Pressurisation Unit – Fluid Category 5
"Midi-Fill Digital®" Model – MFD - Datasheet

Description

"Midi-Fill Digital®" has been designed to comply with the Water Regulations, providing Fluid Category 5 backflow protection for filling and top-up of "other than a house" heating or chilled systems. **Filling loops with a Double Check Valve must no longer be used for "other than a house" primary circuits - see Water Regulations and WRAS interpretation**.

"Midi-Fill Digital®" is a compact & wall mounted filling and automatic make-up unit for adding water to a sealed system.

The primary components consist of –

- Fluid Category 5 backflow prevention – initial fill & top-up
- Pump – with anti seize daily pulse feature
- High & low pressure cut-outs with boiler control output
- Comprehensive BMS controls
- Digital display, setting buttons and button lock
- Self test monitoring system alerting of pressurisation fault **before** heating system is shut down
- Electronic water meters with monthly excessive filling warning trigger (adjustable)
- Pressure transducer- accurate filling and small differential

The unit is supplied fully assembled and tested. Inlet and outlet stainless steel braided hoses with Servicing Valves and push fit connections are provided to facilitate installation.

Applications

Filling and topping up (make-up) –

- Primary Heating Systems
- Under Floor Heating
- Refrigerating Equipment
- Chilled Water Circuits
- Cooling Circuits
- Industrial Processes

WRAS APPROVED PRODUCT

Water Regulations

Clause G24.2 (page 8.24) allows a temporary connecting pipe (quick fill loop) to be used for a **house heating system only** - since the Fluid Category is 3. For "other than a house" applications, the risk is Fluid Category 4 (unless risk assessed by the water supplier and downgraded) and a quick fill loop must not be used – **not even temporarily** (page 6.6, 4a). *For systems that have been risk assessed and downgraded to Fluid Category 3 refer to datasheet "Autofill" – model AFCA*. The non-house system could be filled through an RPZ valve or AB air gap and pump, the latter arrangement is incorporated into the "Midi-Fill Digital®".

"Midi-Fill Digital®" does not require annual servicing and does not need to be notified to the local water company.

Specification - Mechanical

Connection hoses (supplied)	15 or 22 mm stainless braided metal push fit with serv. valve
Pressure Supply min.	1.0 bar dynamic
Pressure Supply max.	10 bar
Cistern Capacity	7 Lt
Enclosure	Wall mounted with lockable door
Weight (wet)	25 kg
Water Regulations Approval	1707367

Materials

Cabinet	Steel (powder coated RAL 7032)
Pump (wetted parts)	Brass (regenerative)
Cistern	Polypropylene
Fittings	Brass or stainless steel

Model shown - MFD22 *– Fluid Category 5*
Sizes - 15 or 22 mm Supplied with flexible hoses incorporating Servicing Valves

Specification – Electrical

Volts/Phase/Frequency	230/1/50
Supply	via 6 A MCB isolator (not supplied) RCBO recommended
Motor type	Induction (brushless)
Low level cut out	Stops pump (BMS & warning lamp on door) – auto reset
Max. current BMS relays	8 A resistive @ 230 V a.c.
Control circuit protection	3 A fuse inside enclosure
Switch Enclosure	IP65
Cable Entries	M20 hole
Solenoid (22 mm only)	230 V 50 Hz IP65
IP Rating EN60529	IP65 (230 V controls)
Power Consumption	535 W
Full Load Current	2.3 A

Boiler & BMS Controls Overview

"Midi-Fill Digital®" addresses the common weakness of pump seizure due to infrequent use by pulsing the pump each day - *no water is admitted into system*. A self test program ensures the pump can generate pressure; otherwise the BMS fault relay activates and the specific fault is displayed on the LCD panel. This self monitoring system warns of faults **before** the system needs topping up and therefore alerts before low pressure boiler shut down situations. These are invariably disruptive and costly – especially for schools.

BMS relay O3 is "User Configurable", allowing groups of faults and warnings to be monitored or ignored. For example, the user may wish to monitor only a single parameter, such as excessive filling for the month. The state may be reversed from "Healthy = contacts open" to "Healthy = contacts closed". Alternatively O3 relay may be configured as a pulsed water meter.

The pump can be manually tested during maintenance and disabled during installation using the controls on the panel.

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Digital Controller

The unit is factory commissioned for systems up to 10 m head. For taller buildings, the cold-fill pressure can be increased using the buttons on the front panel. *Note - the buttons can be locked to prevent tampering*. The following adjustments are permitted –

- Cold fill
- High cut-out pressure
- Excessive monthly water consumption warning trigger

The controller ensures a workable program; since settings must be in range. E.g. the low cut-out pressure is automatically adjusted to 0.3 bar below the cold fill. The high cut-out pressure must be more than 0.5 bar above the cold-fill switch on value.

Panel display messages include –

- System healthy
- Last filled date
- Water consumption – since zeroing
- Water consumption – since 1st of that month
- Low level fault
- Low system pressure fault
- High system pressure fault
- Pump fault
- Excessive monthly water usage warning

Electronic Water Meter

The "Midi-Fill Digital®" incorporates a built-in electronic water meter, which determines the system volume; enabling the quantity of inhibitor to be added via a dosing pot. The meter also indicates any system leakage, which again helps with re-dosing after repair. The meter can be zeroed from the panel. An excessive monthly consumption warning feature is also provided, where a second meter reading illustrates the filling since the 1st of the month. If the filling exceeds the user defined trigger value, a visual warning is displayed on the panel and the warning relay closes. *Note – the boiler control is unaffected and the warning will automatically clear on the 1st of each month – if not cleared manually earlier.* The Flood Protection System (FPS) can be enabled (supplied disabled), preventing the unit from feeding a major leak in the system - a visual warning is displayed and BMS fault relay activated and the pump will be stopped if the monthly warning trigger value is exceeded.

Where a pulsed water meter is required to monitor water consumption, the user configurable BMS relay can be used as a pulsed water meter (1 pulse / litre) – rather than BMS faults.

Adjustable Parameters

Cold Fill	Switch on 0.6 – 3.2 bar (falling) **(max. suggested head 30 m)** Switch off differential 0.2 bar
High cut-out	5.8 bar max (rising) Must be at least 0.5 bar more than cold fill. *E.g. if left at 2.8 bar default, cold fill cannot be set above 2.3 bar*
Electronic water meter monthly trigger point	10 – 1000 Litres

Factory (Default) Settings –

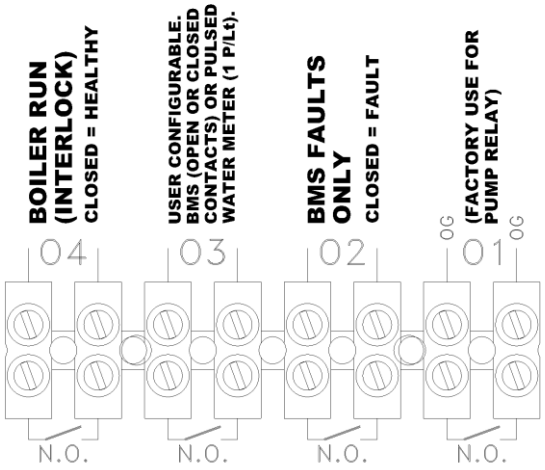
Cold Fill	Switch on 1.2 bar (falling) Switch off 1.4 bar (rising)
Low cut-out (automatic)	0.3 below cold fill = 0.9 bar (falling)
High cut-out	2.8 bar (rising)
Electronic water meter monthly trigger point	50 Litres

Boiler & BMS Controls

Two volt free SPST N.O. relays are provided in the control box for BMS monitoring. The operation is shown in the table below, where ● = contacts closed. The installer has a choice of running one or two BMS monitoring signals back to the panel. Where just one pair of wires is available the installer can choose between - BMS for faults only (relay O2) or combined faults/warnings (relay O3) - see table below.

CONDITION	FAULTS ONLY	BMS USER CONFIGUR-ABLE	BOILER RUN / INTER-LOCK
PRESSURISATION (RELAY NUMBER)	**O2**	**O3**	**O4**
NO POWER (e.g. unit isolated or power cut)			
HEALTHY (no faults or warnings)			●
FAULT – LOW LEVEL (internal tank water level)	●	● G1	●
FAULT – LOW CUT-OUT (low system cut-out pressure)	●	● G1	
FAULT – HIGH CUT-OUT (high system cut-out pressure)	●	● G1	
FAULT – PUMP SEIZED? TRANSDUCER FAULT? (inc. self test)	●	● G1	●
FAULT – FLOOD PROTECTION SYSTEM	●	● G1	●
FILLING DISABLED		● G2	●
WARNING – EXCESSIVE FILLING THIS MONTH		● G3	●
PULSED WATER METER OUTPUT ENABLED INSTEAD OF BMS		● ● ● ● ●	●

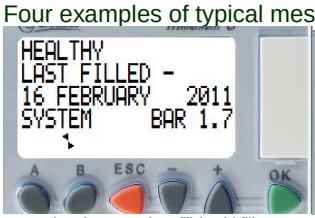
G1, G2, G3, refer to groups, which can be ignored (disabled).
Factory default – as above – all faults and warnings enabled.
Pulsed water meter disabled.



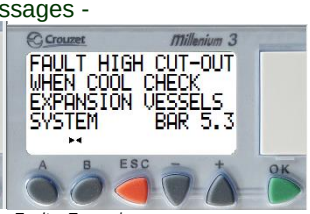
*CONTROL TERMINALS AM176**

Display

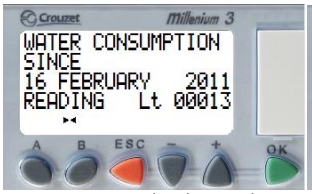
Four examples of typical messages -



Normal – alternates last fill / cold fill



Fault – Excessive pressure



Water consumption since zeroing

Consumption this month

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Filling Rates / Boiler Size

The table below shows the filling rates for both the 15 & 22 mm models. The 22 mm version has a fast-filling solenoid in place of a float valve and a faster system filling rate.

Filling Mode	System Pressure	15 mm	22 mm
	bar	Lt/hr	Lt/hr
Filling Rate	1.0	720	1000
Suggested Boiler Size		0 – 200 kW	Above 200 kW

Codes and Descriptions

Size	Code	Description
15 mm	MFD15	Midi-Fill Digital® Pressurisation Unit
22 mm	MFD22	Midi-Fill Digital® Pressurisation Unit

Ancillaries

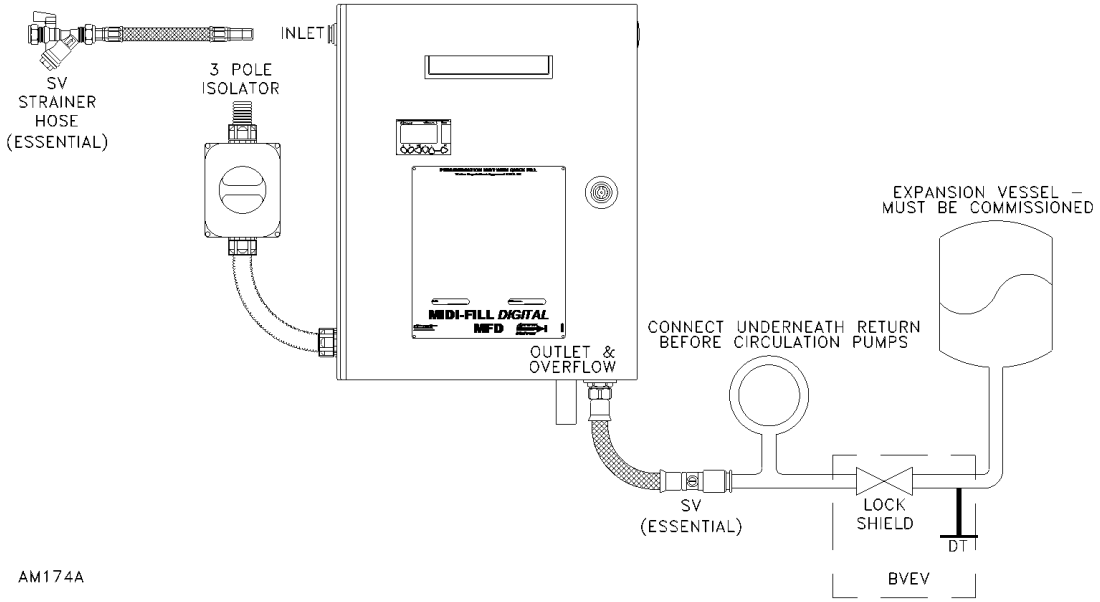
The sealed heating system requires a correctly sized expansion vessel and controls.

Available from Arrow Valves –

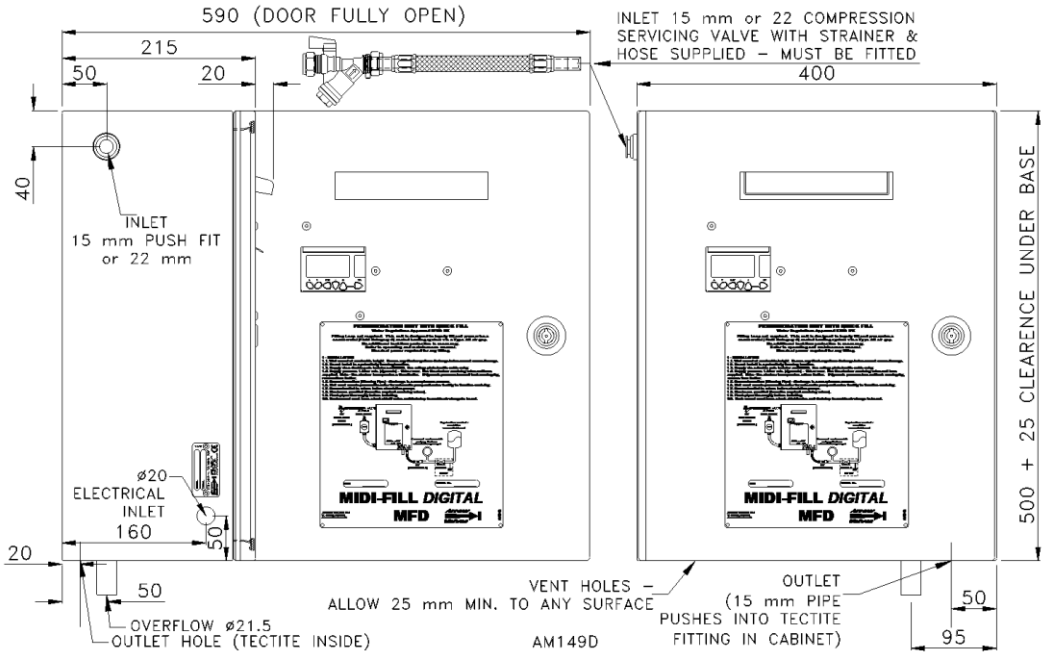
- Wall Mounting Bracket – MIDIBRA
- Stainless Steel Drip Tray – BTDT3
- Bespoke programming
- Expansion Vessels - EVCP
- Expansion Vessel Servicing Valve c/w Drain Tap – BVEV
- Dosing Pots - DP
- Dirt & Air Removers (Deaerators) – ADR

Model - EVCP

Installation Schematic



Dimensions



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