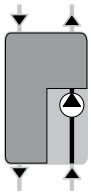
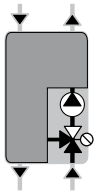
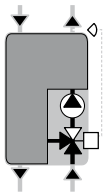
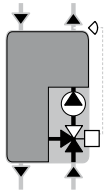
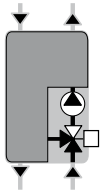
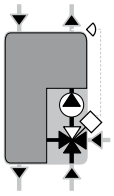
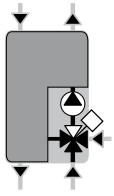
ESBE SYSTEM UNITS

CIRCULATION UNIT

SERIES	FUNCTION	
ESBE GDA100		Direct supply Circulation unit intended for direct supply of heating.
ESBE GFA100		Fixed temperature With a VTA Thermostatic mixing valve ready and mounted on the Circulation unit.
ESBE GRC200		Mixing function With Controller 90C ready and mounted on the Circulation unit. Controller has the possibility to control pump through time program.
ESBE GRC100		Mixing function With Controller CRC ready and mounted on the Circulation unit.
ESBE GRA100		Mixing function With Actuator ARA ready and mounted on the Circulation unit.
ESBE GBC200		Bivalent function With Controller 90-3 ready and mounted on the Circulation unit. Allows simultaneous control of pump in additional Circulation units.
ESBE GBA100		Bivalent function With Actuator ARA ready and mounted on the Circulation unit.

PAGE **CONTENT**

1 Series and Function • General/Safety
2 Hydraulic Installation • Electric Installation
3 Commissioning •Circulation pump operation mode
4 How to use the information leaflet • Maintenance • Spare parts • Faults, Causes and Remedies

GB

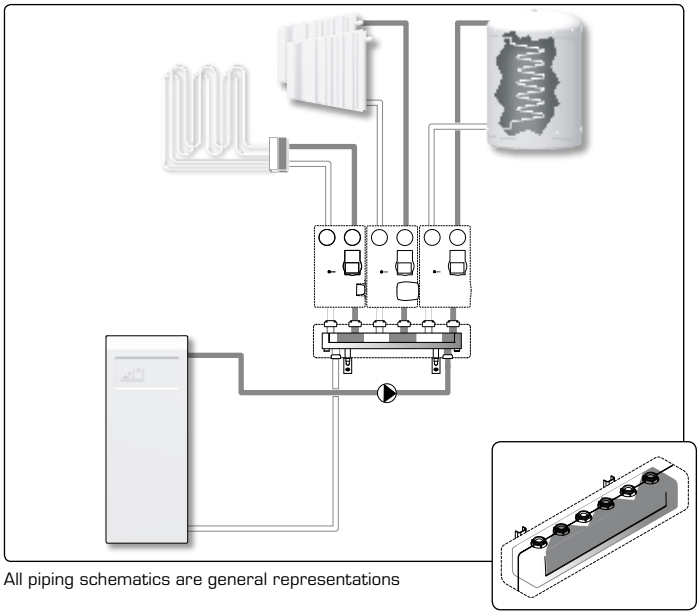
1 i GENERAL/SAFETY

RoHS
LVD 73/23/EEC
EMC 89/336/EEC
PED
Max. operating pressure: PN 6

This instruction manual is an essential component of the product. Read the instructions and the warnings carefully as they contain important information about a safe installation, usage and maintenance.

This product can be used only for the circulation of water and water/glycol in heating or cooling installations.

i INSTALLATION EXAMPLE



All piping schematics are general representations

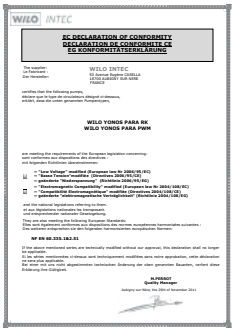
The producer won´t be responsible for damages caused by wrong usage or unrespect of the instructions given in this manual.

The mounting of the unit must be performed by a qualified professional and in compliance with local/regional laws. This manual refers to standard products. Different versions or functions are available.

At mounting - pay attention and follow common practice and general safety norms for the use of machineries, pressurized equipment and at high temperatures.

For electrical components integrated into this product copies of corresponding CE declaration are part of this instruction.

Actuator/Controller



Circulation pump

We reserve the right to modify or improve the product, its technical data and literature at any time and without notice.

2 HYDRAULIC INSTALLATION

SINGULAR INSTALLATION ON THE WALL
Install the appliance on a solid wall which is not subject to vibration.

1. Choose the correct position for the piping and drilling by usage of the Mounting template supplied with the package. Drill the holes in the wall for your installation purposes. Take care not to damage any electrical wiring or existing piping.

2. Detach parts of the circulation unit's insulation shell.

The actuator/controller might be dismounted from the valve to give more space for the installation tools. Do not change the shaft position of the valve.

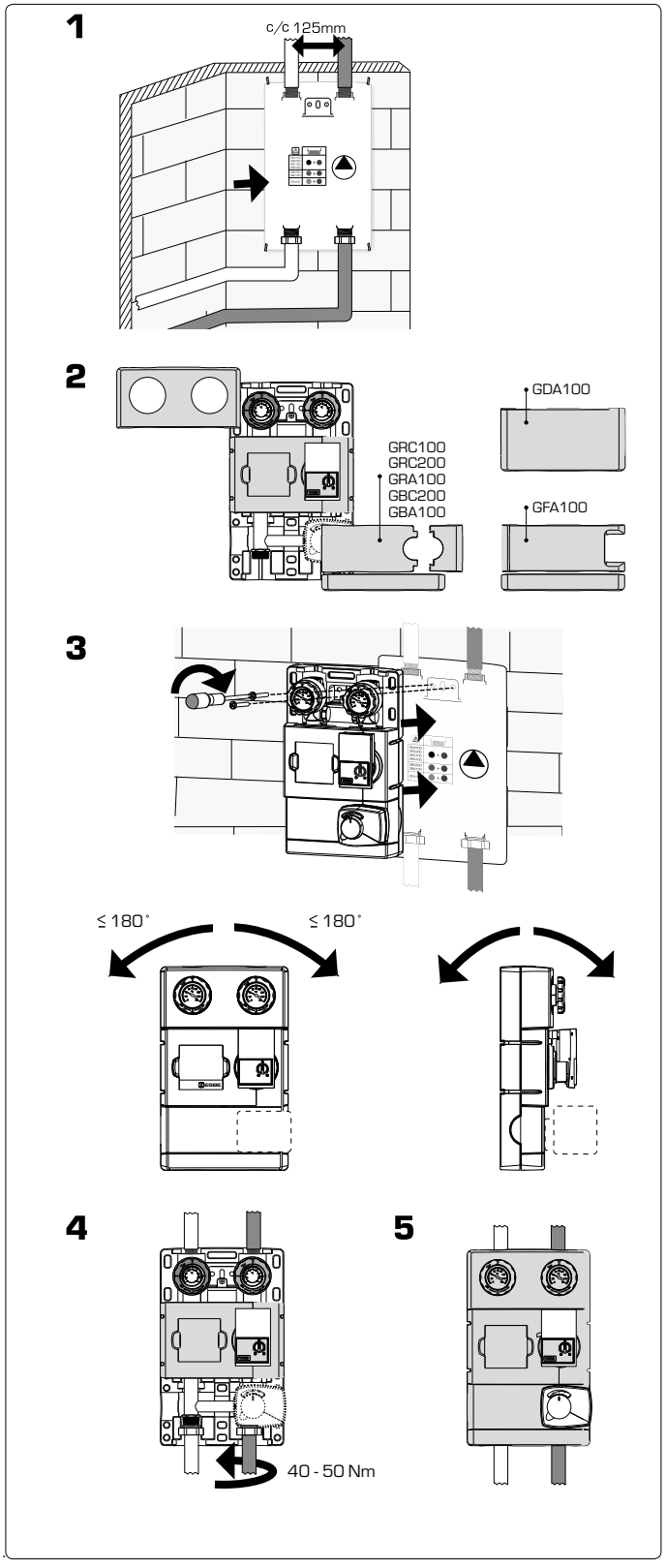
3. Mount the circulation unit on the wall with the supplied screws and plugs. Ensure that they are completely in line and lock them firmly.

⚠ WARNING! *For all installations, verify that the plugs are suitable for the kind of wall chosen. Otherwise replace them with a special model. To value the suitability of the plugs please consider the structure of the wall, all the units connected and the weight of the water.*

4. Connect the pipings.

⚠ WARNING! *Equipment might be damaged when incorrect usage of tools.*

5. Remount the insulation shell parts (and actuator/controller).



MULTIPLE INSTALLATIONS OF CIRCULATION UNITS ON THE WALL
If more than one Circulation Unit should be used we recommend the use of Serie ESBE GMA manifold, with or without hydraulic separator.

When no accumulator tank or other components performing a hydraulic separation are used, then manifold series GMA2XX should be installed.

Adapters are available in two versions ESBE KGR and ESBE KGT. Standard version ESBE KGR for most common units and a special version ESBE KGT for fixed temperature units ESBE GFA. The special version ESBE KGT is to compensate for slightly different mounting dimensions of ESBE GFA.

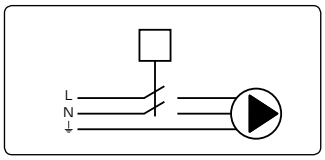
GDA100 AS DISTRIBUTION UNIT FOR ESBE MANIFOLDS GMA100
When installing the GDA100 as distrubution unit for the manifold use suitable adaptors G1"/RN1½".

FEED OF OPEN SYSTEMS
When installing in the feed of open systems, the safety supply must branch off upstream of the circulation unit (EN 12828).

3 ELECTRIC INSTALLATION

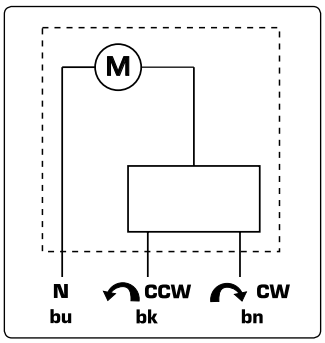
Electric connection of the Circulation Unit depends both on the circulation pump, actuator and /or controller.

CIRCULATION PUMP 230 VAC, 50HZ:
The circulation pump should be preceded by a multi-pole contact breaker in the fixed installation. Earth-connection should not be broken.



You find more information about the circulation pump on www.esbe.eu.

ACTUATOR:
Actuators supplied with 230 VAC should be preceded by a mulitipole contact breaker in the fixed installation.



You find more information about the actuator on www.esbe.eu.

CONTROLLER:
For more information regarding electric connection and parameters setting, read CRC and 90C instruction manuals enclosed.

IF USING LARGER SYSTEMS/CENTRAL REGULATING
Read each product´s instruction manual.

4 COMMISSIONING CIRCULATION UNIT

⚠ WARNING! *Before any intervention disconnect the electric mains through the external mounted switch and depressurise!*

⚠ WARNING! *Depending on the operating status of the circulation pump or system (fluid temperature), the entire Circulation Unit can become very hot.*

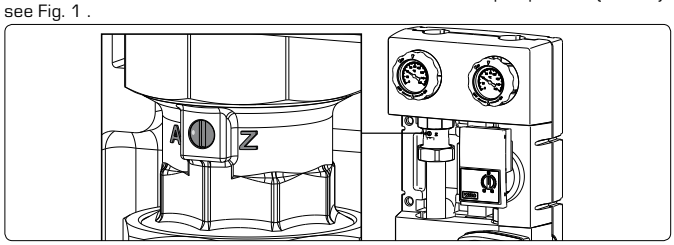
Both primary and secondary loop have to be washed in order to remove any possible mounting residuals.

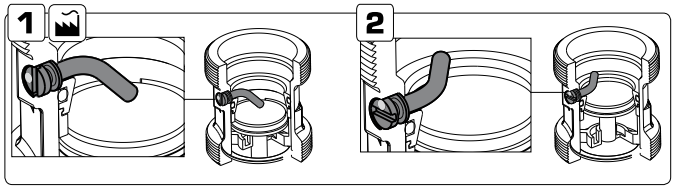
Check that all connections are fully tightened: it´s important to check all connections before filling the system in order to avoid leakages or sprays which may be dangerous for the electric components. Open all shut-off valves and fill the primary and secondary loop following the instructions for the tank, boiler etc. During the filling phase recheck that all connections are tightened.

FILLING AND VENTING
Fill the buffer tank and the primary loop with an appropriated liquid, according to the system instructions, respecting the limits of the components used. While filling the device, open any vents situated in the circuit. Watch the system until it reaches its correct operation condition. If pressure is not enough, adjust the pressure by repeating the above procedure.

To avoid problems with cavitation, fill up the system to get sufficient pressure head on the suction side of the circulation pump. The minimum pressure needed depends on the temperature of the fluid. Recommended min pressure head at fluid temperatures 50/95/110°C is 0,5/4,5/11 m respectively.

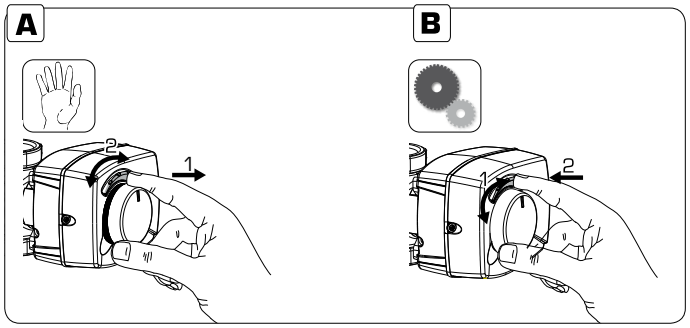
Start the venting function by sett the circulation pump operation knob in venting function described in chapter 5. To make the filling and venting easier it´s possible to force the checkvalve on the return side of the unit, to an open position (default), see Fig. 1 .





After a complete filling and venting cycle, turn the screw on the check valve back to it´s normal operating position, picture 2 and set the circulation pump operation knob to recomended position. See chapter 5.

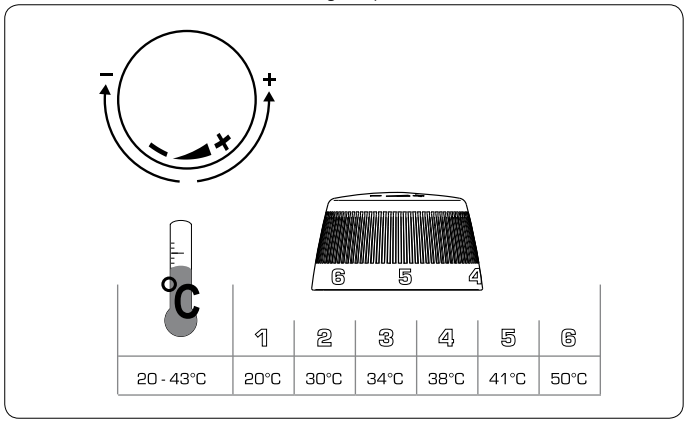
COMMISSIONING ACTUATOR:
During commisioning it might be useful to turn the valve manualy by pulling the knob, picture A. Reset to operation mode by pushing and adjusting the knob back, picture B.



COMMISSIONING CONTROLLER:
For more information regarding comissioning, read CRC or 90C instruction manuals enclosed.

COMMISSIONING IF USING LARGER SYSTEMS/CENTRAL REGULATING
Please read each product´s instruction manual.

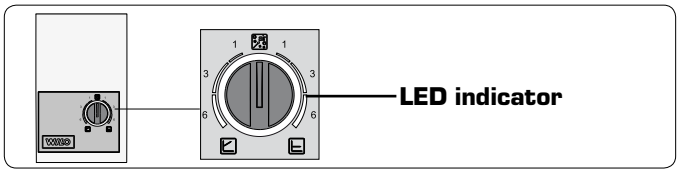
COMMISSIONING FIXED TEMPERATURE OPERATION
To set the mixed water temperature, see recomendations in the table below. All temperature settings must be measured at suitable location with a thermometer to have the correct mixing temperature of the valve.



	1	2	3	4	5	6
20 - 43°C	20°C	30°C	34°C	38°C	41°C	50°C

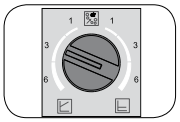
5 CIRCULATION PUMP OPERATION MODE

All functions can be set, activated or deactivated by using the operating knob. The circulation pump is equipped with a LED indicator in order to display the circulation pump operating status. More information in table "Faults, couses and remedies" page 4



SETTING THE CONTROL MODE

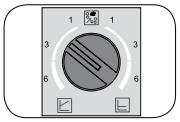
To select the desired control mode turn the operating knob.



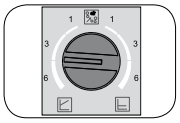
Recommended setting: Δp-v in the middle position, as displayed in the figure.

At commissioning of radiator systems with circulation units equipped with a controller all radiator valves initially should be fully opened. The set temperature of the controller should be adjusted to achieve right temperature in the coldest room. If some rooms tends to be too hot the radiator valves in those rooms afterwards might be adjusted to achieve the right room temperature.

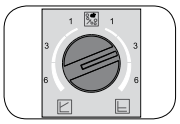
In most cases it is suitable to position the red knob in the middle position to the left (ΔP-v) to get the right capacity from the circulation pump, especially when radiators are used.



In some cases this setting has to be adjusted: If much sound occurs from the radiator system, the capacity of the circulation pump might be too high and the red knob should be slightly turned towards the min position.



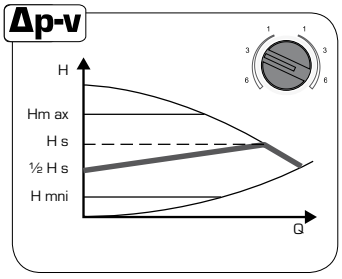
If room temperature decrease when it is very cold outside, the red knob should be slightly turned toward the max position.

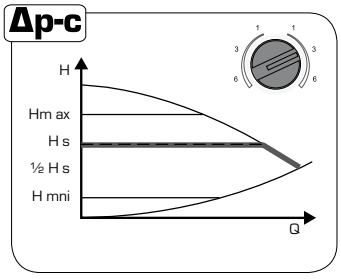


When using applications like floor heating with room thermostats, the performance might be improved by choosing to turn the knob to the right side (ΔP-c). Start in a middle position.

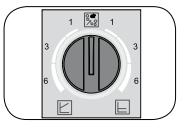
VARIABLE DIFFERENTIAL PRESSURE (ΔP-V) :
The differential-pressure set point H is increased linearly over the permitted volume flow range between ½ H and H. This control mode is especially useful in heating systems with radiators, since the flow noises at the thermostatic valves are reduced.

CONSTANT DIFFERENTIAL PRESSURE (ΔP-C):
The differential-pressure set point H is kept constant over the permitted volume flow range at the set differential-pressure set point up to the maximum circulation pump curve.ESBE recommends this control mode for underfloor-heating circuits or older heating systems with large-sized pipes as well as for all applications with no changeable pipe system curve, e.g. boiler charge circulation pumps.





FILLING AND VENTING FUNCTION



Fill and vent the system correctly. If direct venting of the rotor chamber is required, the venting function can be started manually. By turning the operating knob to the symbol for venting in the middle position, the venting function is activated after 3 seconds.

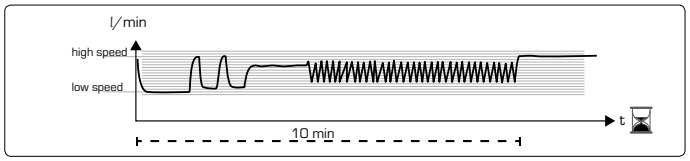
The venting function lasts 10 minutes and is indicated with quick green LED blinking. Noises may be heard when the venting function is running. The process can be stopped if desired by turning the knob. After 10 minutes, the circulation pump stops and goes automatically in Δp-c max mode.

⚠ WARNING! *Dont forget to turn the knob back to recomended setting!*

NOTE: *The venting function removes accumulated air from the rotor chamber of the circulation pump. The venting function of the circulation pump does not necessarily vent the heating system.*

During automatic venting function (10min) the circulation pump runs alternately with high and low speeds to help air bubble from the circulation pump to agglomerate and to lead direct to the venting valve of the installation.

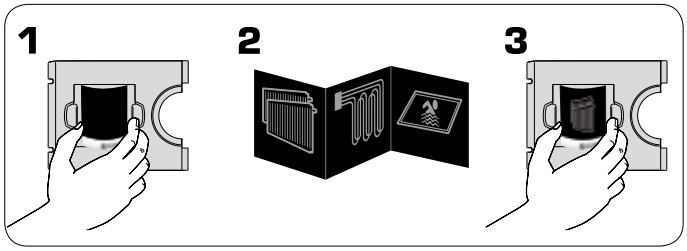
AUTOMATIC AIR VENTING ROUTINE



6 HOW TO USE THE INFORMATION LEAFLET

The Circulation Unit is equipt with an information display containing a leaflet that graphically explains what kind of application the unit is controlling. It gives you also the possibility to write in notes and leave your business card behind.

Just remove the display glass and select the suitable information.



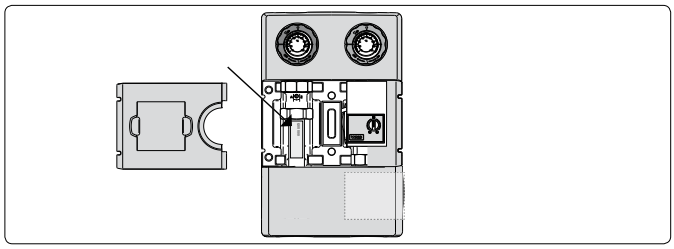
7 MAINTENANCE

The circulation unit does not require any specific maintenance under normal conditions. Althoug it is important to annually check the entire system. Pay specially attention to all threaded or soldered connections and the potential occurrence off limestone sedimentation.

⚠ WARNING *Switch of the electric supply before any operation. Pay attention to the hot water contained.*

8 SPARE PARTS

Spare parts are ordered via ESBE customer service.
In order to avoid queries and incorrect orders, all data on the name plate should be submitted for each order.



9 FAULTS, CAUSES AND REMEDIES

Faults	Meaning	Diagnostic	Cause	Remedy
Circulation Unit not operating	No heating No cooling	Pump not running, led is off. Actuator/Controller not running.	No power supply	Check connections
Circulation Unit not operating	No heating No cooling	Pump is running, led lights. Actuator/Controller is running.	Check valves are closed	Open all valves
Circulation Unit not operating properly	Not sufficient heating Not sufficient cooling	Noise from the system. Pump and Actuator/Controller is running	Air in the system blocks the circulation.	Remove air from the system by filling and venting, see chapter 4.
Circulation Unit not operating properly	Not sufficient heating	Room temperature to low when it´s very cold outside.	**1.** Controller setting **2.** Pump speed	**1.** Adjust Controller settings. **2.** Adjust speed of circulation pump, see chapter 5.
Poor indoor temperature	If radiator valves closes down the controller is not working properly.	Noise from radiators	**1.** Radiator valves are not fully open.	**1.** Open radiator valves.
To high Pressure Differential	Poor energy performance	Noise from system	To high circulation pump speed	Decrease speed of circulation pump, see chapter 5.
LED lights green	Circulation pump in operation	Circulation pump runs according it's setting	Normal operation	
LED blinks quick green	Circulation pump in air venting mode	Circulation pump runs during 10 min in air venting function. Afterwards the targeted performance must be adjusted.	Normal operation	
LED blinks red/ green	Circulation pump in function but stopped	Circulation pump restarts by by itself after the fault is disappeared	**1.** Under voltage U<160 V or Over voltage U>253 V **2.** Module overheating: temperature inside motor to high	**1.** Check voltage supply 195 V < U < 253 V **2.** Check water and ambient temperature
LED blinks red	Circulation pump out of function	Circulation pump stopped (blocked)	Circulation pump does not restart by itself due to a permanent failure	Change circulation pump
LED off	No power supply	No voltage on electronics	**1.** Circulation pump is not connected to power supply **2.** LED is damaged **3.** Electronics are damaged	**1.** Check cable connection **2.** Check if circulation pump is running **3.** Change circulation pump

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