INSTALLATION INSTRUCTIONS

Stratton mk3

Grundfos UPM20M 25-130 180
Pump Control Instructions

IMPORTANT NOTE
THESE INSTRUCTIONS MUST BE READ AND UNDERSTOOD BEFORE INSTALLING, COMMISSIONING, OPERATING OR SERVICING EQUIPMENT

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Technical Enquiries

To supplement the detailed technical brochures, technical advice on the application and use of products in the Hamworthy Heating range is available from our technical team in Poole and our accredited agents.

Site Assembly

Hamworthy offer a service of site assembly for many of our products where plant room access is restricted. Using our trained staff we offer a higher quality of build and assurance of a boiler built and tested by the manufacturer.

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Spare Parts

We offer a comprehensive range of spare parts, providing replacement parts for both current and discontinued products. Delivery options are available to suit you. Please refer to our website for more details.

CONTENTS

1. GENERAL

1.1 Introduction

This kit is suitable for the Stratton mk3 range of boilers, and utilises the Grundfos UPM20M 25-130 180 pump.

This manual explains how to wire the pump leads to the installer wiring connections and determine the pump settings within the boiler control.

The Pump is powered by a 230 V auxillary supply within the boiler, and controlled by a PWM signal.

The UPM20M has been evaluated for use with the Stratton mk3 models referred to in Table 1. The boiler side of the system is sized to water flow and return temperature differential 20 ΔT.

Table 1 Stratton mk 3 for Hamworthy

Stratton mk3	Boiler Size
Stratton mk3	40
Stratton mk3	60
Stratton mk3	70
Stratton mk3	80
Stratton mk3	100
Stratton mk3	120

1.2 Contents

This kit includes the following items:

- Grundfos UPM20M 25-130 180 pump
- Power Lead
- PWM Lead
- Fibre Washer Kit
- Instructions

2. INSTALLATION

2.1 Preparation

Install the Pump Control kit as follows:

⚠ WARNING: Be careful when you install electrical connections. Electric shock can cause serious injury or death and can cause damage to equipment.

1. Make sure that the electrical power supply to the boiler is set to OFF. For safe electrical isolation refer to Gas Safe technical bulletin 118. All work must be carried out by a competent person.

2. For access to the control box (refer to manual Stratton mk 3 INSTALLATION, COMMISSIONING AND SERVICING INSTRUCTIONS Frame 4.6.1).

Table 2 Stratton mk 3 Flow Rates and Pressure Drops

Boiler model	Flow rate Q (m³/hr) Δt 20° C	Pressure Drop (m)	Pump used
S3-40	1.72	4.58	Grundfos UPM20M 25-130 180
S3-60	2.59	6.01	
S3-70	3.02	5.81	
S3-80	3.45	4.89	
S3-100	4.28	7.29	
S3-120	5.14	7.75	

Pumps are also suitable for use when boilers are paired with system separation low loss headers or PHEX (sold as optional items by Hamworthy).

2.2 Installation

Install the pump electrical connections as follows (refer to Figure 1).

1. Mains power connections 13 earth, 14 live and 15 neutral.

2. PWM connections 37 ground (Blue) and 38 PWM (Brown) signal, the remaining Black wire should be taped back or removed.

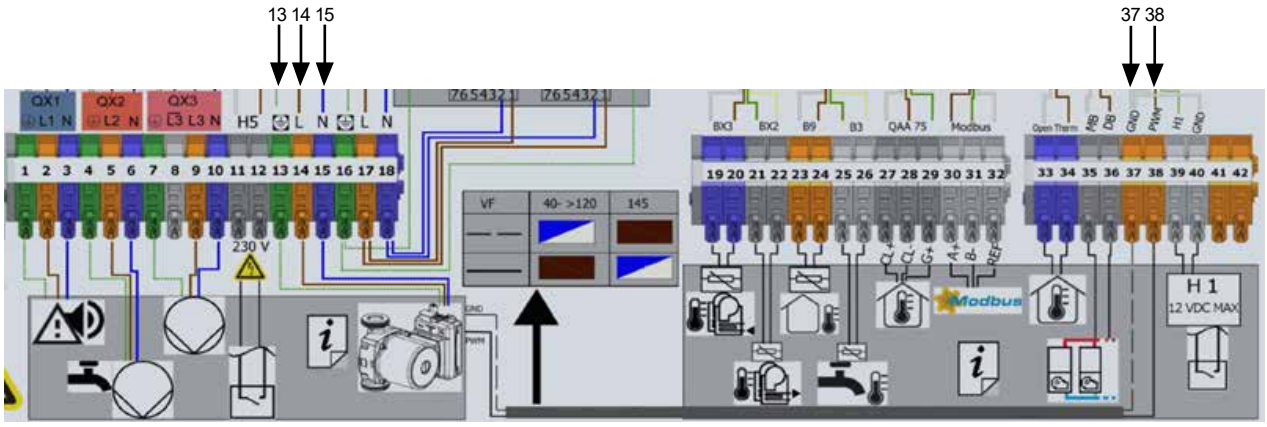

Fig 1. **Pump Electrical Connections**

2.3 Pump Configuration

The following parameters configure the PWM output to control a boiler pump.

Table 3 Stratton mk 3 PWM output

Line No.	Parameter	Settings
6085	Function output P1	Boiler pump Q1
6086	Signal logic output P1	Inverted

2.4 Pump Parameter Settings

The following parameters configure how the pump speed is to be controlled.

Table 4 Stratton mk 3 pump speed control

Line No.	Parameter	Settings
2320	Pump modulation	Burner output
2321	Starting speed	100%

The following parameters determine the PWM values to achieve the flow rates for each boiler model.

Table 5 Cascade Boiler with LLH

Boiler Model	Line No.	Parameter	Setting	Flow Reading (8366) l/m
40	2322	Pump speed min	69	9.5
	2323	Pump speed max	95	28.7
	2505	Threshold flowDetect	8.3	
60	2322	Pump speed min	69	19.2
	2323	Pump speed max	95	39.3
	2505	Threshold flowDetect	16.7	
70	2322	Pump speed min	69	19.2
	2323	Pump speed max	95	50.0
	2505	Threshold flowDetect	16.7	
80	2322	Pump speed min	59	38.3
	2323	Pump speed max	95	69.3
	2505	Threshold flowDetect	35.0	
100	2322	Pump speed min	69	38.3
	2323	Pump speed max	95	71.7
	2505	Threshold flowDetect	35.0	
120	2322	Pump speed min	80	50.0
	2323	Pump speed max	95	86.0
	2505	Threshold flowDetect	45.8	

Table 6 Cascade boiler with PHEX

Boiler Model	Line No.	Parameter	Setting	Flow Reading (8366) l/m
40	2322	Pump speed min	69	9.5
	2323	Pump speed max	95	28.7
	2505	Threshold flowDetect	8.3	
60	2322	Pump speed min	69	19.2
	2323	Pump speed max	95	39.3
	2505	Threshold flowDetect	16.7	
70	2322	Pump speed min	80	19.2
	2323	Pump speed max	95	50.0
	2505	Threshold flowDetect	16.7	
80	2322	Pump speed min	69	38.3
	2323	Pump speed max	95	69.3
	2505	Threshold flowDetect	35.0	
100	2322	Pump speed min	80	38.3
	2323	Pump speed max	95	71.7
	2505	Threshold flowDetect	35.0	
120	2322	Pump speed min	85	50.0
	2323	Pump speed max	95	86.0
	2505	Threshold flowDetect	45.8	

Table 7 Standalone Boiler

Boiler Model	Line No.	Parameter	Setting	Flow Reading (8366) l/m
40	2322	Pump speed min		9.5
	2323	Pump speed max		28.7
	2505	Threshold flowDetect	8.3	
60	2322	Pump speed min		19.2
	2323	Pump speed max		39.3
	2505	Threshold flowDetect	16.7	
70	2322	Pump speed min		19.2
	2323	Pump speed max		50.0
	2505	Threshold flowDetect	16.7	
80	2322	Pump speed min		38.3
	2323	Pump speed max		69.3
	2505	Threshold flowDetect	35.0	
100	2322	Pump speed min		38.3
	2323	Pump speed max		71.7
	2505	Threshold flowDetect	35.0	
120	2322	Pump speed min		50.0
	2323	Pump speed max		86.0
	2505	Threshold flowDetect	45.8	

The process to determine the settings for a modulating boiler pump is dependent upon the hydraulic properties of the installation. For setting of the minimum pump speed the worst-case flow rate of the system should be set, this must be above the minimum flow rate allowed by the boiler model. This will ensure that the minimum speed setting cannot result in a flow rate lower than the minimum flow rate for the boiler model.

The table above shows the initial settings, these can then be adjusted to ensure that the system flow meets the boiler model requirement. The actual value of the flow through the boiler can be read from the boiler HMI under ‘Diagnostics heat generation’ 8366, also by pressing the ‘I’ information button. The value is shown in l/m. So final adjustments can be made to ensure compliance.

2.5 Pump Performance

For pump performance refer to Figures 2, 3 and 4 below.

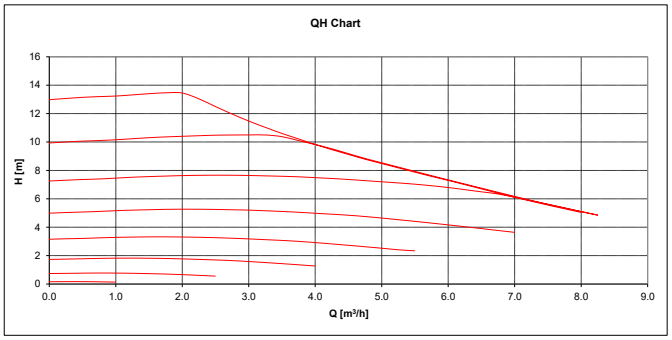

Fig 2. **QH Chart**

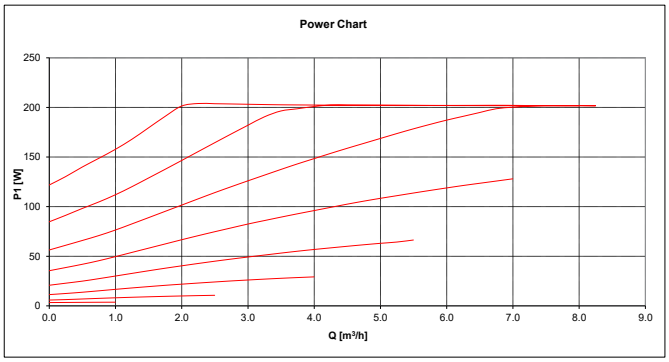

Fig 3. **Power Chart**

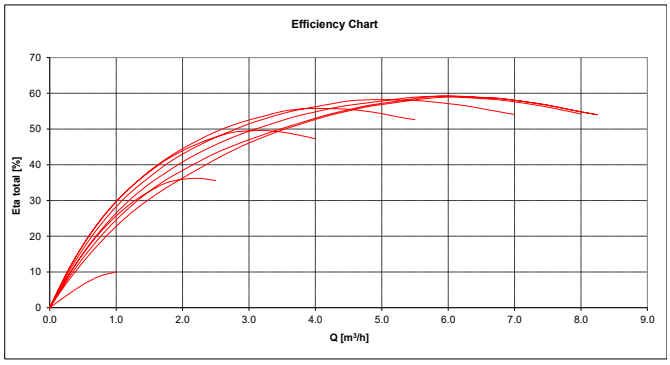

Fig 4. **Efficiency Chart**

2.6 Pump Replacement:

1. Set the appliance that supplies power to the pump to OFF.
2. Isolate the water supply to and from the pump.
3. Drain down the pipework connected to the pump.
4. Make a note of how the electrical leads are connected to the pump at the appliance.
5. Disconnect the pump electrical leads from the appliance.
6. Loosen the pump from the return pipe work and remove it.
7. Take the replacement pump (either a UPM10L or UPM20M) and attach it to the return pipework to complete the header kit water circulation. Use appropriate sealing material if required.
8. Using the previously recorded wiring note (refer to step 4), connect the pump leads to the appliance with the supplied leads.
9. The power lead fits onto the pump by push connection (refer to Fig. 5).
10. To connect the Pump PWM lead, push the push fit connection into the socket until a click is heard. Check the clip has engaged (refer to Fig. 6).
11. Reconnect the PWM lead to the PCB in the appliance. Follow the instructions in the appliance installation guide.
12. Turn on the water supply to the appliance and header kit.
13. All connections should be tightened adequately to provide hydraulic soundness.
14. Switch on the appliance and vent the system.
15. Operate the appliance normally.

Fig 5. Power Lead Connection

Fig 6. PWM Lead Connection

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