NOTE: This product should be disposed of according to all applicable local and national government environment regulations and guidelines!

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All STM® products are specially selected by our experienced technical team at Macnaught®, ensuring they meet our strict quality standards.

For Warranty Terms and Conditions see https://www.stm.net.au/warranty

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COMBINATION	PARTIAL REGISTER	Total Register
1	Litres (L)	Litres (L)
2	Gallons (Gal)	Gallons (Gal)
3	Quarts (Qts)	Gallons (Gal)
4	Pints (Pts)	Gallons (Gal)

Changing the Unit of Measurement

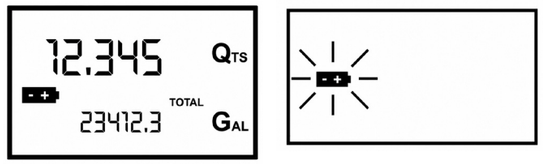
STEP	ACTION
1	Ensure the flow meter is in Standby mode.
2	Briefly press the MENU and RESET buttons simultaneously.
3	The current unit will flash.
4	Press RESET to scroll through the available unit combinations.
5	Press and hold MENU to save the selected combination.
6	The flow meter will restart and operate using the newly selected units.

NOTE : Total and Reset Total values are automatically converted to the selected unit. Recalibration is not required after changing the unit of measurement.

4. MAINTENANCE

The digital flow meter is designed for minimal maintenance. Routine maintenance is limited to battery replacement and turbine cleaning.

4.1. Battery Replacement



The flow meter is equipped with a two-stage low battery indicator.

- **Low Battery Warning**– The battery icon remains continuously displayed, indicating that the batteries should be replaced soon.
- **Battery Exhausted:** – The battery icon flashes, and the flow meter will no longer operate until the batteries are replaced.

To replace the batteries:

- Press the RESET button to update the displayed totals.
- Remove the four cover screws and lift off the battery cover.
- Remove the depleted batteries.
- Install two new AAA 1.5 V alkaline batteries, observing the correct polarity.
- Refit the battery cover, ensuring the sealing gasket is correctly positioned.
- Tighten the cover screws securely.

NOTE : Battery replacement does not affect the stored calibration or totalizer values.

WARNING : Dispose of used batteries in accordance with local environmental regulations.

4.2. Turbine Cleaning

Clean the turbine whenever contamination or debris affects measurement accuracy or turbine rotation.

To clean the Turbine:

- Remove the flow meter from the installation.
- Carefully remove any dirt or debris from the turbine using a suitable cleaning method.
- Ensure the turbine rotates freely before reinstalling the flow meter.
- Replace the turbine if smooth rotation cannot be restored.

CAUTION : Do not use compressed air to clean the turbine, as excessive rotational speed may damage the turbine.

5. TROUBE SHOOTING

Problem	Cause	Solution
Display does not turn ON	Batteries are discharged or installed incorrectly.	Replace the batteries and verify correct polarity.
	Poor battery contact.	Inspect and clean the battery terminals. Ensure proper battery contact.
	Battery compartment not properly closed.	Reinstall and securely fasten the battery cover.
Low measurement accuracy	Calibration factor is incorrect.	Perform on-site or percentage calibration.
	Flow meter operating outside the recommended flow range.	Operate within the specified flow rate.
	Air trapped in the system.	Prime the system and remove trapped air.
	Fluid viscosity outside the specified range.	Use only approved fluids within the specified viscosity range.
Low or no flow indication	Turbine obstructed by debris.	Remove and clean the turbine.
	Flow direction installed incorrectly.	Verify installation follows the IN and OUT flow direction markings.
	Blocked filter or pipeline.	Clean or replace the filter and remove any blockage.
Flow is present but no volume is registered	Turbine is jammed or damaged.	Clean or replace the turbine assembly.
	Internal electronic fault.	Contact an authorized service centre
Unstable or fluctuating readings	Air bubbles present in the fluid.	Purge the system before operation.
	Irregular or pulsating flow.	Maintain a steady flow rate during operation.
Flow meter cannot be calibrated	Incorrect calibration procedure.	Repeat the calibration procedure following the instructions in this manual.
	Reference volume is inaccurate.	Use a calibrated measuring container of known volume.
Buttons does not respond	Buttons not pressed correctly or meter not in Standby mode.	Ensure the flow meter is in Standby before accessing calibration or settings.
	Internal electronic malfunction.	Contact an authorized service centre.
Battery warning icon displayed	Battery charge is low.	Replace both batteries with new AAA alkaline batteries.
Meter resets unexpectedly	Batteries are loose or have poor contact.	Inspect the battery compartment and ensure the batteries are correctly installed.

LEADERS IN FLUID TRANSFER SOLUTIONS

INSTRUCTION MANUAL

DIGITAL DEF/UREA FLOW METER

S-FMDU100



Thank you for purchasing Digital DEF / UREA Flow Meter. This manual will assist you in the safe and reliable operation of this product.

4.1. Entering Calibration Mode

- Ensure the flow meter is in Standby mode.
- Press and hold the **MENU** button.
- The display will show one of the following calibration modes:
  - **FIELD** – On-site Calibration
  - **PERC** – Percentage Calibration
- Press the **RESET** button to switch between the available modes.
- Press the **MENU** button to confirm the selected calibration mode.

4.2. On-site Calibration

This procedure calibrates the flow meter using a known volume of fluid under actual operating conditions.

Before Calibration

For best results :

- Use the same fluid that will be measured during normal operation.
- Maintain a constant flow rate throughout the calibration.
- Use a calibrated reference container with a known volume (50 L recommended).
- Ensure all air has been removed from the system before calibration.

STEP	ACTION
1	Enter **FIELD** calibration mode.
2	Dispense the reference volume into the calibrated container.
3	The upper display records the pulse count while the lower display indicates the calibration attempt number.
4	Up to four calibration runs may be completed using different operating flow rates if required.
5	Press **RESET** to proceed to the next calibration run or skip unused calibration attempts.
6	After the final run, the display shows **End** if calibration is successful or **Err** if calibration failed.
7	Press **RESET** to save the new calibration factor and return to normal operating mode.

NOTE

- Increase the calibration value if the displayed volume is less than the actual dispensed volume.
- Decrease the calibration value if the displayed volume is greater than the actual dispensed volume.

4.3. Percentage Calibration

Percentage Calibration (Direct Modification of the Calibration Factor) is used to compensate for a known measurement error identified during normal operation. If the flow meter consistently indicates a higher or lower volume than the actual dispensed quantity, the calibration factor can be adjusted by applying the corresponding percentage correction.

The new calibration factor is calculated as follows:

Example

PARAMETER	•	VALUE
Error Percentage (E%)	•	-0.9%
Current Calibration Factor	•	1.000
New Calibration Factor	•	1.009

NOTE

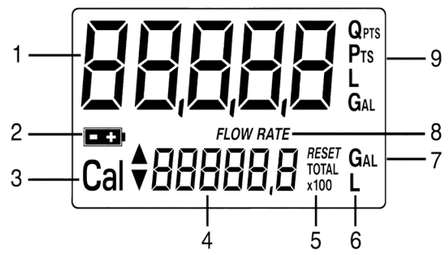
- If the indicated volume is **less than** the actual dispensed volume **(negative error)**, the calibration factor must be **increased**.
- If the indicated volume is **greater than** the actual dispensed volume **(positive error)**, the calibration factor must be decreased.

4.4. METER CONFIGURATION

The METER feature a menu with which the user can select the main measurement unit, Quarts (Qts), Pints (Pts), Litres (Lit), Gallons (Gal); the combination of the unit of measurement of the Partial register and that of the Totals is predefined according to the following table:

3.2. LCD Display

The LCD of the METER features two numerical registers and various indications displayed to the user only when the applicable function so requires.



Key / Indications :

1.	Partial register: 5 figures with moving comma from 0.1 to 99999, indicating the volume dispensed since the reset button was last pressed.
2.	Indication of battery charge.
3.	Indication of calibration mode (Cal).
4.	Totals register: 6 figures with moving comma from 0.1 to 999999, which can indicate two types of Total: 4.1. Accumulative total that cannot be reset (TOTAL) 4.2. Resettable total (Reset TOTAL)
5.	Indication of total multiplication factor (x10/x100)
6.	Indication of type of total (TOTAL/Reset TOTAL)
7.	Indication of unit of measurement of Totals: **L (Litres), Gal (Gallons)**
8.	Indication of Flow Rate mode
9.	Indication of unit of measurement of Partial: **Qts** (Quarts), **Pts** (Pints), **L** (Litres), **Gal** (Gallons)

3.3. USER BUTTONS

The S-FMDU100 features two buttons (Reset and Menu) which individually perform two main functions and, together, other secondary functions.

Main functions:



Reset key (left key): Resetting the partial register and resettable total (Reset TOTAL).



Menu key (right key): Entering instrument calibration mode.

Used together, the two keys permit entering configuration mode, useful for changing the units of measurements and calibration factor.

4. CALIBRATION

The flow meter is factory calibrated to provide accurate measurement under normal operating conditions. If the meter is used with fluids of different viscosity or at flow rates close to the minimum or maximum operating limits, recalibration is recommended to maintain optimum accuracy.

Calibration Modes

The flow meter provides two calibration methods:

- On-site Calibration – Calibrates the meter using a measured quantity of fluid under actual operating conditions.
- Percentage Calibration – Adjusts the calibration factor by applying a percentage correction to compensate for a known measurement error.

NOTE : During calibration, normal dispensing functions are disabled. Calibration data is stored in the flow meter's non-volatile memory and is retained even if the batteries are replaced.

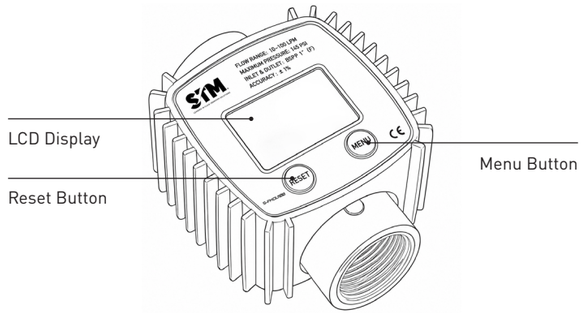
TECHNICAL SPECIFICATIONS

Model	S-FMDD100
Measurement System	Turbine
Resolution (Nominal)	High Flow : 0.010 L/ pulse Low Flow : 0.005 L / pulse
Flow Rate Range	10–100 L/min
Maximum Operating Pressure	145 PSI (10 Bar)
Minimum Burst Pressure	580 PSI (40 Bar)
Storage Temperature	-20°C to 70°C
Inlet / Outlet	1" BSPP (F)
Maximum Storage Humidity	95% RH
Operating Temperature	-10°C to 50°C
Flow Resistance	0.30 bar at 100 L/min
Viscosity Range	2 – 5.35 cSt (centistokes)
Accuracy	±1% after calibration within 10–90 L/min
Repeatability (Typical)	±0.3%
Display	Liquid crystal LCD featuring: • 5-digit partial total • 6-digit resettable total (×10 / ×100) • 6-digit non-resettable total (×10 / ×100)
Power Supply	2 × 1.5 V AAA alkaline batteries
Battery Life	24 months
Product Net Weigh	0.25 kg (including batteries)

3. PRODUCT OVERVIEW

3.1. DEF / Urea Digital Flow Meter

The digital flow meter utilizes a turbine measurement system to accurately measure the flow and total quantity of compatible fluids. As fluid passes through the meter, the turbine rotates and generates electronic pulses, which are processed and displayed on the LCD.



Key Features

- High-precision turbine measuring system for accurate flow measurement.
- Suitable for measuring Urea / DEF.
- Quality body construction with threaded inlet and outlet ports for easy installation.
- Integrated sealed design minimizes the number of potential leak points.
- Large LCD with simultaneous display of Flow Rate, Partial Total, and Resettable/Non-resettable Total.
- Two operating modes:
  - **Normal Mode:** Displays flow rate, partial total, and cumulative total.
  - **Flow Rate Mode:** Displays instantaneous flow rate and partial total.
- Non-volatile memory retains calibration and totalizer data, even when batteries are removed or during extended power loss.

1. SAFETY INSTRUCTIONS

- Read and understand this manual before installation, operation, or servicing of the flow meter.
- Use the flow meter only for approved fluids (Diesel/Kerosene or Urea,DEF or water depending on model).
- **Do not** use near open flames, sparks, or ignition sources.
- **Do not** operate in areas with flammable vapours, explosive atmospheres, or corrosive environments.
- **Do not** expose the device to rain, flooding, or direct water ingress.
- Wear appropriate PPE including safety glasses and fuel-resistant gloves.
- Avoid direct contact with Urea.
- **Do not** modify this product in any way otherwise warranty will be void.

⚠ **WARNING :** Unauthorized servicing will void warranty.

2. GENERAL INSTRUCTIONS

- Install the flow meter according to IN / OUT flow direction markings.
- Ensure all connections are clean, tight, and leak-free before operation. Verify compatibility with the systems pressure and flow specifications before use.
- Only use this meter within specified pressure, temperature, and flow limits.
- Ensure system is fully primed and free from air before measurement.
- Do not operate if any abnormal readings or malfunction is observed.
- Always operate the device in a stable and controlled manner.
- Do not use excessive force on fittings, connectors, or housing.
- Ensure proper sealing of all joints to maintain measurement accuracy.
- Store in a clean, dry, and protected environment when not in use.
- Protect from dust, moisture, and mechanical impact.
- Ensure ports are capped or protected during storage.
- Keep the flow meter clean and free from contamination buildup.
- Inspect seals and fittings periodically for wear or leakage.
- Replace meter if damaged.

WHAT'S IN THE BOX

DEF / UREA Digital Flow Meter 1
User Manual 1

DIMENSIONAL DRAWING (mm)

