



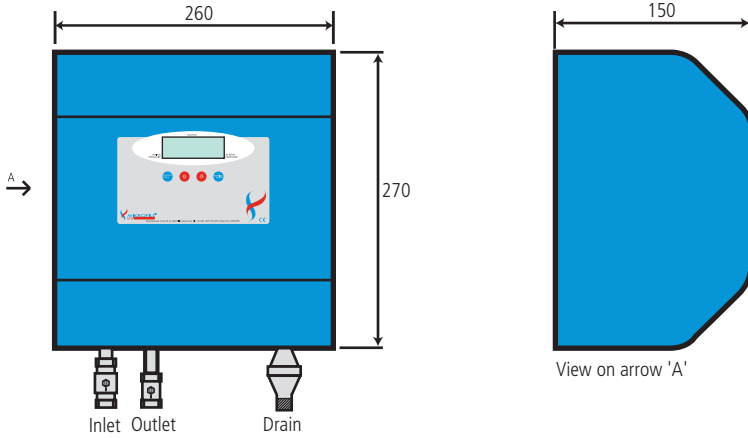
Electronic Filling Device (EFD)

Installation and Maintenance Instructions

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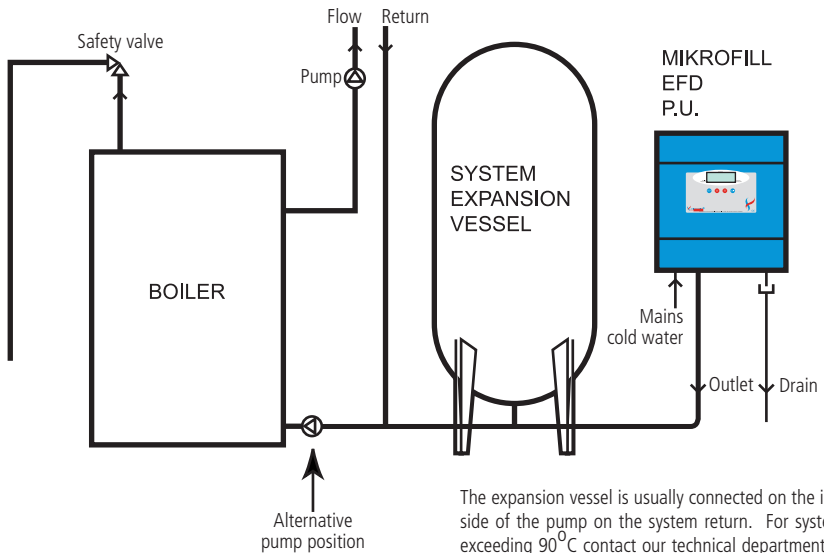
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Dimensions



Weight 8kg

Typical installation diagram



The expansion vessel is usually connected on the inlet side of the pump on the system return. For systems exceeding 90°C contact our technical department for advice.

See notes on pipework sizing on page 5.

The Mikrofill Electronic Filling Device (EFD)

The Mikrofill EFD is a fully automatic sealed system filling device, and is suitable for the water management in all domestic and commercial heating and cooling systems. It is supplied as a fully commissioned unit and should require no "on site" commissioning. It is designed for use in a "normal" environment.

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1 Installation

All Mikrofill products should be installed by a competent person with regard to the relevant requirements of the Health and Safety Regulations, Building Regulations, IEE Regulations, Water Supply (water fittings) Regulations, Water Bye-laws (Scotland) and any other local bye-laws or planning requirements, the Mikrofill EFD is Wras approved - certificate No 0201032.

The Mikrofill EFD is intended for wall mounting and there are four mounting holes on the backplate for this purpose. The unit should be mounted at such a height as to enable the liquid crystal display to be easily read, (see diagram 1).

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1.1 Mains/boosted cold water supply

The Mikrofill EFD is designed to be connected directly to the mains cold water supply, or a boosted cold water supply. The unit is supplied complete with all necessary isolating valves, and incorporates a basket filter in the inlet ball valve. The water inlet is 15mm compression and should be connected to the mains cold water supply by 15mm copper tube or equivalent approved plastic pipework. If the Mikrofill EFD is sited some distance from the mains cold water supply it may be advisable to install a single check valve adjacent to the mains cold water supply. Maximum water temperature: 40°C.

To reduce the pressure drop on very long supply routes then 22mm supply pipework is recommended. The maximum inlet water pressure acceptable is 5 bar, for cold water inlet pressure above 5 bar, it is necessary to fit a pressure reducing valve set at maximum 5 bar.

Fill Pressure:

The EFD is capable of filling a system to within 0.3 bar of the mains pressure if required. The EFD has a maximum working pressure of 7 bar (2 bar above maximum fill pressure).

1.2 Connection to the system

The Mikrofill EFD is connected to the system by way of the 15mm outlet valve, the pipework from the unit should be made in 15mm copper or similarly approved plastic pipework. A suitably sized expansion vessel should be incorporated into the system at this point. Please refer to the typical installation diagram on page 3. If you require any assistance regarding vessel sizing please contact our technical sales department. The final connection into the heating (or cooling) system should be sized accordingly, recommendations are shown below:

Vessel size up to 100L	1/2" (15mm) expansion pipework.
Vessel size up to 300L	3/4" (22mm) expansion pipework
Vessel size up to 1000L	1" (28mm) expansion pipework

For vessel sizes in excess of 1000L capacity please contact our technical sales department.

IMPORTANT NOTE

The expansion vessel nitrogen/air charge must be set at the same pressure as the cold fill pressure of the system*. All Mikrofill expansion vessels are factory commissioned to the correct pressure

* If the installed height of the expansion vessel is different to that of the EFD then please contact our service department who will advise on the nitrogen/air charge.

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1.3 Drain

Following every filling procedure, the EFD will discharge a small amount of water establishing an air break. For this the Mikrofill EFD is supplied fitted with a 3/4" BSP tundish, which must be connected to a suitable drain. Mikrofill Systems Ltd cannot accept responsibility for any consequential damage caused by failure to connect the tundish to a suitable drain.

1.4 EFD Dimensions for fixing

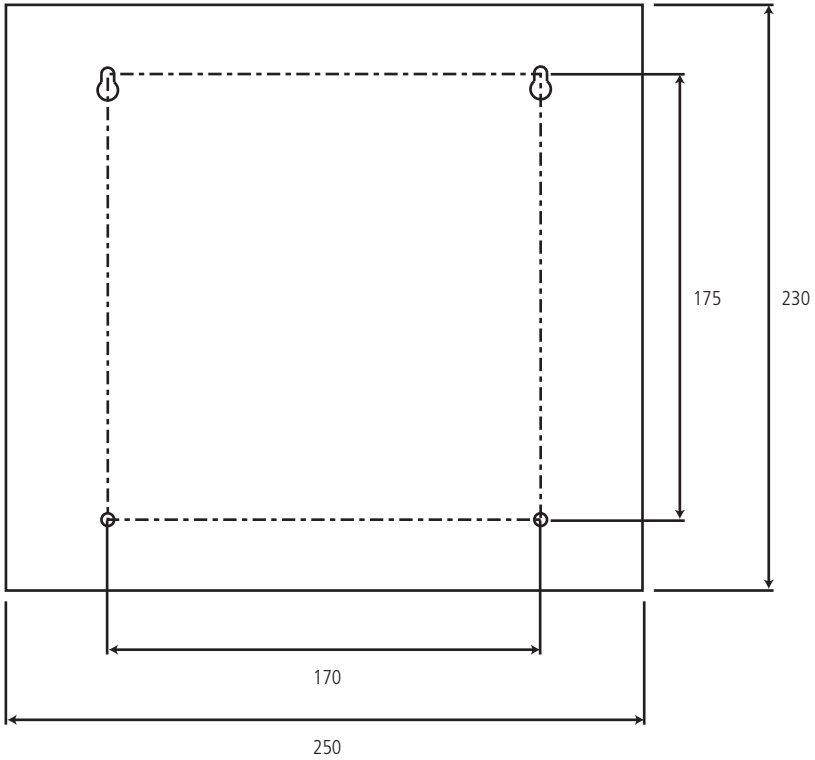


Diagram 1

A maximum size of No. 8 screws or M4 bolts to be used.

A minimum of 100mm clearance on both sides of the unit is required.

The unit must be fitted on a sound, solid surface.

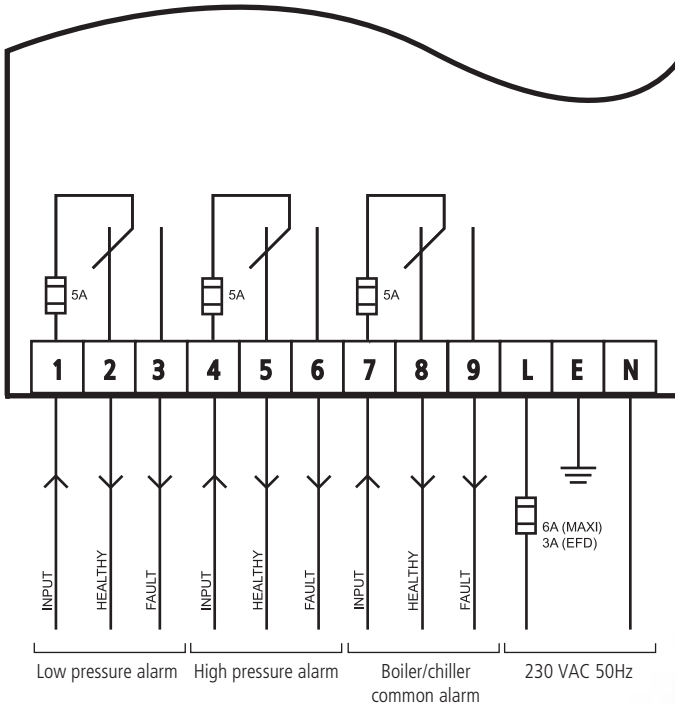
2 Electrical connections

The Mikrofill EFD requires a permanent 240V 50Hz 1 phase supply rated at 3 amp. The unit is internally fused at 3 amp (see electrical installation diagram).

The EFD also incorporates two BMS relays offering volt free contacts for the remote indication of high or low pressure conditions within the heating or cooling system. These relays are also independently fused at 5 amp to protect the Mikrofill EFD from external electrical faults. A further volt free relay is included in the EFD. This is to interlock the boiler or chiller control circuits. Should either of the alarm relays operate, then the relay will shut down the boiler or chiller, and indication of any alarm situation will be indicated on the display. The relays are suitable for use on control voltages up to 250V.

Once the Mikrofill EFD has been correctly connected the unit is ready for use. Ensure that the EFD has a water supply and the EFD service valve is open. Check for water leaks, switch on electrical supply to the unit and the illuminated on/off switch to the left hand side of the unit, the unit will start to fill the system. When the system has achieved the EFD set pressure, the unit will stop filling, discharge a small amount of water and go to standby.

2.1 Electrical diagram




Electrical data


Supply: 230V 1ph 6 amp
 Full load current: 1 amp
 Start current: 1 amp
 Fuse rating: 3 amp
 BMS relays and boiler/chiller relays: volt free contacts rated at 250VAC at 5 amp
 All relays are independently fused at 5 amp

Keypad function

System Data Button

This button operates a scroll function normally for information only. When in the service mode, it allows selection of particular setting parameters.

 Button - used when in service mode to increase parameter values

 Button - used when in service mode to decrease parameter values

Service Mode

A multi-function button that, when in operational mode, is used to mute alarm conditions. In normal operational mode the keypad buttons are for information only and do not affect any of the parameters preset in the service mode.

3 Alarm conditions

Please note the EFD is a factory pre-commissioned product, should you require to change any of the preset parameters – please see 'Settings'.

3.1 System inhibited

The EFD continuously monitors the inlet water pressure. If this pressure falls to below an acceptable level then the unit will operate a safety shut down. When water pressure is reinstated the unit will automatically reset.

3.2 Flood alert

The EFD can differentiate between normal system fill rates and excessive water demand usually due to a flood condition. If this situation occurs the EFD will shut down, and issue a flood alert warning on the LCD. This alert must be reset manually, by switching off the EFD waiting 30 seconds and switching back on. If the leak has been rectified the unit will then operate as normal.

3.3 High or low pressure alarms

If, for any reason the system water pressure reaches a high or low condition, as determined by the preset parameters the EFD will show the alarm message, the relevant BMS relay will operate and the Boiler/chiller control relay will shut down the boiler or chiller. When normal operating pressure is resumed the unit will automatically reset.

3.4 Frequent use alarm

This alarm is to assist in diagnosing any leaks that may be present in the heating (or cooling system). If in any 24 hr period the EFD operates more than a preset limit i.e. 5, then a frequent use alarm will show (the operation of the system will not be affected, this function is for information only).

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3.5 Frequent use reset

This is achieved by switching the power supply to the unit off and on again.

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3.6 Hours run facility

This is accessed by scrolling the system data button.

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3.7 Hours run reset

This is achieved by depressing the   buttons simultaneously.

IMPORTANT NOTE

The EFD has a predetermined fill rate of 14 litres per minute. Therefore, by multiplying the fill rate by the hours run the water usage can be calculated.

4 Fault diagnosis


System faults will be apparent from the alarm message displayed. The EFD itself has a full self-diagnostic microprocessor unit which continually self-checks the operation. If an internal fault is diagnosed then the fault will be displayed on the screen, e.g. sensor disconnected.

EFD Fault conditions

Fault indications	Cause	Remedies
System inhibited	Low mains water pressure	Pressure must be maintained at no less than 0.3 bar above the system pressure
	Dirty filter	Clean valve filter
Sensor failure	Possible sensor fault	1. Switch unit off and back on. If sensor failure does not reappear on the display see note 2. If sensor failure does reappear, check sensors are connected to the printed circuit board correctly. If the problem persists ring our service department.
	Incoming voltage instability	2. If this occurs switch the unit off and back on, the unit should then operate as normal. If this fault appears on a regular basis then a mains electrical filter (anti surge device) is required. Ring our service department for advice.
Low pressure alarm	System pressure low	Check system for leaks, switch unit off and back on to reinstate. Check low alarm setting.
High pressure alarm	System pressure high	Reduce pressure in system and check expansion vessel air charge/size. Check high alarm setting.
Flood alarm	Possible excess water leak on the system	Check system for leaks, then switch unit off and back on to reinstate.
Frequent use alarm	Possible persistent leak on system	If the unit operates more than the set value in a 24hr period the unit will bring up the frequent use alarm. This will not stop the unit from operating but indicates that there may be a small leak on the system. Switch the unit off and back on to reinstate. Investigate possible leak.

The Mikrofill EFD has been designed such that most apparent 'faults' can be remedied on site. If in doubt ring our service department on 01527 574574.

5 Manual override

Should the Mikrofill fail for any reason then a manual override facility can be employed. After ensuring that the heating system is charged with water, and that the Mikrofill is not indicating a system fault, rather than a unit fault i.e. flood alarm, then the BMS relays can be overridden by depressing the  and service buttons simultaneously for 3 seconds. Repeating the operation will return the BMS relays to normal mode.

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6 Audible alarm override

If the Mikrofill EFD does indicate a fault, an audible alarm will sound. This can be overridden by depressing the service button.



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7 Adjusting settings

The Mikrofill EFD is supplied pre-commissioned with the settings as shown on the commissioning report. The settings can be adjusted on site as follows:

7.1 Press and hold the system data & service mode buttons simultaneously for approx 3 seconds



7.2 The display will indicate that you are now in the service mode

7.3 Use the 'system data' button to scroll through the settings, each setting can be adjusted by use of the   buttons. The following information describes the function of each setting (section 8)

7.4 After adjusting the settings, the unit will return to its standard operating mode approximately 30 seconds after release of the buttons.



8 Menu Functions

- Target low – this is the pressure at which the unit will operate i.e. start to fill. This is usually set at 0.2 – 0.3 below the target high
- Target high – this is the pressure at which the unit will cease filling i.e. the cold fill pressure
- Alarm low – the pressure at which the low pressure alarm relay will operate. Usually set 0.4 – 0.5 bar below the target low
- Alarm high – the pressure at which the high pressure alarm relay will operate, usually set 0.5 bar below the system safety valve setting
- Hours run – for information only, no setting required – Please note – to zero the hours run, the   buttons need to be pressed simultaneously for 3 seconds
- Dry run – this function affects the flood protection facility, the longer the dry run setting (which is calculated in minutes) the less responsive the flood protection
- Delay off – this setting allows adjustment (to prevent over or under shoot) of the fill pressure – increasing time prevents under shoot, decreasing time prevents over shoot
- Frequent use – this setting warns of frequent use which would indicate a system leak and will show a warning message if in any 24 hour period the unit operates in excess of the frequent use setting
- Delay on – this setting is a further flood protection setting and reducing the setting will reduce the sensitivity of the flood protection
- Diff delay – no setting required

9 Maintenance

EFD - The inlet filter which is housed in the service valve should be checked and cleaned annually.

EXPANSION VESSELS – Charge pressure should be checked annually when the system is cold (the air charge pressure must equal the cold fill pressure of the EFD).

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