

flowmate **1400**

1400 - FLOWMATE

OPERATION INSTRUCTIONS

VERSION 1.1

**1400 REMOTE 200 LITRE KIT
1400/R REMOTE 1400 90 LITRE KIT
AND
1400/3 FLOWMATE / BAZOOKA KIT**

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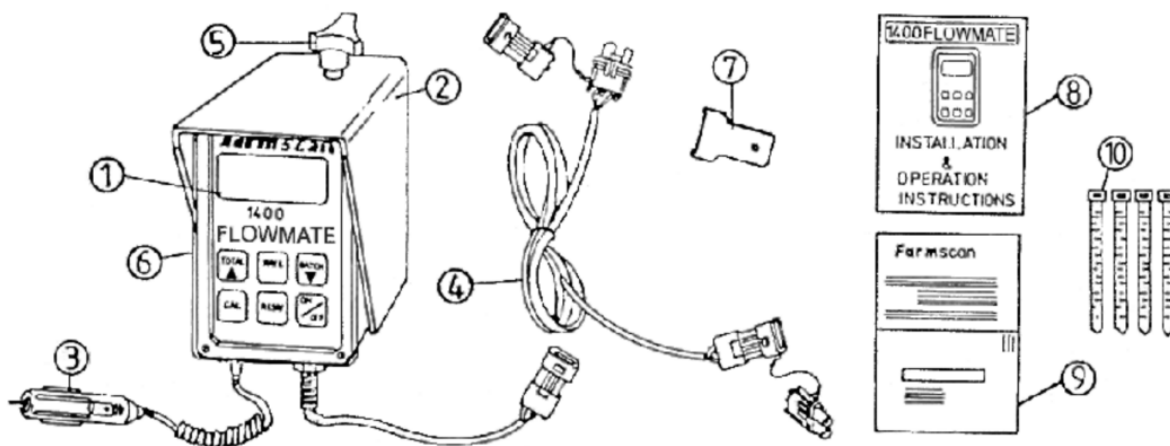
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1.0 Component List

1.1 Common Parts

1400 REMOTE & 1400/3 FLOWMATE KIT:

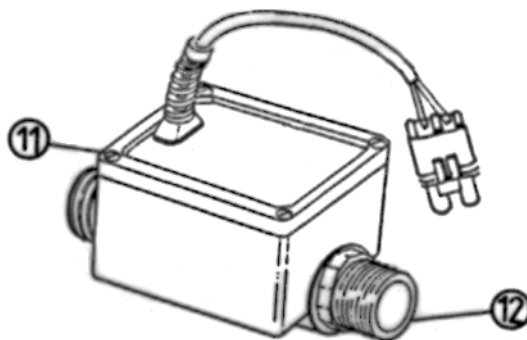
REF	PART No.	DESCRIPTION	QTY
1	A-1400R	REMOTE FLOWMATE UNIT	1
2	AH-500	WEATHER COVER 1000 SERIES	1
3	AC-500	D.C. RECHARGE CABLE	1
4	AC-205	5m 2 WAY PACKARD EXTENSION CABLE	1
5	AH-861	SECURING KNOBS	1
6	AH-480	CLEAR KEYPAD MEMBRANE	1
7	AH-200	TURBINE SERVICE TOOL	1
8	AM-1400/R/3	INSTRUCTION MANUAL	1
9	AM-200	WARRANTY REGISTRATION CARD	1
10	HG-706	PLASTIC CABLE TIES 290 x 5mm	10



1.2 Additional Parts

1400 REMOTE FLOWMATE 200LT KIT:

11	AA-220	1" TURBINE FLOWSSENSOR COIL TYPE	1
12	HH-1100	1" BSPT POLY/GLASS NIPPLE	2



1400/3 FLOWMATE / BAZOOKA KIT:

13	AA-170	2" BAZOOKA FLOWSENSOR	1
14	AH-422	'U' CLAMPS 60mm	2

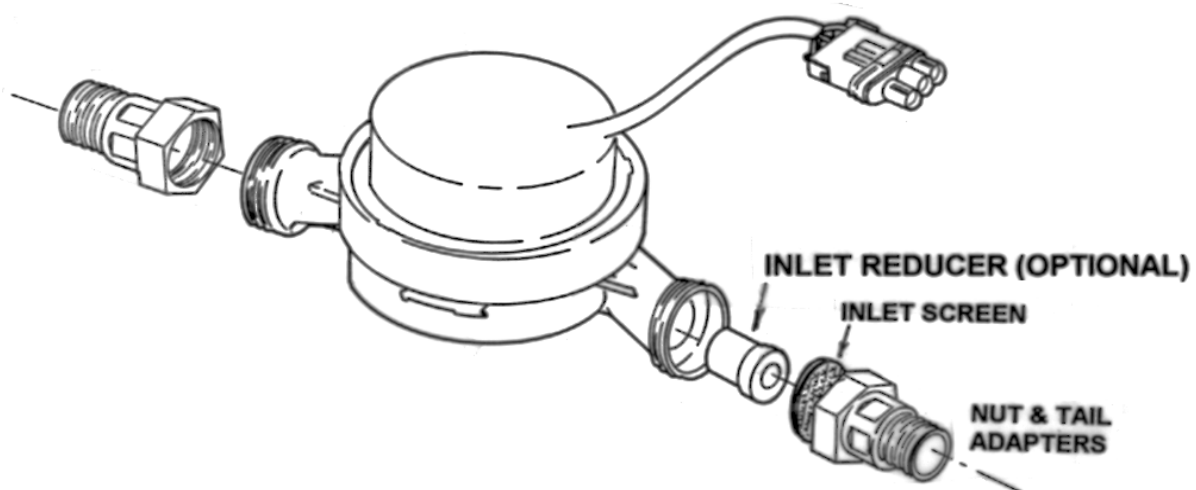
**1400/R REMOTE 1400 90 LITRE:**

1	A-1400/R/12	REMOTE 1400 DISPLAY 12 VOLT	1
2	AH-500	1000 SERIES WEATHERCOVER	1
3	AH-480	CLEAR KEYPAD MEMBRANE	1
4	AH-861	SECURING KNOBS	1
5	AC-101	8m POWER CABLE	1
6	AC-305	3 WAY 5m PACKARD EXTENSION CABLE	1
7	AA-120P	2 - 90L/MIN FLOWSENSOR	1
8	AH-430	20mm BRASS NUT & TAIL ADAPTERS	2
9	HG-706	CABLE TIES	20
10	AM-1400R	INSTRUCTION MANUAL	1
11	AM-200	FARMSCAN WARRANTY CARD	1

1.3 Optional Components

12	AH-130	*INLET REDUCER	1
13	AC-305	5m 3 WAY EXTENSION CABLE	1
14	AC-310	10m 3 WAY EXTENSION CABLE	1

*NOTE: Flowrate down to 0.5 LPM can be achieved using INLET REDUCER.



2.0 General Information

The 1400 FLOWMATE readout gives both an overall TOTAL of volume used and a resettable BATCH total for each operation. The flowrate (L/MIN or GAL/MIN) can be displayed whilst liquid is flowing.

Both the TOTAL AND BATCH readings can be reset or left to accumulate so you can reset the BATCH reading after each operation and keep the TOTAL readings for future reference.

Metering of Water, Diesoline and solvent based materials including most Agricultural Chemicals is possible. The meter is not suitable for acids such as defoliant.

After installing the equipment, the correct calibration factor must be established and set. The calibration factor will vary depending on liquid viscosity.

NOTE: In very cold conditions, the display digits may appear to change slowly, but this will not affect the accuracy of the meter.

3.0 Installation

3.1 Flowsensor Installation

Install the flowsensor in line with the direction of flow as shown by the arrow on the meter body, or the INLET or OUTLET stickers. Do not install the meter directly onto a vibrating pump.

The meter will work accurately on gravity feed, suction or pressure side of a pump providing the flow rate and pressure is within the designated range.

PART No.	TYPE	MIN FLOW	MAX FLOW	MAX PRESSURE
AA-220	1" TURBINE FLOWSENSOR	8 LPM (2 US GPM)	200 LPM (52 US GPM)	1000 kPa (145 psi)
AA-170	2" BAZOOKA FLOWSENSOR	50 LPM (13 US GPM)	500 LPM (132 US GPM)	1000 kPa (145 psi)
AA-120P	1" METAL BODY FLOWSENSOR	2 LPM (0.53 US GPM)	90 LPM (23 US GPM)	1000 kPa (145 psi)

NOTE: Flow rates down to 0.5 L/MIN (0.132 US gal/min) can be achieved on AA-120P only with INLET REDUCER option.

Make sure the Flowsensor can be easily removed for servicing of the impeller.

With 1" TURBINE FLOWSENSOR (AA-220), use nipples provided to avoid risk of damage from over length threads screwed into meter. With 1" METAL BODY FLOWSENSOR (AA-120P), nut & tail adapters must be used.

3.2 Readout Installation

Mount FLOWMATE readout in a protected location using weather cover to protect against direct moisture and sunlight.

Do not mount readout close to electric motors or petrol engines.

Replace clear membrane over keypad if lost or damaged.

Use 5m cable to connect flowsensor to FLOWMATE and ensure cable is secured away from risk of damage with cable ties.

3.3 Power

The 1400/R REMOTE 90 litre flowsensor requires a constant 12 volt D.C. source. There are no rechargeable batteries fitted.

Connect the RED / BLACK battery power cable direct to 12 Volts D.C. power.

RED to POSITIVE
BLACK to NEGATIVE

4.0 Operation

4.1 On/Off Key

When you press the ON/OFF key the readout will momentarily display the active calibration memory.

EG. OR OR

Then immediately display the current TOTAL litres in memory.

EG.

When you turn the meter OFF, all totals and calibration settings will remain in memory.

If the meter is not used for 30 minutes the display will shutdown to reduce power consumption. The display will re activate immediately flow commences or when a key (other than the ON/OFF key) is pressed.

Turn the meter OFF when not in use to conserve the batteries.

The readout will FLASH when batteries need recharging.

4.2 Total Key

Press the TOTAL key to display the current accumulated total volume.

The readout features a floating decimal point to allow the following resolution.

0 - 999.9	Tenths of a litre (or gallon)
1000 - 9,999,999	Whole litres (or gallons)

Because the readout is limited to four digits, above 9999 litres (or gallons) the total will be displayed in two consecutive screens with a one (1) second interval.

eg. 19,864 litres would appear firstly as:

Then:

To zero the TOTAL, first press TOTAL, then hold down the RESET key for approximately two seconds until display clears.

4.3 Batch Key

Press the BATCH key to display a separate accumulated volume total, similar to a car trip meter. You can zero the BATCH total independently of the overall TOTAL. Display resolution is the same as total volume.

To zero the Batch total, first press BATCH, then hold down the RESET key for approximately two seconds until display clears.

4.4 Rate Key

Press the **RATE** key at any time liquid is flowing to display instantaneous flow rate in litres per minute or gallons per minute.

5.0 Calibration

The FLOWMATE requires a correct calibration factor to be entered into any one of 3 calibration memories before operation.

The calibration factor refers to the number of electrical pulses per litre (PPL) or pulses per gallon generated by the turbine impeller.

The PPL calibration factor will vary for different viscosity materials.

Calibration factors may also vary with different installations.

Engraved into the underside of each 1" Turbine Flowsensor is a factory tested reference calibration factor for water. eg. PPL 113.3.

To read US gallons multiply engraved PPL factor by 3.785
To read IMP gallons multiply engraved PPL factor by 4.546

This factor may be entered if measuring water, but should be verified by metering a known quantity of liquid.

The TEST BATCH CALIBRATION PROCEDURE should be used to establish a new calibration factor (PPL) for other liquids of various viscosities and must be used for the 2" Bazooka Flowsensor.

The Calibration Factor will remain in memory, so long as the unit remains charged.

Once you know a new factor, it can be manually entered at any time using the MANUAL CALIBRATION PROCEDURE, so write it down for future reference.

5.1 Calibration Warning

If calibration factors are corrupted or lost due to discharged batteries, the readout will display HELP to indicate the calibration factors must be re entered.

eg. HELP

5.2 Manual Calibration Procedure:

1. Press CAL key in succession to choose one of three memory locations H1, H2 or H3. After each key press, the current calibration factor for that memory will be displayed.

eg. H1 ⇒ 113.3
H2 ⇒ 101.7
H3 ⇒ 125.4

- To engage one of the three calibration factors displayed, press RATE key after the required factor is displayed.

To alter a calibration factor, use UP or DOWN key first, then press RATE key to engage.

- Turn meter OFF then ON again to check that the correct calibration memory is engaged. (See OPERATION ON/OFF KEY)

5.3 Test Batch Calibration:

This procedure involves pumping or sucking an exact known quantity of liquid through the flowsensor. The FLOWMATE will count the total number of pulses generated then display the new calibration factor.

When pumping liquid, pre prime the meter to avoid counting errors at start of test. Any type of tap installed downstream of the meter will help.

If sucking liquid through the 1" Turbine Flowsensor take a calibrated bucket and fill to 20 litres (5 gal), start with the probe submerged and suck 15 litres (4 gal) out to avoid errors caused by sucking Air at the finish.

Use 20 litres (5 gal) or more for 1" Flowsensor
Use 100 litres (26 gal) or more for 2" Flowsensor

The test must be done with the meter fully installed and at the normal flowrate for best results.

Maximum test batch is 999 litres (or 999 gal).

5.4 Test Batch Procedure:

- Fully prime meter with liquid.
- Turn meter ON and press CAL key to select any memory location. (H1, H2 or H3).

eg.

- Press RESET key to display the default test batch quantity of 20 litres (or gallons).

eg. LITRES

- Use the UP or DOWN keys to alter the test batch quantity if desired.

eg. LITRES

5. Press RESET key to accept test quantity and the display will zero.

eg.

6. Now pump or suck the test quantity through the meter and shut off flow at the correct point. The total pulses counted will be displayed.

eg.

7. Press RESET to display the new calibration factor, which should be recorded for future reference.

eg. PPL

8. Press RATE key to engage new calibration factor.

9. Pump or suck a known quantity to verify the Calibration.

6.0 Battery Recharging

The FLOWMATE has inbuilt rechargeable Nickel Cadmium batteries, which can be charged via a normal 12 volt D.C. cigarette lighter socket.

When fully charged, the batteries will provide at least 500 hrs continuous use.

The FLOWMATE display will flash when the batteries are running low.

NOTE: DO NOT press CAL when display is flashing, otherwise Calibration Factors may be lost from memory.

To recharge the batteries, connect the charging cable, and then leave FLOWMATE OFF overnight to recharge the batteries. The green charge cable light will be 'ON' to indicate power from the cigarette lighter socket is active.

If batteries are totally flat, full recharge will take 16 hours. FLOWMATE may be operated whilst on recharge if necessary.

WARNING: The rechargeable batteries are not user serviceable. Do not remove the facia bezel screws as this will damage the seal and void the warranty.

Extending Battery life: The life of Rechargeable Batteries will be severely reduced by the practice of daily recharging. Best practice is to wait till the display starts flashing before recharge.

! CAUTION !

FLOWSENSOR MUST BE THOROUGHLY DECONTAMINATED BEFORE PERFORMING ANY MAINTENANCE OF WETTED PARTS.

7.0 Maintenance

1. Check INLET strainer for build up of debris, which may cause inaccurate readings.
2. Flush flowsensor with fresh water immediately after use.
3. Clean impeller magnets as explained in TROUBLESHOOTING if operation becomes erratic.
4. Recharge the batteries every three months if not using the meter regularly.

8.0 Troubleshooting

PROBLEM	POSSIBLE CAUSE / REMEDY
1. WON'T SWITCH 'ON'	<ul style="list-style-type: none"> a) Recharge batteries for 5 Min to regain basic battery operation. b) Make sure Green light on charger cable is ON when charging c) If no response from Meter, return FLOWMATE & Recharge cable, to your nearest Farmscan dealer or authorised service agent.
2. COUNTING INCORRECTLY OR READING WHEN NO FLOW	<ul style="list-style-type: none"> a) Recalibrate meter as explained using TEST BATCH PROCEDURE. b) If meter is subject to intense motor vibration, isolate meter from vibration with rubber hosing. c) If pump hammers, then fix pump or fit a suitable pulsation dampener. d) Keep meter away from petrol engine ignition wiring. e) Is Air being sucked through turbine? f) Follow Troubleshooting (3) to check impeller is not binding.
3. FLOWMATE WON'T COUNT	<ul style="list-style-type: none"> a) Make sure Calibration factor is set correctly. b) Disconnect Flowsensor cable at FLOWMATE end. Switch FLOWMATE on and press RATE key, then use a pair of long nosed pliers to intermittently short out across pins of connector plug into FLOWMATE, which should cause an erratic RATE readout. c) If No response return FLOWMATE to Farmscan Dealer for repair. d) If Response OK, repeat test (b) at Flowsensor end of extension cable back to FLOWMATE. e) If Response OK, then follow Turbine Service Procedure.
4. GREEN LIGHT ON CHARGER CABLE FAILS	<ul style="list-style-type: none"> a) Make sure vehicle ignition key is ON. b) Plug cable into a different vehicle to check if cigarette lighter socket is faulty. c) Remove knurled fitting at cigarette lighter end of charge cable and replace fuse with MAXIMUM 3AMP 3AG fuse. d) Replace faulty charge cable.

PROBLEM	POSSIBLE CAUSE / REMEDY
<p>5. TURBINE SERVICE PROCEDURE</p>	<p>a) Remove complete Flowsensor from plumbing and thoroughly decontaminate internally.</p> <p>b) Without mouth contact blow softly into INLET of Flowsensor and Turbine Impeller should spin freely for a couple of seconds.</p> <p>c) Disassemble Turbine using service tool supplied and inspect impeller magnets (x2) for metallic particle build up that will weaken magnetic strength.</p> <p>d) Scrub magnets clean with toothbrush and soapy water then reassemble as shown in drawing.</p> <p>NOTE: Sloppy fit of shaft into guides is Normal, as is a little end-play.</p> <p>e) Firmly tighten Turbine retaining ring and reset Turbine with soft blowing - Turbine should spin freely for a couple of seconds.</p> <p>If Turbine damaged, order full replacement kit AH-202 Black Turbine Kit.</p> <p>f) To Test Flowsensor electrically measure across pins of Flowsensor should read (50 - 70 Ohms Coil Resistance).</p>

9.0 Turbine Assembly

