active		
81	ID OF THE DDC TO WHICH THE REQUEST IS SENT	960		
83	TYPE OF SETPOINT INPUT	0→analog	1→DDC ⁽¹⁾ setpoint digital	2→RB100 setpoint digital
84	TEMP. CORRESPONDING TO THE MIN. SETPOINT	set [°C]	---	---
85	TEMP. CORRESPONDING TO THE MAX. SETPOINT	set [°C]	---	---
86	MAX. TEMP. CORRESPONDING TO OFF REQUEST	set [°C]	---	---
87	SETPOINT RESOLUTION	set [°C]	---	---
88	LOCAL SETPOINT FOR DIGITAL INPUT	---	---	set [°C]
100	DHW0 SERVICE	1→active		
101	ID OF THE DDC TO WHICH THE REQUEST IS SENT	960		
102	TYPE OF GROUP FROM WHICH THE REQUEST IS RECEIVED	0→basic		
103	TYPE OF SETPOINT INPUT	0→analog	1→DDC ⁽¹⁾ setpoint digital	2→RB100 setpoint digital
104	TEMP. CORRESPONDING TO THE MIN. SETPOINT	set [°C]	---	---
105	TEMP. CORRESPONDING TO THE MAX. SETPOINT	set [°C]	---	---
106	MAX. TEMP. CORRESPONDING TO OFF REQUEST	set [°C]	---	---
107	SETPOINT RESOLUTION	set [°C]	---	---
108	LOCAL SETPOINT FOR DIGITAL INPUT	---	---	set [°C]
120	DHW1 SERVICE	1→active		
121	ID OF THE DDC TO WHICH THE REQUEST IS SENT	960		
122	TYPE OF GROUP FROM WHICH THE REQUEST IS	1→separate		



	RECEIVED			
123	TYPE OF SETPOINT INPUT	0→analog	1→DDC ⁽¹⁾ setpoint digital	2→RB100 setpoint digital
124	TEMP. CORRESPONDING TO THE MIN. SETPOINT	set [°C]	---	---
125	TEMP. CORRESPONDING TO THE MAX. SETPOINT	set [°C]	---	---
126	MAX. TEMP. CORRESPONDING TO OFF REQUEST	set [°C]	---	---
127	SETPOINT RESOLUTION	set [°C]	---	---
128	LOCAL SETPOINT FOR DIGITAL INPUT	---	---	set [°C]

NOTES

(1) FOR PROGRAMMING, REFER TO THE DIRECT DIGITAL CONTROLLER (DDC) MANUAL

set[°C] → SET THE DESIRED TEMPERATURE VALUE



For setting, refer to the RB100 interface user's manual.

2.5.4 Configuring the Direct Digital Controller (DDC) Id: 960

- Configuring the machines on the DDC: "Units-DDC Binding";
 - Main Menu → System Installation → DDC → Units-DDC Binding
- Configuring the Basic plant portion: "Heating and DHW (Simultan. Service)";
 - Main Menu → System Installation → Plants → Base Plant Part → Heat/DHW Setp Prio
- Configuring the Separable plant Portion: "DHW Only";
 - Main Menu → System Installation → Plants → Splitt. Plant Part → Heating/DHW Select

At this point the plant is working.



For setting the operating parameters (setpoint, differential, steps, etc.) refer to the Direct Digital Controller (DDC) user and programming manual.

2.6 PLANT 6: Heating and cooling (2 pipes) with Separable DHW

The plant allows the alternative production of hot water and cold water to satisfy the heating and cooling needs respectively. The plant is also designed to produce the domestic hot water (Separable DHW). In this type of plant, in the winter season, part of the units employed for heating (units belonging to the “Separable Group”) are separated from the plant (by means of motorized three-way valves) to be dedicated to the production of domestic hot water. The system allows to integrate the heating units with the Separable Group if there is no demand for Domestic hot water (DHW). In the summer season, the units belonging to the “Separable Group” produce only domestic hot water; therefore, they are always “separated” from the cooling plant.

2.6.1 Hydraulic connection diagram

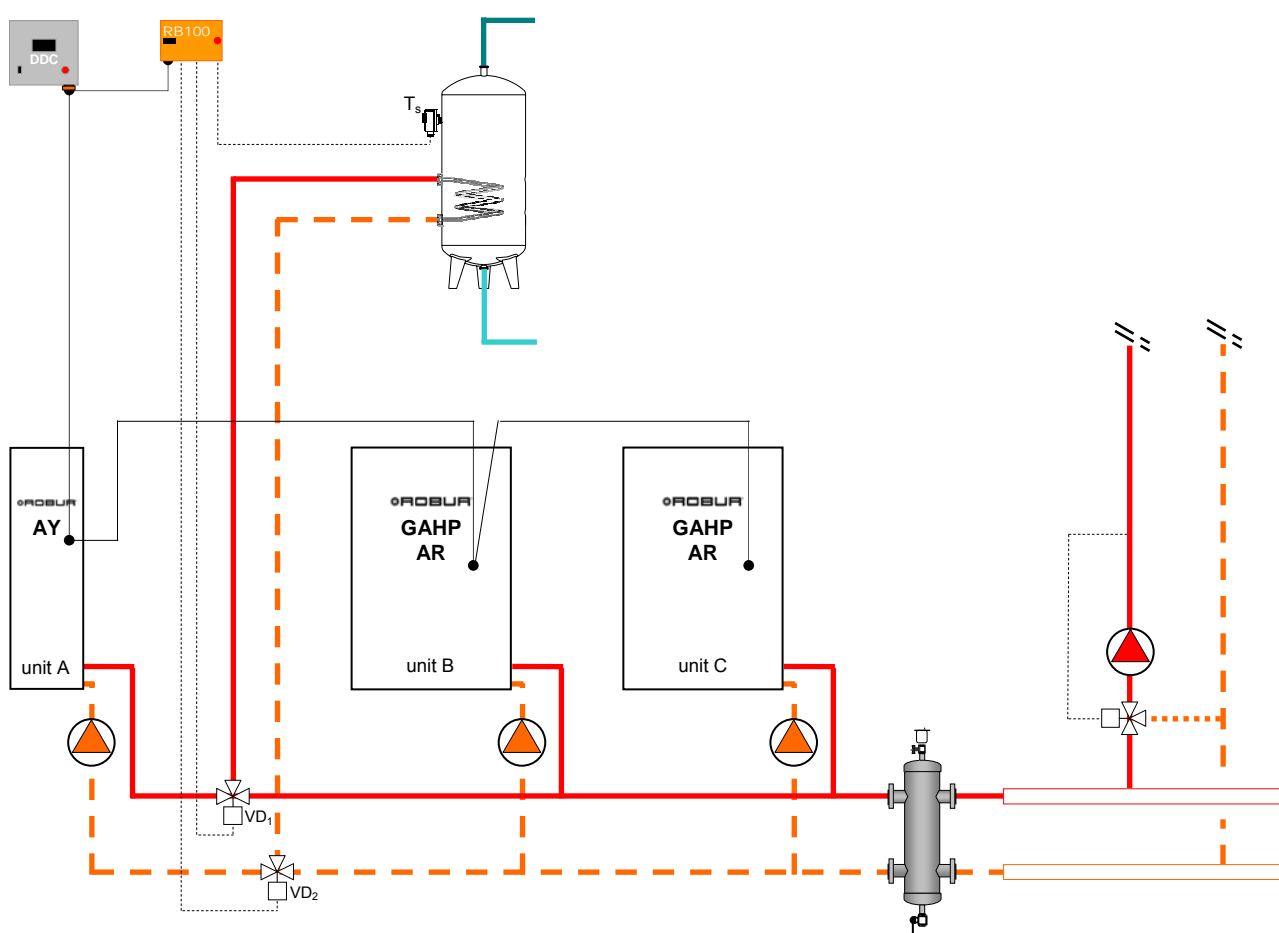


Figure 9 Hydraulic connection diagram



For the **electrical connections** to make on the RB100 refer to Paragraph 2.12 on page 39.



For the characteristics of the diverter valves refer to what described in Paragraph 1.3 on page 6.



2.6.2 Configuring unit cards

PARAMETERS TO SET FOR THE PLANT SHOWN IN FIGURE 9				
S60 PARAMETERS SETUP				
UNIT	40 CARD CODE (COMMUNICATION WITH DDC)	60 COLD PLANT ID	150 HOT PLANT ID	172 BELONGING GROUP (0:BASIC//1:SEPARABLE)
A	000	---	0	1
B	001	0	0	0
C	002	0	0	0



For setting, refer to the unit user's manual.

2.6.3 Configuring the RB100 interface

PARAMETERS COMMON TO ALL SERVICES		
PARAMETER	PARAMETER DESCRIPTION	VALUE TO ENTER
40	CARD CODE (COMMUNICATION WITH DDC)	471

PARAMETERS RELATIVE TO THE VALVE SERVICE		
PARAMETER	PARAMETER DESCRIPTION	VALUE TO ENTER
150	PLANT CODE	0
151	TYPE OF USE OF THE VALVE	1 ⁽¹⁾

NOTES

(1) SEPARATION VALVE FOR DHW WITHOUT LIMIT SWITCH. IF YOU HAVE A VALVE WITH LIMIT SWITCH SET THE "2" VALUE

PARAMETERS FOR INDIVIDUAL SERVICE				
PAR.	PARAMETER DESCRIPTION	VALUE TO ENTER		
60	COLD SERVICE	1→active		
61	ID OF THE DDC TO WHICH THE REQUEST IS SENT	960		
63	TYPE OF SETPOINT INPUT	0→analog	1→DDC ⁽¹⁾ setpoint digital	2→RB100 setpoint digital
64	TEMP. CORRESPONDING TO THE MAX. SETPOINT	set [°C]	---	---
65	TEMP. CORRESPONDING TO THE MIN. SETPOINT	set [°C]	---	---
66	MIN. TEMP. CORRESPONDING TO OFF REQUEST	set [°C]	---	---
67	SETPOINT RESOLUTION	set [°C]	---	---
68	LOCAL SETPOINT FOR DIGITAL INPUT	---	---	set [°C]
80	HOT SERVICE	1→active		
81	ID OF THE DDC TO WHICH THE REQUEST IS SENT	960		
83	TYPE OF SETPOINT INPUT	0→analog	1→DDC ⁽¹⁾ setpoint digital	2→RB100 setpoint digital
84	TEMP. CORRESPONDING TO THE MIN. SETPOINT	set [°C]	---	---
85	TEMP. CORRESPONDING TO THE MAX. SETPOINT	set [°C]	---	---
86	MAX. TEMP. CORRESPONDING TO OFF REQUEST	set [°C]	---	---
87	SETPOINT RESOLUTION	set [°C]	---	---
88	LOCAL SETPOINT FOR DIGITAL INPUT	---	---	set [°C]
100	DHW0 SERVICE	0→inactive		
120	DHW1 SERVICE	1→active		
121	ID OF THE DDC TO WHICH THE REQUEST IS SENT	960		

122	TYPE OF GROUP FROM WHICH THE REQUEST IS RECEIVED	1→separable		
123	TYPE OF SETPOINT INPUT	0→analog	1→DDC ⁽¹⁾ setpoint digital	2→RB100 setpoint digital
124	TEMP. CORRESPONDING TO THE MIN. SETPOINT	set [°C]	---	---
125	TEMP. CORRESPONDING TO THE MAX. SETPOINT	set [°C]	---	---
126	MAX. TEMP. CORRESPONDING TO OFF REQUEST	set [°C]	---	---
127	SETPOINT RESOLUTION	set [°C]	---	---
128	LOCAL SETPOINT FOR DIGITAL INPUT	---	---	set [°C]

NOTES


(1) FOR PROGRAMMING, REFER TO THE DIRECT DIGITAL CONTROLLER (DDC) MANUAL

set[°C] → SET THE DESIRED TEMPERATURE VALUE



For setting, refer to the RB100 interface user's manual.

2.6.4 Configuring the Direct Digital Controller (DDC) Id: 960

- Configuring both the machines and the DHW valves on the DDC: "Units-DDC Binding";
 - Main Menu → System Installation → DDC → Units-DDC Binding ( on the units and on the DHW valves)
- Configuring the Basic plant Portion: "Heating Only";
 - Main Menu → System Installation → Plants → Base Plant Part → Heat/DHW Setp Prio
- Configuring the Separable plant Portion: "Heating and DHW (Alternate Service)";
 - Main Menu → System Installation → Plants → Splitt. Plant Part → Heating/DHW Select

At this point the plant is working.



For setting the operating parameters (setpoint, differential, steps, DHW valve parameters, switching time delay, etc.) refer to the Direct Digital Controller (DDC) user and programming manual.



To manage the cold/hot switching (and vice versa) refer to the **SEZIONE 1**, since currently the cold and hot demands coming from the RB100 do not allow to switch from the cooling to the heating operating mode and vice versa.



2.7 PLANT 7: Heating and conditioning (2 pipes) with Basic DHW and Separable DHW

The plant allows the alternative production of hot water and cold water to satisfy the heating and cooling needs respectively. In this type of plant, in the winter season, the system can produce both domestic hot water by using the same units employed for heating (Basic DHW) and domestic hot water by using part of the units employed for heating (units belonging to the “Separable Group”). These last are separated from the plant (by means of motorized three-way valves) to be dedicated to the production of domestic hot water. The system allows to integrate the heating units with the “Separable Group” if there is no demand for Separable DHW. In the summer season, the Basic DHW function is inactive and the units belonging to the “Separable Group” produce only domestic hot water; therefore, they are always “separated” from the cooling plant.

2.7.1 Hydraulic connection diagram

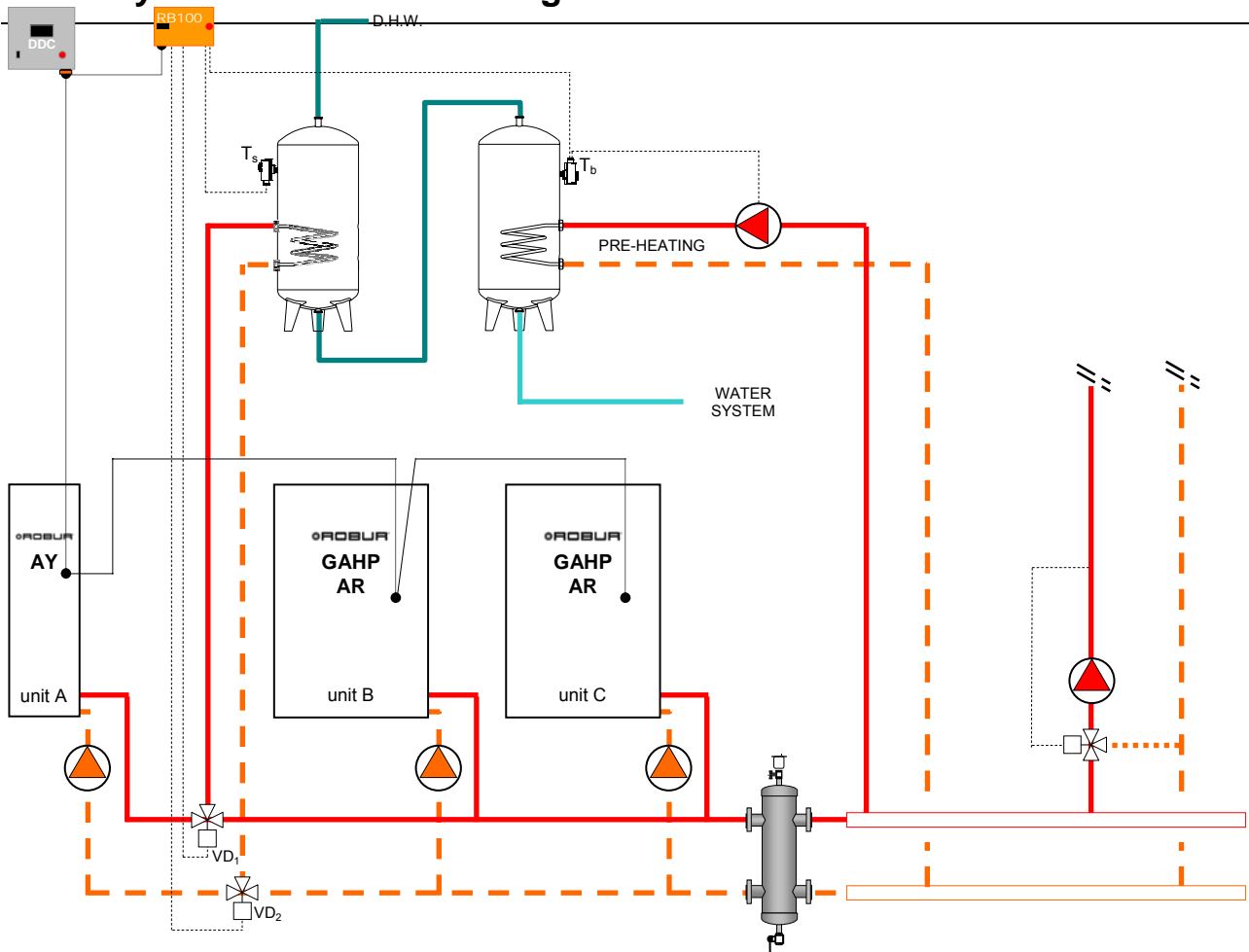


Figure 10 Hydraulic connection diagram



For the **electrical connections** to make on the RB100 refer to Paragraph 2.12 on page 39.



For the characteristics of the diverter valves refer to what described in Paragraph 1.3 on page 6.

2.7.2 Configuring unit cards

PARAMETERS TO SET FOR THE PLANT SHOWN IN FIGURE 10				
S60 PARAMETERS SETUP				
UNIT	40 CARD CODE (COMMUNICATION WITH DDC)	60 COLD PLANT ID	150 HOT PLANT ID	172 BELONGING GROUP (0:BASIC / 1:SEPARABLE)
A	000	---	0	1
B	001	0	0	0
C	002	0	0	0



For setting, refer to the unit user's manual.

2.7.3 Configuring the RB100 interface

PARAMETERS COMMON TO ALL SERVICES		
PARAMETER	PARAMETER DESCRIPTION	VALUE TO ENTER
40	CARD CODE (COMMUNICATION WITH DDC)	471

PARAMETERS RELATIVE TO THE VALVE SERVICE		
PARAMETER	PARAMETER DESCRIPTION	VALUE TO ENTER
150	PLANT CODE	0
151	TYPE OF USE OF THE VALVE	1 ⁽¹⁾

NOTES

(1) SEPARATION VALVE FOR DHW WITHOUT LIMIT SWITCH. IF YOU HAVE A VALVE WITH LIMIT SWITCH SET THE "2" VALUE

PARAMETERS FOR INDIVIDUAL SERVICE				
PAR.	PARAMETER DESCRIPTION	VALUE TO ENTER		
60	COLD SERVICE	1→active		
61	ID OF THE DDC TO WHICH THE REQUEST IS SENT	960		
63	TYPE OF SETPOINT INPUT	0→analog	1→DDC ⁽¹⁾ setpoint digital	2→RB100 setpoint digital
64	TEMP. CORRESPONDING TO THE MAX. SETPOINT	set [°C]	---	---
65	TEMP. CORRESPONDING TO THE MIN. SETPOINT	set [°C]	---	---
66	MIN. TEMP. CORRESPONDING TO OFF REQUEST	set [°C]	---	---
67	SETPOINT RESOLUTION	set [°C]	---	---
68	LOCAL SETPOINT FOR DIGITAL INPUT	---	---	set [°C]
80	HOT SERVICE	1→active		
81	ID OF THE DDC TO WHICH THE REQUEST IS SENT	960		
83	TYPE OF SETPOINT INPUT	0→analog	1→DDC ⁽¹⁾ setpoint digital	2→RB100 setpoint digital
84	TEMP. CORRESPONDING TO THE MIN. SETPOINT	set [°C]	---	---
85	TEMP. CORRESPONDING TO THE MAX. SETPOINT	set [°C]	---	---
86	MAX. TEMP. CORRESPONDING TO OFF REQUEST	set [°C]	---	---
87	SETPOINT RESOLUTION	set [°C]	---	---
88	LOCAL SETPOINT FOR DIGITAL INPUT	---	---	set [°C]
100	DHW0 SERVICE	1→active		
101	ID OF THE DDC TO WHICH THE REQUEST IS SENT	960		
102	TYPE OF GROUP FROM WHICH THE REQUEST IS RECEIVED	0→basic		



103	TYPE OF SETPOINT INPUT	0→analog	1→DDC ⁽¹⁾ setpoint digital	2→RB100 setpoint digital
104	TEMP. CORRESPONDING TO THE MIN. SETPOINT	set [°C]	---	---
105	TEMP. CORRESPONDING TO THE MAX. SETPOINT	set [°C]	---	---
106	MAX. TEMP. CORRESPONDING TO OFF REQUEST	set [°C]	---	---
107	SETPOINT RESOLUTION	set [°C]	---	---
108	LOCAL SETPOINT FOR DIGITAL INPUT	---	---	set [°C]
120	DHW1 SERVICE	1→active		
121	ID OF THE DDC TO WHICH THE REQUEST IS SENT	960		
122	TYPE OF GROUP FROM WHICH THE REQUEST IS RECEIVED	1→separable		
123	TYPE OF SETPOINT INPUT	0→analog	1→DDC ⁽¹⁾ setpoint digital	2→RB100 setpoint digital
124	TEMP. CORRESPONDING TO THE MIN. SETPOINT	set [°C]	---	---
125	TEMP. CORRESPONDING TO THE MAX. SETPOINT	set [°C]	---	---
126	MAX. TEMP. CORRESPONDING TO OFF REQUEST	set [°C]	---	---
127	SETPOINT RESOLUTION	set [°C]	---	---
128	LOCAL SETPOINT FOR DIGITAL INPUT	---	---	set [°C]

NOTES


(1) FOR PROGRAMMING, REFER TO THE DIRECT DIGITAL CONTROLLER (DDC) MANUAL

set[°C] → SET THE DESIRED TEMPERATURE VALUE



For setting, refer to the RB100 interface user's manual.

2.7.4 Configuring the Direct Digital Controller (DDC) Id: 960

- Configuring both the machines and the DHW valves on the DDC: "Units-DDC Binding";
 - Main Menu → System Installation → DDC → Units-DDC Binding
( on the units and on the DHW valves)
- Configuring the Basic plant portion: "Heating and DHW (Simultan. Service)";
 - Main Menu → System Installation → Plants → Base Plant Part → Heat/DHW Setp Prio
- Configuring the Separable plant Portion: "Heating and DHW (Alternate Service)";
 - Main Menu → System Installation → Plants → Splitt. Plant Part → Heating/DHW Select

At this point the plant is working.



For setting the operating parameters (setpoint, differential, steps, DHW valve parameters, switching time delay, etc.) refer to the Direct Digital Controller (DDC) user and programming manual.



To manage the cold/hot switching (and vice versa) refer to the SEZIONE 1, since currently the cold and hot demands coming from the RB100 do not allow to switch from the cooling to the heating operating mode and vice versa.

2.8 PLANT 8: Heating and cooling (2 pipes) with Separate DHW

The plant allows the alternative production of hot water and cold water to satisfy the heating and cooling needs respectively. In this type of plant, both in the winter and summer season, the system produces domestic hot water by using the units belonging to the “Separable Group”. In this type the cold/hot plant and the installation dedicated to the production of domestic hot water are physically separated and each one works independently based on the requests received.

2.8.1 Hydraulic connection diagram

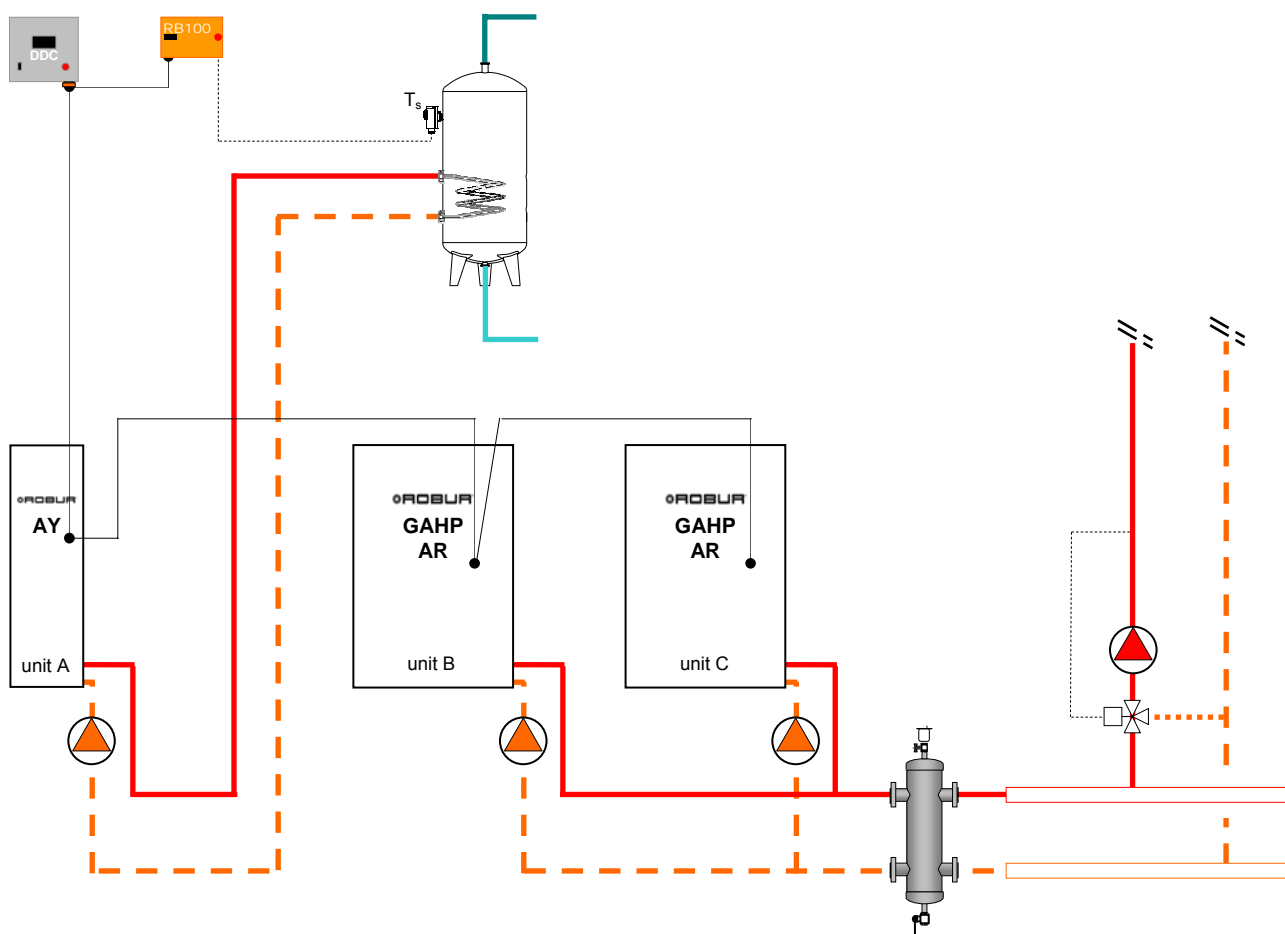


Figure 11 Hydraulic connection diagram



For the **electrical connections** to make on the RB100 refer to Paragraph 2.12 on page 39.



2.8.2 Configuring unit cards

PARAMETERS TO SET FOR THE PLANT SHOWN IN FIGURE 11				
S60 PARAMETERS SETUP				
UNIT	40 CARD CODE (COMMUNICATION WITH DDC)	60 COLD PLANT ID	150 HOT PLANT ID	172 BELONGING GROUP (0: BASIC // 1: SEPARABLE)
A	000	---	0	1
B	001	0	0	0
C	002	0	0	0



For setting, refer to the unit user's manual.

2.8.3 Configuring the RB100 interface

PARAMETERS COMMON TO ALL SERVICES		
PARAMETER	PARAMETER DESCRIPTION	VALUE TO ENTER
40	CARD CODE (COMMUNICATION WITH DDC)	471

PARAMETERS RELATIVE TO THE VALVE SERVICE		
PARAMETER	PARAMETER DESCRIPTION	VALUE TO ENTER
150	PLANT CODE	---
151	TYPE OF USE OF THE VALVE	0

PARAMETERS FOR INDIVIDUAL SERVICE				
PAR.	PARAMETER DESCRIPTION	VALUE TO ENTER		
60	COLD SERVICE	1→active		
61	ID OF THE DDC TO WHICH THE REQUEST IS SENT	960		
63	TYPE OF SETPOINT INPUT	0→analog	1→DDC ⁽¹⁾ setpoint digital	2→RB100 setpoint digital
64	TEMP. CORRESPONDING TO THE MAX. SETPOINT	set [°C]	---	---
65	TEMP. CORRESPONDING TO THE MIN. SETPOINT	set [°C]	---	---
66	MIN. TEMP. CORRESPONDING TO OFF REQUEST	set [°C]	---	---
67	SETPOINT RESOLUTION	set [°C]	---	---
68	LOCAL SETPOINT FOR DIGITAL INPUT	---	---	set [°C]
80	HOT SERVICE	1→active		
81	ID OF THE DDC TO WHICH THE REQUEST IS SENT	960		
83	TYPE OF SETPOINT INPUT	0→analog	1→DDC ⁽¹⁾ setpoint digital	2→RB100 setpoint digital
84	TEMP. CORRESPONDING TO THE MIN. SETPOINT	set [°C]	---	---
85	TEMP. CORRESPONDING TO THE MAX. SETPOINT	set [°C]	---	---
86	MAX. TEMP. CORRESPONDING TO OFF REQUEST	set [°C]	---	---
87	SETPOINT RESOLUTION	set [°C]	---	---
88	LOCAL SETPOINT FOR DIGITAL INPUT	---	---	set [°C]
100	DHW0 SERVICE	0→inactive		
120	DHW1 SERVICE	1→active		
121	ID OF THE DDC TO WHICH THE REQUEST IS SENT	960		
122	TYPE OF GROUP FROM WHICH THE REQUEST IS RECEIVED	1→separate		

123	TYPE OF SETPOINT INPUT	0→analog	1→DDC ⁽¹⁾ setpoint digital	2→RB100 setpoint digital
124	TEMP. CORRESPONDING TO THE MIN. SETPOINT	set [°C]	---	---
125	TEMP. CORRESPONDING TO THE MAX. SETPOINT	set [°C]	---	---
126	MAX. TEMP. CORRESPONDING TO OFF REQUEST	set [°C]	---	---
127	SETPOINT RESOLUTION	set [°C]	---	---
128	LOCAL SETPOINT FOR DIGITAL INPUT	---	---	set [°C]

NOTES

(1) FOR PROGRAMMING, REFER TO THE DIRECT DIGITAL CONTROLLER (DDC) MANUAL

set[°C] → SET THE DESIRED TEMPERATURE VALUE



For setting, refer to the RB100 interface user's manual.

2.8.4 Configuring the Direct Digital Controller (DDC) Id: 960

- Configuring the machines on the DDC: "Units-DDC Binding";
 - Main Menu → System Installation → DDC → Units-DDC Binding
- Configuring the Basic plant Portion: "Heating Only";
 - Main Menu → System Installation → Plants → Base Plant Part → Heat/DHW Setp Prio
- Configuring the Separable plant Portion: "DHW Only";
 - Main Menu → System Installation → Plants → Splitt. Plant Part → Heating/DHW Select

At this point the plant is working.



For setting the operating parameters (setpoint, differential, steps, etc.) refer to the Direct Digital Controller (DDC) user and programming manual.



To manage the cold/hot switching (and vice versa) refer to the SEZIONE 1, since currently the cold and hot demands coming from the RB100 do not allow to switch from the cooling to the heating operating mode and vice versa.



2.9 PLANT 9: Heating and cooling (2 pipes) with Basic DHW and Separate DHW

The plant allows the alternative production of hot water and cold water to satisfy the heating and cooling needs respectively. In this type of plant, both in the winter and summer season, the system produces domestic hot water by using the units belonging to the “Separable Group”. In this type the cold/hot plant and the installation dedicated to the production of domestic hot water are physically separated and each one works independently based on the requests received. Moreover, during the heating operating mode, you can produce domestic hot water by using the same units employed for heating (Basic DHW). On the contrary, this is not possible when the system is in cooling operating mode.

2.9.1 Hydraulic connection diagram

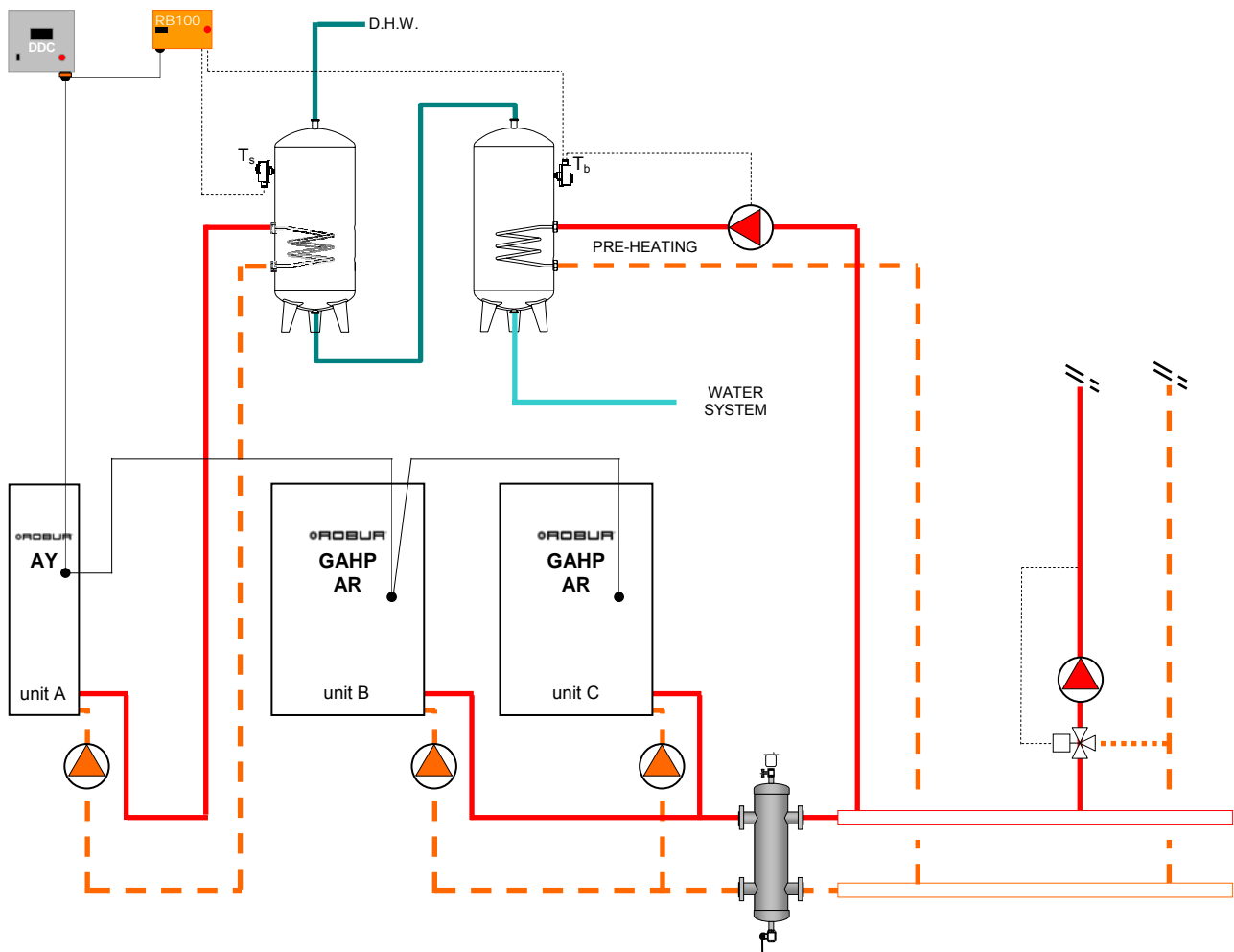


Figure 12 Hydraulic connection diagram



For the **electrical connections** to make on the RB100 refer to Paragraph 2.12 on page 39.

2.9.2 Configuring unit cards

PARAMETERS TO SET FOR THE PLANT SHOWN IN FIGURE 12				
S60 PARAMETERS SETUP				
UNIT	40 CARD CODE (COMMUNICATION WITH DDC)	60 COLD PLANT ID	150 HOT PLANT ID	172 BELONGING GROUP (0: BASIC // 1: SEPARABLE)
A	000	---	0	1
B	001	0	0	0
C	002	0	0	0



For setting, refer to the unit user's manual.

2.9.3 Configuring the RB100 interface

PARAMETERS COMMON TO ALL SERVICES		
PARAMETER	PARAMETER DESCRIPTION	VALUE TO ENTER
40	CARD CODE (COMMUNICATION WITH DDC)	471

PARAMETERS RELATIVE TO THE VALVE SERVICE		
PARAMETER	PARAMETER DESCRIPTION	VALUE TO ENTER
150	PLANT CODE	---
151	TYPE OF USE OF THE VALVE	0

PARAMETERS FOR INDIVIDUAL SERVICE				
PAR.	PARAMETER DESCRIPTION	VALUE TO ENTER		
60	COLD SERVICE	1→active		
61	ID OF THE DDC TO WHICH THE REQUEST IS SENT	960		
63	TYPE OF SETPOINT INPUT	0→analog	1→DDC ⁽¹⁾ setpoint digital	2→RB100 setpoint digital
64	TEMP. CORRESPONDING TO THE MAX. SETPOINT	set [°C]	---	---
65	TEMP. CORRESPONDING TO THE MIN. SETPOINT	set [°C]	---	---
66	MIN. TEMP. CORRESPONDING TO OFF REQUEST	set [°C]	---	---
67	SETPOINT RESOLUTION	set [°C]	---	---
68	LOCAL SETPOINT FOR DIGITAL INPUT	---	---	set [°C]
80	HOT SERVICE	1→active		
81	ID OF THE DDC TO WHICH THE REQUEST IS SENT	960		
83	TYPE OF SETPOINT INPUT	0→analog	1→DDC ⁽¹⁾ setpoint digital	2→RB100 setpoint digital
84	TEMP. CORRESPONDING TO THE MIN. SETPOINT	set [°C]	---	---
85	TEMP. CORRESPONDING TO THE MAX. SETPOINT	set [°C]	---	---
86	MAX. TEMP. CORRESPONDING TO OFF REQUEST	set [°C]	---	---
87	SETPOINT RESOLUTION	set [°C]	---	---
88	LOCAL SETPOINT FOR DIGITAL INPUT	---	---	set [°C]
100	DHW0 SERVICE	1→active		
101	ID OF THE DDC TO WHICH THE REQUEST IS SENT	960		
102	TYPE OF GROUP FROM WHICH THE REQUEST IS RECEIVED	0→basic		
103	TYPE OF SETPOINT INPUT	0→analog	1→DDC ⁽¹⁾ setpoint digital	2→RB100 setpoint digital



104	TEMP. CORRESPONDING TO THE MIN. SETPOINT	set [°C]	---	---
105	TEMP. CORRESPONDING TO THE MAX. SETPOINT	set [°C]	---	---
106	MAX. TEMP. CORRESPONDING TO OFF REQUEST	set [°C]	---	---
107	SETPOINT RESOLUTION	set [°C]	---	---
108	LOCAL SETPOINT FOR DIGITAL INPUT	---	---	set [°C]
120	DHW1 SERVICE	1→active		
121	ID OF THE DDC TO WHICH THE REQUEST IS SENT	960		
122	TYPE OF GROUP FROM WHICH THE REQUEST IS RECEIVED	1→separate		
123	TYPE OF SETPOINT INPUT	0→analog	1→DDC ⁽¹⁾ setpoint digital	2→RB100 setpoint digital
124	TEMP. CORRESPONDING TO THE MIN. SETPOINT	set [°C]	---	---
125	TEMP. CORRESPONDING TO THE MAX. SETPOINT	set [°C]	---	---
126	MAX. TEMP. CORRESPONDING TO OFF REQUEST	set [°C]	---	---
127	SETPOINT RESOLUTION	set [°C]	---	---
128	LOCAL SETPOINT FOR DIGITAL INPUT	---	---	set [°C]

NOTES

(1) FOR PROGRAMMING, REFER TO THE DIRECT DIGITAL CONTROLLER (DDC) MANUAL

set[°C] → SET THE DESIRED TEMPERATURE VALUE



For setting, refer to the RB100 interface user's manual.

2.9.4 Configuring the Direct Digital Controller (DDC) Id: 960

- Configuring the machines on the DDC: "Units-DDC Binding";
 - Main Menu → System Installation → DDC → Units-DDC Binding
- Configuring the Basic plant portion: "Heating and DHW (Simultan. Service)";
 - Main Menu → System Installation → Plants → Base Plant Part → Heat/DHW Setp Prio
- Configuring the Separable plant Portion: "DHW Only";
 - Main Menu → System Installation → Plants → Splitt. Plant Part → Heating/DHW Select

At this point the plant is working.



For setting the operating parameters (setpoint, differential, steps, etc.) refer to the Direct Digital Controller (DDC) user and programming manual.



To manage the cold/hot switching (and vice versa) refer to the SEZIONE 1, since currently the cold and hot demands coming from the RB100 do not allow to switch from the cooling to the heating operating mode and vice versa.

2.10 PLANT 10: Heating and conditioning (2 split collecting pipes) with Basic DHW

The plant allows the alternative production of hot water and cold water to satisfy the heating and cooling needs respectively. In this type of plant, both in the winter and summer season, the system can produce domestic hot water (Basic DHW) by using the same units employed for heating. Moreover, you can manage cold/hot valves to switch from the cooling to the heating operating mode and vice versa.

2.10.1 Hydraulic connection diagram

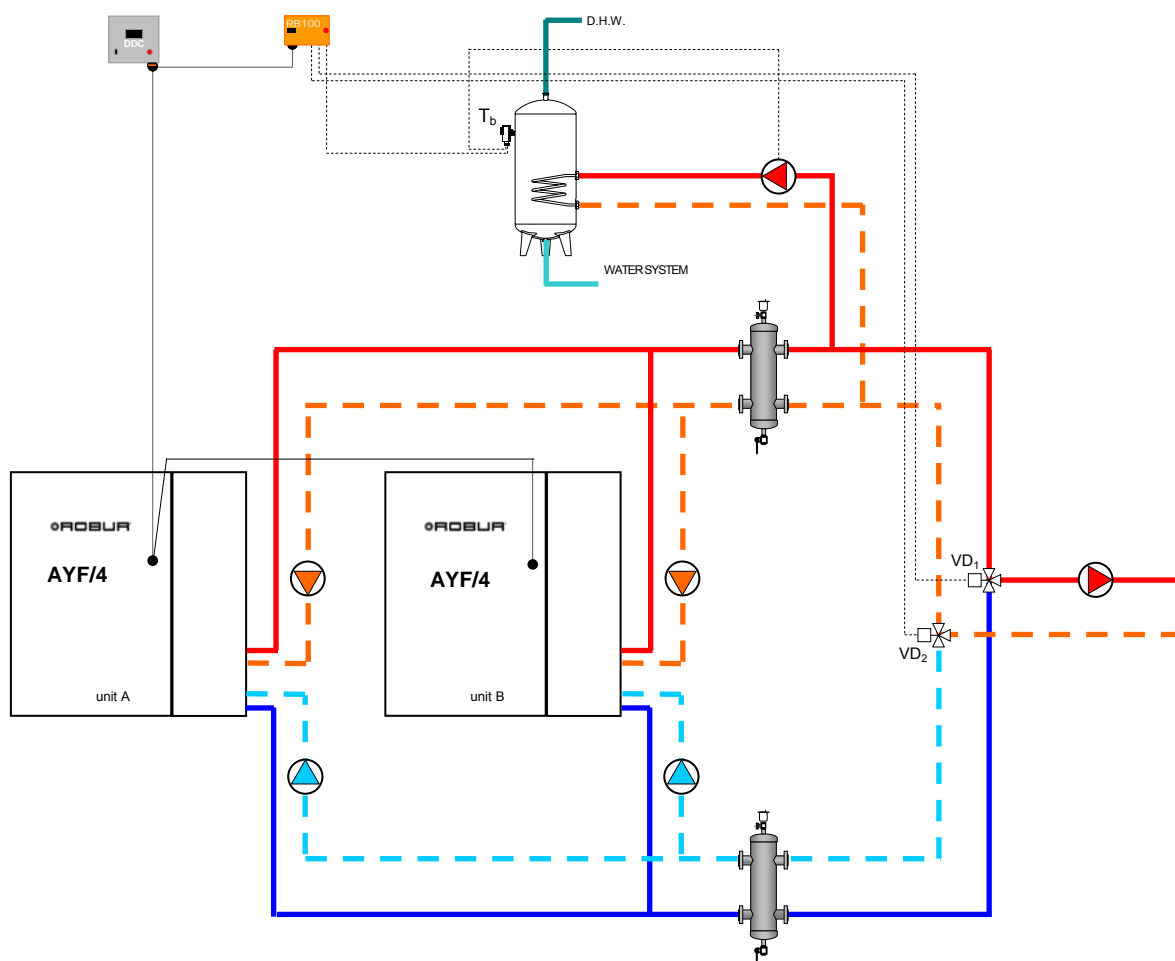


Figure 13 Hydraulic connection diagram



For the **electrical connections** to make on the RB100 refer to Paragraph 2.12 on page 39.



For the characteristics of the diverter valves refer to what described in Paragraph 1.3 on page 6.



2.10.2 Configuring unit cards

PARAMETERS TO SET FOR THE PLANT SHOWN IN FIGURE 13				
S60 PARAMETERS SETUP				
UNIT	40 CARD CODE (COMMUNICATION WITH DDC)	60 COLD PLANT ID	150 HOT PLANT ID	172 BELONGING GROUP (0:BASIC // 1:SEPARABLE)
A	000	0	0	0
B	001	0	0	0



For setting, refer to the unit user's manual.

2.10.3 Configuring the RB100 interface

PARAMETERS COMMON TO ALL SERVICES		
PARAMETER	PARAMETER DESCRIPTION	VALUE TO ENTER
40	CARD CODE (COMMUNICATION WITH DDC)	471

PARAMETERS RELATIVE TO THE VALVE SERVICE		
PARAMETER	PARAMETER DESCRIPTION	VALUE TO ENTER
150	PLANT CODE	0
151	TYPE OF USE OF THE VALVE	3 ⁽¹⁾

NOTES

(1) SEPARATION VALVE FOR DHW WITHOUT LIMIT SWITCH. IF YOU HAVE A VALVE WITH LIMIT SWITCH SET THE "4" VALUE

PARAMETERS FOR INDIVIDUAL SERVICE				
PAR.	PARAMETER DESCRIPTION	VALUE TO ENTER		
60	COLD SERVICE	1→active		
61	ID OF THE DDC TO WHICH THE REQUEST IS SENT	960		
63	TYPE OF SETPOINT INPUT	0→analog	1→DDC ⁽¹⁾ setpoint digital	2→RB100 setpoint digital
64	TEMP. CORRESPONDING TO THE MAX. SETPOINT	set [°C]	---	---
65	TEMP. CORRESPONDING TO THE MIN. SETPOINT	set [°C]	---	---
66	MIN. TEMP. CORRESPONDING TO OFF REQUEST	set [°C]	---	---
67	SETPOINT RESOLUTION	set [°C]	---	---
68	LOCAL SETPOINT FOR DIGITAL INPUT	---	---	set [°C]
80	HOT SERVICE	1→active		
81	ID OF THE DDC TO WHICH THE REQUEST IS SENT	960		
83	TYPE OF SETPOINT INPUT	0→analog	1→DDC ⁽¹⁾ setpoint digital	2→RB100 setpoint digital
84	TEMP. CORRESPONDING TO THE MIN. SETPOINT	set [°C]	---	---
85	TEMP. CORRESPONDING TO THE MAX. SETPOINT	set [°C]	---	---
86	MAX. TEMP. CORRESPONDING TO OFF REQUEST	set [°C]	---	---
87	SETPOINT RESOLUTION	set [°C]	---	---
88	LOCAL SETPOINT FOR DIGITAL INPUT	---	---	set [°C]
100	DHW0 SERVICE	1→active		
101	ID OF THE DDC TO WHICH THE REQUEST IS SENT	960		
102	TYPE OF GROUP FROM WHICH THE REQUEST IS RECEIVED	0→basic		
103	TYPE OF SETPOINT INPUT	0→analog	1→DDC ⁽¹⁾ setpoint digital	2→RB100 setpoint digital

104	TEMP. CORRESPONDING TO THE MIN. SETPOINT	set [°C]	---	---
105	TEMP. CORRESPONDING TO THE MAX. SETPOINT	set [°C]	---	---
106	MAX. TEMP. CORRESPONDING TO OFF REQUEST	set [°C]	---	---
107	SETPOINT RESOLUTION	set [°C]	---	---
108	LOCAL SETPOINT FOR DIGITAL INPUT	---	---	set [°C]
120	DHW1 SERVICE	0→inactive		

NOTES


(1) FOR PROGRAMMING, REFER TO THE DIRECT DIGITAL CONTROLLER (DDC) MANUAL

set[°C] → SET THE DESIRED TEMPERATURE VALUE



For setting, refer to the RB100 interface user's manual.

2.10.4 Configuring the Direct Digital Controller (DDC) Id: 960

- Configuring both the machines and the H/C (Heating/Cooling) valves on the DDC: "Units-DDC Binding";
 - Main Menu → System Installation → DDC → Units-DDC Binding
( on the units and on the H/C (Heating/Cooling) valves)
- Configuring the Basic plant portion: "Heating and DHW (Simultan. Service)";
 - Main Menu → System Installation → Plants → Base Plant Part → Heat/DHW Setp Prio

At this point the plant is working.



For setting the operating parameters (setpoint, differential, steps, H/C reversal valve parameters, etc.) refer to the Direct Digital Controller (DDC) user and programming manual.



To manage the cold/hot switching (and vice versa) refer to the **SEZIONE 1**, since currently the cold and hot demands coming from the RB100 do not allow to switch from the cooling to the heating operating mode and vice versa.



2.11 PLANT 11: Only DHW

The plant allows the only production of domestic hot water.

If only a digital input is available, you can manage the domestic plant only with the DDC, by using the Direct Digital Controller R-W inputs. Obviously, if you need to manage an analog input it is necessary to use the RB100 interface.

2.11.1 Hydraulic connection diagram

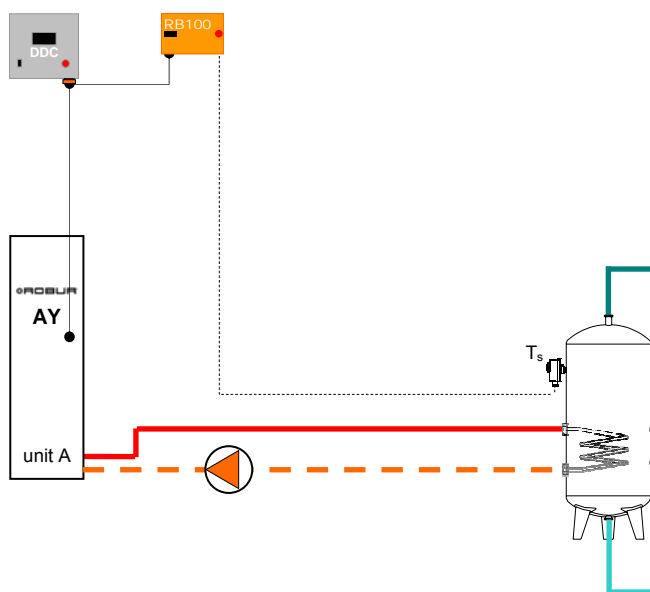


Figure 14 Hydraulic connection diagram



In a plant of this type you can introduce one or more ACF units which work on a stand-alone installation. In this case the plant is supplied with 4 pipes (also the cold service shall be configured).



For the **electrical connections** to make on the RB100 refer to Paragraph 2.12 on page 39.

2.11.2 Configuring unit cards

PARAMETERS TO SET FOR THE PLANT SHOWN IN FIGURE 14				
S60 PARAMETERS SETUP				
UNIT	40 CARD CODE (COMMUNICATION WITH DDC)	60 COLD PLANT ID	150 HOT PLANT ID	172 BELONGING GROUP (0:BASIC // 1:SEPARABLE)
A	000	---	0	1



For setting, refer to the unit user's manual.

2.11.3 Configuring the RB100 interface

PARAMETERS COMMON TO ALL SERVICES				
PARAMETER	PARAMETER DESCRIPTION		VALUE TO ENTER	
40	CARD CODE (COMMUNICATION WITH DDC)		471	

PARAMETERS RELATIVE TO THE VALVE SERVICE				
PARAMETER	PARAMETER DESCRIPTION		VALUE TO ENTER	
150	PLANT CODE		---	
151	TYPE OF USE OF THE VALVE		0	

PARAMETERS FOR INDIVIDUAL SERVICE				
PAR.	PARAMETER DESCRIPTION		VALUE TO ENTER	
60	COLD SERVICE		0→inactive	
80	HOT SERVICE		0→inactive	
100	DHW0 SERVICE		0→inactive	
120	DHW1 SERVICE		1→active	
121	ID OF THE DDC TO WHICH THE REQUEST IS SENT		960	
122	TYPE OF GROUP FROM WHICH THE REQUEST IS RECEIVED		1→separate	
123	TYPE OF SETPOINT INPUT		0→analog	1→DDC ⁽¹⁾ setpoint digital
124	TEMP. CORRESPONDING TO THE MIN. SETPOINT		set [°C]	---
125	TEMP. CORRESPONDING TO THE MAX. SETPOINT		set [°C]	---
126	MAX. TEMP. CORRESPONDING TO OFF REQUEST		set [°C]	---
127	SETPOINT RESOLUTION		set [°C]	---
128	LOCAL SETPOINT FOR DIGITAL INPUT		---	set [°C]

NOTES

(1) FOR PROGRAMMING, REFER TO THE DIRECT DIGITAL CONTROLLER (DDC) MANUAL

set[°C] → SET THE DESIRED TEMPERATURE VALUE



For setting, refer to the RB100 interface user's manual.

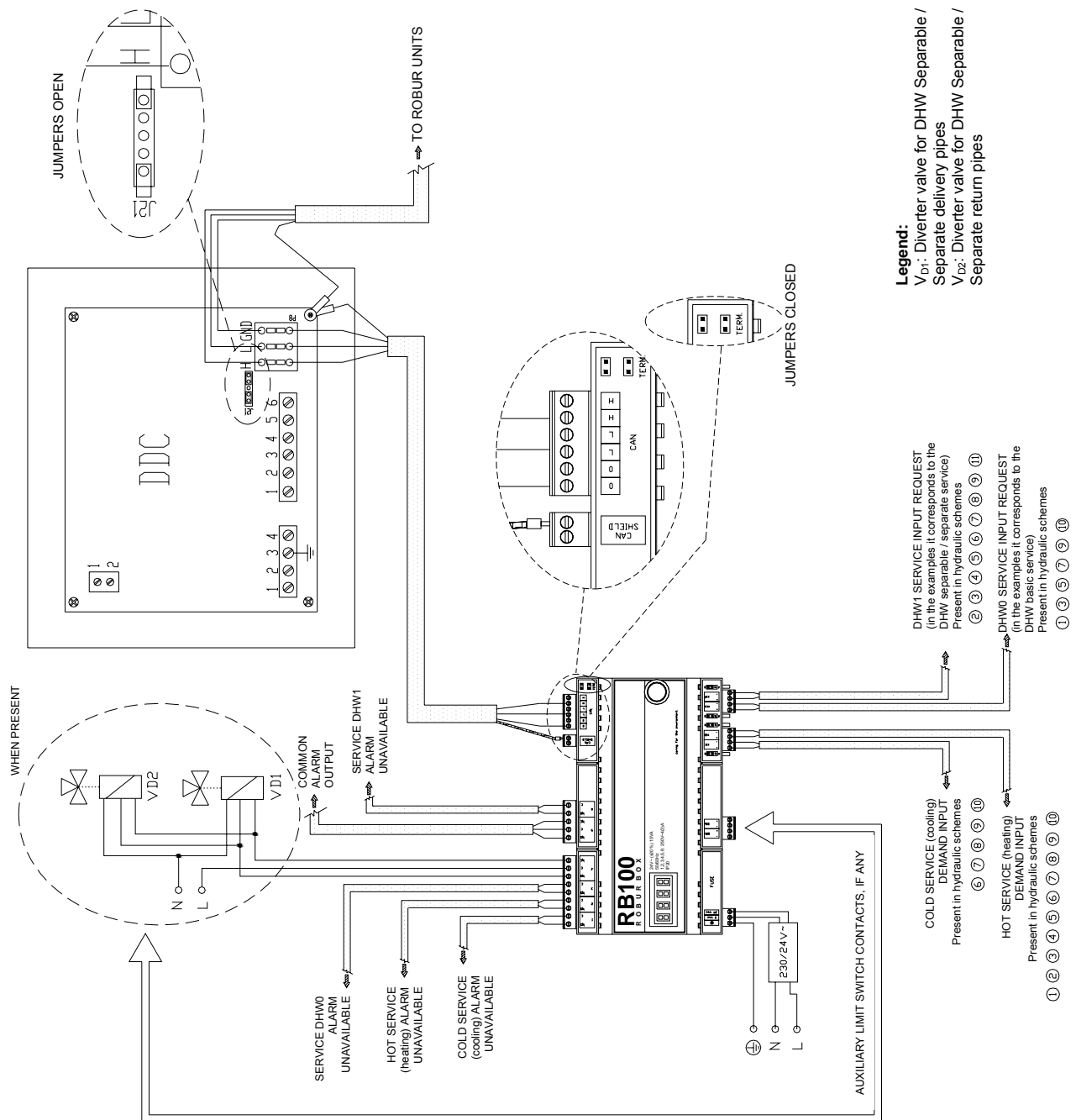
2.11.4 Configuring the Direct Digital Controller (DDC) Id: 960




- Configuring the machines on the DDC: "Units-DDC Binding";
 - Main Menu → System Installation → DDC → Units-DDC Binding
- Configuring the Separable plant Portion: "DHW Only";
 - Main Menu → System Installation → Plants → Splitt. Plant Part → Heating/DHW Select

At this point the plant is working.



For setting the operating parameters (setpoint, differential, steps, etc.) refer to the Direct Digital Controller (DDC) user and programming manual.



-  The connection detail of the request service (analog or digital input) is provided in APPENDIX on page 53.
-  The connection detail of the unavailable service outputs is provided in APPENDIX on page 55.
-  If valves with auxiliary limit switch contacts are available, see the schemes provided in APPENDIX on page 55.



SEZIONE 3 PLANTS WITHOUT DHW

In this section, intended for designers, hydraulic and electrical installation technicians and Robur Authorised Technical Assistance Centres (TAC), you will find some examples of plants without DHW which can be controlled by means of the RB100 interface. For each plant described below the hydraulic scheme, the relevant configuration of the RB100, DDC and Robur units parameters, the electric scheme of the main connections to the Robur Box are provided.

3.1 PLANT 1: 4 pipe Heating and Cooling Plant

The plant is a common 4-pipe installation which allows the simultaneous production of hot water and cold water to satisfy at the same time the heating and cooling needs on stand-alone plants. The (Cold and/or Hot) demands coming to the RB100 can be sent from an external controller which, for example, can generate a 0-10 V analog output towards the RB100 in function of a climate curve, with the consequent possibility of variation of the delivery/return temperature of the water based on external parameters.

3.1.1 Hydraulic connection diagram

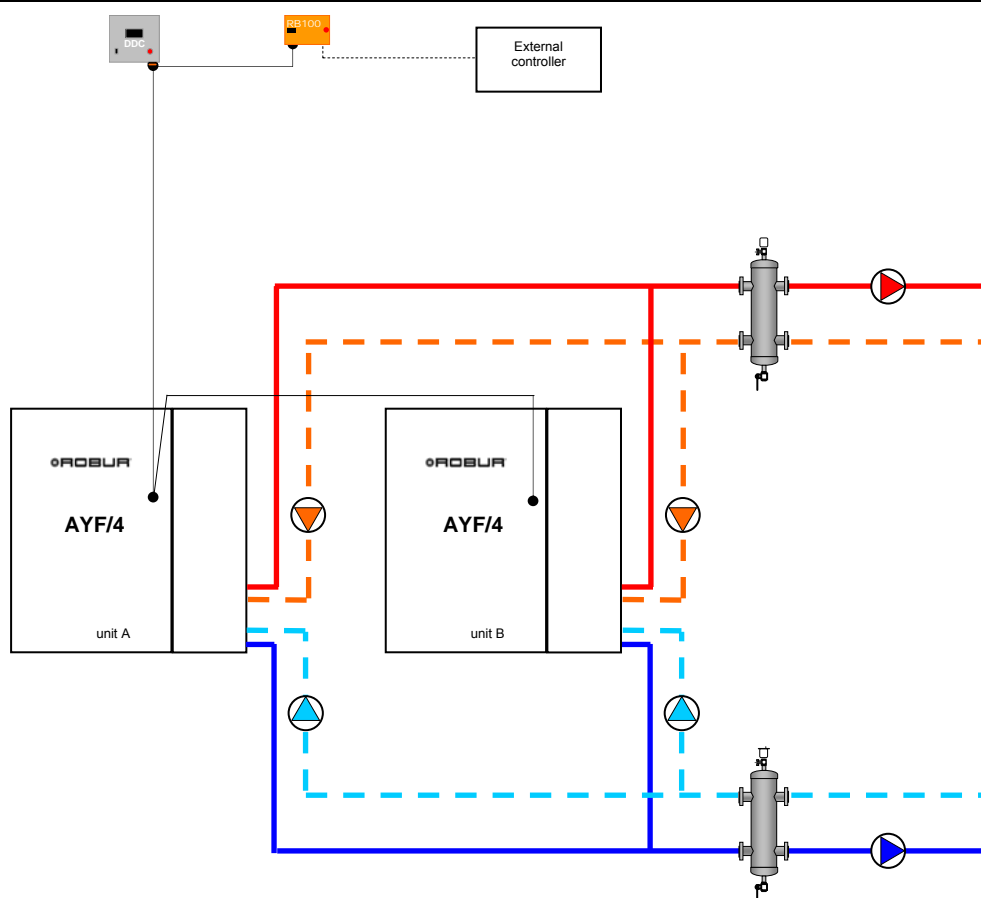


Figure 16 Hydraulic connection diagram



For the **electrical connections** to make on the RB100 refer to Paragraph 3.3 on page 46.

3.1.2 Configuring unit cards

PARAMETERS TO SET FOR THE PLANT SHOWN IN FIGURE 16				
S60 PARAMETERS SETUP				
UNIT	40 CARD CODE (COMMUNICATION WITH DDC)	60 COLD PLANT ID	150 HOT PLANT ID	172 BELONGING GROUP (0: BASIC // 1: SEPARABLE)
A	000	0	1	0
B	001	0	1	0



For setting, refer to the unit user's manual.

3.1.3 Configuring the RB100 interface

PARAMETERS COMMON TO ALL SERVICES		
PARAMETER	PARAMETER DESCRIPTION	VALUE TO ENTER
40	CARD CODE (COMMUNICATION WITH DDC)	471

PARAMETERS RELATIVE TO THE VALVE SERVICE		
PARAMETER	PARAMETER DESCRIPTION	VALUE TO ENTER
150	PLANT CODE	---
151	TYPE OF USE OF THE VALVE	0

PARAMETERS FOR INDIVIDUAL SERVICE				
PAR.	PARAMETER DESCRIPTION	VALUE TO ENTER		
60	COLD SERVICE	1→active		
61	ID OF THE DDC TO WHICH THE REQUEST IS SENT	960		
63	TYPE OF SETPOINT INPUT	0→analog	1→DDC ⁽¹⁾ setpoint digital	2→RB100 setpoint digital
64	TEMP. CORRESPONDING TO THE MAX. SETPOINT	set [°C]	---	---
65	TEMP. CORRESPONDING TO THE MIN. SETPOINT	set [°C]	---	---
66	MIN. TEMP. CORRESPONDING TO OFF REQUEST	set [°C]	---	---
67	SETPOINT RESOLUTION	set [°C]	---	---
68	LOCAL SETPOINT FOR DIGITAL INPUT	---	---	set [°C]
80	HOT SERVICE	1→active		
81	ID OF THE DDC TO WHICH THE REQUEST IS SENT	960		
83	TYPE OF SETPOINT INPUT	0→analog	1→DDC ⁽¹⁾ setpoint digital	2→RB100 setpoint digital
84	TEMP. CORRESPONDING TO THE MIN. SETPOINT	set [°C]	---	---
85	TEMP. CORRESPONDING TO THE MAX. SETPOINT	set [°C]	---	---
86	MAX. TEMP. CORRESPONDING TO OFF REQUEST	set [°C]	---	---
87	SETPOINT RESOLUTION	set [°C]	---	---
88	LOCAL SETPOINT FOR DIGITAL INPUT	---	---	set [°C]
100	DHW0 SERVICE	0→inactive		
120	DHW1 SERVICE	0→inactive		

NOTES

(1) FOR PROGRAMMING, REFER TO THE DIRECT DIGITAL CONTROLLER (DDC) MANUAL

set[°C] → SET THE DESIRED TEMPERATURE VALUE



For setting, refer to the RB100 interface user's manual.



For setting the “DDC digital setpoint” refer to the Direct Digital Controller (DDC) user and programming manual.

3.1.4 Configuring the Direct Digital Controller (DDC) Id: 960

- Configuring the machines on the DDC: “Units-DDC Binding”;
 - Main Menu → System Installation → DDC → Units-DDC Binding

At this point the plant is working.



For setting the operating parameters (setpoint, differential, steps, etc.) refer to the Direct Digital Controller (DDC) user and programming manual.



In the case of plants with only the hot or cold side, you only need to connect the input and configure the desired service.

3.2 PLANT 2: 2 pipe Heating/Cooling Plant

The plant is a common 2-pipe installation which allows the alternative production of hot water and cold water to satisfy the heating and cooling needs respectively. The (Cold or Hot) demands coming to the RB100 can be sent from an external controller which, for example, can generate a 0-10 V analog output towards the RB100 in function of a climate curve, with the consequent possibility of variation of the delivery/return temperature of the water based on external parameters.

3.2.1 Hydraulic connection diagram

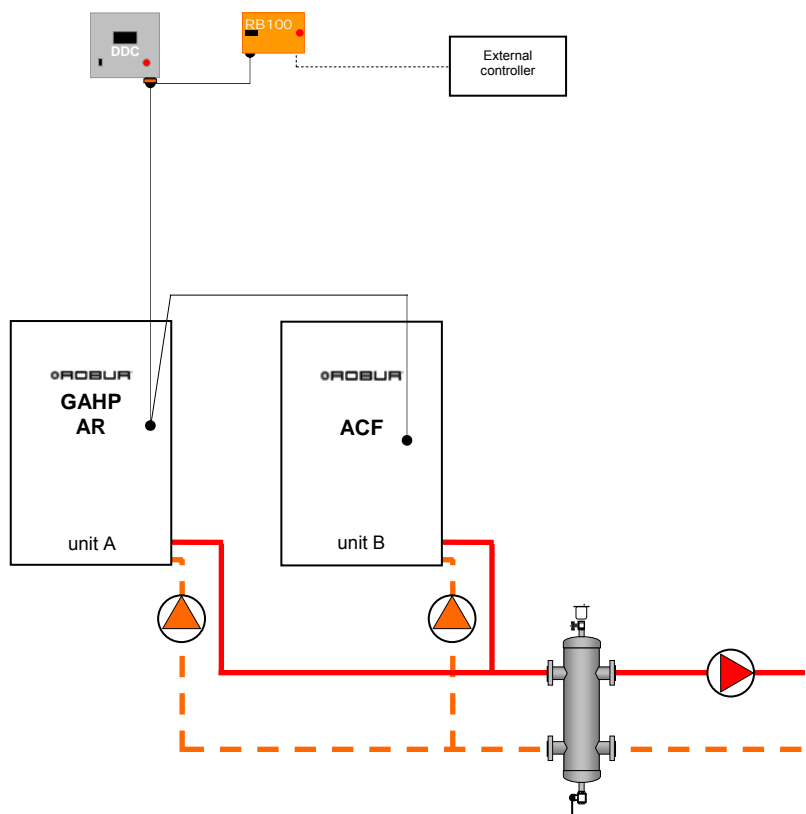


Figure 17 Hydraulic connection diagram

For the **electrical connections** to make on the RB100 refer to Paragraph 3.3 on page 46.

3.2.2 Configuring unit cards

PARAMETERS TO SET FOR THE PLANT SHOWN IN FIGURE 17				
S60 PARAMETERS SETUP				
UNIT	40 CARD CODE (COMMUNICATION WITH DDC)	60 COLD PLANT ID	150 HOT PLANT ID	172 BELONGING GROUP (0: BASIC // 1: SEPARABLE)
A	000	0	0	0
B	001	0	0	0

For setting, refer to the unit user's manual.



3.2.3 Configuring the RB100 interface

PARAMETERS COMMON TO ALL SERVICES		
PARAMETER	PARAMETER DESCRIPTION	VALUE TO ENTER
40	CARD CODE (COMMUNICATION WITH DDC)	471

PARAMETERS RELATIVE TO THE VALVE SERVICE		
PARAMETER	PARAMETER DESCRIPTION	VALUE TO ENTER
150	PLANT CODE	---
151	TYPE OF USE OF THE VALVE	0

PARAMETERS FOR INDIVIDUAL SERVICE				
PAR.	PARAMETER DESCRIPTION	VALUE TO ENTER		
60	COLD SERVICE	1→active		
61	ID OF THE DDC TO WHICH THE REQUEST IS SENT	960		
63	TYPE OF SETPOINT INPUT	0→analog	1→DDC ⁽¹⁾ setpoint digital	2→RB100 setpoint digital
64	TEMP. CORRESPONDING TO THE MAX. SETPOINT	set [°C]	---	---
65	TEMP. CORRESPONDING TO THE MIN. SETPOINT	set [°C]	---	---
66	MIN. TEMP. CORRESPONDING TO OFF REQUEST	set [°C]	---	---
67	SETPOINT RESOLUTION	set [°C]	---	---
68	LOCAL SETPOINT FOR DIGITAL INPUT	---	---	set [°C]
80	HOT SERVICE	1→active		
81	ID OF THE DDC TO WHICH THE REQUEST IS SENT	960		
83	TYPE OF SETPOINT INPUT	0→analog	1→DDC ⁽¹⁾ setpoint digital	2→RB100 setpoint digital
84	TEMP. CORRESPONDING TO THE MIN. SETPOINT	set [°C]	---	---
85	TEMP. CORRESPONDING TO THE MAX. SETPOINT	set [°C]	---	---
86	MAX. TEMP. CORRESPONDING TO OFF REQUEST	set [°C]	---	---
87	SETPOINT RESOLUTION	set [°C]	---	---
88	LOCAL SETPOINT FOR DIGITAL INPUT	---	---	set [°C]
100	DHW0 SERVICE	0→inactive		
120	DHW1 SERVICE	0→inactive		

NOTES

(1) FOR PROGRAMMING, REFER TO THE DIRECT DIGITAL CONTROLLER (DDC) MANUAL

set[°C] → SET THE DESIRED TEMPERATURE VALUE



For setting, refer to the RB100 interface user's manual.



For setting the “DDC digital setpoint” refer to the Direct Digital Controller (DDC) user and programming manual.

3.2.4 Configuring the Direct Digital Controller (DDC) Id: 960

- Configuring the machines on the DDC: “Units-DDC Binding”;
 - Main Menu → System Installation → DDC → Units-DDC Binding

At this point the plant is working.



For setting the operating parameters (setpoint, differential, steps, etc.) refer to the Direct Digital Controller (DDC) user and programming manual.

3.3 RB100 Electrical Connections for plants without DHW.

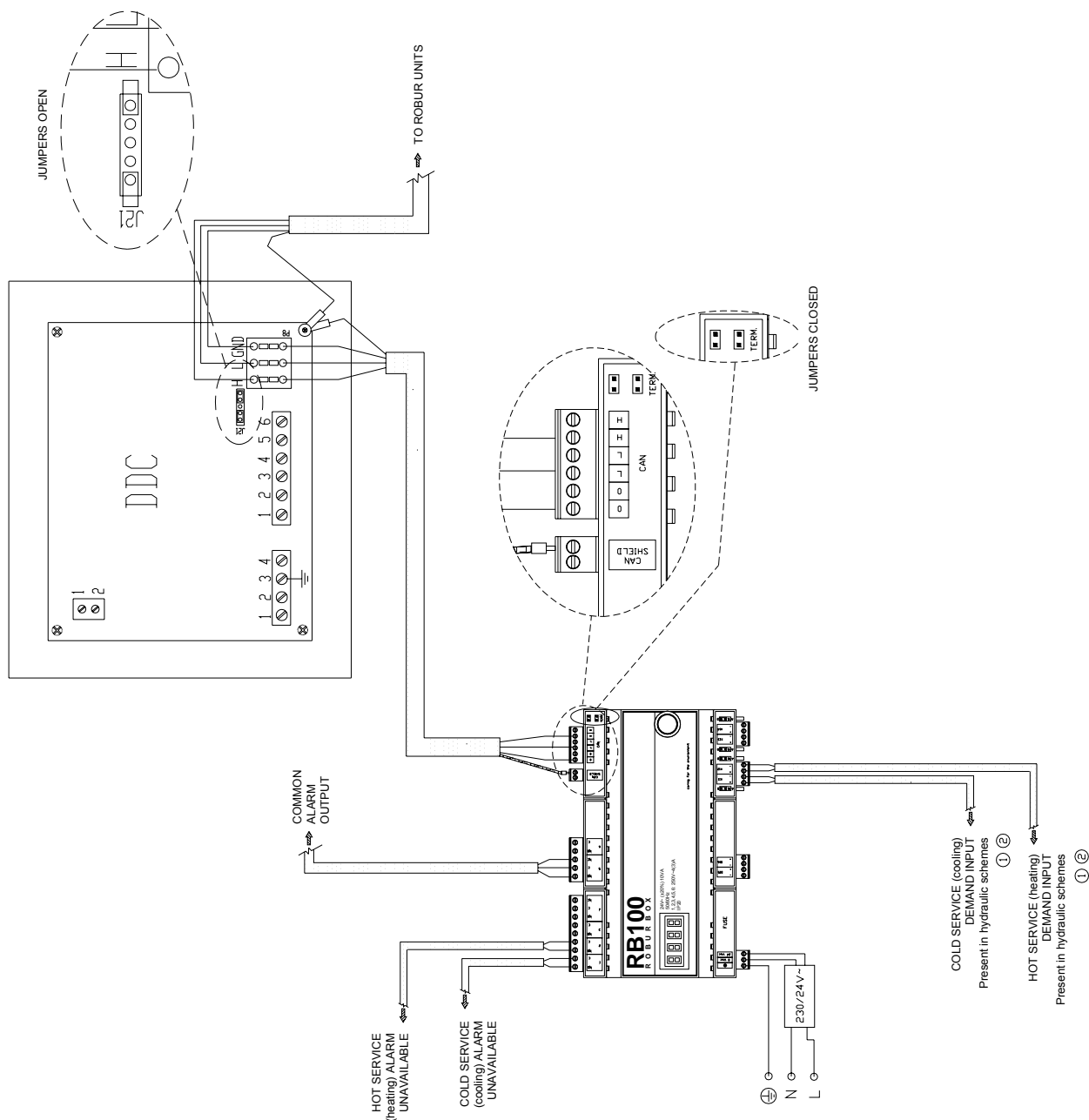


Figure 18 Electrical connection diagram for plants without DHW



The connection detail of the request service (analog or digital input) is provided in APPENDIX on page 53.



The connection detail of the unavailable service outputs is provided in APPENDIX on page 55.



To manage the cold/hot switching (and vice versa) refer to the SEZIONE 1, since currently the cold and hot demands coming from the RB100 do not allow to switch from the cooling to the heating operating mode and vice versa



SEZIONE 4 SPECIAL PLANTS

4.1 PLANT 1: 2 pipe Heating and Cooling Plant with Basic DHW and Separable DHW

The plant allows the simultaneous production of hot water and cold water to satisfy the heating or cooling needs. In this type of plant, both in the winter and summer season, the system produces domestic hot water, by using the units belonging to the “Separable Group”, and domestic hot water by using the same units employed for heating (Basic Group).

For this plant configuration you need to use 2 RB100 interface devices: one for the management of the separation valves (for the DHW production with units belonging to the separable plant portion) and the other for the management of the operating mode switching valves (to switch from cooling to heating and vice versa).

4.1.1 Hydraulic connection diagram

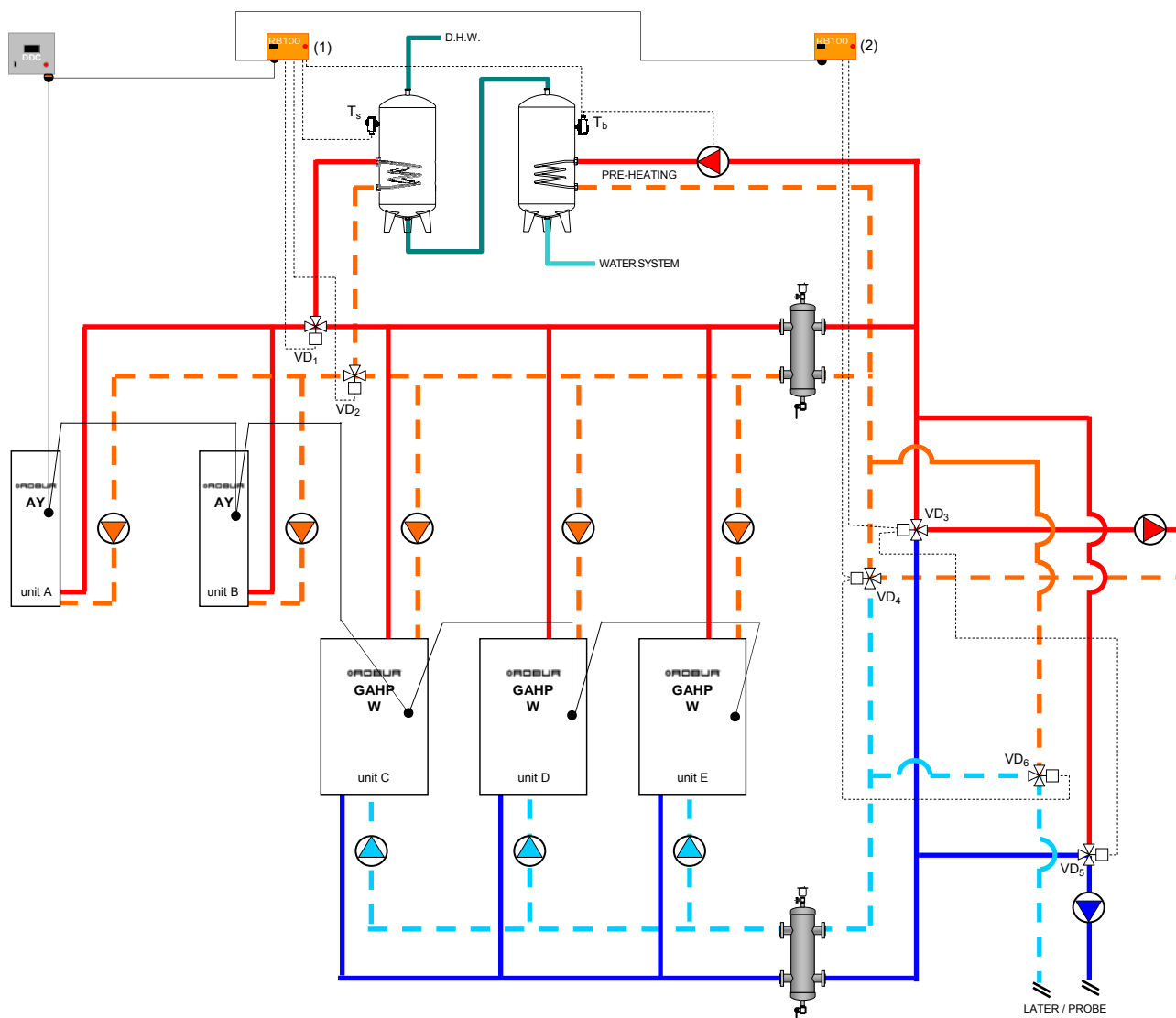


Figure 19 Hydraulic connection diagram



For the **electrical connections** to make on the RB100 refer to Paragraph 4.1.6 on page 51.



For the characteristics of the diverter valves refer to what described in Paragraph 1.3 on page 6.

4.1.2 Configuring unit cards

PARAMETERS TO SET FOR THE PLANT SHOWN IN FIGURE 19				
S60 PARAMETERS SETUP				
UNIT	40 CARD CODE (COMMUNICATION WITH DDC)	60 COLD PLANT ID	150 HOT PLANT ID	172 BELONGING GROUP (0:BASIC // 1:SEPARABLE)
A	000	---	0	1
B	001	0	0	1
C	002	0	0	0
D	003	0	0	0
E	004	0	0	0



For setting, refer to the unit user's manual.

4.1.3 Configuring the RB100 interface (1)

PARAMETERS COMMON TO ALL SERVICES		
PARAMETER	PARAMETER DESCRIPTION	VALUE TO ENTER
40	CARD CODE (COMMUNICATION WITH DDC)	471

PARAMETERS RELATIVE TO THE VALVE SERVICE		
PARAMETER	PARAMETER DESCRIPTION	VALUE TO ENTER
150	PLANT CODE	0
151	TYPE OF USE OF THE VALVE	1 ⁽¹⁾

NOTES

(1) SEPARATION VALVE FOR DHW WITHOUT LIMIT SWITCH. IF YOU HAVE A VALVE WITH LIMIT SWITCH SET THE "2" VALUE

PARAMETERS FOR INDIVIDUAL SERVICE				
PAR.	PARAMETER DESCRIPTION	VALUE TO ENTER		
60	COLD SERVICE	0→inactive		
80	HOT SERVICE	0→inactive		
100	DHW0 SERVICE	1→active		
101	ID OF THE DDC TO WHICH THE REQUEST IS SENT	960		
102	TYPE OF GROUP FROM WHICH THE REQUEST IS RECEIVED	0→basic		
103	TYPE OF SETPOINT INPUT	0→analog	1→DDC ⁽¹⁾ setpoint digital	2→RB100 setpoint digital
104	TEMP. CORRESPONDING TO THE MIN. SETPOINT	set [°C]	---	---
105	TEMP. CORRESPONDING TO THE MAX. SETPOINT	set [°C]	---	---
106	MAX. TEMP. CORRESPONDING TO OFF REQUEST	set [°C]	---	---
107	SETPOINT RESOLUTION	set [°C]	---	---
108	LOCAL SETPOINT FOR DIGITAL INPUT	---	---	set [°C]



120	DHW1 SERVICE	1→active		
121	ID OF THE DDC TO WHICH THE REQUEST IS SENT	960		
122	TYPE OF GROUP FROM WHICH THE REQUEST IS RECEIVED	1→separable		
123	TYPE OF SETPOINT INPUT	0→analog	1→DDC ⁽¹⁾ setpoint digital	2→RB100 setpoint digital
124	TEMP. CORRESPONDING TO THE MIN. SETPOINT	set [°C]	---	---
125	TEMP. CORRESPONDING TO THE MAX. SETPOINT	set [°C]	---	---
126	MAX. TEMP. CORRESPONDING TO OFF REQUEST	set [°C]	---	---
127	SETPOINT RESOLUTION	set [°C]	---	---
128	LOCAL SETPOINT FOR DIGITAL INPUT	---	---	set [°C]

NOTES

(1) FOR PROGRAMMING, REFER TO THE DIRECT DIGITAL CONTROLLER (DDC) MANUAL

set[°C] → SET THE DESIRED TEMPERATURE VALUE

4.1.4 Configuring the RB100 interface (2)

PARAMETERS COMMON TO ALL SERVICES		
PARAMETER	PARAMETER DESCRIPTION	VALUE TO ENTER
40	CARD CODE (COMMUNICATION WITH DDC)	472

PARAMETERS RELATIVE TO THE VALVE SERVICE		
PARAMETER	PARAMETER DESCRIPTION	VALUE TO ENTER
150	PLANT CODE	0
151	TYPE OF USE OF THE VALVE	3 ⁽¹⁾

NOTES

(1) SEPARATION VALVE FOR DHW WITHOUT LIMIT SWITCH. IF YOU HAVE A VALVE WITH LIMIT SWITCH SET THE "4" VALUE

PARAMETERS FOR INDIVIDUAL SERVICE				
PAR.	PARAMETER DESCRIPTION	VALUE TO ENTER		
60	COLD SERVICE	1→active		
61	ID OF THE DDC TO WHICH THE REQUEST IS SENT	960		
63	TYPE OF SETPOINT INPUT	0→analog	1→DDC ⁽¹⁾ setpoint digital	2→RB100 setpoint digital
64	TEMP. CORRESPONDING TO THE MAX. SETPOINT	set [°C]	---	---
65	TEMP. CORRESPONDING TO THE MIN. SETPOINT	set [°C]	---	---
66	MIN. TEMP. CORRESPONDING TO OFF REQUEST	set [°C]	---	---
67	SETPOINT RESOLUTION	set [°C]	---	---
68	LOCAL SETPOINT FOR DIGITAL INPUT	---	---	set [°C]
80	HOT SERVICE	1→active		
81	ID OF THE DDC TO WHICH THE REQUEST IS SENT	960		
83	TYPE OF SETPOINT INPUT	0→analog	1→DDC ⁽¹⁾ setpoint digital	2→RB100 setpoint digital
84	TEMP. CORRESPONDING TO THE MIN. SETPOINT	set [°C]	---	---
85	TEMP. CORRESPONDING TO THE MAX. SETPOINT	set [°C]	---	---
86	MAX. TEMP. CORRESPONDING TO OFF REQUEST	set [°C]	---	---
87	SETPOINT RESOLUTION	set [°C]	---	---
88	LOCAL SETPOINT FOR DIGITAL INPUT	---	---	set [°C]
100	DHW0 SERVICE	0→inactive		
120	DHW1 SERVICE	0→inactive		

NOTES

(1) FOR PROGRAMMING, REFER TO THE DIRECT DIGITAL CONTROLLER (DDC) MANUAL

set[°C] → SET THE DESIRED TEMPERATURE VALUE



For setting, refer to the RB100 interface user's manual.



Both the RB100 interfaces, available on the plant, can have all service requests active. Just for simplicity, the DHW services have been enabled only on the RB100 which manages the DHW valve service and the cold/hot services only on the RB100 which manages the C-H (Cooling-Heating) valve service.

4.1.5 Configuring the Direct Digital Controller (DDC) Id: 960

- Configuring both the machines, the DHW valves and the H/C (Heating/Cooling) valves on the DDC: "Units-DDC Binding";
 - Main Menu → System Installation → DDC → Units-DDC Binding
(☒ on the units, on the DHW valves and on the H/C (Heating/Cooling) valves)
- Configuring the Basic plant portion: "Heating and DHW (Simultan. Service)";
 - Main Menu → System Installation → Plants → Base Plant Part → Heat/DHW Setp Prio
- Configuring the Separable plant Portion: "Heating and DHW (Alternate Service)";
 - Main Menu → System Installation → Plants → Splitt. Plant Part → Heating/DHW Select

At this point the plant is working.



For setting the operating parameters (setpoint, differential, steps, DHW valve parameters, switching time delay, H/C reversal valve parameters, etc.) refer to the Direct Digital Controller (DDC) User and Programming Manual.



4.1.6 Electrical Connections

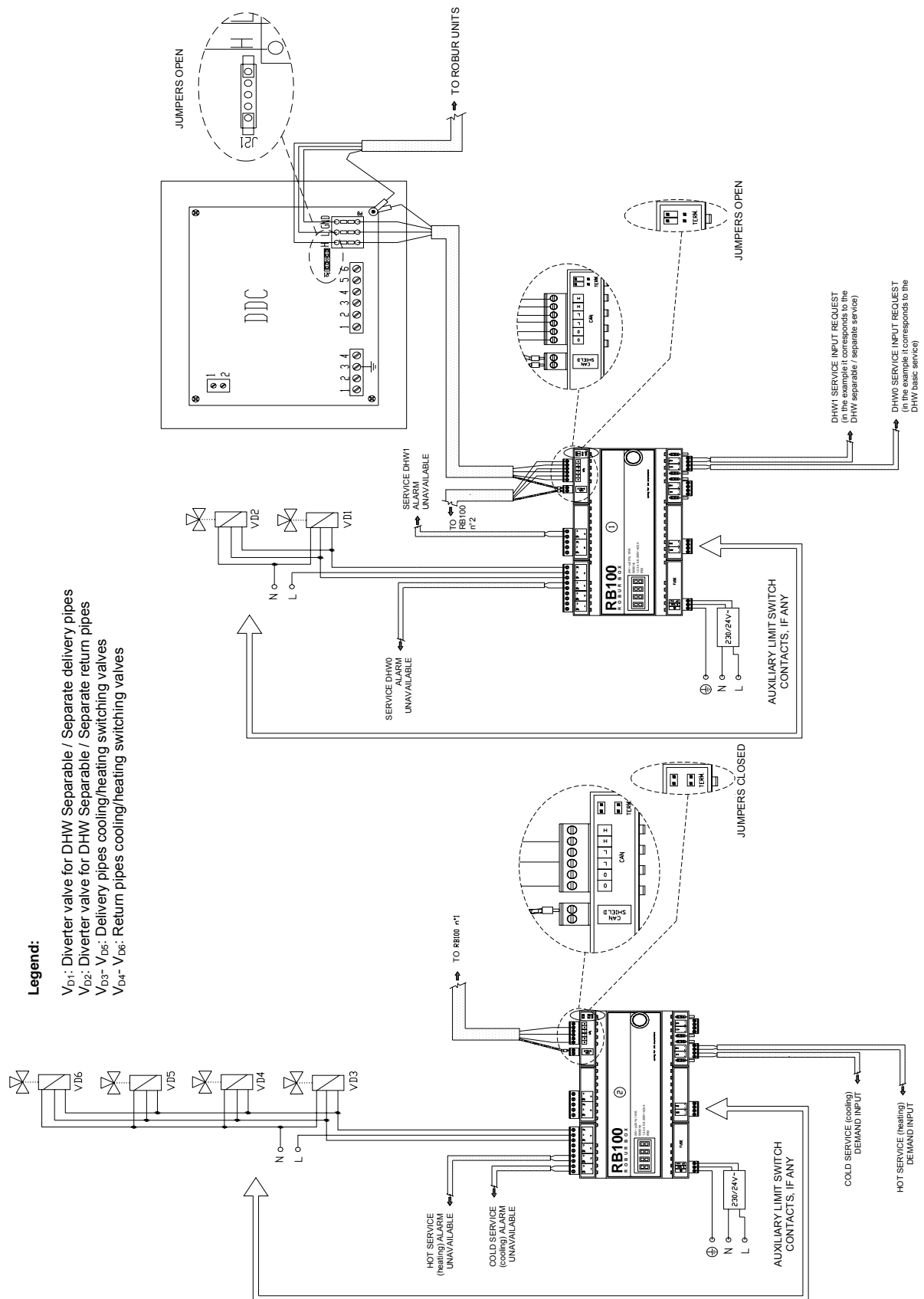


Figure 20 Electrical connection diagram for the plant represented in Figure 19



The connection detail of the request service (analog or digital input) is provided in APPENDIX on page 53.



The connection detail of the unavailable service outputs is provided in APPENDIX on page 55.



If valves with auxiliary limit switch contacts are available, see the schemes provided in APPENDIX on page 55.



To manage the cold/hot switching (and vice versa) refer to the SEZIONE 1 , since currently the cold and hot demands coming from the RB100 do not allow to switch from the cooling to the heating operating mode and vice versa.

APPENDIX

Request Services Connection



It is necessary to underline that each one of the 4 services (Cold, Hot and 2 DHW) can be configured both as analog and as digital; therefore, only one scheme for each one of the two types of connection, which can be applied to each service independently, will be represented here below.



Remind that it also necessary to place correctly the jumpers located next to the input terminals of the concerned service and configure properly the service (for more details read the Installation and user manual - D-LBR468).

Digital Input

For the input used as digital, remember that the external contact must have an operating voltage of at least 12 Vdc and must ensure the closure with a minimum 5 mA current.

The maximum allowable length of the service connecting cables for this type of inputs is no less important and not to be neglected at all:

Max Resistance for On [Ω]	Max Resistance for Off [$k\Omega$]	Max cable length (m)
200 [Ω]	50 [$k\Omega$]	300 (m)



The cable must be shielded with the shield connected to earth at one end.

Connection Scheme

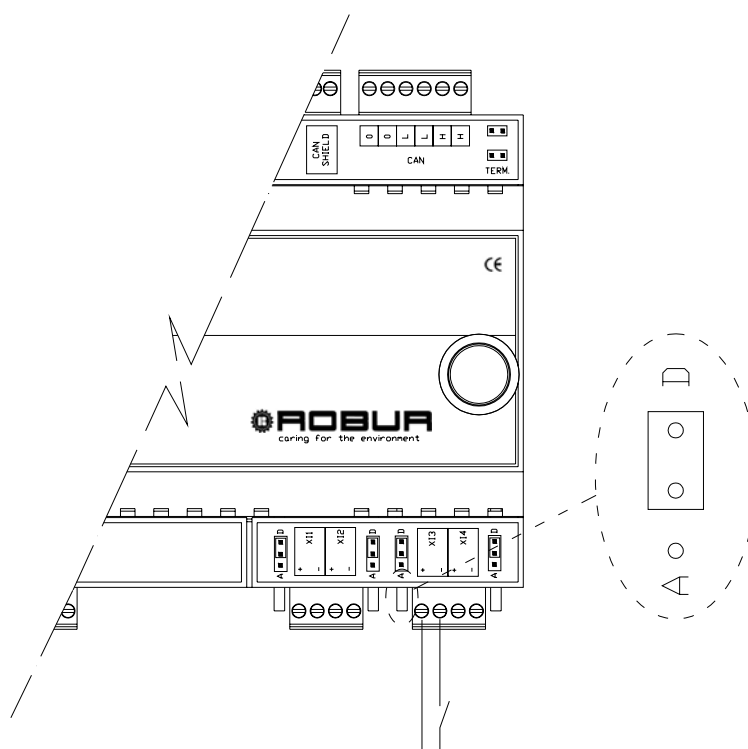


Figure 21 RB100 Series: electrical connection for digital input

Analog Input

For connecting the service as analog input, remind that the input voltage must range between 0 and 10 Vdc.

The maximum allowable length of the connection cables to the inputs of the request services is no less important and not to be neglected at all:

Max cable length (m)	Cable section (mm ²)
300	1.5
100	0.5

Given that the examples of cable length mentioned above are only two, in case of different cable section (in any case smaller than or equal to 1.5 mm²) you can calculate the maximum allowable length by using the following formula:

$$l = s \times 200$$

where:

l = length [m]

s = section [mm²]



The cable must be shielded with the shield connected to earth at one end.



Maximum error of measurement, including the error due to the cable resistance:
± 40 mV (± 0.4% f. s.).

Connection Scheme

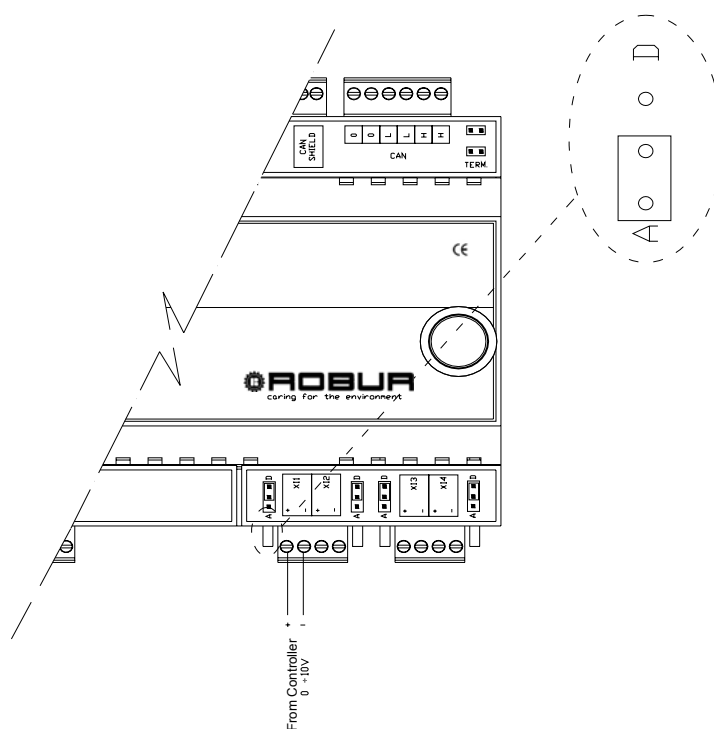


Figure 22 RB100 Series: electrical connection for analog input

Outputs connection For Unavailable Service

For connecting the outputs to the unavailable service relay, remember that:

- the unavailable service output consists of a (NO) free contact;
- the maximum applicable voltage is 250 Vac;
- the maximum applicable current is:
 - o resistive loads: 4A;
 - o inductive loads: 3A;
- the maximum cable length is equal to 300 metres.

Valve Service Connection

Outputs

- The valve control output is composed of a free (NO/NC) diverter contact:
 - o the NO contact is closed when the system requires that the position of the valve is towards the heating side or towards the separable group;
 - o the NC contact is closed when the system requires that the position of the valve is towards the cooling side or towards the basic group;
- the output control relay is of bistable type (in case of power cut to the appliance, the contact remains in the position in which it was originally);
- the maximum applicable voltage is 250 Vac;
- the maximum applicable current is:
 - o resistive loads: 4A;
 - o inductive loads: 3A;
- the maximum cable length is equal to 300 metres.

Inputs

There are two digital inputs for the management of auxiliary limit switch contacts, if any.

Maximum allowable length of connection cables for inputs:

Max Resistance for On [Ω]	Max Resistance for Off [$k\Omega$]	Max cable length (m)
200 [Ω]	50 [$k\Omega$]	300 (m)



The digital input cable must be shielded with the shield connected to earth at one end.

Connection scheme

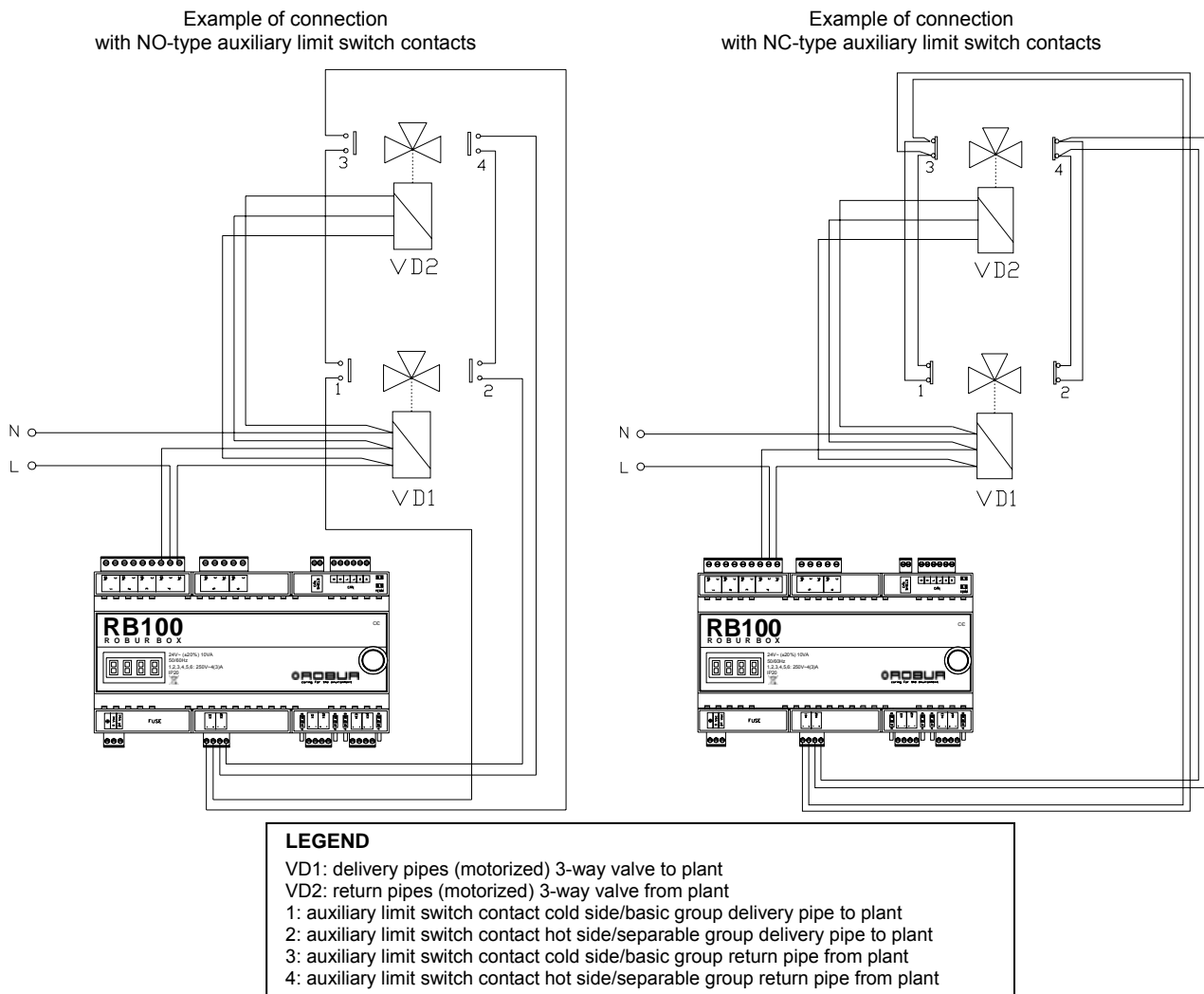


Figure 23 RB100 Series: Example of electrical connection for valve service

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Robur Mission



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