MIKROFILL®
ETHOS BOILERS

INSPIRED | EFFICIENCY

EFD
Wall Mounted
Pressure Manager

TECHNICAL DOCUMENTATION

TABLE OF CONTENTS

The Mikrofill Electronic Filling Device (EFD)

Technical data

WRAS Approval No.	0612047
Electrical Approval No.	ENEC No. 1314
Electrical Details	
Supply Voltage	230Volt
Full Load Current	1 Amp
Start Current	1 Amp
Fuse Rating	3 Amp
Max Load BMS Relays	5 Amp
Connection Details	
Water Inlet	15mm Compression
Water Outlet	15mm Compression
Drain (via tundish)	3/4" BSP
Max Inlet Pressure	5 Bar
Max Coldfill Pressure	4.7 Bar
Nominal Flow Rate	12 l/min
Dimensions	
Height	270mm
Width	260mm
Depth	150mm
Unit Weight	7.5 kg

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 domestic and commercial heating and cooling systems. It is designed for use in a "normal" environment.

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. 0612047.

The Mikrofill EFD is intended for wall mounting. The unit should be mounted at such a height as to enable the liquid crystal display to be easily read.
(see page 7).

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 EFD is supplied complete with a flexible hose which must be connected to 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.

Fill Pressure:

The EFD is capable of filling a system to within 0.3 bar of the inlet water pressure.

Where the mains water inlet pressure exceeds 5 bar please contact our technical department on 08452 60 60 20 for further installation information.

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 incoporated into the system at this point. Please refer to the typical installation diagram on page 7. If you require any assistance regarding vessel sizing please contact our service department. The final connection into the 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

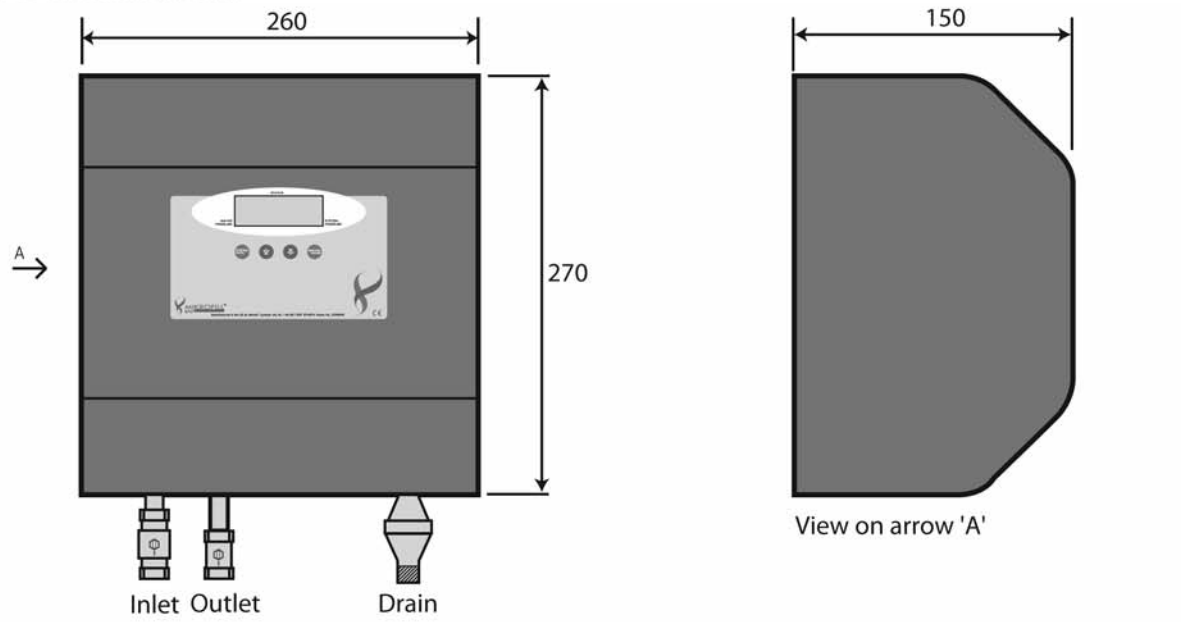
The expansion vessel nitrogen/air charge must be set to the same pressure as the cold fill pressure of the system*.

* 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 required.

1.3 Drain

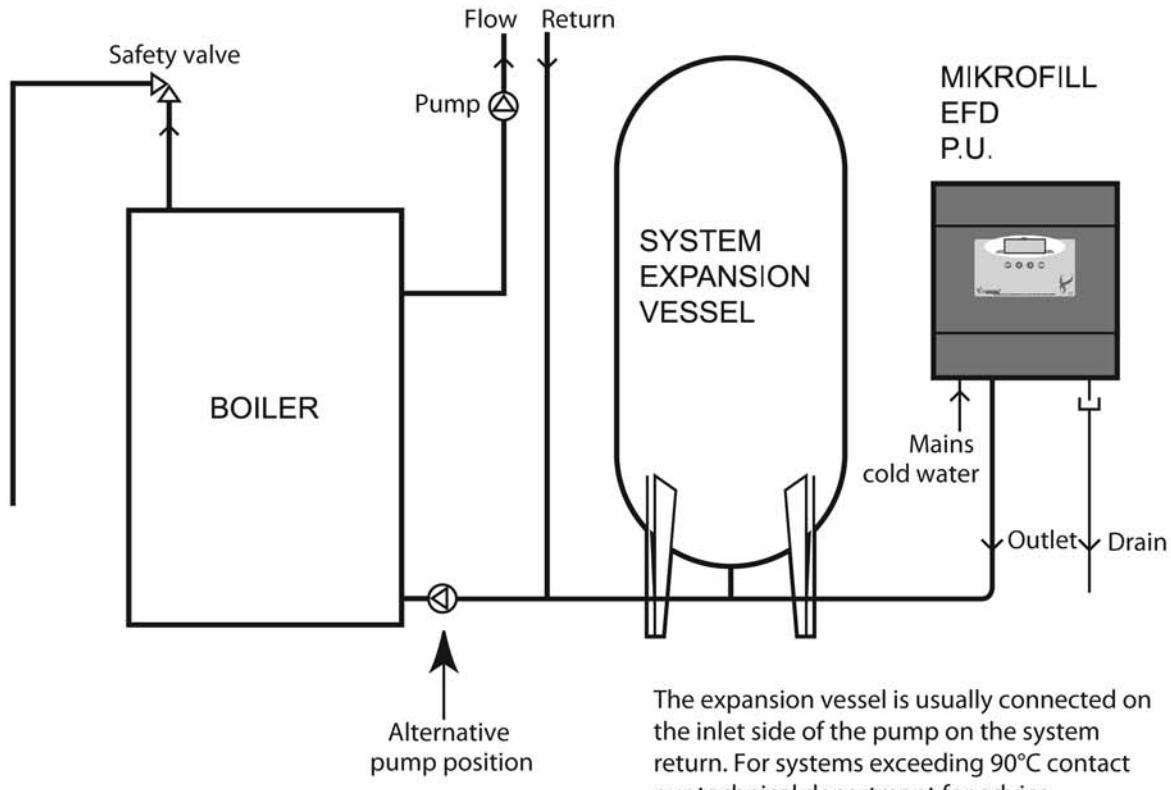
Following every filling procedure, the EFD will discharge a small amount of water establishing an air break. For this the Mikrofill EFD is supplied fitted with a 3/4" BSP tundish, which must be connected to a suitable drain. Mikrofill Systems Ltd cannot accept responsibility for any conseqeuntial damage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

1.4 Dimensions



Weight 7.5kg

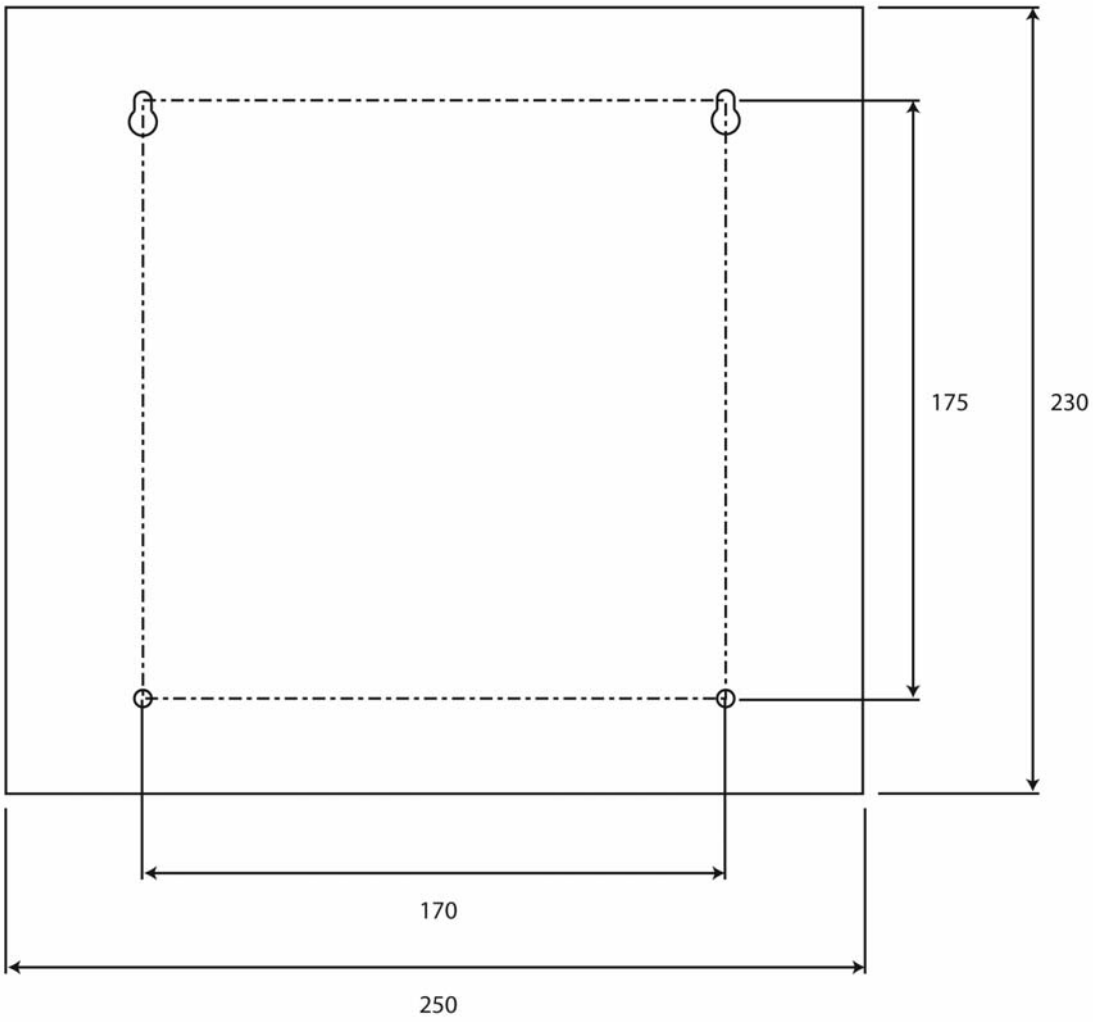
Typical installation diagram



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.

1.5 EFD Dimensions for fixing



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.

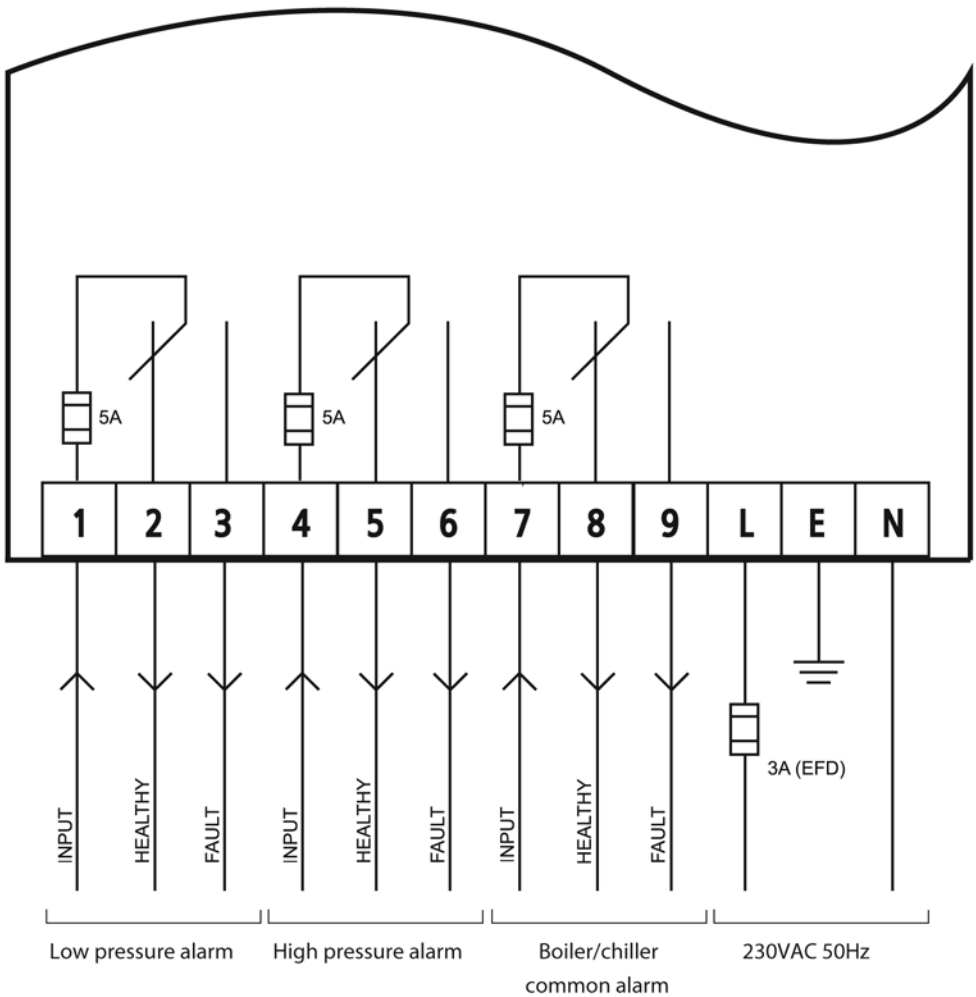
2 Electrical connections

The Mikrofill EFD requires a permanent 230V 50Hz 1 phase fused 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 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/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 indcated on the display. The relays are suitable for use on control voltages upto 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 3 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

3 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 mode the keypad buttons are for information only and do not affect any of the parameters preset in the service mode.
(For information on service mode see section 9, page13)

4 Status display

4.1 Pressure correct

The EFD continuously monitors the system pressure, when the system pressure is within the set parameters the unit will show Pressure Correct on the LCD display

4.2 Filling stopped due to low mains water pressure

The EFD continuously monitors the inlet water pressure, if the pressure falls below an acceptable level then the unit will operate a safety shutdown. When water pressure is reinstated the unit will operate as normal.

4.3 Hours run/water usage

This is accessed by scrolling the system data button.

4.4 Hours run/water usage reset

This is achieved by depressing the buttons simultaneously.

5 Alarm conditions

For information on the diagnosis of alarm conditions see section 5 "fault diagnosis".
Should you require to change any of the preset parameters to overcome alarm conditions - please see section 9 'Service Mode (adjusting settings)'.

5.1 Optional leak alert

The EFD can differentiate between normal system fill rates and excessive water demand usually due to a severe system leakage. If this situation occurs the EFD will shut down, and issue a leak alert warning showing 'filling stopped due to leak' or ' filling stopped due to possible leak'on the LCD. This alert must be reset manually, by switching off the EFD and switching back on. If the leak has been rectified the unit will operate as normal.

In some cases it may be required to disable or enable the flood alert facility.

To disable/enable the leak alert press and hold the SERVICE MODE service button when the display is showing 'Service mode' scroll through the service settings using the SYSTEM DATA system data button to get to leak alert setting. Change the setting from enable/disable using the or buttons.

5.2 High or low pressure alarms

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

5.3 Frequent use alarm

This alarm is to assist in diagnosing any small leaks that may be present in the heating (or cooling) system. If in any 24hr period the EFD operates more than the preset limit i.e. 25 times, then a frequent use will be shown (the operation of the unit will not be affected).

5.4 Frequent use reset

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

6 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 failure.

EFD Status/Fault conditions

Fault Indications	Cause	Remedies
Filling stopped due to low mains water pressure	Low mains water pressure	Investigate low mains water pressure
	Dirty filter	Clean valve filter
Sensor failure	Possible sensor fault	1. Switch unit off and back on. The unit should return to normal operation, if the unit displays a "flashing hash" in the bottom right hand corner of the display this indicates a possible fault, if this continues for 10 minutes the unit will go to sensor failure, indicating a genuine unit fault.
	Incoming voltage instability	2. If a voltage instablilty occurs the unit will not operate to fill the system and a "flashing hash" will appear in the bottom right hand corner of the display. This will only be present while there is a voltage instability. If this occurs for a 10 minute period the unit will go to sensor failure.
Low pressure alarm	System pressure low	Check system for leaks, switch unit off and back on to reinstate. Check low alarm settings.
High pressure alarm	System pressure high	Reduce pressure in system and check expansion vessel air charge/size. Check high alarm settings.
Filling stopped due to leak/possible leak	Possible excess water leak on the system	Check system for leaks, repair as necessary, then switch the off and back on to reinstate.
Frequent use alarm	Possible persistent water 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.

7 Manual override

In the unlikely event of a sensor failure the unit may give incorrect readings and could cause alarm conditions. If this occurs, a manual override can be employed by depressing the and the service mode buttons simultaneously for 3 seconds; thus reinstating the BMS relays in the unit. Before operating the manual override you must ensure there is sufficient pressure in the system. The manual override must not be employed if the unit has shown a flood alarm condition or, if there is insufficient pressure in the system.

8 Audible alarm mute

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

9 Service mode (adjusting settings)

The settings can be adjusted on site as follows:

8.1 Press and hold the service mode button for approx. 8 seconds

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

8.3 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 10)

8.4 After adjusting the settings, the unit will return to its normal operating mode approximately 30 seconds after release of the buttons

10 Menu functions

- Cold fill pressure - this is the required pressure of the system when the system is cold.
- Alarm low - the pressure at which the low pressure alarm relay will operate. Usually set 0.6 - 0.7 bar below the cold fill pressure.
- Alarm high - the pressure at which the high pressure alarm relay will operate. Usually set 0. 2 bar below the system safety valve setting.
- Usage - for information on water used in the system, no setting required - please note, to zero the usage, 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, set at 0.00 to disable 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 24hr 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.
- Contrast adjust - alters the contrast of the LCD display.
- Disable audible alarm - turns off the audible sounder.
- Fault log - logs the last five faults
  MP - Low mains water pressure
  LP - Low system pressure alarm
  HP - High system pressure alarm
  SF - Sensor failure
  DR - Leak alert due to no increase in pressure while filling
  FS - Leak alert due to drop in pressure while filling

11 Maintenance

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

EXPANSION VESSELS - Charge pressure should be checked annually, when the system is cold the air charge must be equal to the cold fill pressure of the EFD.

Nemko

MIKROFILL SYSTEMS LTD
WEST COURT
MERSE ROAD
NORTH MOONS MOAT
REDDITCH
WORCESTERSHIRE
B98 9HL

T: +44 (0)8452 60 60 20

F: +44 (0)8452 60 60 21

E: info@mikrofill.com

W: www.mikrofill.com

MFS/TDEFD/06/09

design & print by box clever marketing ltd
www.boxclevermarketing.com