

# Grant Vortex Mag One

## Universal Magnetic Central Heating Filter

### Installation and Servicing Instructions



## IMPORTANT NOTE FOR INSTALLERS

These instructions are intended to guide Installers on the installation, commissioning and servicing of the Grant Vortex Mag One magnetic filter. After installing the magnetic filter, leave these instructions with the user.

## SPECIAL TEXT FORMATS

The following special text formats are used in these instructions for the purposes listed below:

### **! WARNING !**

**Warning of possible human injury as a consequence of not following the instructions in the warning.**

### **! CAUTION !**

**Caution concerning likely damage to equipment or tools as a consequence of not following the instructions in the caution.**

### **! NOTE !**

**Used for emphasis or information not directly concerned with the surrounding text but of importance to the reader.**

## PRODUCT CODES COVERED

These instructions cover the following product codes:

VM01/X

## SERVICING

The magnetic filter should be serviced at least every twelve months and the details entered in the Service Log in these instructions.



### **GRANT ENGINEERING (UK) LIMITED**

Hopton House, Hopton Industrial Estate, Devizes, Wiltshire, SN10 2EU

Tel: +44 (0)1380 736920 Fax: +44 (0)1380 736991

Email: [info@grantuk.com](mailto:info@grantuk.com) [www.grantuk.com](http://www.grantuk.com)

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# 1 INTRODUCTION

## 1.1 GENERAL

The Mag One magnetic central heating filter is the ideal solution to costly and unnecessary system breakdowns caused by both magnetic and non-ferrous particulate in fluid based systems.

Thanks to its innovative triple action magnetic filtration system, it identifies and retains all types of magnetite and non-ferrous debris.

The Mag One magnetic central heating filter can be used on all types of central heating systems in any orientation and it is recommended, for maximum effect, that it be installed on the return leg of the circuit, between the last radiator and the boiler/heat pump.

The isolating flat face ball valves, provided with the magnetic filter, make maintenance and installation quick and simple.

As well as being fitted in conjunction with the installation of a new system, the Mag One magnetic filter is well suited to being retro-fitted to an existing system where the boiler/heat pump is being replaced – protecting new components and increasing the life span and effectiveness of existing ones.

## 1.2 HOW A MAGNETIC FILTER WORKS

Through a combination of innovative product design and a clever use of the laws of physics, water is guided through the components of the Mag One to achieve maximum filtration with each pass of the circuit.

Water enters the filter through our ingenious diverter block and then passes into the magnetic filter 500 ml capacity pressure drop chamber.

Here, particulate is forced through the non-ferrous filter and down towards the magnet. Through a process of natural convection, water then circulates back to the top of the filter and back into the system leaving all magnetite and particulate debris captive at the base of the filter's magnetic core.

All system contaminants are then easily removed during servicing by isolating the Mag One from the system and removing the magnet from the screw cap at the top of the pot then opening the drain valve, removing the majority of contaminants within the pot in seconds.

## 1.3 SAFEKEEPING OF THE INSTALLATION INSTRUCTIONS

These Installation and Servicing Instructions must be handed over to the householder on completion of the installation. They should be kept for future reference as necessary.

## 1.4 PRODUCT CONTENTS

The following are included with the Mag One:

- 1 x Installation and Servicing Instructions
- 1 x Magnetic Filter body
- 1 x Accessories box containing:
  - 1 x Connection block
  - 2 x Isolating Valves
- 1 x Resealable bag containing:
  - 1 x Large o-ring for screw seal (1 x spare)
  - 2 x Large flat washers for the inlet connection (1 x spare and 1 to be fitted during installation)
  - 4 x Small flat washers for between the connection block and isolating valves (2 x spare and 2 to be fitted during installation)
  - 1 x Small o-ring for manual air vent (1 x spare)
- 1 x Resealable bag (contained within above bag) containing:
  - 1 x Brass hose adaptor
  - 1 x Air bleed key
  - 1 x Service label
- 1 x Sealed bag containing:
  - 2 x 28/22 mm reducing valves (refer to Section 1.8)
- 1 x Spanner

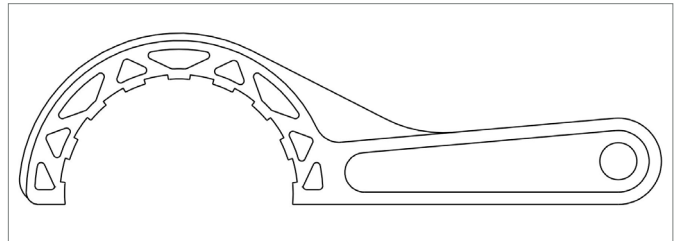


Figure 1-1: Mag One spanner

## 1.5 INSTALLATION

Installation must be carried out by a competent installer in compliance with all current local planning requirements, Building Regulations, codes of practise, Health and Safety legislation.

## 1.6 LOCATION

The Mag One should be installed on the return leg of the circuit, between the last radiator and the boiler/heat pump.

**Table 1-2:** Installation locations

Location	Suitable?
Internally	Yes
Inside internal boiler casing	No
Externally	No
Inside external boiler casing	Yes

## 1.7 ORIENTATION

The Mag One body can be rotated by 360° and installed in any orientation without affecting performance.

## 1.8 ACCESS AND CLEARANCES

Please allow enough clearance around the Mag One to ensure the isolating valves can be fully closed.

It is recommended that a clearance of at least 250 mm is given to enable the magnet and filter to be removed during servicing.

Sufficient clearance must also be given to ensure that the Mag One can be drained easily into a suitable container.

## 1.9 REDUCING VALVES

The Mag One is supplied with a pair of 28 mm isolating valves and 28/22 mm reducers for connection to 22 mm pipe.

## 1.10 MAGNET CAUTIONARY ADVICE

### **! WARNING !**

**The magnet fitted in the Mag One has a strong attractive force and consideration should be given to the following:**

- **Magnets could affect the functioning of pacemakers and implanted heart defibrillators**
- **Keeping magnets away from devices and objects, i.e. TVs, laptops, credit and ATM cards, etc. that could be damaged by strong magnetic fields.**

## 2 TECHNICAL DATA

### 2.1 MATERIALS SPECIFICATION

**Table 2-1:** Materials specification

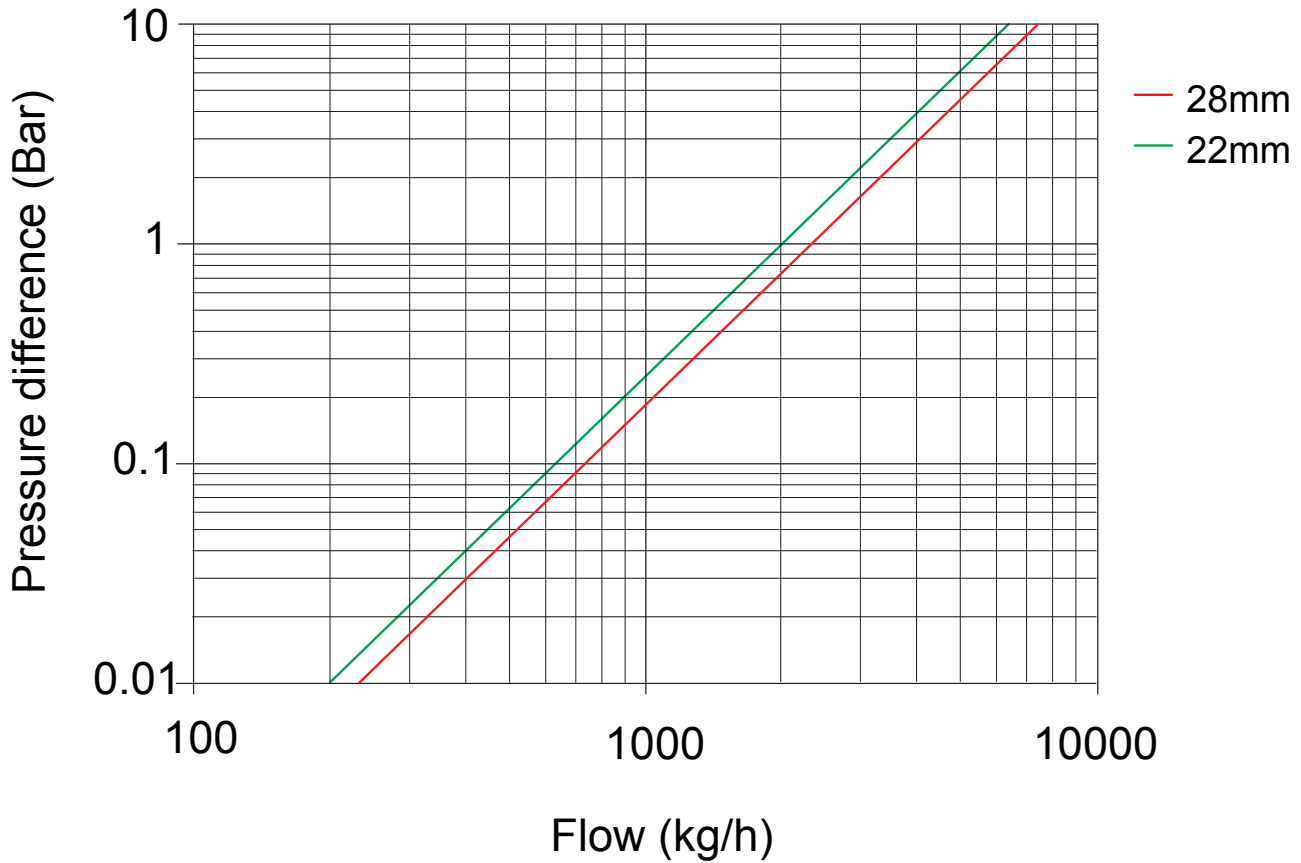
Valve body and screw cap	PA66 30% GF
Integral non-ferrous filter	POM
Screw cap, connector pot and drain valve seals	EPDM
Ball valve and drain valve o-ring seals	EPDM
Magnet	Noedymium earth magnets
Ball valves, connector block and drain valve	Brass

### 2.2 MAGNET SPECIFICATION

**Table 2-2:** Magnet specification

Gauss (G) rating	12,000
------------------	--------

### 2.3 FLOW RATE AND PRESSURE DROP



**Figure 2-3:** Flow rate and pressure drop

## 2.4 DIMENSIONS

### ! NOTE !

Please allow enough clearance around the Mag One to ensure the isolating valves can be fully closed.  
It is recommended that a clearance of at least 250 mm is given to enable the magnet and filter to be removed during servicing.

Sufficient clearance must also be given to ensure that the Mag One can be drained easily into a suitable container.

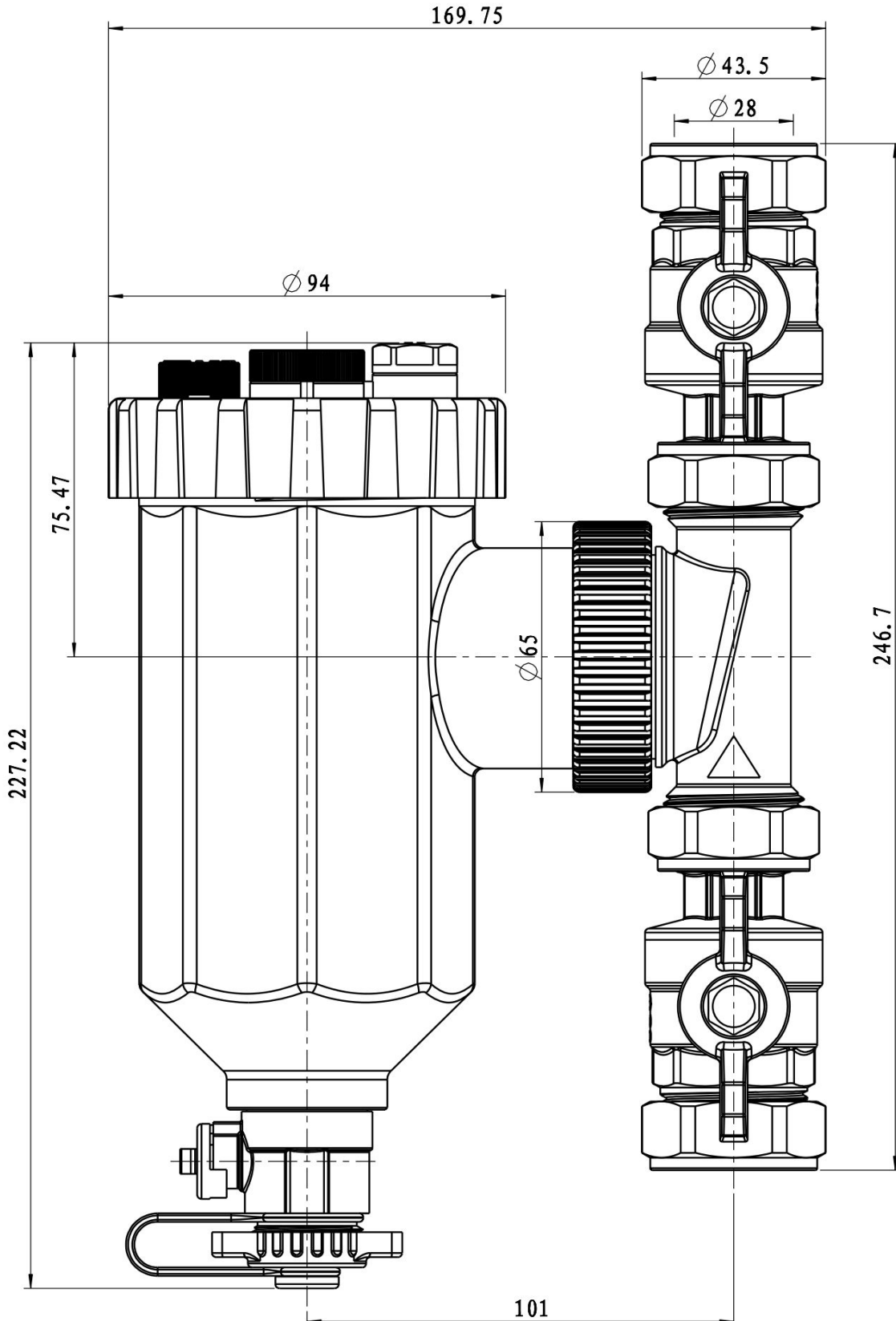


Figure 2-4: Mag One dimensions

# 3 INSTALLATION

## 3.1 INSTALLATION PROCEDURE

Prior to installation, ensure that the system has been power flushed and has been suitably drained down. On open vented systems, make sure that the feed and expansion tank is isolated.

The Mag One should be installed on the return leg of the circuit, between the last radiator and the boiler/heat pump.

The Mag One body can be rotated by 360° and installed in any orientation without affecting performance.

Please allow enough clearance around the Mag One to ensure the isolating valves can be fully closed.

It is recommended that a clearance of at least 250 mm is given to enable the magnet and filter to be removed during servicing.

Sufficient clearance must also be given to ensure that the Mag One can be drained easily into a suitable container.

1. Remove 205 mm of system pipework for the installation, making sure that open ends of both pieces are free of debris or burrs and ready to receive the nut and olive.
2. Fit both isolating valves but do not tighten fully. If connecting to 22 mm pipe, fit the 28/22 mm reducers supplied in the kit.
3. Slip the connection block between the flat face of isolating valves, taking particular care to ensure that the directional arrow on the connection block is pointing in the direction of the flow of water. Failure to do so will result in reduced flow and inhibited filter performance.
4. Hand tighten the isolating valves to the connection block making sure that the rubber washers provided have been situated between the two. When you are happy that the connection block and isolating valves are facing an appropriate direction for the installation, fully tighten all four nuts.
5. Present the filter to the connection block making sure that you have inserted the rubber seal into the inlet connection on the filter body. Gently position the filter into the connector block and when you are satisfied with the position of the filter, hand tighten. If further tightening is required, gentle pressure can be applied with a suitably sized set of pump pliers.

### ! WARNING !

Excessive tightening of the connection block/filter union may irreparably damage the filter.

## 3.2 NUMBER OF MAGNETIC FILTERS REQUIRED

Prior to ordering, ensure you have determined the correct number of magnetic filters required for the system.

This will be dependent on pipe sizes of the system and the output of the heat source.

Refer to Sections 3.3 and 3.4 for further information.

## 3.3 INSTALLING WITH PIPE SIZES OF 22 mm OR 28 mm

Table 3-1: 22 mm or 28 mm pipe sizes

Pipe size	5K differential (heat pumps)	20K differential (boilers)
22 mm	≤5.8kW maximum	≤26kW maximum
28 mm	≤10kW maximum	≤36kW maximum

If the output of the heating system exceeds that of the maximum kW, then two magnetic filters would need to be installed in parallel (not series). Please ensure there is sufficient clearance between the two magnetic filters for the lower filter and magnet to be removed and for the upper magnetic filter to be drained.

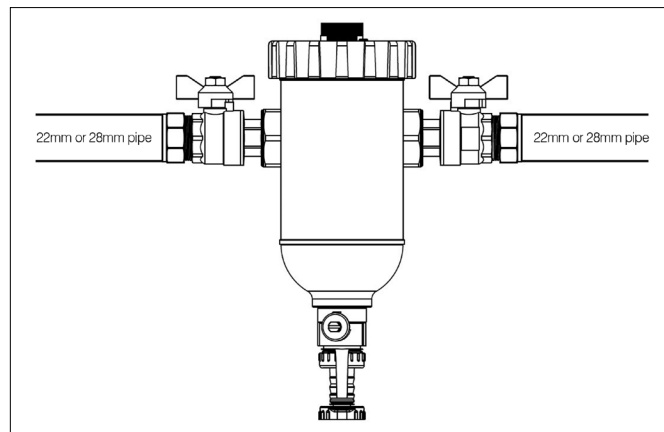


Figure 3-2: 22 or 28 mm pipe size

## 3.4 INSTALLING WITH PIPE SIZES OF 35 mm

Table 3-3: 35 mm pipe sizes

Pipe size	5K differential (heat pumps)	20K differential (boilers)
35 mm	≤15.5kW maximum	≤70kW maximum

If the output of the heating system exceeds that of the maximum kW, then two magnetic filters would need to be installed in parallel (not series). Please ensure there is sufficient clearance between the two magnetic filters for the lower filter and magnet to be removed and for the upper magnetic filter to be drained.

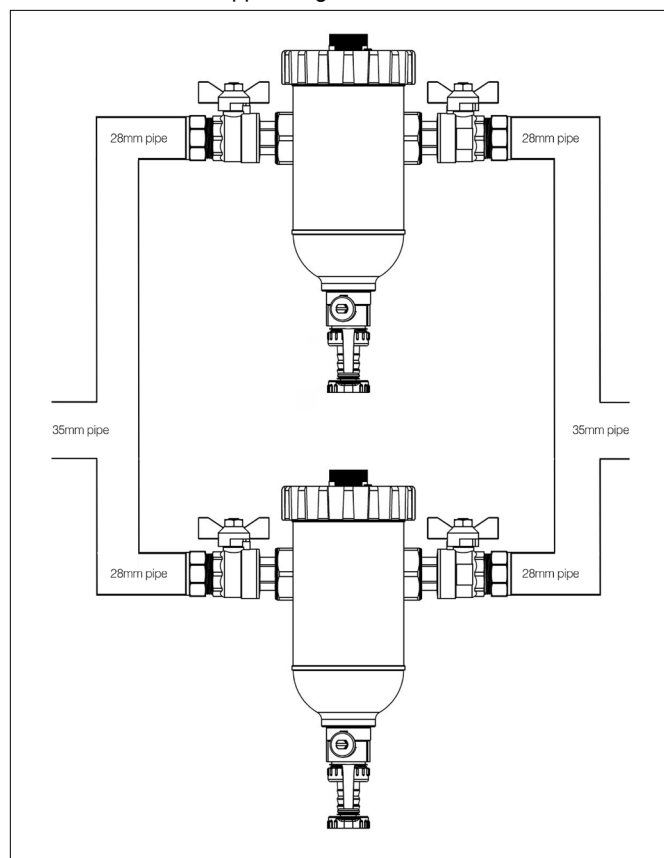


Figure 3-2: 35 mm pipe size

## 3.5 CASCADE SYSTEMS

For cascade systems, one magnetic filter will be required for each heat source.



## 4 COMMISSIONING

### BEFORE YOU COMMISSION

For optimum performance after installation, the boiler/heat pump and the associated heating system must be flushed in accordance with the guidelines given in BS 7593 (Treatment of water in domestic hot water central heating systems). This must involve the use of a proprietary cleaner, such as Sentinel X300 (new systems), Sentinel X400 (existing systems), or Fernox Restorer. After cleaning, it is vitally important that all traces of the cleaner are thoroughly flushed from the system.

For long term protection against corrosion and scale, after cleaning/flushing a suitable inhibitor should be added to the system water, such as Sentinel X100 or Fernox MB-1, in accordance with the manufacturers' instructions.

Failure to follow the above will invalidate the guarantee.

The procedure for commissioning the filter is as follows:

1. Open the lowest isolating valve to the air bleed – leave the upper most isolating valve closed. The air bleed should be closed initially during commissioning.
2. Making sure that all open ends of the system are closed, begin to refill the system.
3. Bleed radiators as required.

4. Return to the Mag One filter and open the air bleed until water flows from it.
5. Open the top isolating valve and allow the remaining system volume to fill.
6. Open the air bleed again to ensure all air has been removed from the filter.
7. Adjust the installation/service date wheel to reflect the month the Mag One filter was installed. This will act as a service guideline for the end user.
8. A service label is supplied with the Mag One and this must be completed by the installer and displayed in an unobtrusive but obvious position on or near the filter.

### ! NOTE !

**Air may continue to be present in the system pipework for a small period as the central heating is run after installation of the Mag One filter.**

**We recommend that you check the air bleed again to ensure that all air has been purged from the system.**

## 5 SERVICING

We recommend that the Mag One filter is serviced once every twelve months, or as required in heavily contaminated systems.

The Mag One is supplied with a range of replacement o-rings and washers, should these be needed, as well as a brass drain hose adaptor for draining the filter during servicing.

Prior to cleaning the Mag One filter, ensure that the working environment is safe.

It is advisable to turn the boiler/heat pump off before commencing any maintenance works.

Caution should also be taken regarding the temperature of the contents of the filter.

1. Firstly, turn the isolating valves to the closed position.
2. Unscrew the magnet from the screw cap and pull it free from the pot. This will demagnetise any ferrous material in the pot and allow it to fall to the base.
3. After having attached the brass hose adaptor to the drain

valve, slowly open the drain valve at the base of the Mag One filter and allow the contents of the pot to drain in a suitable container ensuring the surrounding area is fully protected.

4. Once the flow of water has stopped, open the manual air bleed to ensure that the filter is completely empty.
5. Remove the screw cap from the main body of the filter and remove the POM non-ferrous filter from inside the pot. Rinse both of these with clean water only.
6. Once complete, reassemble and commission the filter as before.
7. Adjust the installation/service date wheel to reflect the month the Mag One filter was serviced. This will act as a service guideline for the end user.
8. Update the service label.

## 6 CHEMICAL DOSING

Before any chemical dosing is attempted, first ensure that system pressure has been relieved and an appropriate volume of fluid has been removed to accommodate the dosing agent.

To dose from the Mag One filter:

1. Isolate it from the system using the isolating valves
2. Drain the pot contents into a suitable container and open the manual air bleed to ensure the dosing pot is completely empty.
3. Close the drain valve and manual air bleed, unscrew the cap at the top of the pot and remove.
4. Dose the system using a suitable corrosion inhibitor in accordance with the manufacturers instructions.
5. When complete, replace the screw cap and open the isolating valves.
6. Repeat as necessary to dose with required amount.
7. Top up the system volume as required.

## 7 GUARANTEE

You are now the proud owner of a Mag One magnetic filter from Grant Engineering (UK) Limited which has been designed to give years of reliable, trouble free, operation.

Grant Engineering (UK) Limited guarantees the manufacture of the Mag One including all mechanical components for a period of **two years from the date of installation**<sup>4</sup>, provided that the Mag One has been installed in full accordance with the installation and servicing instructions issued.

### If a fault or defect occurs within the manufacturer's guarantee period

If your Mag One should fail within the guarantee period, you must contact Grant Engineering (UK) Limited who will arrange for the repair under the terms of their guarantee, providing that the Mag One has been correctly installed, commissioned and serviced (if the appliance has been installed for more than twelve months) by a competent person and the fault is not due to tampering, misuse, trapped air or the failure of any external components not supplied by Grant Engineering (UK) Limited.

### In the first instance

Contact your installer or commissioning engineer to ensure that the fault does not lie with the system components or any incorrect setting of the system controls that falls outside of the manufacturer's guarantee otherwise a service charge could result. Grant Engineering (UK) Limited will not be liable for any charges arising from this process.

### If a fault covered by the manufacturer's guarantee is found

Ask your installer to contact Grant Engineering (UK) Limited Service Department on +44 (0)1380 736920 who will arrange for a competent service engineer to rectify the fault.

### Remember - before you contact Grant Engineering (UK) Limited:

- Ensure the Mag One has been installed, commissioned and serviced by a competent person in accordance with the installation and servicing instructions.
- Ensure the problem is not being caused by the heating system or its controls. Consult the installation and servicing instructions supplied with the boiler for guidance.

### Free of charge repairs

During the **two year** guarantee period no charge for parts will be made, provided that the Mag One has been installed and commissioned correctly in accordance with the manufacturer's installation and servicing instructions and, for a Mag One over twelve months old, details of annual service is available<sup>2</sup>.

The following documents must be made available to Grant Engineering (UK) Limited on request:

- Service documents

### Chargeable repairs

A charge may be made (if necessary following testing of parts) if the breakdown is due to any fault(s) caused by the plumbing or heating system, e.g. trapped air, etc. See 'Extent of manufacturer's guarantee' below.

### Extent of manufacturer's guarantee:

The manufacturer's guarantee does not cover the following:

- If the Mag One has been installed for over **two years**.
- If the Mag One has not been installed, commissioned, or serviced by a competent person in accordance with the installation and servicing instructions.
- Fault(s) due to accidental damage, tampering, unauthorised adjustment, neglect, misuse or operating the Mag One contrary to the manufacturer's installation and servicing instructions.
- Damage due to external causes such as bad weather conditions (flood, storms, lightning, frost, snow, or ice), fire, explosion, accident or theft.
- Fault(s) due to incorrectly sized expansion vessel(s), incorrect vessel charge pressure or inadequate expansion on the system.
- Fault(s) caused by external electricians and external components not supplied by Grant Engineering (UK) Limited.
- Mag One servicing, de-scaling or flushing.

- Checking and replenishing system pressure.
- Components not supplied by Grant Engineering (UK) Limited.
- Heating system components, such as radiators, pipes, fittings, pumps and valves not supplied by Grant Engineering (UK) Limited.
- Instances where the Mag One has been un-installed and re-installed in another location.
- Use of spare parts not authorised by Grant Engineering (UK) Limited.

### Terms of manufacturer's guarantee:

- The Company shall mean Grant Engineering (UK) Limited.
- The Mag One must be installed by a competent installer and in full accordance with the relevant Codes of Practice, Regulations and Legislation in force at the time of installation.
- The Mag One is guaranteed for **two years** from the date of installation<sup>3</sup>, providing that after twelve months the annual service has been completed<sup>2</sup>. Any work undertaken must be authorised by the Company and carried out by a competent service engineer.
- This guarantee does not cover breakdowns caused by incorrect installation, neglect, misuse, accident or failure to operate the Mag One in accordance with the manufacturer's installation and servicing instructions.
- The balance of the guarantee is transferable providing the installation is serviced prior to the dwelling's new owners taking up residence. Grant Engineering (UK) Limited must be informed of the new owner's details.
- The Company will endeavour to provide prompt service in the unlikely event of a problem occurring, but cannot be held responsible for any consequences of delay however caused.
- This guarantee applies to Grant Engineering (UK) Limited Mag One purchased and installed on the UK mainland, Isle of Wight, Channel Islands and Scottish Isles only<sup>1</sup>. Provision of in-guarantee cover elsewhere in the UK is subject to agreement with the Company.
- All claims under this guarantee must be made to the Company prior to any work being undertaken. Invoices for call out/repair work by any third party will not be accepted unless previously authorised by the Company.
- Proof of purchase and date of installation, commissioning and service documents must be provided on request.
- If a replacement Mag One is supplied under the guarantee (due to a manufacturing fault) the product guarantee continues from the installation date of the original Mag One, and **not** from the installation date of the replacement<sup>3</sup>.
- The replacement of a Mag One under this guarantee does not include any consequential costs.
- The Mag One must not be sited in a location where it may be subjected to frost.

### Foot notes:

1. The UK mainland consists of England, Scotland and Wales only. Please note that for the purposes of this definition, Northern Ireland, Isle of Man and Scilly Isles are **not** considered part of the UK mainland.
2. We recommend that your Mag One is serviced every twelve months (even when the guarantee has expired) to prolong the lifespan and ensure it is operating safely and efficiently.
3. The guarantee period will commence from the date of installation, unless the installation date is more than six months from the date of purchase, in which case the guarantee period will commence six months from the date of purchase.

# 8 SERVICE LOG

<b>Service 1</b>	Date
	Engineer
	Company name
	Telephone number
	Comments
	Signature

<b>Service 6</b>	Date
	Engineer
	Company name
	Telephone number
	Comments
	Signature

<b>Service 2</b>	Date
	Engineer
	Company name
	Telephone number
	Comments
	Signature

<b>Service 7</b>	Date
	Engineer
	Company name
	Telephone number
	Comments
	Signature

<b>Service 3</b>	Date
	Engineer
	Company name
	Telephone number
	Comments
	Signature

<b>Service 8</b>	Date
	Engineer
	Company name
	Telephone number
	Comments
	Signature

<b>Service 4</b>	Date
	Engineer
	Company name
	Telephone number
	Comments
	Signature

<b>Service 9</b>	Date
	Engineer
	Company name
	Telephone number
	Comments
	Signature

<b>Service 5</b>	Date
	Engineer
	Company name
	Telephone number
	Comments
	Signature

<b>Service 10</b>	Date
	Engineer
	Company name
	Telephone number
	Comments
	Signature



**GRANT ENGINEERING (UK) LIMITED**

Hopton House, Hopton Industrial Estate, Devizes, Wiltshire, SN10 2EU  
Tel: +44 (0)1380 736920 Fax: +44 (0)1380 736991  
Email: [info@grantuk.com](mailto:info@grantuk.com) [www.grantuk.com](http://www.grantuk.com)