Regulus

www.regulus.eu

BIO 55 MIX-BP G75 1F

Installation and Operation Manual

BIO 55 MIX-BP G75 1F

LOAD UNIT

EN

BIO 55 MIX-BP G75 1F

Contents

A. SAFETY INSTRUCTIONS

- **The hydraulic connection** of the load unit must be carried out by a person qualified according to the applicable standards and regulations.
- Any **interventions in the electrical installation** must be carried out by a person qualified according to the applicable standards and regulations.
- **The BIO 55 MIX-BP G75 1F load unit is in no way a replacement for the safety components** of the heating system, hot water system and boiler. These safety elements must always be installed in accordance with the applicable standards and regulations. The diagrams published in this manual represent wiring examples and may not be complete. Carry out the actual installation according to the heating design and ensure that all prescribed safety features are fitted.

B. INTRODUCTION, DESCRIPTION

BIO 55 MIX-BP G75 1F Load Unit includes a complete hydraulic connections for the installation of a heating system with a solid fuel boiler. All you need to do is connect **a suitable controller, boiler, safety elements, one heating system and a thermal store**, then set the desired parameters in the external controller.

The Load Unit involves

- two Grundfos UPM3 Flex AS 25-75 circulation pumps (enabling control either by PWM signal or by selecting a pump performance curve)
- TSV3BM load valve with automatic bypass balancing
- 3-way mixing way for maintaining the desired temperature in the heating circuit*
- two ball valves with drain valves for shutting off and draining the heating system
- check valve integrated in the ball valve body located at the return line from the heating system
- two ball valves to shut off the boiler circuitu
- two drain valves to drain the load unit
- two ball valves permitting to shut off the thermal store circuit (enclosed in supply)
- handle for ball valves
- four thermometers
- outets for connecting a (combination) thermal store and alternative outlets for connecting optional accessories

** Mixing valve actuator is not included in supply and shall be ordered separately.*

The Load Unit delivery includes a package containing:

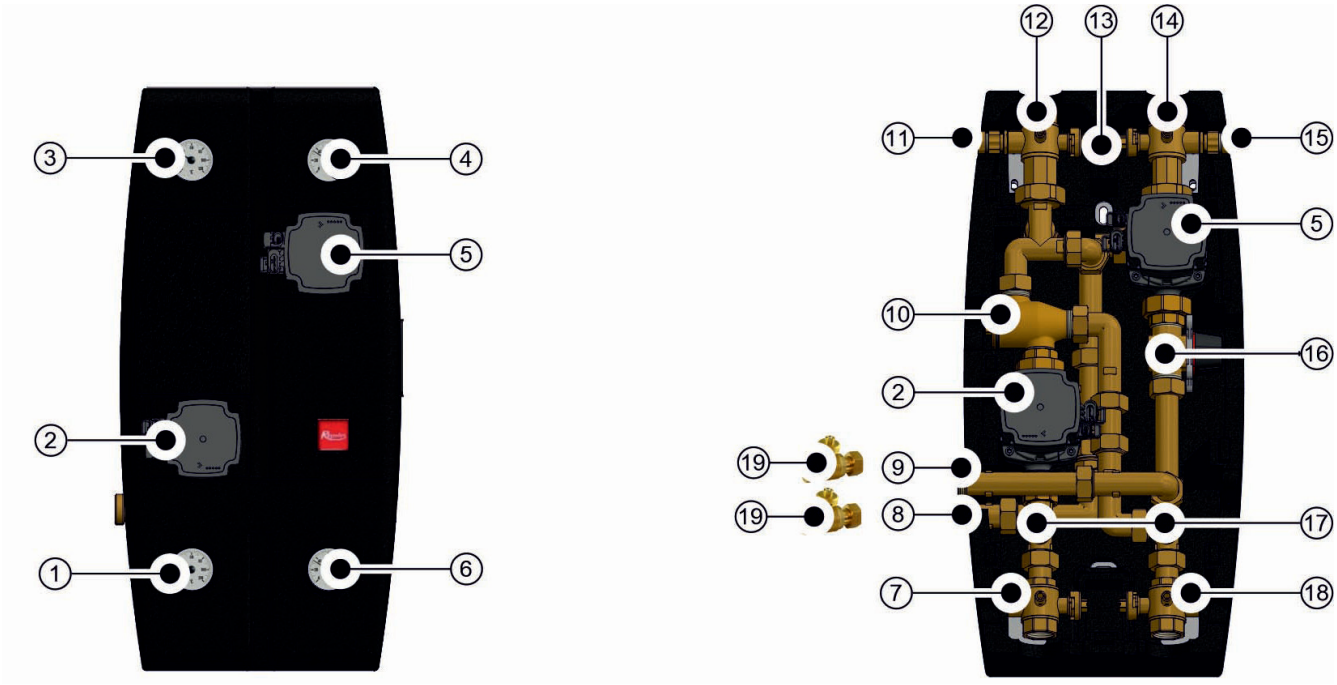
Mounting kit:

- 2 screws, 5x50, pan head
- 2 washers 6.4 in stainless steel DIN 9021/A2
- 2 wall plugs, 8mm, TX

Others:

- 2 ball valve with union nut, G1“Fu x G1“F

B.1. LOAD UNIT COMPONENTS



1 – Boiler return line thermometer
2 – Grundfos UPM3 Flex AS 25-75 boiler pump
3 – Return heating water thermometer
4 – Heating water flow thermometer
5 – Grundfos UPM3 Flex AS 25-75 heating circuit pump
6 – Boiler flow thermometer
7 – G 1“ Fu × G 1“ F × G 1/2 “ F ball valve w. free outlet and sheath for temperature sensor*
8 – G 1” F return line from thermal store
9 – G 1“ F outlet to thermal store
10 – TSV3BM load valve
11 – G 1/2“ M drain valve with hose tail
12 – G 6/4“ Fu × G 1“ F × G 1/2“ F ball valve w. check valve and sheath for temperature sensor
13 – Handle for ball valves
14 – G 6/4 “ Fu × G 1“ F × G 1/2“ F ball valve w. heating circuit temperature sensor
15 – G 1/2“ M drain valve with hose tail
16 – LK 840 mixing valve
17 – Mini drain valves
18 – G 1“ Fu × G 1“ F × G 1/2 “ F ball valve w. free outlet and sheath for temperature sensor*
19 – DN 20 ball valve to be mounted on pos. 8 and 9 (included in the enclosed package)

** The G 1/2“ F free outlets from ball valves on pos. 7 and 18 can be used for connecting further accessories. If you do not need to connect any, the outlet remains plugged.*

B.2. LOAD UNIT DATA

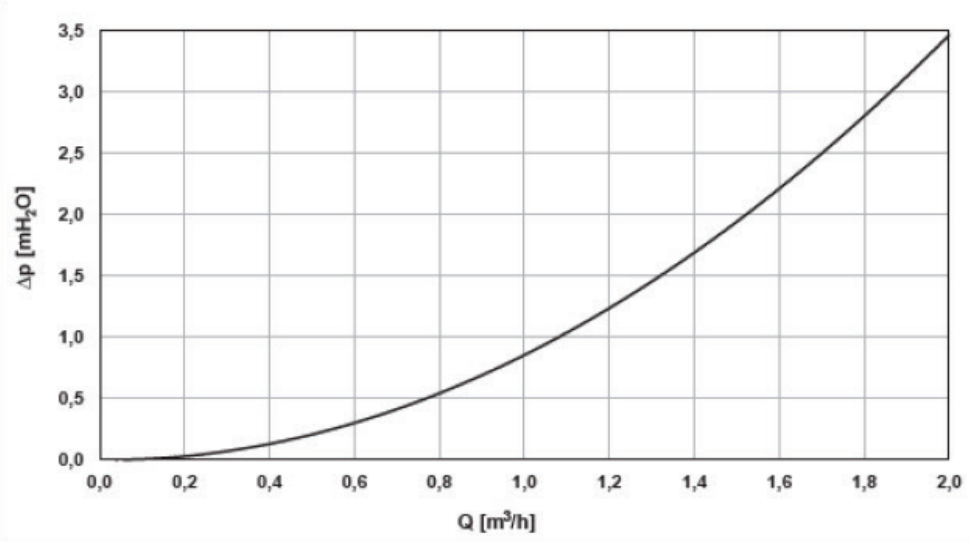
Technical Data	
Fluid working temperature	5-95 °C
Max. working pressure	6 bar
Min. working pressure	0.5 bar
Ambient temperature	5-40 °C
Max. relative humidity	80%, non condensing
Max. temperature of sheath sensors	95 °C
Min. return water temperature to boiler	55 °C
Max. boiler output at flow of 1730 l/h	40 kW at Δt 20 °C 20 kW at Δt 10 °C
Max. heating system output at flow of 1730 l/h	40 kW at Δt 20 °C 20 kW at Δt 10 °C
Insulation material	EPP RG 60 g/l
Overall dimensions (H x W x D)	640 x 350 x 210 mm
Total weight	16.5 kg
Code	**17553**

Electric Data	
Load Unit power supply	230 V, 50 Hz (powered from an external controller)
Load Unit max. power input	120 W
IP rating of the Load Unit	IP20

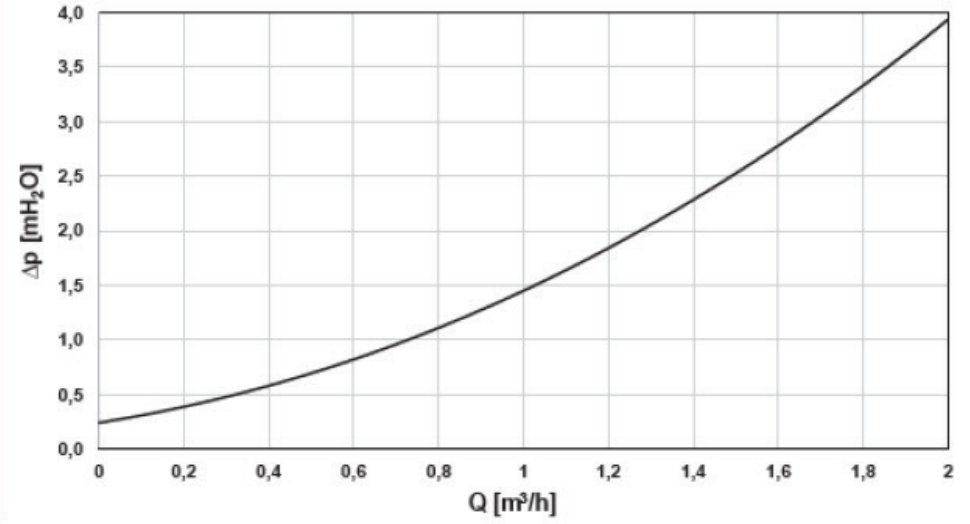
Table of Kvs values	
Mixing valve	6.3 m^3/h
Ball valves	20.2 m^3/h

B.3. PRESSURE DROP GRAPH

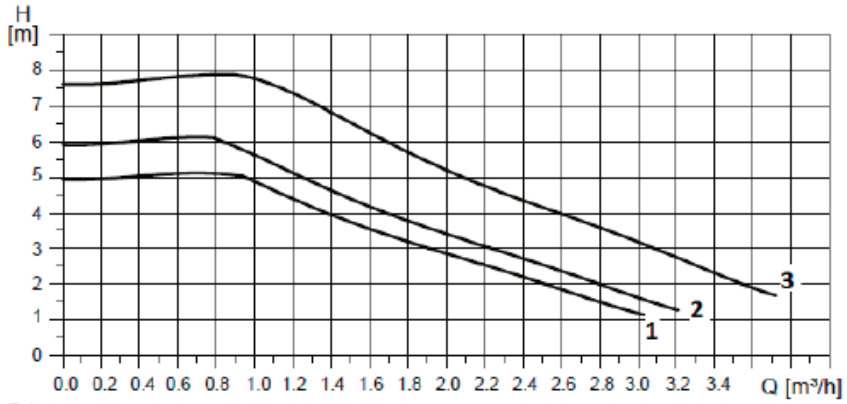
BOILER SIDE

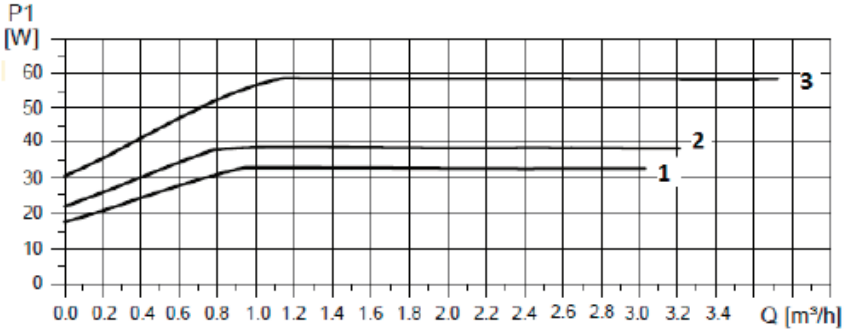


HEATING CIRCUIT



PERFORMANCE CURVES FOR UPM3 FLEX AS 25-75 130 PUMP

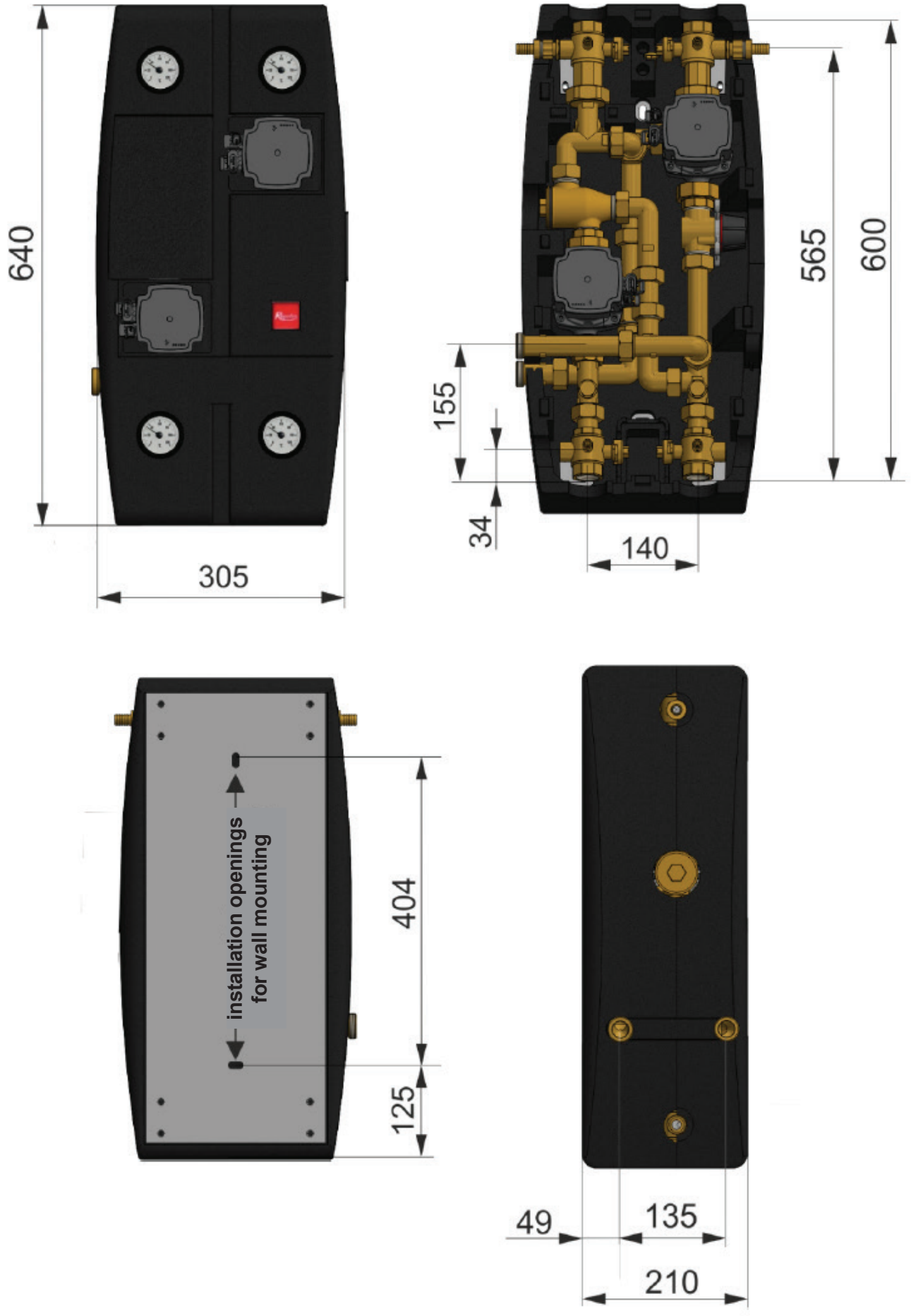




Curve	Max. H (upper graph)	Max. P_1 (lower graph)
1	5 m	33 W
2	6 m	39 W
3	7,5 m	60 W

B.4. DIMENSIONS

Note: The dimensional diagram of the open load unit is rotated for illustrative purposes, the outlets for the thermal store connection are mutually aligned (see side view).

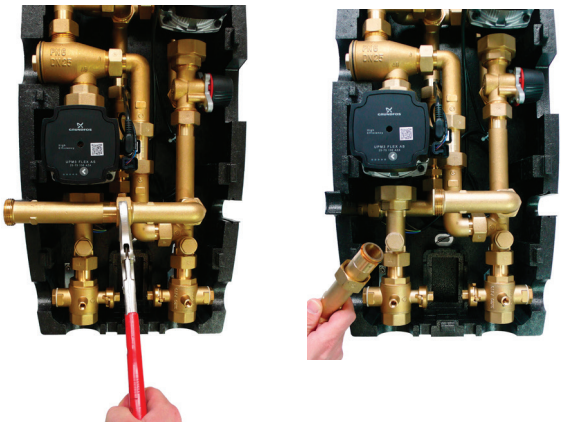
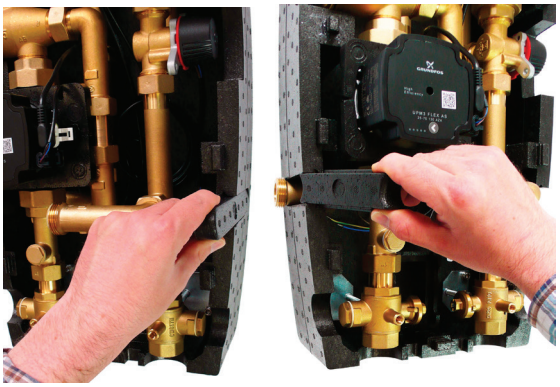
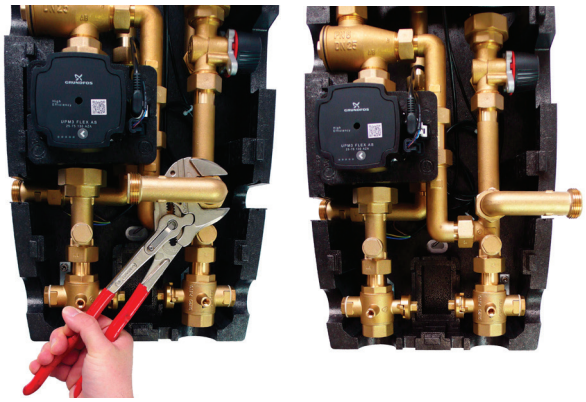
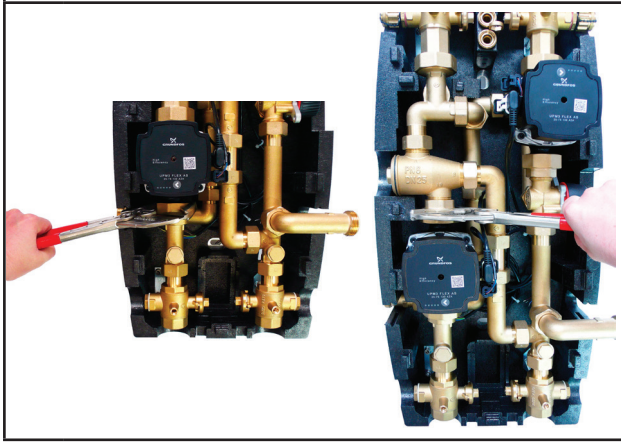
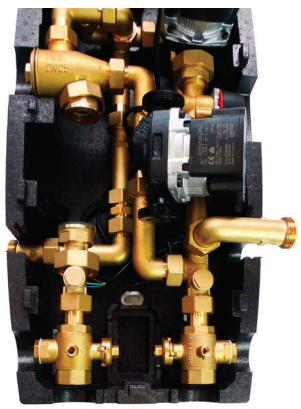


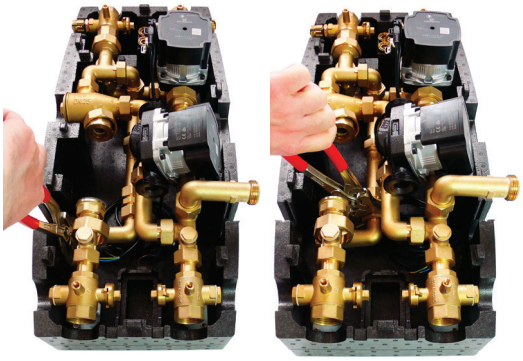
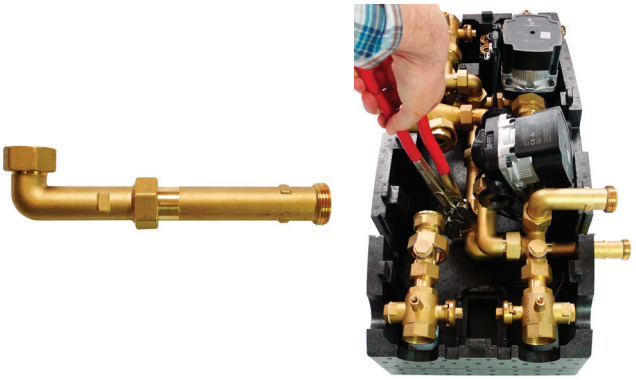
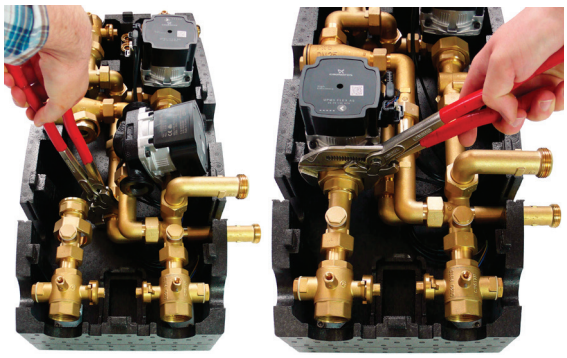
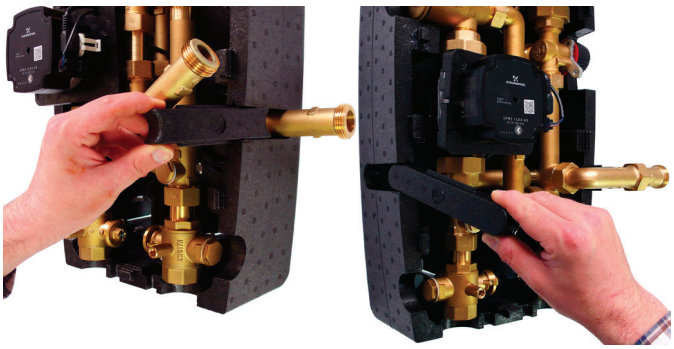
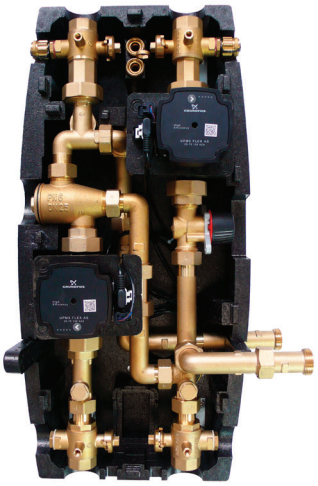
C. LOAD UNIT INSTALLATION

The load unit is designed for wall mounting. It shall be mounted in the selected position using the enclosed installation kit. Two mounting holes in the sheet metal in the rear section of the insulation are used for wall mounting, see dimension diagram below.

Note: In the basic version, the thermal store is supposed to be connected on the left side of the load unit. If necessary, the load unit can be converted to be connected to a thermal store on the right side.

Procedure for conversion of the load unit to connect the thermal store from the right

1 Remove the top part of insulation.	**2** Loosen the nut and remove the extension for the outlet to the thermal store (this will be used in step 8).
	
3 On the right and left side of the insulation body there are insulated passage points for connecting the thermal store; take out the insulation pieces from both the passage points.	**4** Loosen the nut and turn the elbow to the right.
	
5 Take out the insulation piece for the boiler pump. Loosen the nuts at both the discharge and suction ports of the pump so that you can easily handle the pump.	**6** Move the pump to the side to allow free access to the elbow.
	

7 Loosen the elbow and take it out of the load unit.	**8** Assemble the elbow with the extension removed in step 3 and re-install it to same location so that the outlet now points to the right.
	
9 Mount the pump back to its original place, tighten both nuts and return back the pump insulation piece.	**10** Replace all the remaining pieces of insulation to their original places.
	
11 The load unit should now look like this.	**12** Reinstall the top part of the insulation.
	

C.1. HYDRAULIC CONNECTION OF THE LOAD UNIT

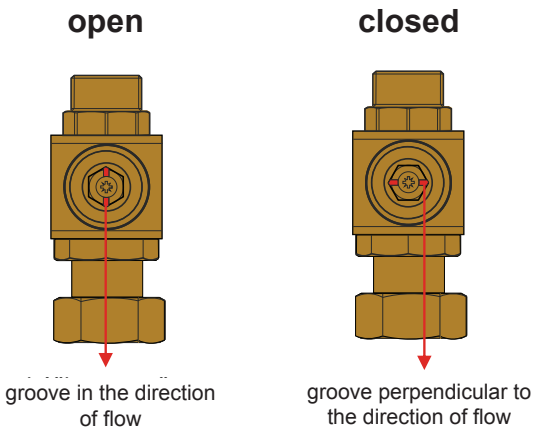
HOW TO PROCEED:

Make hydraulic connections of the boiler and safety elements, heating system, thermal store(s) or hot water tank(s) with the load unit, respecting the selected hydraulic variant (see the following page). Fill and air bleed the system. Perform a pressure test.

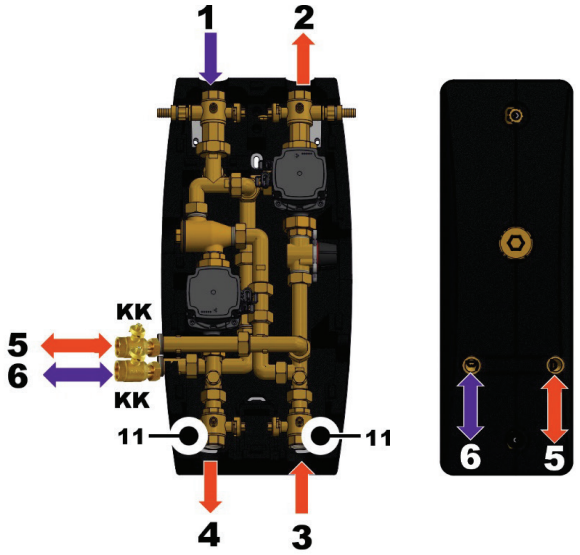
HOW TO CONNECT PIPING:

Connect the piping following the diagram below. The load unit has two side outlets from ball valves for connecting optional accessories (plugged) from ball valves 11. These outlets are connected with the boiler even when the ball valves are closed.

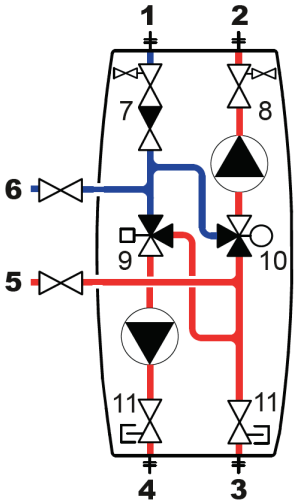
Before starting operation, make sure all ball valves are in the open position (the open/closed position on ball valves inside the load unit is shown by the groove position).



Piping connections



Inner hydraulic connection



Pos.	Description	Conn.
1	Return from heating system	G 1“ F
2	Outlet to heating system	
3	Flow from boiler	G 1“ F
4	Return to boiler	
5	Outlet to thermal store w. ball valve (enclosed)	G 1“ F
6	Return from thermal store w. ball valve (enclosed)	
7	Ball valve w. integrated check and drain valves*	
8	Ball valve w. integrated drain valve*	
9	Load valve	
10	Mixing valve	
11	Ball valve w. outlet to connect optional accessories*	G 1/2“ F (plugged rom the factory)

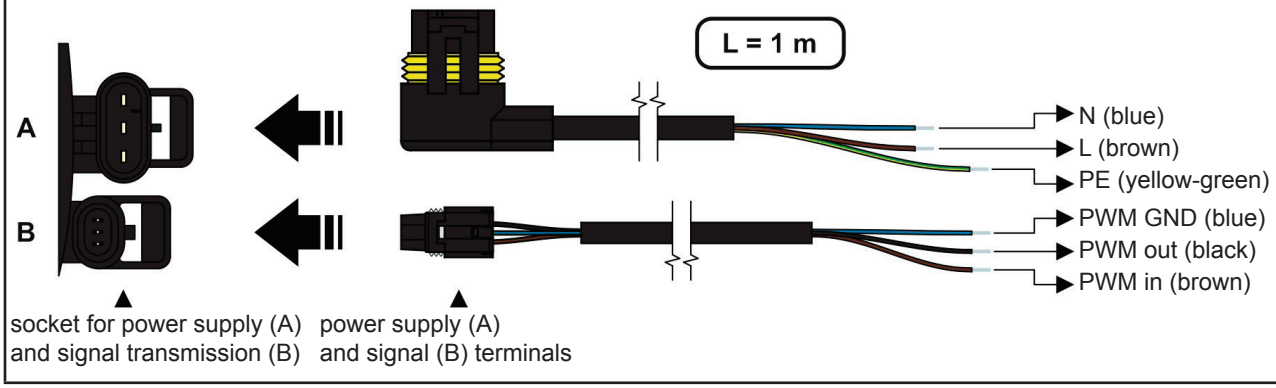
Key to components

- Ball valve w. drain valve
- Load valve
- Mixing valve
- Ball valve w. outlet to connect optional accessories
- Ball valve w. integrated check and drain valves

** remains connected with the boiler/heating system even when the ball valve is closed*

C.2. PUMP CONNECTION

Pump Wiring



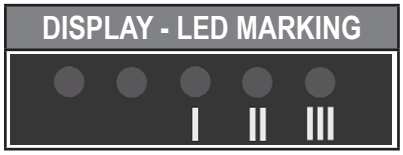
C.2.1. Pump Control

The circulation pump can be controlled by an external PWM signal (profile for use in heating systems) or without a PWM signal by selecting a pump performance curve.
A maximum curve of a pump working range can be defined.

- with PWM signal the pump speed changes with the signal value up to the maximum of the selected curve
- without PWM signal the pump runs at the max. speed according to the selected curve

Performance display

The LED marking is further omitted for better clarity.



DISPLAY	PERFORMANCE CURVE	STATE	Max. H (upper graph)
	1	LOW PERFORMANCE	5 m
	2	MEDIUM PERFORMANCE	6 m
	3	HIGH PERFORMANCE	7,5 m

WARNING: LEDs may be mirrored, depending on the specific pump type.

GREEN LED FLASHING FREQUENCY	PWM SIGNAL RECEPTION
1 flash per second	NO
8 flashes per second	YES

When switched on, the pump runs at factory settings or the last setting. The display shows the current pump performance.

Setting selection for UPM3

To select your desired setting, press the button repeatedly until you find the setting you need (see the pic. above). If you pass the desired setting, you have to go one more round until it appears again.

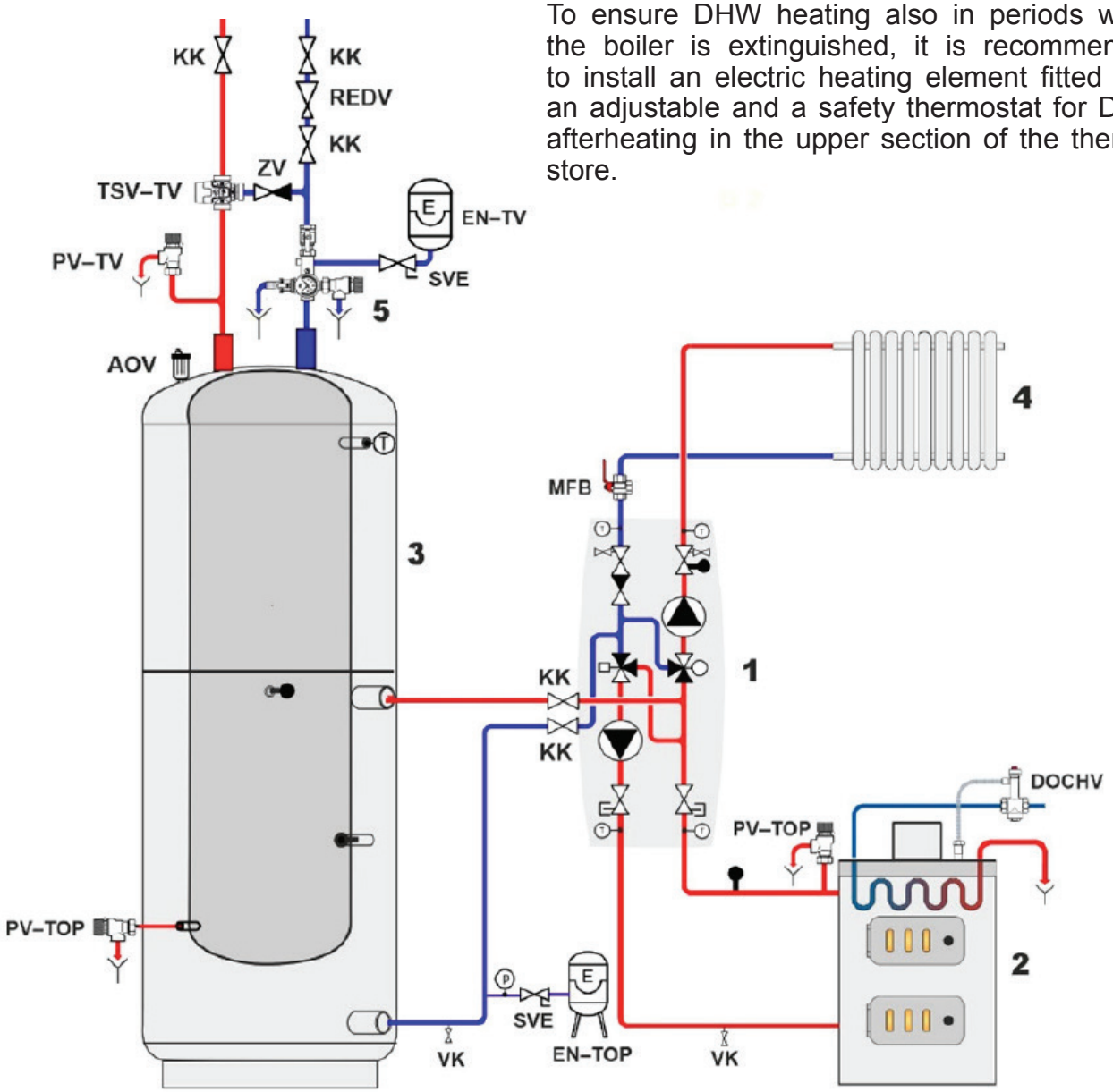
C.3. CONNECTION EXAMPLES

These basic diagrams can be extended with accessories that can always be found after the respective diagram on the following pages.

C.3.1. Variant 1

A system with a solid fuel boiler w. manual stoking, one heating circuit and a combination thermal store. The BIO MIX Load Unit ensures DHW and space heating and heat storage in the combination thermal store.

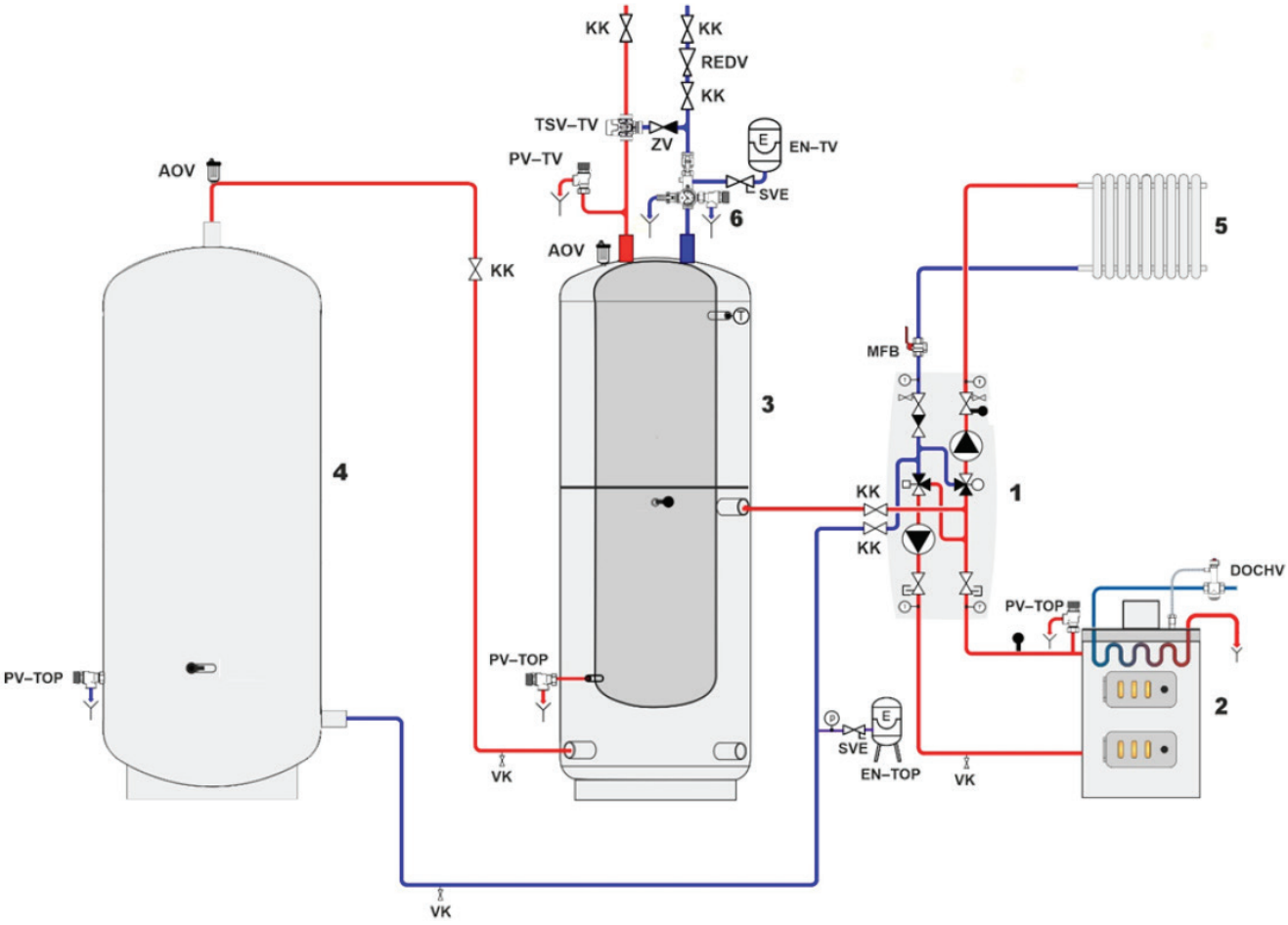
To ensure DHW heating also in periods when the boiler is extinguished, it is recommended to install an electric heating element fitted with an adjustable and a safety thermostat for DHW afterheating in the upper section of the thermal store.



DESCRIPTION			
KK	ball valve	**1**	RegulusBIO Load Unit
ZV	check valve	**2**	boiler
VK	drain valve	**3**	combination thermal store with DHW
REDV	pressure reducing valve (5 bar)	**4**	heating system
SVE	expansion vessel service valve	**5**	safety kit*
DOCHV	thermal safety relief valve (e.g. BVTS)	* the safety kit involves a test valve, check valve, drain valve, safety valve, pressure gauge and outlet to connect an expansion vessel	
TSV-TV	anti-scald valve		
PV-TOP	heating system safety valve (3 bar)		
EN-TV	DHW expansion vessel		
EN-TOP	heating system expansion vessel		
AOV	automatic air vent valve		
MFB	Magnet Filterball		
PV-TV	DHW safety valve		

C.3.2. Variant 2

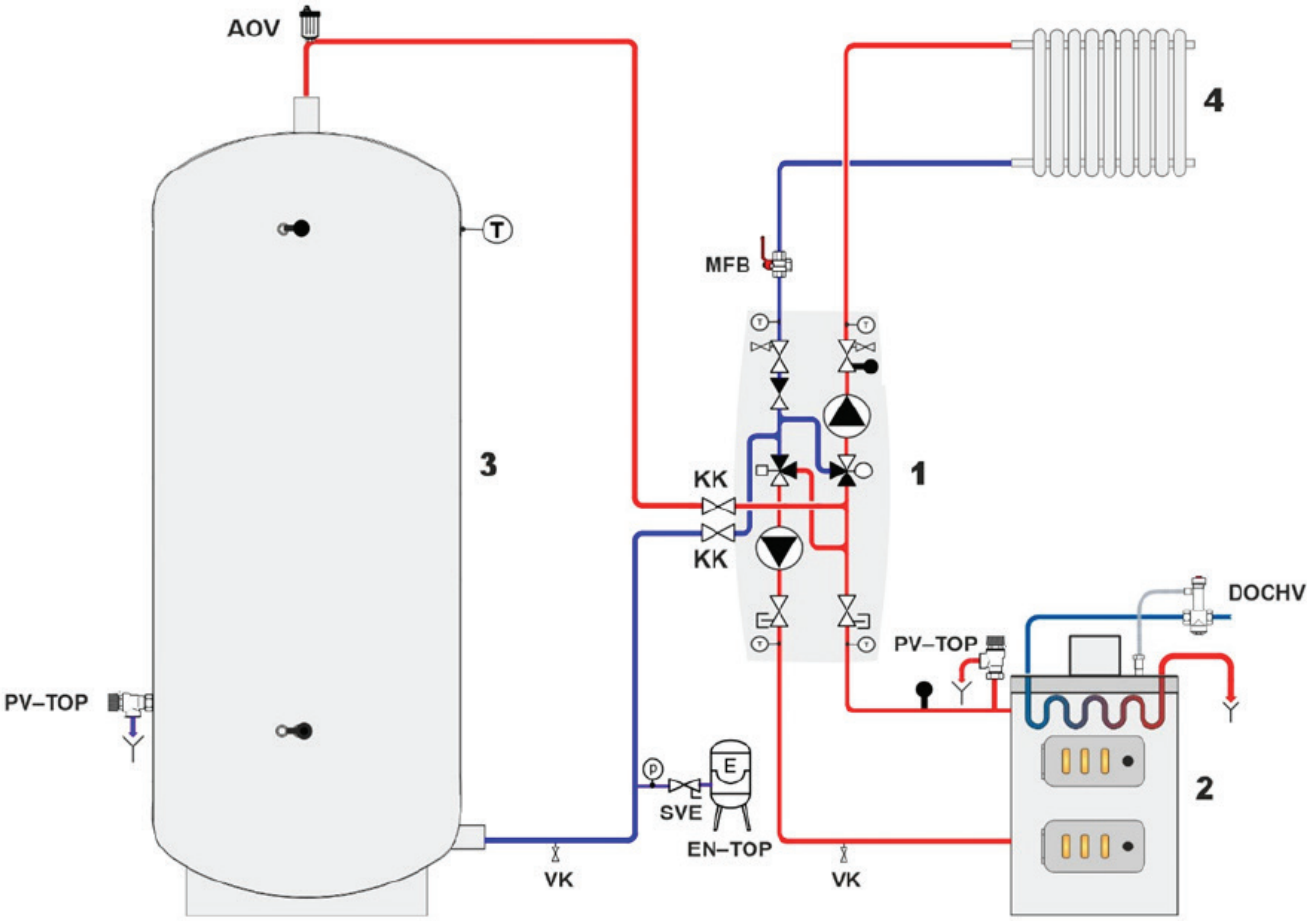
A system with a solid fuel boiler w. manual stoking, one heating circuit, combination thermal store and a thermal store. The BIO MIX Load Unit ensures DHW and space heating and heat storage in the combination and standard thermal stores. To ensure DHW heating also in periods when the boiler is extinguished, it is recommended to install an electric heating element fitted with an adjustable and a safety thermostat for DHW afterheating in the upper section of the thermal store.



DESCRIPTION			
KK	ball valve	**1**	RegulusBIO Load Unit
ZV	check valve	**2**	boiler
VK	drain valve	**3**	combination thermal store with DHW
REDV	pressure reducing valve (5 bar)	**4**	thermal store
SVE	expansion vessel service valve	**5**	heating system
DOCHV	thermal safety relief valve (e.g. BVTS)	**6**	safety kit*
TSV-TV	anti-scald valve	*the safety kit involves a test valve, check valve, drain valve, safety valve, pressure gauge and outlet to connect an expansion vessel	
PV-TOP	heating system safety valve (3 bar)		
EN-TV	DHW expansion vessel		
EN-TOP	heating system expansion vessel		
AOV	automatic air vent valve		
MFB	Magnet Filterball		
PV-TV	DHW safety valve		

C.3.3. Variant 3

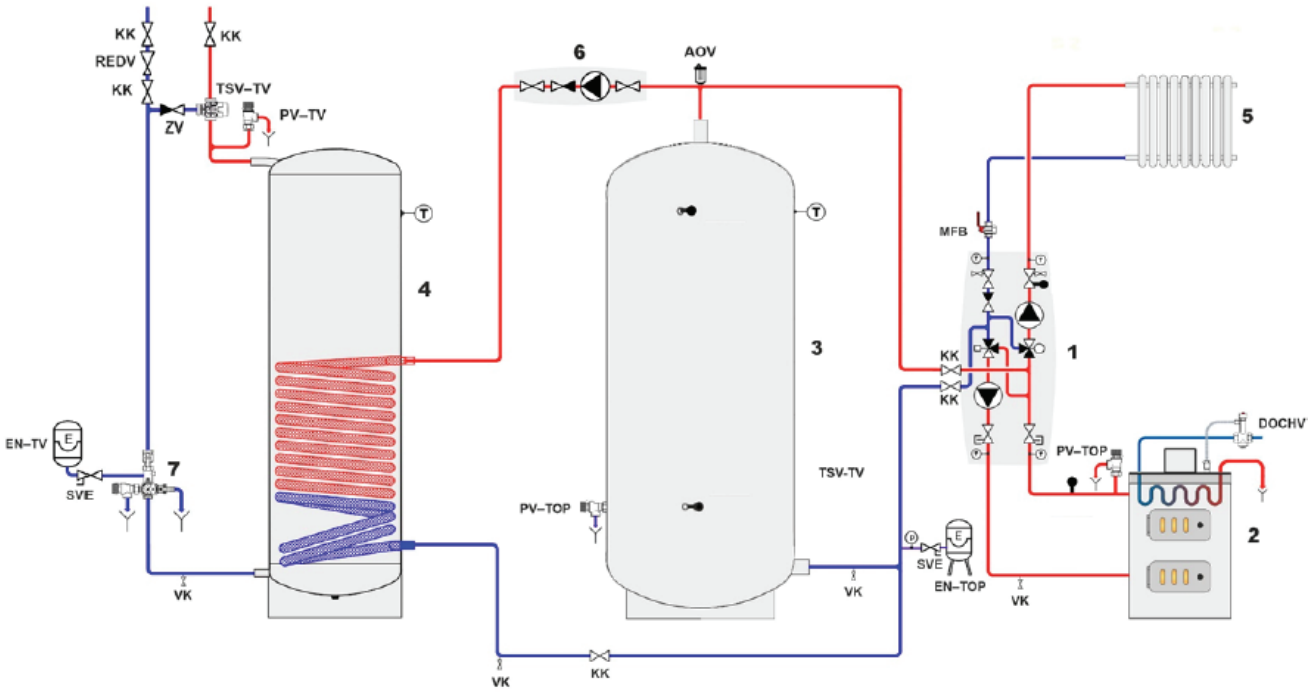
A system with a solid fuel boiler w. manual stoking, one heating circuit and a thermal store.
The BIO MIX Load Unit ensures heating of a building and heat storage in the thermal store.



DESCRIPTION			
KK	ball valve	**1**	RegulusBIO Load Unit
ZV	check valve	**2**	boiler
VK	drain valve	**3**	thermal store
SVE	expansion vessel service valve	**4**	heating system
DOCHV	thermal safety relief valve (e.g. BVTS)		
PV-TOP	heating system safety valve (3 bar)		
EN-TOP	heating system expansion vessel		
AOV	automatic air vent valve		
MFB	Magnet Filterball		

C.3.4. Variant 4

A system with a solid fuel boiler w. manual stoking, one heating circuit, a thermal store and a hot water storage store. The BIO MIX Load Unit ensures DHW and space heating and heat storage in the thermal store. To ensure DHW heating also in periods when the boiler is extinguished, it is recommended to install an electric heating element fitted with an adjustable and a safety thermostat in the hot water storage tank.



DESCRIPTION			
KK	ball valve	**1**	RegulusBIO Load Unit
ZV	check valve	**2**	boiler
VK	drain valve	**3**	thermal store
REDV	pressure reducing valve (5 bar)	**4**	hot water storage tank
SVE	expansion vessel service valve	**5**	heating system
DOCHV	thermal safety relief valve (e.g. BVTS)	**6**	pump station for heat exchange
TSV-TV	anti-scald valve	**7**	safety kit*
PV-TOP	heating system safety valve (3 bar)	* the safety kit involves a test valve, check valve, drain valve, safety valve, pressure gauge and outlet to connect an expansion vessel	
EN-TV	DHW expansion vessel		
EN-TOP	heating system expansion vessel		
AOV	automatic air vent valve		
MFB	Magnet Filterball		
PV-TV	DHW safety valve		

C.3.5. NECESSARY ACCESSORIES FOR VARIANT 4

Pump station for heat exchange	
	Pump station for heat exchange ensures heating of hot water storage tank (by heat transfer from a thermal store). It shall be ordered separately. It is recommended to use e.g. CSE OTS ZV G70 (code 15042) or CSE OTS ZV G60 (code 19088).

C.3.6. OPTIONAL ACCESSORIES FOR VARIANTS 1, 2 and 4

The following accessories are recommended for variants 1, 2 and 4.

Electric heating element for DHW afterheating	
Hot water always available.	
	To ensure DHW heating also in periods when the boiler is extinguished, it is recommended to install an electric heating element fitted with an adjustable and a safety thermostat – preferably the **ETT M** model. The temperature is set directly on the element using the control knob and thanks to its power cord with an el. plug no professional electrician is needed for wiring.

D. SERVICING, MAINTENANCE

D.1. BOILER AND HEATING CIRCUIT PUMPS

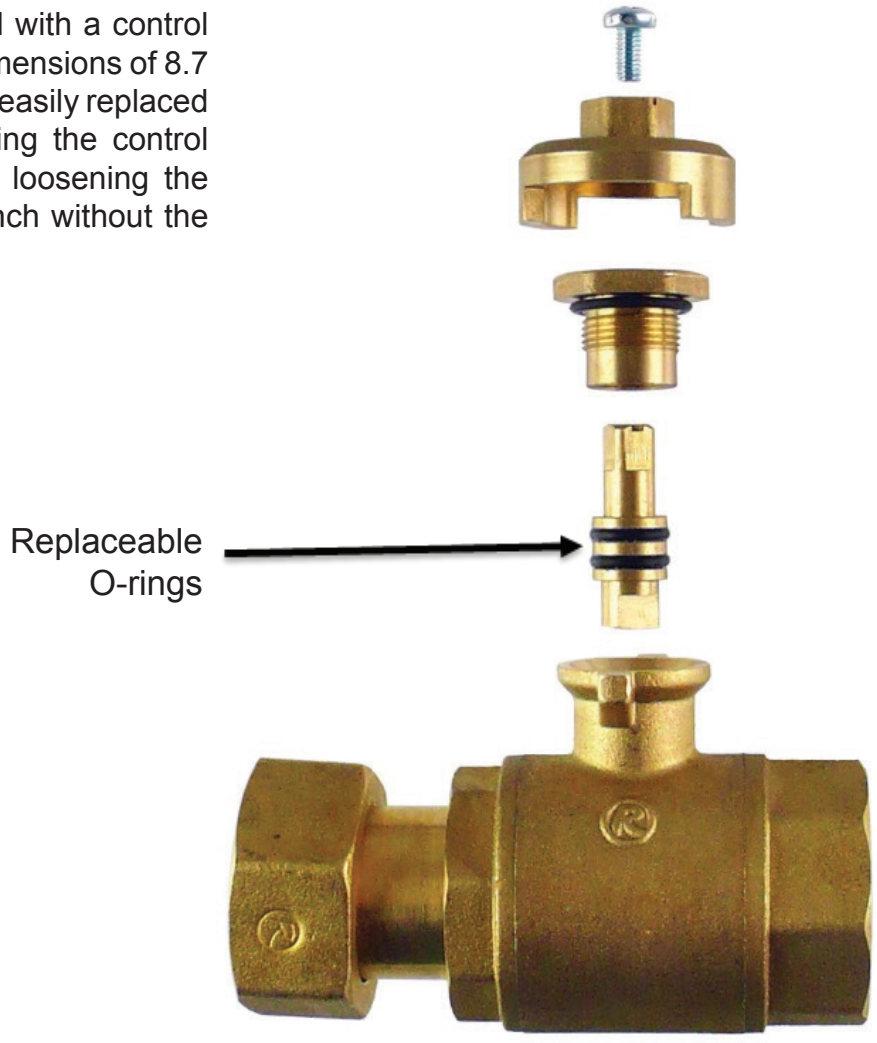
The operating status and possible pump faults are displayed by LED indication directly on the pump.

FAULT DISPLAY

DISPLAY	CONTROL MODE
	Seized pump
	Too low supply voltage
	Electric fault

D.2. BALL VALVES

The ball valves are equipped with a control shaft with two O-rings with dimensions of 8.7 x 1.8 mm. These rings can be easily replaced after closing the tap, removing the control element with stop ends and loosening the packing nut with a # 21 wrench without the need to drain the system.



v1.1-01/2022

REGULUS spol. s r.o.
E-mail: sales@regulus.eu
Web: www.regulus.eu