

Regulus

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BIO 55 G 1F

Installation and Operation Manual | EN
BIO 55 G 1F LOAD UNIT

BIO 55 G 1F

Contents

1.	Introduction	3
2.	Description	3
3.	Load Unit Data	3
4.	Load Unit Components	4
4.1.	Pumps for Boiler and Heating Circuits	5
4.2.	TSV3BM Load Valve	7
4.3.	Ball Valves	8
5.	Load Unit Installation	9
6.	Hydraulic Variant	11

1. INTRODUCTION

BIO 55 G 1F Insulated Load Unit is used to connect a heating system with a hydronic fireplace or solid fuel boiler and a hot water storage tank. The return water temperature to boiler is kept at 55 °C min. by a load valve in order to prevent low-temperature corrosion in the boiler. The output of the heating system is controlled by regulating the boiler output – e.g. by switching on/off a pellet-fired boiler.

2. DESCRIPTION

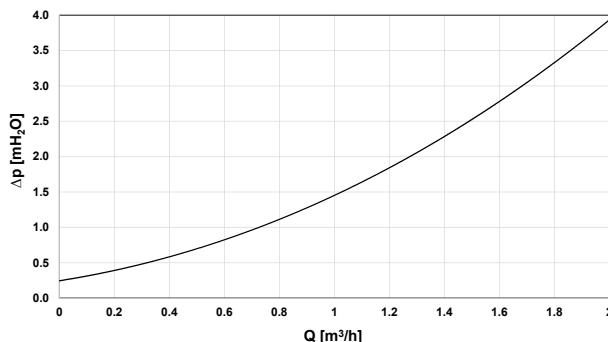
Main Features	
Description	The Load Unit includes: <ul style="list-style-type: none">• two Grundfos UPM3 Flex AS 25-75 circulation pumps (with the possibility of control by a PWM signal or by selecting a pump performance curve)• TSV3BM load valve with automatic bypass balancing• two ball valves with drain valve for shutting off and draining the heating system• check valve integrated in the ball valve body located at the outlet from the heating system• two ball valves and a drain valve to shut off the boiler circuit• two drain valves to drain the load unit• two ball valves permitting to shut off the HW storage tank circuit (included in supply)• lever for ball valves• four thermometers• outlets to connect a hot water storage tank and alternative outlets to connect optional accessories
Working fluid	water, antifreeze heat-transfer fluid for heating systems
Installation	vertically on a wall using the installation kit
Connections	2 x G 1" F to connect a heating system 2 x G 1" F to connect a boiler circuit 2 x G 1" F to connect a hot water storage tank 2 x G 1/2" F alternative outlets to connect optional accessories (if you do not need to use the outputs, they can be plugged with the enclosed plugs)
Code	17502

3. LOAD UNIT DATA

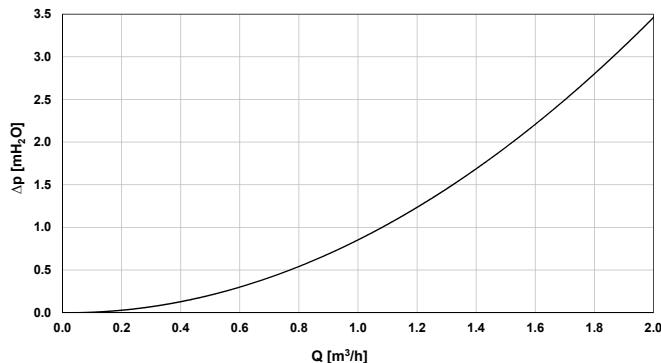
Technical Data	
Fluid working temperature	5-95 °C
Max. working pressure	6 bar
Min. working pressure	0.5 bar
Ambient temperature	5-40 °C
Max. relative humidity	80%, non condensing
Load unit max. power input	120 W
IP rating	IP 20
Load unit power supply	230 V, 50 Hz or from an external controller
Max. boiler output	38 kW at Δt 20 °C
Heating system max. heat output	38 kW at Δt 20 °C
Insulation material	EPP RG 60 g/l
Overall dimensions	640 x 250 x 350 mm
Total weight	15.5 kg

Pump Station Pressure Drop Graph

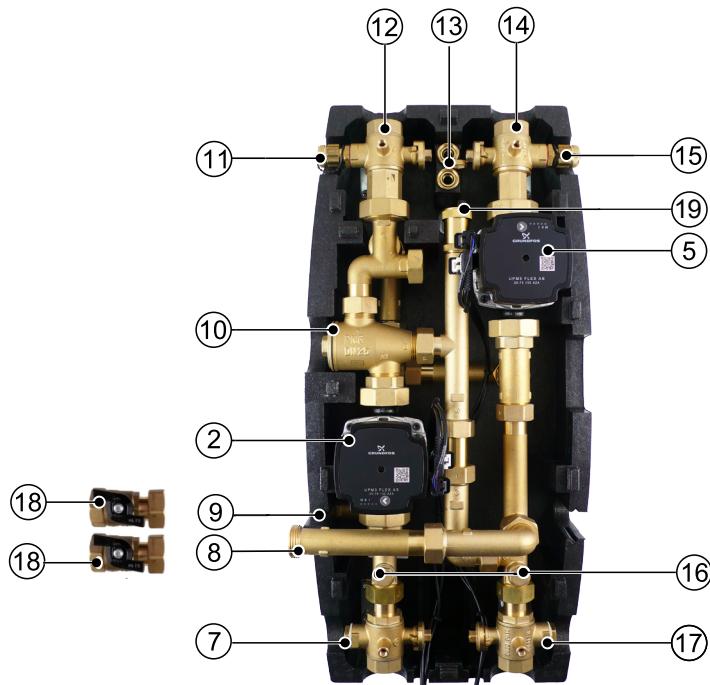
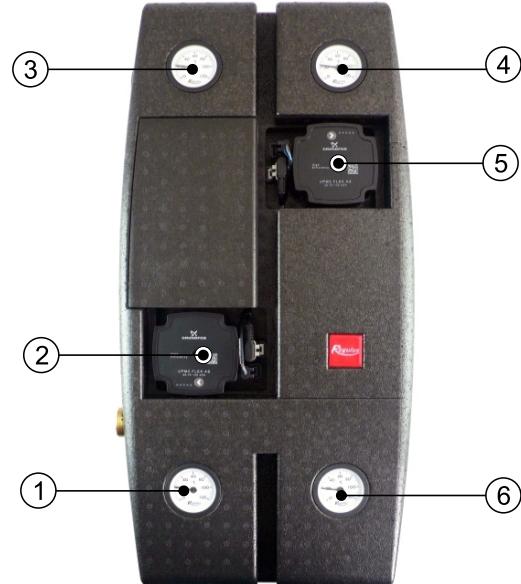
Heating system



Boiler side



4. LOAD UNIT COMPONENTS



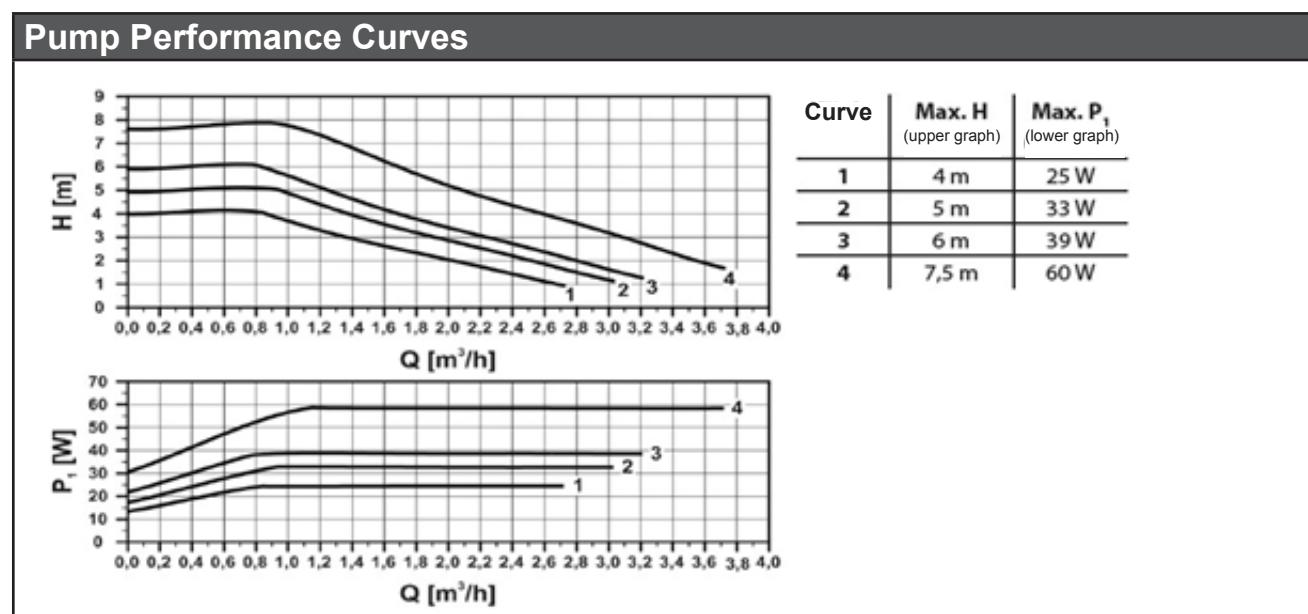
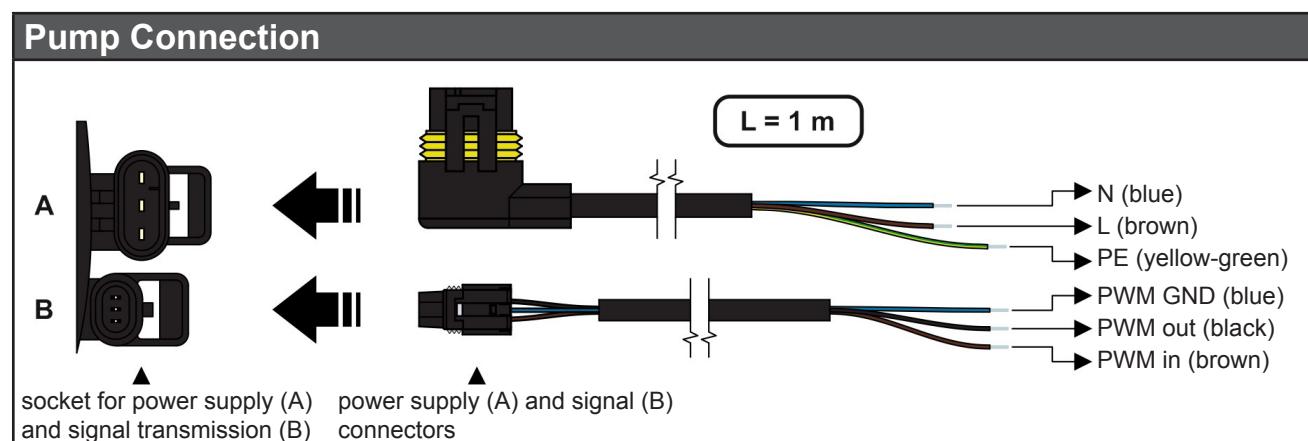
- 1 – Heating water thermometer, inlet to boiler circuit
- 2 – Grundfos UPM3 Flex AS 25-75 pump in boiler circuit
- 3 – Heating water thermometer, outlet from heating circuit
- 4 – Heating water thermometer, inlet to heating circuit
- 5 – Grundfos UPM3 Flex AS 25-75 pump in heating circuit
- 6 – Heating water thermometer, outlet from boiler circuit
- 7 – G 1" Fu × G 1" F × G 1/2" F ball valve w. sheath for temperature sensor *
- 8 – G 1" F HW storage tank connection (lower)
- 9 – G 1" F HW storage tank connection (upper)
- 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. sheath for temperature sensor
- 15 – G 1/2" M drain valve with hose tail
- 16 – Drain plugs
- 17 – G 1" Fu × G 1" F × G 1/2" F ball valve w. sheath for temperature sensor *
- 18 – DN 20 ball valves to be mounted on connection points 8 and 9 (enclosed)
- 19 – Automatic air vent valve

* The G 1/2" F free outlets at ball valves at positions 7 and 17 can be used to connect additional accessories. If you do not need to connect any, the output remains closed by a plug.

4.1. PUMPS FOR BOILER AND HEATING CIRCUITS

UPM3 FLEX AS 25-75 130 pump is a wet running circulator. Its speed can be controlled either by selecting a pump performance curve or by a PWM signal.

Technical Data	
Power supply	230 V, 50 Hz, from an external controller
Power input (min./max)	2 / 60 W
Current (min./max)	0.04 – 0.58 A
Max. speed	5991 rpm
Max. head	7.5 m
Energy Efficiency Index (EEI)	≤ 0.17 by EN 16297/3
IP rating	IP44
Motor protection	not needed
Min. pressure at the suction port to avoid cavitation	0.5 mH ₂ O at 70 °C 5.1 mH ₂ O at 95 °C 11 mH ₂ O at 110 °C



PUMP SETTINGS

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

With PWM signal the pump speed changes with the signal value up to the maximum of the selected curve.

When switched on, the pump runs at factory settings or the last setting. The display shows the momentary pump performance that is shown by LEDs according to the table below.

DISPLAY	STATE	PERFORMANCE in % of $P_{1,\max}$
1 flashing green LED	standby mode (external control only)	0
1 green + 1 yellow LED	low performance	0–25
1 green + 2 yellow LEDs	medium-low performance	25–50
1 green + 3 yellow LEDs	medium-high performance	50–75
1 green + 4 yellow LEDs	high performance	75–100

The selected setting is displayed by pressing the grey button on the pump display. The individual performance curves are indicated by the light signal as shown below. **WARNING: LEDs may be turned by 180°, depending on the specific pump type.**

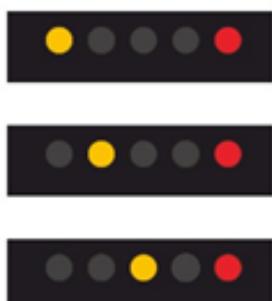
If you need to set a different performance curve, follow these steps:

- Press and hold the grey pushbutton until the LEDs start flashing. The pump will switch to adjustment selection mode.
- To select your desired setting, press the button repeatedly until you find the setting you need (see the figures below). If you pass the desired setting, you have to go one more round until it appears again – there is no way back in the loop.
- Release the button for more than 10 s and the LEDs will return to “performance view”, while the last setting is saved.



ERROR DISPLAY

The fault is indicated on the pump display by LEDs, as shown in the following figure.



4.2. TSV3BM LOAD VALVE

Load valve with automatic bypass balancing protects the boiler against low-temperature corrosion. It keeps the water in the boiler circuit at such a temperature that the condensation of water vapours contained in the flue gas does not occur in the boiler combustion chamber. It has a built-in thermostatic element that closes the inlet from the heating system if the temperature of the return water to the boiler is lower than the opening temperature. After reaching the opening temperature, the thermostatic element slowly opens the return water inlet from the heating system so that after mixing with the hot water coming from the boiler, the opening temperature of the return water to the boiler is reached. At the same time, it also closes inlet from the boiler, limiting the hot water flow from the bypass until it is completely closed.

Technical Data of TSV3BM Load Valve	
Opening temperature	55 °C
K _v _s value	Direction from A to AB: 9.8 m ³ /h Direction from B to AB: 5.3 m ³ /h

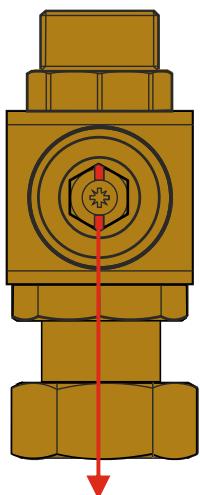
4.3. BALL VALVES

The ball valves are operated by a lever that is not placed on the valve during operation. The open / closed position on the ball valve is indicated by a groove. If the groove is perpendicular to the direction of flow, the ball valve is closed, if it is in the direction of flow, the ball valve is open, see fig. The groove position is marked in red in the figure.

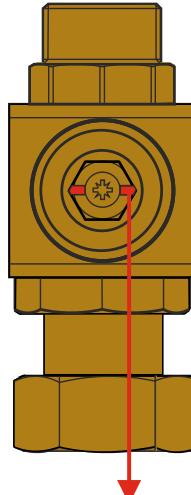
During normal operation, all ball valves shall be in the open position. If necessary, the ball valve can be closed from the open position by turning the lever 90° to the right. When maintenance is complete, turn the lever to the left to open it. Before closing / opening the ball valve, the top section of the insulation shall be removed first. As a result, unintentional closure of the system by an unauthorized person is not possible.

The ball valves are fitted with a packing with two O-rings of 8.7 x 1.8 mm that can be easily replaced by removing the control element with end stops and loosening the packing nut with # 21 spanner.

open



closed



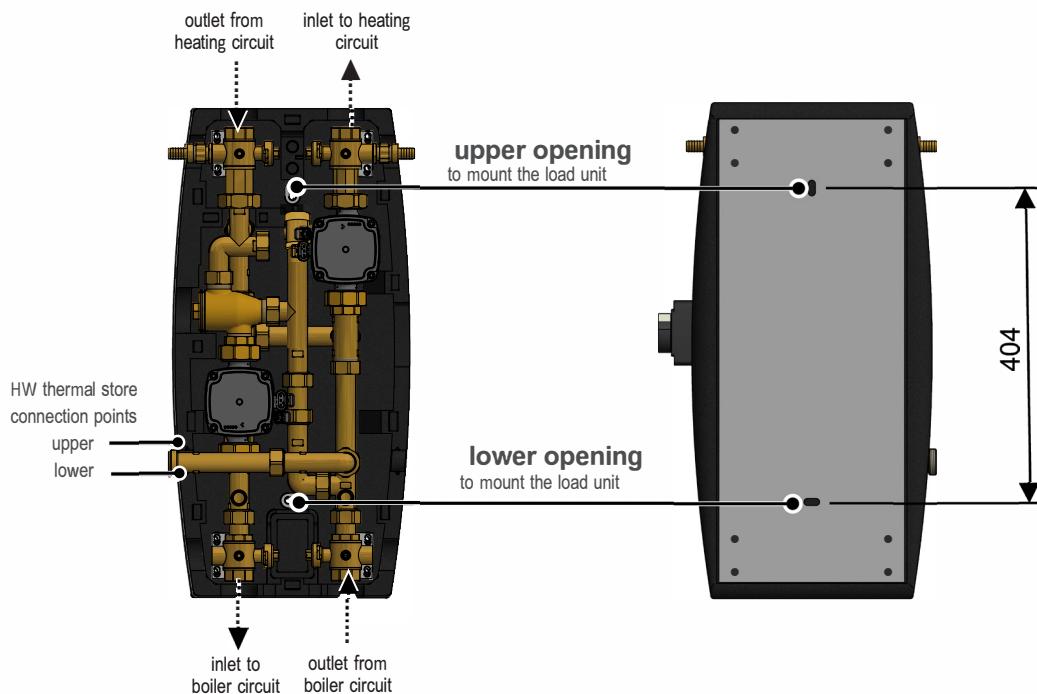
groove in the
flow direction

groove perpendicular
to the flow direction

5. LOAD UNIT INSTALLATION

The load unit is designed for wall mounting. In the rear section of the insulation there are two mounting holes for fixing the metal plate to the wall, see picture.

In the basic version, the hot water storage tank 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 hot water storage tank on the right side, as described at the end of the instructions in the appendix. Insulation passage points are prepared for both variants of hot water storage tank position.



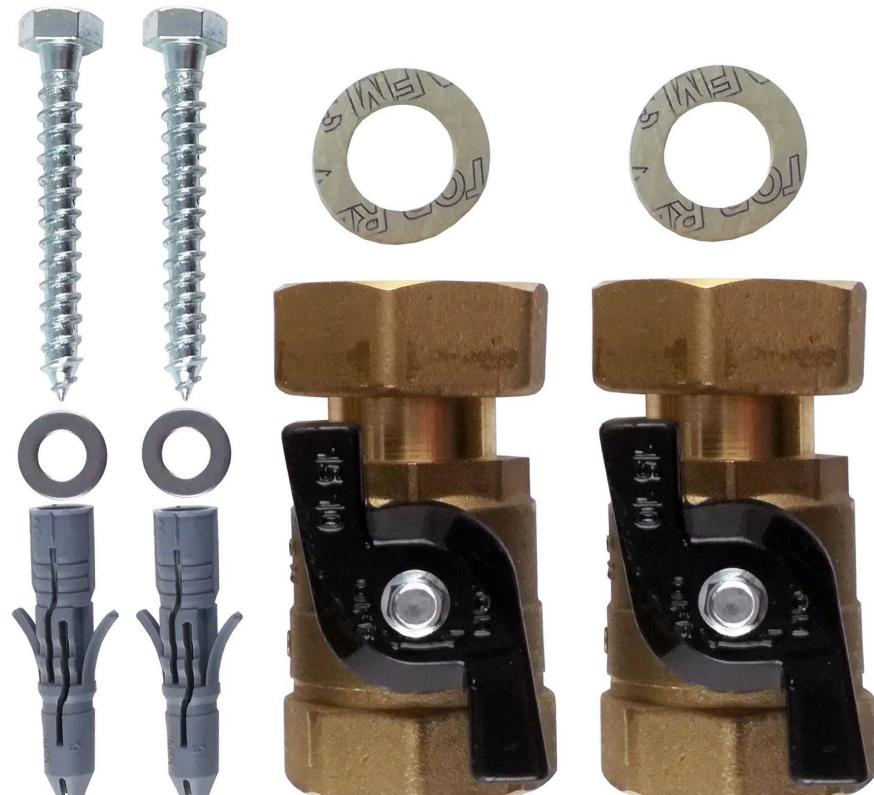
The load unit is fixed to the intended location using the mounting kit supplied. Select the load unit mounting height on the wall so that you can read the data on the thermometers without any problems.

Two DN 20 ball valves are also included in supply (see load unit components, pos. 18). The ball valves are installed at the outlets at positions 8 and 9 (see chapter 4). If necessary, they serve for closing and isolating the hot water storage tank circuit from other parts of the system.

The mounting kit and the ball valves are included in the load unit supply. A detailed list of the contents of the package is shown on the next page.

PACKAGE CONTENTS

Mounting kit		
Screw 5x50, round head	2 pcs	
6.4 stainless steel washer, DIN 9021/A2	2 pcs	
Wall plug 8mm TX	2 pcs	
Other		
G 1 "Fu x G 1" F ball valves with union nut	2 pcs	



INSTALLATION PROCEDURE

1. Connect the pipes
2. Fill the system, air bleed
3. Perform a pressure test

6. HYDRAULIC VARIANT

The load unit is intended for installation in systems with solid fuel boiler with manual stoking, one heating circuit and hot water storage tank.

