

# HOME BOOSTER 3.0 & 4.5 Bar Installation & Operating Instructions

Residential and Light Commercial  
Package cold water pressure booster set



# Declaration of Conformity

We GRUNDFOS declare under our sole responsibility that the Home Booster packaged booster sets referenced in these installation instructions to which this declaration relates are in conformity with the Council Directives on the approximation of the laws of the EEC Member States relating to:

- Low Voltage Directive (2006/95/EEC)
- EMC Directive (2004/108/EC)

By Inspection from the individual component manufacturers:

- BS EN 60335-1:2002 Household and similar electrical appliances, Safety Part 1: General requirements
- BS EN 60335-2-41:2003 Household and similar electrical appliances, Safety Part 2-41: Particular requirements for pumps.
- BS EN 60730-1&A2:2008 Automatic electrical controls for household and similar use, Part 1: General requirements
- BS EN 1717:2000 Protection against pollution of portable water in water installations and general requirements of devices to prevent pollution by backflow.

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

29th April 2011  
Grundfos Manufacturing Ltd  
Ferryboat Lane, Castletown  
Sunderland, SR5 3JL



Mr Lee Carlin, General Manager

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

## General Data

### 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

1. The Grundfos warranty covers all defects within the Home Booster 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.
2. Under no circumstances should faulty equipment be dismantled. Failure to comply with this instruction could invalidate the warranty.
3. 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 Home Booster has been designed to be compact, reliable, and simple to install, and to provide many years of efficient and reliable service. 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 OPERATING CONDITIONS

Liquid temperature range:		+3°C to +40°C
Ambient temperature:		up to +40°C
Relative Humidity:		up to 95 % non condensing
Maximum pressures:	Home Booster 3.0 Bar:	3.6 bar
	Home Booster 4.5 Bar:	5.6 bar
	Mains Inlet pressure:	6 bar
Noise level:		65 dB(A)

### WRAS APPROVAL

The wetted components of the Home Booster 3.0 Bar and 4.5 Bar models 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 pump within 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 build 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 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 Home 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.

**Please now read the other sections of this document before proceeding with the installation and commissioning of the Home Booster.**

# 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.

Do not attempt to supply electricity to the Home Booster without first ensuring that the motor fan covers are correctly fitted and held securely in place.

## GENERAL INFORMATION

1. The discharge pipework must be at least the same size as the booster set connection size 22mm, as a smaller size may result in reduced pressure and flow at the outlets.
2. The installation 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 dependant on the ambient air temperature, growth rates will be higher when the conditions are warm. The tank should be 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. Please provide adequate drainage facilities and protection from water damage in the immediate vicinity of the booster set.
5. 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.
6. 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.

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.

The ability of the cold water mains supply should also be taken into account when considering the size of the cold water storage tank.

## SLAVE TANK

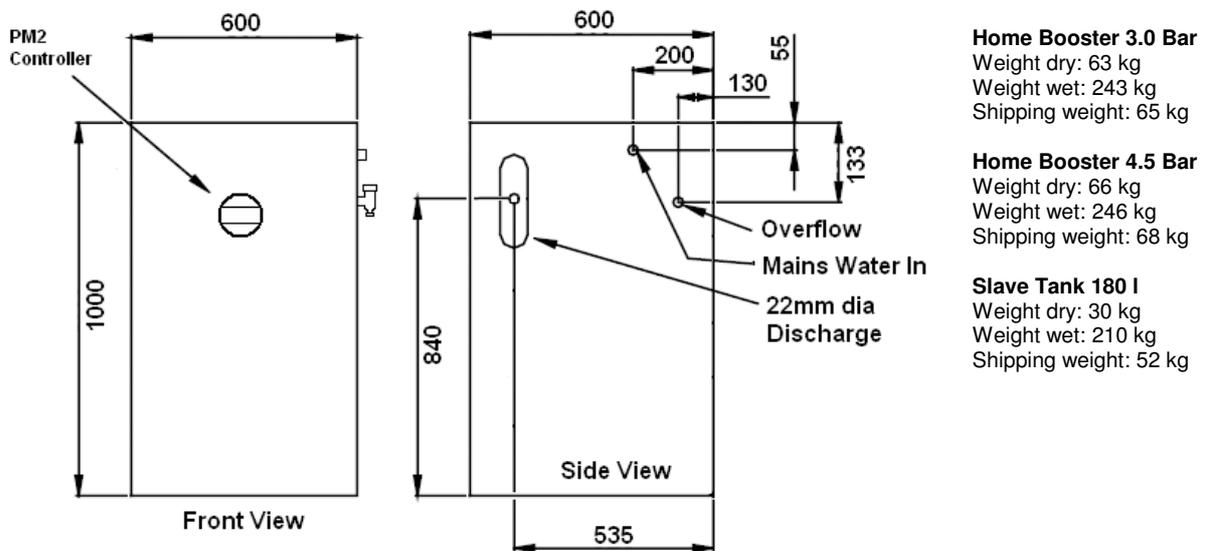
Where the installation requires additional cold water storage, a slave tank can be connected to the Home Booster to provide an additional 180 litres of storage. The slave tank should be mounted on the same level as the Home Booster. A 2" BSP female connection is provided on the rear of the Home Booster and 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. Where floor space is limited, the slave tank can be located above the home booster on a platform, adequate clearance must be left above the Home Booster for access to the cover screws. In this arrangement the mains fills the upper slave tank, and the slave tank then fills the Home Booster by a 15mm pipe from the 2" BSP connection to the mains water connection on the Home Booster. In this arrangement, the capacity of the slave tank is not available immediately as it must fill the Home Booster tank first. This arrangement can be of benefit where the mains water supply is poor at refilling the storage tank. Ensure that the support base is able to support the combined weight of the Home Booster and slave tank.

## 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.

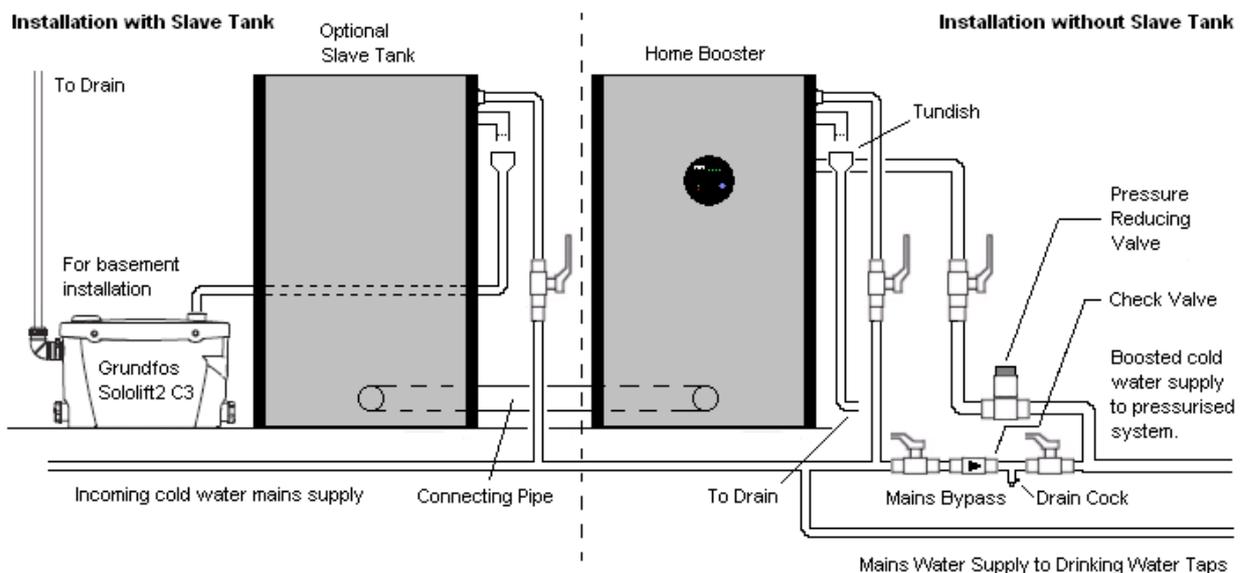
**The bypass arrangement must be installed strictly in accordance with the Water Byelaws Regulations. To prevent stagnation, the water in the bypass should be left drained when the bypass is not in use. A bypass must NOT be installed if pumping non potable CAT 5 contaminated liquid. The diagram below is for guidance only.**

## WEIGHTS & DIMENSIONS



All dimensions in (mm)

## TYPICAL INSTALLATION - shown with optional Slave Tank option



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%, with a 10 amp maximum MCB or fuse. The full load current for the Home Booster 3.0 Bar is 2.8. amps, and 4.0 amps for the Home Booster 4.5 Bar.

# 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 main 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, please see illustration to the right.



# 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 of the commissioning procedures on the following pages please ensure that the following connections and checks have been carried out on the booster set.

1. The discharge connection is connected to the system pipework.
2. The electrical supply cables are correctly connected to the main isolator switch.
3. Check that the precharge pressure in the pressure tanks is set to **90% of the cut-in pressure**.
4. Check that the discharge pipework mounted isolating valve is open.
5. Check that all isolating valves on the Home Booster set are open.
6. Check the booster set pipework connections for leaks.
7. The Home Booster pump is fitted with an automatic air vent.



## DISCHARGE PRESSURE SETTING

The Home Booster discharge cut-in pressure is factory set on the PM2 controller. 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

**The DIP switches are factory set.** For information the settings for the Home Booster 3.0 and 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.

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 precharge pressure = 2.25 bar

### Home Booster 4.5 Bar

Cut-in pressure = 3.5 bar (maximum 5.0 bar)  
Vessel precharge pressure = 3.15 bar

OFF/ON    White box shows switch position

1.5 BAR	1	<input type="checkbox"/>	+0.5	} START
	2	<input type="checkbox"/>	+1.0	
	3	<input type="checkbox"/>	+1.0	
	4	<input type="checkbox"/>	+1.0	
	5	<input type="checkbox"/>	STOP = START + 1 BAR	
	6	<input type="checkbox"/>	AUTO RESET	
	7	<input type="checkbox"/>	ANTI CYCLING	
	8	<input type="checkbox"/>	MAX RUN 30 MIN.	

OFF/ON    White box shows switch position

1.5 BAR	1	<input type="checkbox"/>	+0.5	} START
	2	<input type="checkbox"/>	+1.0	
	3	<input type="checkbox"/>	+1.0	
	4	<input type="checkbox"/>	+1.0	
	5	<input type="checkbox"/>	STOP = START + 1 BAR	
	6	<input type="checkbox"/>	AUTO RESET	
	7	<input type="checkbox"/>	ANTI CYCLING	
	8	<input type="checkbox"/>	MAX RUN 30 MIN.	

## VESSEL PRE-CHARGE PRESSURE



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

The pressure vessel precharge 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  $2.5 \times 0.9 = 2.25$  bar.

The vessel precharge pressure should be adjusted before the pump is filled with water. If the system has already been filled and the pump run, then:

1. Switch off the pump.
2. Release the water pressure by opening a cold water tap supplied by the Home Booster.
3. The precharge pressure can now be checked using a car tyre pressure gauge. The Schraeder air valve is located in the top righthand corner of the pump back plate.
4. The tap should be left open while checking and adjusting the precharge 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 through 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. 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 GRUNDFOS 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 Europump Ltd for on 01942 263628. 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.



Before removing the terminal box cover from the electric motor or before any removal/dismantling of the pump/motor unit takes place, ensure that the electricity supply to the Home Booster has been suitably isolated and cannot be switched 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 that there are no leaks on the internal pipe work, the pump particularly around the shaft seal, and pressure tank.
2. Check for any corrosion particularly on the pressure tank.
3. Check that the pump shaft is free to rotate.
4. Check that water does not appear at the valve on the pressure tanks when the air valve is depressed.
5. Check and adjust if necessary the precharge pressure of the pressure vessel.
6. Check that the pump operate 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.

Should any faults be found check the symptoms with the Fault Finding Chart and if necessary contact Grundfos Pump Ltd for advice or Grundfos Europump 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.

# Fault Finding Chart

FAULT	INDICATION/CAUSE	CORRECTIVE ACTION
1) No lights on the PM2 controller.	a) No electrical supply to Home Booster.	a) Check mains isolator is ON. Check the fuse in the plug or switched fuse isolator. Confirm 240V between Live and Neutral. 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. Check incoming mains water supply. Check ball valve for debris. 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 too high. b) The 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) Precharge pressure in vessel incorrect. b) Leak from system.	a) Check vessel precharge pressure and adjust to 90% of cut-in pressure setting. b) Check the system for leaking taps and ball valves etc.
6) Pumps 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 outlet 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) The red indicator light is permanently on.	a) Pump dry running, generates neither pressure or flow. b) Start pressure set too high. c) Pump defective. d) PM2 defective.	a) Check water level in tank. Check strainer for blockage. Check the PM2 DIP switch cut-in pressure settings. b) 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

## 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
PM2 Controller	96848740
8 Litre Pressure Vessel	96526321
Automatic Air Vent, Brass WRAS	97909984
22mm JG Plastic Service Valve	97563994
Ballcock & Overflow Kit	97939412
Weir Screen & Bezel Kit	97939418
Internal Hoses Kit (both models)	97939421

### GRUNDFOS PUMPS LTD

**Leighton Buzzard (Head Office):** Grovebury Road, Leighton Buzzard, Bedfordshire LU7 4TL. Tel: 01525 850000, Fax: 01525 850011.

#### Domestic Building Services:

Leighton Buzzard, Bedfordshire Tel: 01525 775402, Fax: 01525 775236.

#### Commercial Building Services:

Leigh, Lancashire: Tel: 01942 263600, Fax: 01942 605970

Livingston, West Lothian: Tel: 01506 461666, Fax: 01506 461555.

#### Spares:

Tel: 01942 263490, Fax: 01942 603462.

Email: ukspares@grundfos.com

#### Grundfos Europump Ltd:

Tel: 01942 263628, Fax: 01942 602830.

REF: GB/HBCM/OM/DBS/0511



It is the continuing policy of Grundfos to develop and improve our products, and we reserve the right to amend prices and specification without prior notice.