

Balcrank®

High Flow DR Meter

Model 3120-120High Flow DR Meter



Thoroughly read and understand this manual before installing, operating or servicing this equipment.

Operation, Installation, Maintenance and Repair Guide

GENERAL SAFETY



! IMPORTANT

Read these safety warnings and instructions in this manual completely, before installation and start up of the control handle. It is the responsibility

of the purchaser to retain this manual for reference. Failure to comply with the recommendations stated in this manual will damage the control handle and void factory warranty.



! WARNING

Airborne particles and loud noise hazards.

Wear ear and eye protection.



CAUTION

- 1) Always read and follow the fluid manufacturers's recommendations regarding the use of protective eye wear, clothing, gloves, and other personal equipment.
- 2) Never alter or modify any parts of this product; doing so may cause damage and/or personal injury.



CAUTION

Maximum Fluid Pressure 1450 PSI (100 bar). Under no circumstances should the control handle be aimed at any person or your own body at anytime. Personal injury may result.



! WARNING

DANGER: Not for use with fluids that have a flash point below 100°F (38°C, examples: gasoline, alcohol). Sparking could result in an explosion which could result in death.



! WARNING

Always use the following Pressure Relief Procedure whenever shutting off, cleaning, or in any way checking or servicing the control handle:

- 1) Disconnect compressed air line or turn off power supply at the fluid pump.
- 2) Point the control handle outlet into a waste container and open trigger to relieve pressure.
- 3) Open any bleed-type supply air valves and fluid drain valves in the system.
- 4) Leave the drain valves open until you are ready to re-pressurize the system.

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PRODUCT DESCRIPTION

The High Flow DR Electronic meter is designed specifically for metering motor oils, automatic transmission fluid, antifreeze (Glycol) and antifreeze/water solution. When not in use for 30 seconds, the meter enters "sleep mode", which prolongs battery life. When in sleep mode, the meter is turned on by a simple press of the ON/RESET button or if the meter detects fluid flow.

The electronic register module can be programmed to dispense in pints, quarts, liters, or gallons and will totalize in liters or gallons. A calibration factor and unit of measure are programmed during factory test. The 5-digit liquid crystal display, accurate to the third decimal place, shows the exact amount of fluid dispensed.

TECHNICAL SPECIFICATIONS

Accuracy (after field calibration).....	+/- 0.5%
Flow range.....	1.0 - 18.5 Gal/min.
Max working pressure.....	1450 psi (100bar)
Weight.....	1.76lbs
Inlet.....	3/4" NPT compatible
Outlet.....	3/4" NPT compatible
Batteries.....	2 x 1.5V AAA
Operating Temp. Range.....	14°F - 140°F
Fluid compatibility.....	Oils (up to SAE 140), ATF, Antifreeze (Glycol), Antifreeze/ water solution
Wetted Parts.....	Aluminium, Acetal, NBR, Stainless Steel

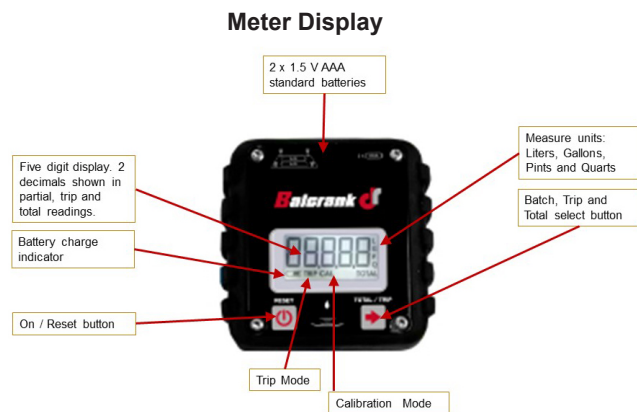
DISPLAY FUNCTIONS

ON/RESET BUTTON

Press once to switch on the meter. Press and hold for 1 second to reset the batch total or the "Trip" to zero. This button is also used when programming the unit of measure and during calibration.

SELECT BUTTON

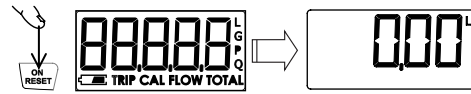
Press once to toggle through batch, trip, and cumulative totals. This button is also used when programming the unit of measure and during calibration.



OPERATION

Press the ON/RESET button to turn on the meter, The meter performs a check on the display by showing all the segments briefly (Fig. 1). If needed, reset the batch total to zero by pressing the ON/RESET button for 1 second.

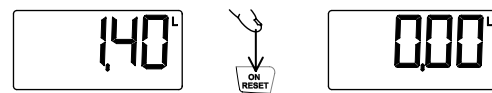
Fig. 1



TOTALIZERS

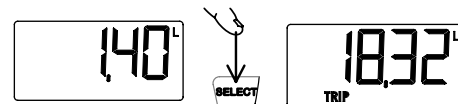
The BATCH total is a resettable total that displays the current running total while dispensing fluid. To reset the BATCH total, press and hold the ON/RESET button for 1 second (Fig. 2).

Fig. 2



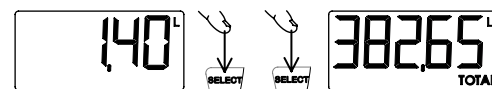
The TRIP is a resettable total that can be used to track the quantity that has been dispensed over a given period which can then be reset to zero when desired. The TRIP totalizer is reached by pressing the SELECT button (Fig. 3). To reset the TRIP totalizer, press and hold the ON/RESET button for 1 second.

Fig. 3

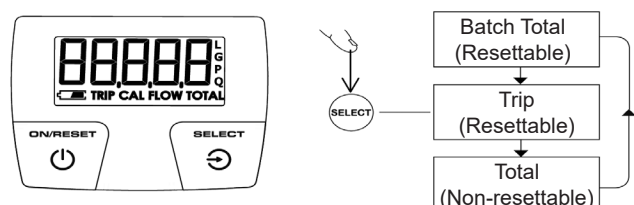


The TOTAL is a non-resettable total that keeps a running total for the life of the meter (Fig. 4).

Fig. 4



The TOTAL will automatically reset to zero (0), when it reaches a value of 99,999.



CONFIGURATION - Unit of Measure

The meter has four possible combinations of units of measure that can be set based on the table below.

Batch Total	TRIP Register	Total Register
Liters (L)	Liters (L)	Liters (L)
Gallons (Gal)	Gallons (Gal)	Gallons (Gal)
Quarts (Qt)	Quarts (Qt)	Gallons (Gal)
Pints (Pt)	Pints (Pt)	Gallons (Gal)

To change between these combinations, the meter must be in batch mode. With the meter displaying the batch total (Fig. 5) press and hold the ON/RESET and SELECT buttons simultaneously for 1 second (Fig. 6). The word "Unit" will appear in the display. You can then change the unit of measure by pressing the SELECT button until the desired unit of measure is displayed (Fig. 7). To save the new unit of measure, press the ON/RESET button (Fig. 8).

UNITS OF MEASURE

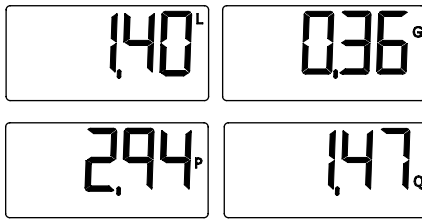


Fig. 5



Fig. 6

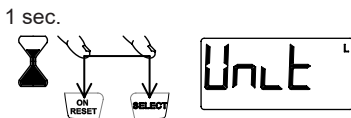
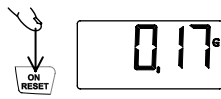


Fig. 7



Fig. 8



CONFIGURATION - Calibration

The meter is calibrated at the factory and does not normally require calibration for the fluids generally used in workshops. If using fluids with high or low viscosity, as well as if working with high flows or very low flows, calibration may be required.

Calibration may also be required after having used the meter for a long time, especially if working with fluids with that leave behind residues.

Verify the precision of the meter prior to use and proceed with calibration if required.

In order to perform the calibration process correctly the following rules must be adhered to:

1. The calibration can be performed for any volume, however it is recommended that a minimum of 1 unit (Quart, Gallon, Pint, Liter) and a maximum 25 units can be used.
2. The container used must be calibrated and be completely empty (prior use of the container can easily leave behind 0.1 quarts even if it appears to be empty). Put the container upside down for a while, or clean it before starting the calibration process.
3. When the fluid is being released you must wait until all the air contained in it is eliminated. This can take some time. If precision scales are used the accumulation of air has no effect.

CALIBRATION PROCEDURE

The calibration process is semi-automatic. To start the process, the meter must be in batch mode (Fig. 9) and is accessed by simultaneously pressing the buttons ON/RESET and SELECT for 3 seconds (Fig. 10). After releasing the buttons the current calibration factor is shown on the meter (Fig. 11).

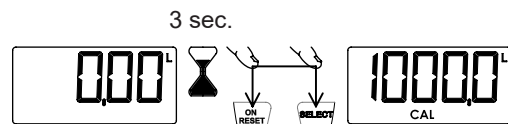


Fig. 9

Fig. 10

Fig. 11

If the screen does not show the correct unit of measure press the SELECT button (Fig. 12) successively until displaying the required unit (Fig. 13). Press ON/RESET (Fig. 14) to start the calibration process (Fig. 15).

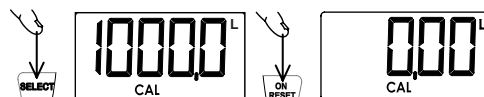


Fig. 12

Fig. 13

Fig. 14

Fig. 15

Begin dispensing the desired volume into the container. Remember that you must release at least 1 unit (Quart, Gallon, Pint, or Liter) to perform a good calibration. In the example shown the actual volume that has been dispensed is 2 liters according to the reading on the calibrated container (Fig. 16) and that the meter recorded 2.1 liters (Fig. 17).

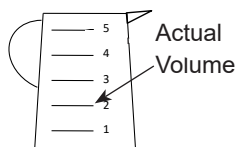


Fig. 16



Fig. 17

To adjust the meter to the actual quantity dispensed (measured in the calibrated container or scales), press the ON/RESET button for 1 second (Fig. 18). The digits start to flash (Fig. 19) indicating that the value shown can be modified. Each press of the ON/RESET button increases the value by 0.1 unit and each press of the SELECT button (Fig. 20) reduces this value by 0.1 unit (Fig. 21).

1 sec.



Fig. 18

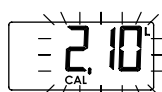


Fig. 19

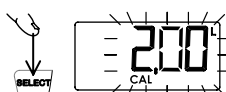


Fig. 20

Fig. 21

Once the meter has been adjusted to reflect the actual quantity that was dispensed (Fig. 21) press the ON/RESET button for 1 second (Fig. 22). The meter shows the new stored calibration factor (Fig. 23) and then exits the calibration process. The screen shows the batch total with the unit that was set during the calibration process (Fig. 24).

1 sec.



Fig. 22



Fig. 23



Fig. 24

If, during any phase of the calibration process, you wish to exit without saving the changes made you must press the SELECT button for 1 second. Likewise, if 30 seconds of inactivity elapses during the process, the meter switches off automatically and exits the calibration process without storing the data.

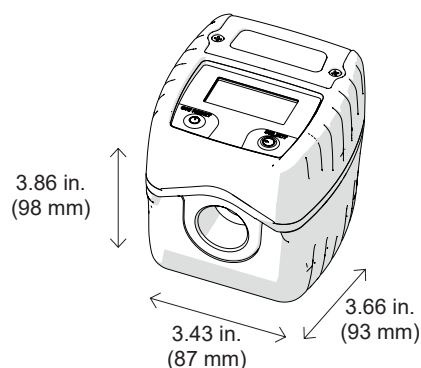


NOTE

For proper calibration it is important to:

- completely eliminate air from the system
- use an accurate sample container
- during calibration, ensure dispensing is done at a constant flow rate equivalent to normal dispensing until the container reaches the desired quantity. You may start and stop the flow but do not "trickle" flow
- after dispensing wait a short period to ensure any air bubbles have dissipated

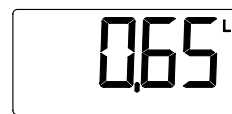
METER DIMENSIONS



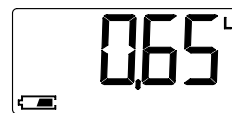
MAINTENANCE

The meter is designed to be virtually maintenance free. The only maintenance required is periodic battery replacement.

The meter comes complete with two 1.5 V size AAA alkaline batteries. The function of the low-battery alarm icon is shown below.



BATTERIES OK (NO ICON)



BATTERIES HALF CHARGED (HALF ICON)



BATTERIES DEAD (EMPTY ICON)
REPLACE THE BATTERIES

REPLACING THE BATTERIES



NOTE

Observe the polarity on the batteries when installing

The location of the batteries is shown below

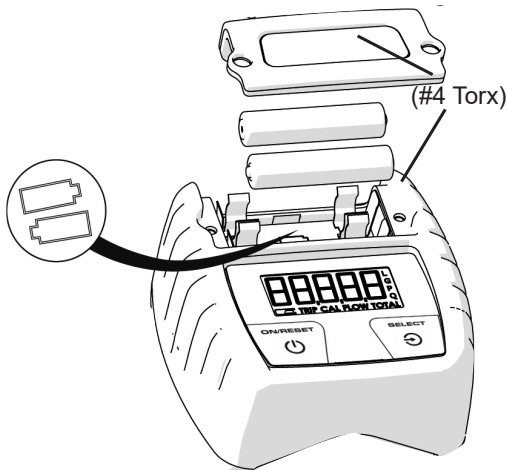
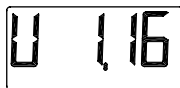


Fig. 25

1. Remove the four #4 Torx screws from the rear casing (4), then remove the back cover (Fig 25).
2. Remove the old batteries.
3. Install the new batteries (observe polarity).
4. Re-install the battery cover and tighten the screws.

When new batteries are installed, the display will briefly show the software version (similar to the below).



CLEANING THE FLUID CHAMBER / REPLACING THE OVAL GEARS

Refer to the steps below, the exploded view on page 7, and figure 26 (below) for cleaning the fluid chamber.

1. Remove the four #2 phillips screws from the rear casing (4), then remove the back cover
2. Lift off the front casing/display assembly (3)
3. Remove the eight 2.5mm allen screws of the metering chamber cover, then remove the cover (1)
4. Make note of the position/orientation of the oval gears (2), then remove the oval gears
5. Clean the chamber and the gears carefully using a soft brush
6. Replace the oval gears. When replacing the gears, the gear with magnet installs on the right side (Fig. 26). Magnets should face up with flush side on top. Before replacing the meter cover, insure the gears spin freely.
7. Replace the metering chamber cover and tighten the allen screws
8. Replace the top cover/display assembly, the back cover and install the phillips screws.

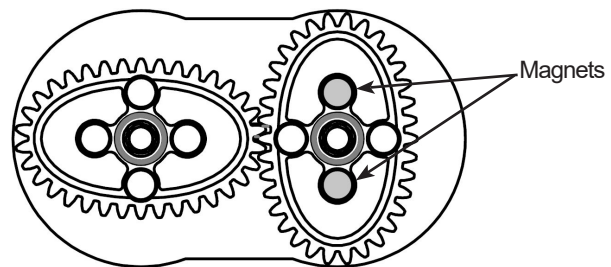


Fig. 26

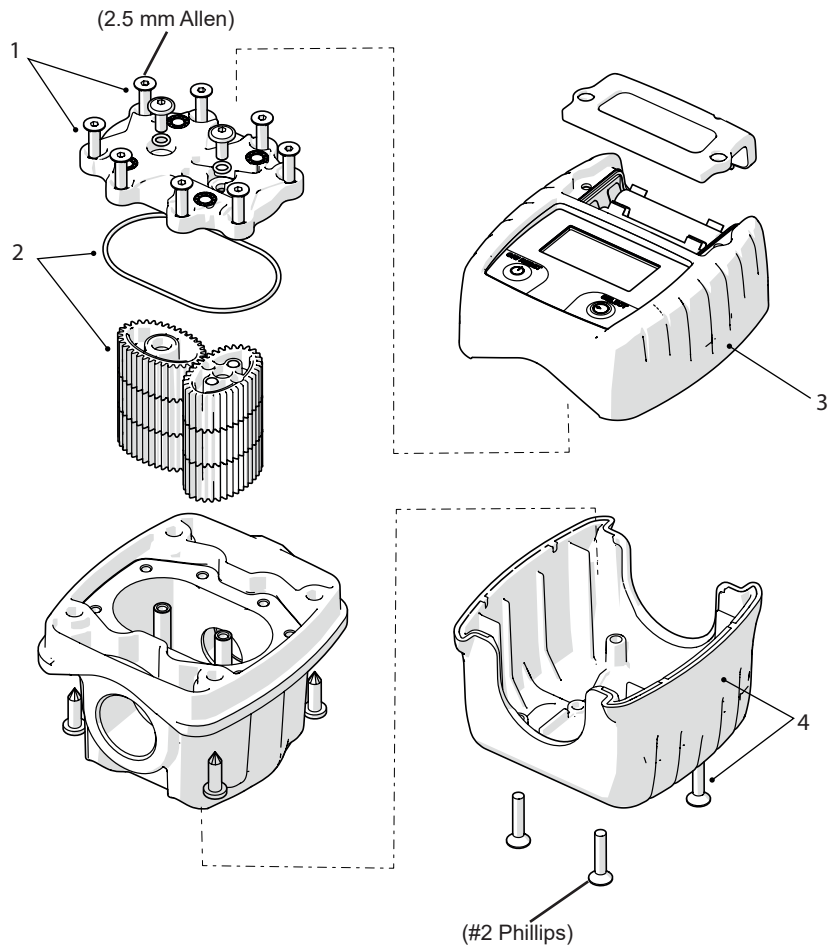


WARNING

Always use the following Pressure Relief Procedure whenever shutting off, cleaning, or in any way checking or servicing this equipment:

- 1) Disconnect compressed air line or turn off power supply at the fluid pump.
- 2) Point the control handle outlet into a waste container and open trigger to relieve pressure.
- 3) Open any bleed-type supply air valves and fluid drain valves in the system.
- 4) Leave the drain valves open until you are ready to re-pressurize the system.

EXPLODED VIEW



PARTS LIST

Item	Description	Qty
1	Counter-sunk screw	8
	Metering chamber cover	1
2	O-Ring	1
	Oval gear	6
	Magnet	2

Item	Description	Qty
3	Electronic card	1
	Front Casing	1
	Screw w/plastic thread PCB	4
	Screw w/plastic thread casing	4
4	Rear casing	1
	Self-tapping screw	4

REPAIRKITS

Description	Part Number	Included Items
Gears kit	833508	2
Circuit board kit	833311	3

TROUBLESHOOTING

Symptom	Possible Cause	Remedy
Blurred or unclear reading.	Batteries dead.	Replace the batteries
The meter does not switch on.	Batteries dead.	Replace the batteries
The meter is inaccurate.	Erroneous calibration factor.	Calibrate the meter
	A fluid with very high or very low viscosity is being used.	Calibrate the meter
	Very high or low fluid temperature.	Calibrate the meter.
	The meter is working outside its field of application (see technical specifications).	Restore the working conditions (flow, viscosity, temperature...) to those required by the meter
Reduced flow.	Debris in the fluid chamber.	Clean the fluid chamber
	Filter / strainer clogged	Clean or replace the filter / strainer
The meter does not count.	Faulty reed sensor.	Inform technical support

**For Warranty Information Visit
www.balcrank.com**

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Revision Log:

Rev. A - Release
Rev. B - Added Repair Part Numbers
Rev. C - Updated shroud image and diagrams

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Rev. B 08/15