HOME BOOSTER 3.0 & 4.0 Bar

Installation and Operating instructions

GB **Residential and light Commercial**
Packaged cold water pressure boosting set

be
think
innovate

GRUNDFOS

www.grundfos.co.uk

EC/EU Declaration of Conformity

Name of manufacturer: Grundfos Manufacturing Limited.
Address: Ferryboat Lane,
Castletown,
Sunderland.
SR5 3JL.

We, Grundfos, declare under sole responsibility that the product **Home Booster,** to which the declaration below relates, are in conformity with the Council Directives listed below on the approximation of the laws if the EC/EU member states.

- **Machinery Directive (2006/42/EC).**
  Standards used: EN ISO 12100:2010
- **Low Voltage Directive (2014/35/EU).**
  Standard used: EN 60335-1:2012
  Standard used: EN 60335-2:2003 + A2:2010
- **EMC Directive (2014/30/EU)**
  Standard used: EN 60730-1:2011

This product is manufactured according to EN 1717 with a type AB air gap and an unrestricted, non-circular opening for overflow

This EC/EU declaration of conformity is only valid when published as part of the Grundfos Installation and Operating instructions (publication number **97939519**).

Authorised signature:

John Austin – Engineering Manager
(Name) (Position)
Date of issue: 01/08/2016

If further details are required please contact the Grundfos offices listed on the back page of these instructions.

When and how to use the Home Booster Installation & Operating instructions

Prior to **Installation, Commissioning** and **System verification** of this product, the installer should fully read these Installation and Operating instructions.

The Installation and operation must also comply with local regulations and accepted codes of good practice.

The user is responsible for periodic inspection of the product, at a recommended interval of every 6 months.

The use of this product requires experience with and knowledge of the product.

Persons with reduced physical, sensory or mental capabilities must not use this product, unless they are under supervision or have been instructed in the use of the product by a person responsible for their safety.

Symbols used in this document

WARNING

If these safety instructions are not observed, it may result in personal injury or damage to property.

WARNING (Electrical)

If these instructions are not observed, it may lead to electric shock with consequent risk of serious personal injury or death.

CAUTION

CAUTION	**If these safety instructions are not observed, it may result in malfunction or damage to the equipment**

NOTE

NOTE	Notes or instructions that make the job easier and ensure safe operation

Scope of these Instructions

These Installation and Operating instructions apply to the: **Home Booster 3.0 & 4.5 Bar**

For Technical Information consult the **Home Booster** Datasheet

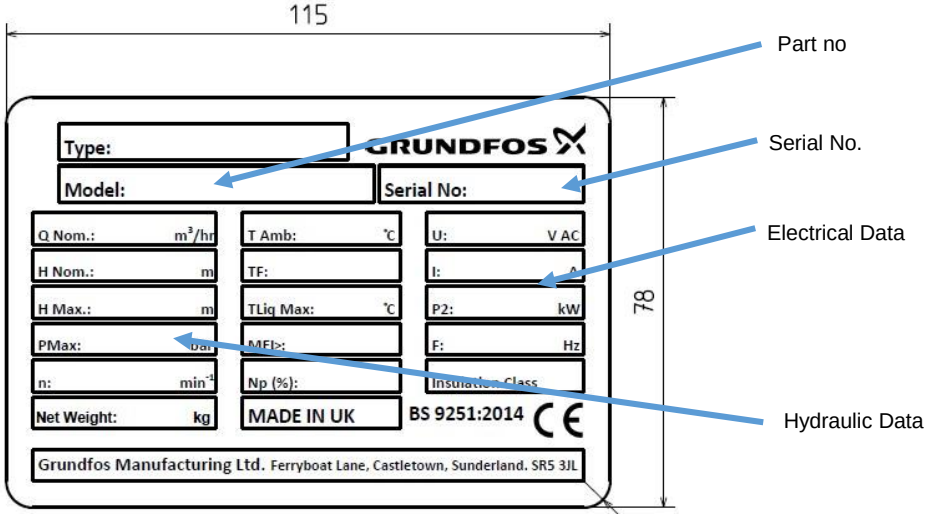
For CM Pump specific information please consult the CM Installation and Operating manual supplied with the product documentation.

All of the above documents can also be found on the Grundfos Product Center website at: www.grundfos.co.uk

Product Identification

The **Home Booster** has a silver label attached to the top of the unit.

This label gives the following key information.



Product introduction and description.

The Grundfos **Home Booster** is a self-contained cold water booster set, designed for domestic properties where the existing mains water supply is insufficient to meet the demand requirements of pressurised hot and cold water systems. The unit features an integral 200 litre storage tank with Type AB air gap, in accordance with Water Byelaws regulations. The high quality stainless steel pump delivers high efficiency, sustained performance, long working life and quiet operation. The pump is controlled by the PM2 Pressure Manager controller, the latest controller from Grundfos.

Installation is straightforward requiring connection of mains cold water supply, discharge pipe, overflow pipe and electrical connections. The product is designed to the highest standards and is intended to give many years of trouble free service.

DELIVERY AND HANDLING

The **Home Booster** set is supplied from the factory mounted on a wooden pallet suitable for handling by forklift equipment. The weight and size of the **Home Booster** may require the use of proprietary lifting equipment in order to be handled safely. During installation ensure the recommended procedures for lifting pallet mounted equipment are observed.

INSPECTION

On delivery, the **Home Booster** should be unpacked and inspected; any damage must be reported to the supplier within seven days in writing.

It is important that these installation and operating instructions are studied carefully before any installation takes place. The installation and operation should also be in accordance with local regulations and accepted codes of practice.

WARRANTY

The Grundfos warranty covers all defects within the **Home Booste**r originating from faulty workmanship and/or materials for a period of two years from the date of installation or thirty months from the date of despatch from the factory, whichever is the shorter. The warranty covers the replacement of any faulty parts and our labour cost to replace the faulty parts. It does not cover the cost of removing, returning and refitting the booster set or any secondary losses arising from the failure.

Under no circumstances should faulty equipment be dismantled.
Failure to comply with this instruction could invalidate the warranty.

Defects arising from incorrect installation, water containing debris, or harmful chemicals, inadequate electrical protection, faulty ancillary equipment, lightning or other circumstances beyond our control, are not covered by the warranty.

SITE STORAGE

It is strongly recommended once the **Home Booster** has been delivered to site, that it is placed immediately into a dust, moisture and frost-free area which has been secured to prevent unauthorised interference.

APPLICATIONS

The main applications for the Grundfos **Home Booster** are:
Domestic pressure boosting and Light Commercial pressure boosting

Booster sets must not be used in an environment, which has been classified as hazardous and could therefore cause an explosion if there is a danger of ignition by a flame path.

Grundfos Pumps Ltd do not accept any responsibility for the use of booster sets to pump liquids which could be construed as being hazardous to health either by touch, ingestion or inhalation of fumes or gases given off by the liquid.

MAXIMUM/MINIMUM OPERATING CONDITIONS

Electrical Supply: 230 v +10/-6 % **Fuse Protection:** 5A
Type of protections: Class 1 (Earthed) Equipment
EMC Environment: B (light industrial, commercial and residential)
Equipment type: Stationary, fixed equipment
Construction type: Fixed construction, no moveable parts
Pollution Degree: 3 **Noise Level:** <65 dB(A)
Liquid temperature range: +3°C to +40°C **Usage:** Indoor
Ambient temperature: up to +40°C **Altitude:** use up to 2 km above sea level
Relative Humidity: up to 95 % non-condensing **Max Inlet pressure:** 6 bar
Maximum pressures: Home Booster 3.0: 3.6 bar **Home Booster 4.5:** 5.6 bar

WRAS APPROVAL - The wetted components of the **Home Booster** are WRAS approved for use with potable water.

QUICK GUIDE

This is a simplified guide to the installation and commissioning of the Grundfos **Home Booster**. Please refer to the individual sections in this document for full details.

CONTROLLER DIP SWITCH SETTINGS

The DIP switch settings in the PM2 controller are factory set. There is no need to open the pressure manager and change the DIP switch settings.

INSTALLATION

1. Position the **Home Booster** on to a flat and level solid foundation.
2. Connect the mains water supply.
3. Connect the overflow pipe work.
4. Connect the discharge pipe work.
5. Connect the electrical supply cable.

COMMISSIONING

1. Fill the tank with water and check for leaks.
2. The **Home Booster** is fitted with an automatic air vent valve to release air trapped within the pump.
3. Run the pump by switching on the electrical supply, if the pressure does not built up, switch off and on again after 10 seconds to allow air to escape. Venting of the pump may need to be repeated a number of times if the pressure does not build up.

CHECKING THE DIP SWITCH SETTINGS

When the reset button is depressed for at least 3 seconds, the eight right most pressure lights indicate the DIP switches settings. Lights that are illuminated indicate that a switch is in the ON position according to the table below.

Light field [bar]	2.5	3.0	3.5	4.0	4.5	5.0	5.5	6.0
DIP switch no.	1	2	3	4	5	6	7	8

TESTING

1. Switch on the electrical supply.
2. The pump will start, and the pressure will begin to increase as shown by the pressure indicator lights.
3. Once the pressure has built up, close the outlet isolating valve within the **Home Booster** to create a no flow condition. The pump will run-on for 30 to 40 seconds and then stop.
4. Open the isolating valve within the **Homer Booster**, the pressure will begin to fall if an outlet fitting has been left open. The pump will then start and the pressure increase.
The pump will continue to run as long as there is a flow demand.
5. Close the system outlet fitting, the pump will stop after a short time 30 to 40 seconds. If the pump does not stop, then there is a flow demand, which is causing the pump to continue operating.
6. If the pump continues to run even though the system outlet fitting is closed, then close the isolating valve within the **Home Booster**, and the pump should stop.
7. Investigate the cause of the flow demand in the system, for example filling toilet cisterns etc.

INSTALLATION


Do not attempt to start the pump until the storage tank has been filled with water and the pump primed and vented.


All electrical connections should be carried out by a qualified and authorised electrician in accordance with the latest issue of the I.E.E. regulations. The **Home Booster** must be earthed. It is strongly recommended that an Earth Leakage Circuit Breaker (ELCB) is fitted on the incoming electrical supply.


Do not remove pump motor terminal box, motor fan or PM2 covers unless electrical cables or any other electrical protective covering without first ensuring that the electrical supply is suitably isolated and cannot be switched on.


Do not attempt to supply electricity to the **Home Booster** and run the pump without ensuring that all electrical fittings, cables and enclosures are intact and suitably electrically isolated from human touch during operation.

GENERAL INFORMATION

1. Discharge pipework **must be** at least the same size as the booster set connection size 22mm, smaller size may result in reduced pressure and flow at the outlets.
2. Discharge pipework must be properly supported **before** being connected to the booster set so that the booster set internal pipe work is not stressed.
3. The pipework installation from the booster set should be in accordance with local water authority regulations.
4. The electrical installation of the booster set should be in accordance with the latest issue of the I.E.E. regulations.
5. Check that the cold-water storage tank has adequate capacity to meet the water consumption demand. A slave tank is available to provide an additional 180 l of storage if required.

WATER QUALITY

Consideration must be given to maintaining the quality of the water stored within the **Home Booster** tank, and indeed any other stored water arrangement, in order to ensure that the water remains fit for use. The quality of stored water will deteriorate with time, bacterial growth is dependent on the ambient air temperature, growth rates will be higher when the conditions are warm. The tank should drained and flushed, if the water remains unused for an extended period.

As with any stored water arrangement, it is recommended that the storage tank(s) is cleaned and disinfected annually, in order to remove accumulated debris, which could provide a habitat for bacterial growth. The water within the unit should be sampled periodically to check bacterial levels, generally between two and four times a year is recommended. Contact a water treatment specialist for further advice.

LOCATION


The **Home Booster** must not be installed into roof spaces. The small level of vibration associated with any rotating equipment will cause disturbance; and considerable water damage could result if a leak occurs. Please provide drainage facilities for the unit in case of leakage or loss of water during commissioning and service.

1. The **Home Booster** set should be sited in a dry, well ventilated, and frost-free position, where it will not be subjected to extremes of temperature. In order to reduce bacteria growth the ambient temperature should ideally be less than 20°C. The **Home Booster** may be located outdoors in a weather, frost and rodent proof enclosure with adequate ventilation especially during hot weather.
2. All pipe work subject to freezing conditions must be adequately protected.
3. Ensure that the **Home Booster** is positioned to allow access for examination and service.
4. To enable maintenance and service of the unit to be carried out satisfactorily, the area should have adequate lighting for this work to be carried out safely.
5. The **Home Booster** should not be installed in an unventilated small space to ensure adequate ventilation for the motor.

FOUNDATION & MOUNTING

The **Home Booster** should be mounted on a solid foundation capable of supporting the weight of the unit. The supporting surface must be flat and level to avoid distortion of the tank.
The recommended support arrangement is a concrete plinth or floor.

Grundfos does not recommend installation of the **Home Booster** onto a wooden substrate. Due to possible noise and vibration transmission into the structure of the building. The ideal location is in a ground floor utility room or a garage with concrete flooring.

STORAGE TANK

The **Home Booster** has an integral cold-water storage tank having a type AB Air Gap, and must be installed in accordance with the Water Byelaws Regulations.
The quality of the water within the storage tank is potable and is therefore suitable for drinking. However, it should be borne in mind that the quality of stored water will deteriorate with time, particularly if the ambient air temperature is high. Therefore, if the unit is to be left for an extended period of time it is recommended to completely drain the storage tank before it is left.

NOTE Check that the tank cold-water storage tank has adequate capacity to meet the demand of the users within the building. As a general rule, allow 125 litres storage per person. Alternatively, the storage can be based on the number of bedrooms, in which case multiply 125 litres by the number of bedrooms plus one.

A person will use approximately 120 to 150 litres per day, for standard fittings and use. Where space is restricted the amount of storage can be reduced on the basis that half of this volume is used in the morning and evening.

NOTE The ability of the cold water mains supply should also be taken into account when considering the size of the cold-water storage tank. The cold water mains will start to refill the tank at the same time the pump discharges the water from the tank.

NOTE The **Home Booster** float valve is factory fitted with the 3.1 mm diameter (low pressure) seat. The cold water mains infill rate can be increased by simply exchanging the ball float valve seat for one of the higher flow seats available from plumbing center stockists. Ensure that the seat used is suitable for the cold water mains supply.

SLAVE TANK

Where the installation requires additional cold water storage, a slave tank can be connected to the **Home Booster** to provide an additional 180 litres of storage.

NOTE The slave tank should be mounted on the same level as the **Home Booster**.
A 2" BSP female connection is provided on the rear of the **Home Booster** and the slave tank for inter-connection of the tanks. When the slave tank is used the mains water supply should be connected to the slave tank to ensure a good exchange of the water within the tanks.

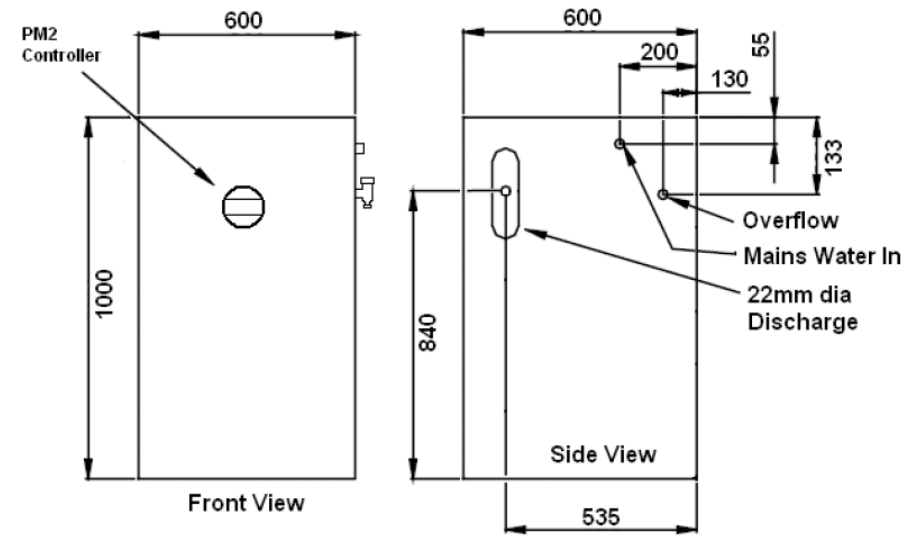
CAUTION **Do not over tighten the slave/Home booster tank connection.**
This may cause the tank to leak at the insert location.
Grundfos recommend a liquid type thread sealant.

BYPASS

In the event of a failure of the **Home Booster**, it is recommended to install a cold water mains water bypass, to allow continued water supply albeit at a reduced pressure to the installation.
The bypass arrangement must be installed strictly in accordance with the Water Byelaws Regulations. To prevent stagnation, the water in the bypass should be left drained when the bypass is not in use.

CAUTION **A bypass must NOT be installed if pumping non-potable CAT 5 contaminated liquid.**
The diagram below is for guidance only.

WEIGHTS & DIMENSIONS



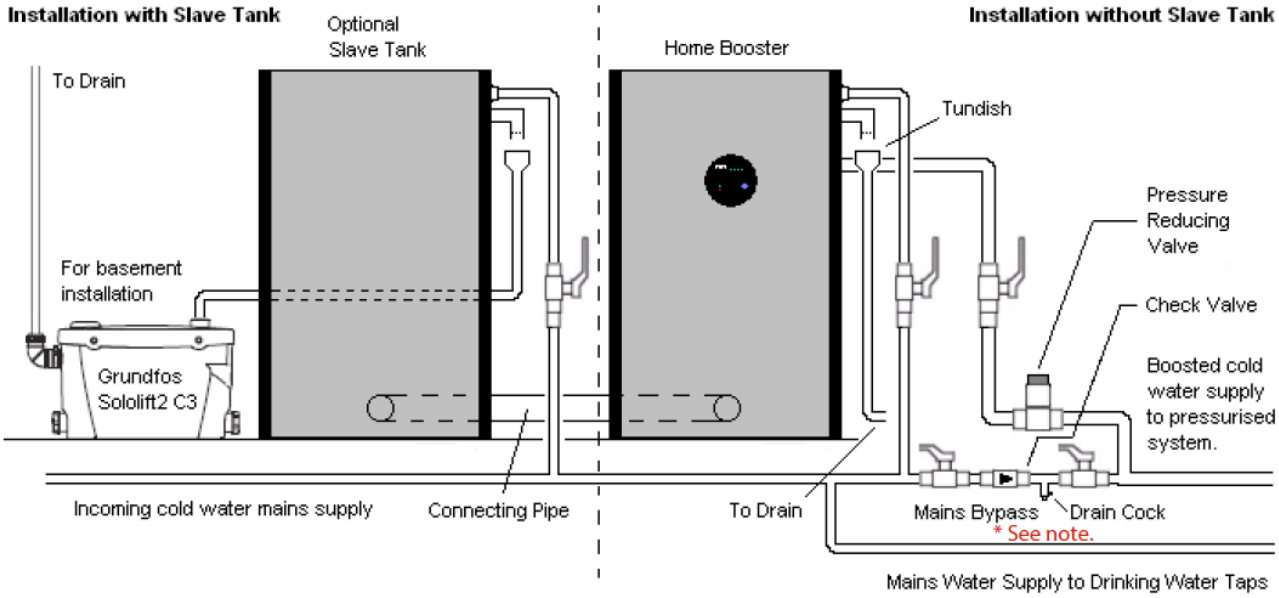
All dimensions in (mm)

Home Booster 3.0 Bar
Weight dry: 63 kg
Weight wet: 243 kg
Shipping weight: 65 kg

Home Booster 4.5 Bar
Weight dry: 66 kg
Weight wet: 246 kg
Shipping weight: 68 kg

Slave Tank 180 l
Weight dry: 30 kg
Weight wet: 210 kg
Shipping weight: 52 kg

TYPICAL INSTALLATION - shown with optional Slave Tank option



***If the fluid category is classified as either 3/4/5 then the Mains byepass cannot be used.**

NOTE For basement installations the Grundfos Sololift2 C-3 can be used to pump overflow water from the **Home Booster** to drain.

The above diagram is for guidance only, please refer to the Water Byelaws Regulations for full details.

ELECTRICAL GENERAL

Ensure that the electricity supply has been suitably isolated and cannot be switched on, before removing any electrical covers. All electrical connections should be carried out by a qualified and authorised electrician in accordance with local site regulations and also in accordance with the latest issue of the I.E.E. regulations. It is strongly recommended that an Earth Leakage Circuit Breaker (ELCB) is fitted to the incoming electrical supply.

GENERAL INFORMATION

The **Home Booster** is suitable for a single phase supply voltage of 230V +10/-6%, with a 10 amp minimum backup MCB (type B) or fuse.

The full load current is: **Home Booster** 3.0 Bar - 2.8. Amps,
Home Booster 4.5 Bar – 4.0 Amps

ELECTRICAL CONNECTIONS

Do not attempt to start the pump until the tank has been filled with water and the pump vented. The electrical installation should be in accordance with the latest issue of the I.E.E. regulations.

ELECTRICAL SUPPLY CONNECTION

The **Home Booster** is supplied with a mains cable fitted with a plug with a 5A fuse. Alternatively the mains power cable may be permanently wired directly into a fused switch spur with a 5A fuse.

A channel is provided beneath the unit for the cable to exit from the rear of the **Home Booster**

COMMISSIONING

Do not attempt to start the pump until the tank has been filled with water, and the pump primed and vented.

Pay attention to the direction that any water will take and ensure that the escaping water does not cause damage or enter and subsequently damage the pump motor/motor terminal box.

Before carrying out any commissioning procedures please ensure that the following connections and checks have been carried out on the **Home booster** set.

1. Check the discharge connection is connected to the system.
2. Check the electrical supply cable is correctly connected.
3. Check the vessel pre-charge pressure is either:
   MD300200 = 2.25 bar, **MD450200** = 3.15 bar
4. Check that all isolating valves on the **Home Booster** set are open.
5. Check the Auto air vent is open.
6. Check for any leaks.

DISCHARGE PRESSURE SETTING

The **Home Booster** discharge cut-in and cut-out pressure is factory set in the PM2 controller.

CAUTION **This should not require adjustment!**

The maximum discharge pressure setting should not be set higher than the pressure the pump can achieve, otherwise the pump will not stop with a no water demand condition, and will result in heating of the liquid in the pump, and possible shaft seal damage.

PM2 CONTROLLER SETTING

CAUTION **The DIP switches are factory set and should not require adjustment!**

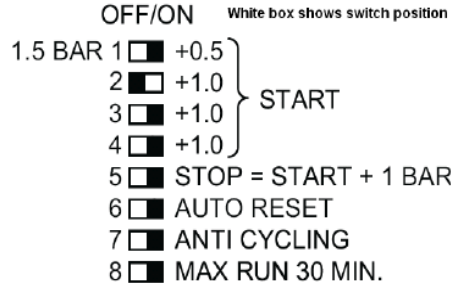
For information the settings for the **Home Booster** 3.0 and **Home Booster** 4.5 are given below:

Switch positions 1 to 4 determine the cut-in pressure setting.
The DIP switches 1 to 4 add additional pressure to the basic cut-in pressure of 1.5 bar.
Switch positions 5 to 8 should not be changed from the 'OFF' position.

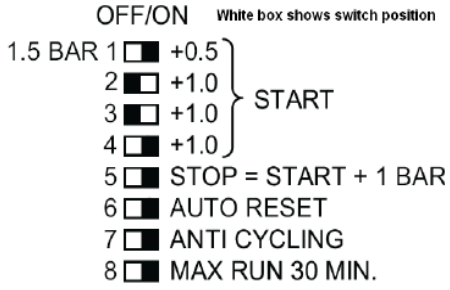
CAUTION **If the discharge pressure setting is changed, the pressure vessel pre-charge pressure must also be adjusted accordingly.**

The pre-charge pressure must be set to 90% of the cut-in pressure setting.

Home Booster 3.0 Bar
Cut-in pressure = 2.5 bar (maximum 3.0 bar)
Vessel pre-charge pressure = 2.25 bar



Home Booster 4.5 Bar
Cut-in pressure = 3.5 bar (maximum 5.0 bar)
Vessel pre-charge pressure = 3.15 bar



VESSEL PRE-CHARGE PRESSURE

NOTE When adjusting the vessel pre-charge pressure, the vessel connection must effectively be open to atmosphere. Failure to set the pre-charge pressure correctly will cause incorrect operation of the **Home Booster**.

The pressure vessel pre-charge must be set to 90% of the cut-in pressure setting.
Example, if the cut-in pressure is set to 2.5 bar,
then the pre-charge pressure must be set to 2.5 x 0.9 = ***2.25 bar****.*

The vessel pre-charge pressure should be adjusted before the pump is filled with water.
If the system has already been filled and the pump ran, then:
1. Switch off the pump.
2. Release the water pressure by opening a cold water tap supplied by the **Home Booster**.
3. The pre-charge pressure can now be checked using a car tyre pressure gauge.
The Schrader air valve is located in the top right hand corner of the pump back plate.
4. The tap should be left open while checking and adjusting the pre-charge pressure.
For small pressure adjustments a foot pump can be used. If large amounts of gas are required then dry nitrogen should be used in order to prevent corrosion within the vessel.

OPERATION
The 200 litre integral water storage tank within **Home Booster** supplies water to the pump though an isolating valve and strainer. An automatic air vent is fitted for venting the pump. The pump is controlled by the Grundfos PM2 controller. When power is applied, the PM2 will sense the discharge pressure, if the pressure is below the cut-in pressure the pump will start. The pressure will build up in the system, the pump will continue to run until there is a no flow condition. The pressure in the system can build up to the closed valve pressure of the pump.
The PM2 has built-in pump protection against dry running. The pump will be stopped after 30 seconds, and the red alarm indicator illuminated, if the pump is running and the pressure remains below the cut-in pressure, with no flow through the pump. The pump will remain stopped until the reset button is pushed.

FROST PROTECTION
The **Home Booster** must be protected from freezing conditions. If the booster set is being stored during periods of frost, the tank, pump and pipework should be drained to avoid damage. Remove all drain and vent plugs and allow the pump to drain.

CAUTION **Do not replace the plugs until the booster set is to be used again.**
The pump must be vented/primed before it is started again.

MAINTENANCE

The **Home Booster** has been designed for the minimum of maintenance. However, it should be inspected on a regular basis. It is therefore recommended that a GRUNDFOS maintenance contract is taken out to cover maintenance of the set.

For further details please contact **Grundfos Service Ltd** for on 01942 263 628.

However, it is the customer's responsibility to inspect the **Home Booster** in addition to any maintenance contract to ensure the safety and correct operation of the set during the interim period between service visits.

Ensure that the **Home Booster** unit is electrically and hydraulically isolated before any maintenance work is undertaken. Ensure that this isolation cannot be turned back on.

Care should be exercised when carrying out maintenance work as there may be sharp edges exposed which can cut skin.

INSPECTION

The **Home Booster** should be inspected at regular intervals, this must be carried out when the **Home Booster** has been shut down. The following checks should be carried out at this time:

1. Check there are no leaks on the internal pipe work, the pump and pressure tank.
2. Check for any corrosion particularly on the pressure tank.
3. Check that water does not appear at the valve on the pressure tanks when the air valve is depressed.
4. Check and adjust if necessary the pre-charge pressure of the pressure vessel.
5. Check that the pump operates quietly and smoothly without vibration or excessive noise.

Any large deviations from the system values should be investigated for a possible fault.
Should any faults be found check the symptoms with the Fault Finding chart and if necessary contact Grundfos Pumps Ltd for advice or Grundfos Service Ltd for service.

Once inspection and any maintenance work is completed, ensure that the isolating valves are opened fully, and that the electricity supply to the booster set is restored. Check that the correct system pressure is achieved.

DISPOSAL

This product or parts of it must be disposed of in an environmentally sound way:

1. Use the public or private waste collection service.
2. If this is not possible, contact the nearest Grundfos company or service workshop.

SPARES PARTS

Part Description	**Grundfos Product Code**
Pump CM 3-4 I for 3.5 Bar	96934524
Pump CM 3-6 I for 4.5 Bar	96959353
Kit, PM2 Controller	98652197
Kit, Pressure Vessel	97534509
Kit, Air Vent	98652053
Kit, Service Valve	98652187
Kit, Mains inlet and Warning pipe	98651662
Kit, Misc. Screws, Bolts, Screen	98651985
Kit, Hoses Kit (both models)	98652198

Grundfos Service Ltd
Beswick House, Greenfold Way,
Lancashire. WN7 3XJ

Tel: 01942 263 628
email: servicesupportuk@grundfos.com
Technical Assistance, Tel: 01525 850 000

FAULT FINDING

Ensure that the **Home Booster** unit is electrically and hydraulically isolated before any Fault finding work is undertaken. Ensure that this isolation cannot be turned back on.

FAULT	INDICATION/CAUSE	CORRECTIVE ACTION
1) No lights on the PM2 controller.	a) No electricity supplied to the PM2 controller.	a) Check mains isolator/switch is ON b) Check the fuse in the plug or fused spur. c) Confirm 230 V AC between Live and Neutral d) Replace the PM2 controller
2) Pump runs for a short time, then stops and red light illuminates.	a) Pump air locked. b) Storage tank empty.	a) Check that the pump is vented. b) Check water level in storage tank. c) Check incoming mains water supply. d) Check ball valve for debris. e) Check strainer for debris.
3) Pump ON light illuminated on PM2, but pump does not run.	a) Relay contact in PM2 defective. b) Pump shaft seized.	a) Check electrical supply in pump motor terminal box. *The PM2 is faulty if no voltage between the pump Live and Neutral terminals.* b) Check that pump shaft is free to rotate.
4) Pump does not start when tap is opened, and Pump ON light is OFF.	a) Start pressure set to high. b) PM2 is defective.	a) Check the PM2 DIP switch cut-in pressure settings. b) Replace the PM2 Controller.
5) Pump stops, but starts again after a short time	a) Pre-charge pressure in vessel incorrect. b) Leak in system.	a) Check vessel pre-charge pressure and adjust to 90% of cut-in pressure setting. b) Check the system for leaking taps and ball valves etc.
6) Pump delivers correct pressure, but does not stop with no demand.	a) Pressure setting too high. b) Flow demand or leak	a) Check switch settings in PM2 controller. b) Close discharge isolating valve, the pump should stop. If the pump stops, there is a system flow which is keeping the pump running on the flow switch.
7) Red light is permanently ON.	a) Pump dry running, generates neither pressure of flow b) Start pressure set too high. c) Pump defective. d) PM2 defective	a) Check water level in tank. Check strainer for blockage. b) Check/change the PM2 DIP switch cut-in pressure settings. c) Check the operation of the pump. The pump should start when the reset button is pressed. d) Replace PM2.

G**rundfos Service Ltd**
Beswick House, Greenfold Way,
Lancashire. WN7 3XJ

Tel: 01942 263 628
email: servicesupportuk@grundfos.com
Technical Assistance, Tel: 01525 850 000

Part number and description for this manual
Part no: 97939519 – Installation and Operating Instructions – Home Booster
ECM: 1190769 dd 15/08/2016
GB REF: GB/HBCM/OM/DBS/3316