

DR013
0311
0002

# DR LCD Instruction Manual



# INTRODUCTION

## SYSTEM DESCRIPTION OF THE Gx012P

### Functions and features

The flow rate / totalizer model DR is a microprocessor driven instrument designed to display flow rate, total and accumulated total.

This product has been designed with a focus on:

ultra-low power consumption to allow long-life battery powered applications (type DR012).

An aluminium housing offering IP67 (NEMA 4X) environmental protection.

### Configuration of the unit

The DR has been designed to be implemented in many types of applications. For that reason, a SETUP-level is available to configure your DR according to your specific requirements.

It includes several important features, such as K-factors, measurement units etc. All settings are stored in EEPROM memory and will not be lost in the event of power failure.

### Display information

The unit has a large transfective LCD with all kinds of symbols and digits to display measuring units, status information, trend-indication and key-word messages.

Flow rate and totals can be displayed by using the S button to move through the various options..

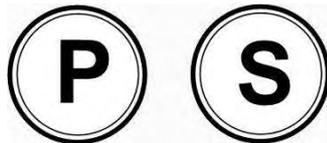
A backup of the total and accumulated total in EEPROM memory is made every minute.

## OPERATIONAL

### GENERAL

This chapter describes the daily use of the DR/DRA This instruction is meant for users / operators.

### CONTROL PANEL



The following keys are available:

### Functions of the keys



This key is used to program and save new values or settings. It is also used to gain access to SETUP-level.



This key is used to SELECT the display defaults, ACC.TOTAL, RATE, TOTAL, BATCH. The key is also used in the setup program to scroll through the base levels and options in each level.

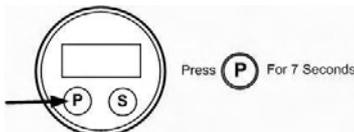


Pressing both keys simultaneously to CLEAR the value for total and batch then press P for NO or S for YES to clear the total/batch. In the setup mode pressing both keys simultaneously whilst in the upper levels of each of the functions will allow modification of the setting and pressing again will save setting.

## PROGRAMMING SETUP-LEVEL

### GENERAL

Configuration of the DR is done at SETUP-level. SETUP-level is reached by pressing the PROG/ENTER key for 7 seconds; at which time, setup will be displayed. In order to return to the operator level, PROG will have to be pressed for three seconds. Alternatively, if no keys are pressed for 2 minutes, the unit will exit SETUP automatically. SETUP can be reached at all times while the DR remains fully operational.



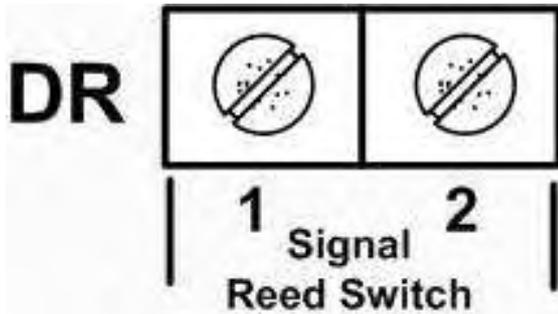
SETUP FUNCTIONS AND VARIABLES			
<b>1</b>	<b>TOTAL/BATCH TOTAL</b>		
	1.1	UNIT	L - m3 - UKGAL - USGAL - OILbbl -UKbbl –USbbl
	1.2	DECIMALS	0 - 1 - 2 - 3
<b>2</b>	<b>ACCUMULATED TOTAL</b>		
	2.1	UNIT	L - m3 - UKGAL - USGAL - OILbbl -UKbbl –USbbl
	2.2	DECIMALS	0 - 1 - 2 - 3
<b>3</b>	<b>RATE</b>		
	3.1	UNIT	L - m3 - UKGAL - USGAL - OILbbl -UKbbl –USbbl
	3.2	PERIOD	sec - min - hour
	3.3	DECIMALS	0 - 1 - 2 - 3
	3.4	CALCULATION	per 1 - 255 pulses (default 10)
	3.5	CUT-OFF	0.1 - 999.9 seconds (Default 35)
<b>4</b>	<b>METER</b>		
	4	METER SIGNAL	Reed Switch Only
	4.1	K FACTOR (Pulses per Unit)	0000.000 to 9999.999
<b>5</b>	<b>OTHERS</b>		
	6.1	TYPE	DR
	6.2	SOFTWARE VERSION	03.xx.xx
	6.3	SERIAL NO.	xxxxxxx

## Explanation of SETUP-functions

### SETUP PARAMETERS

SETUP PARAMETERS	
<b>TOTAL/BATCH TOTAL</b> <b>1.1</b>	<p>SETUP - 1.1 determines the measurement unit for total and batch total The following units can be selected:</p> <p style="text-align: center;">L - m3 - UKGAL - USGAL - UKbbl - USbbl - OILbbl</p> <p>Please note that the K-Factor entered in 4.1 should be in pulses per litre and unit adjustment is done automatically.</p>
<b>DECIMALS</b> <b>1.2</b>	<p>The decimal point determines for total and batch total the number of digits following the decimal point. The following can be selected:</p> <p style="text-align: center;">0000000 - 111111.1 - 22222.22 - 3333.333</p>
<b>TOTAL ACCUMULATED</b> <b>2.1</b>	<p>SETUP - 2.1 determines the measurement unit for accumulated total. The following units can be selected:</p> <p style="text-align: center;">L - m3 - UKGAL - USGAL - UKbbl - USbbl - OILbbl</p> <p>Please note that the K-Factor entered in 4.1 should be in pulses per litre and unit adjustment is done automatically.</p>
<b>Decimals</b> <b>2.2</b>	<p>The decimal point determines for accumulated total the number of digits following the decimal point. The following can be selected:</p> <p style="text-align: center;">0000000 - 111111.1 - 22222.22 - 3333.333</p>
<b>Flow Note</b>	<p><i>The settings for total and flow rate are entirely separate. In this way, different units of measurement can be used for each e.g. cubic meters for total and liters for flow rate. The display update time for flow rate is one second or more.</i></p>
<b>RATE</b> <b>3.1</b>	<p>SETUP - 21 determines the measurement unit for flow rate.</p> <p>The following units can be selected:</p> <p style="text-align: center;">L - m3 - UKGAL - USGAL - UKbbl - USbbl - OILbbl</p> <p>Please note that the K-Factor entered in 4.1 should be in pulses per litre and unit adjustment is done automatically.</p>
<b>TIME UNIT</b> <b>3.2</b>	<p>The flow rate can be calculated per second (SEC), minute (MIN), hour (HR) or day (DAY).</p>
<b>DECIMALS</b> <b>3.3</b>	<p>This setting determines for flow rate the number of digits following the decimal point. The following can be selected:</p> <p style="text-align: center;">00000 - 1111.1 - 2222.22 - 3333.333</p>
<b>CALCULATION</b> <b>3.4</b>	<p>The flow rate is calculated by measuring the time between a number of pulses, for example 10 pulses. The more pulses the more accurate the flow rate will be. The maximum value is 255 pulses.</p> <p><b>Note:</b> <i>the lower the number of pulses, the higher the power consumption of the unit will be (important for battery powered applications).</i></p> <p><b>Note:</b> <i>for low frequency applications (below 10Hz): do not program more than 10 pulses else the update time will be very slow.</i></p> <p><b>Note:</b> <i>for high frequency application (above 1kHz) do program a value of 100 or more pulses.</i></p>
<b>CUT-OFF TIME</b> <b>3.5</b>	<p>With this setting, you determine a minimum flow requirement thresh-hold, if during this time less than XXX-pulses (SETUP 26) are generated, the flow rate will be displayed as zero. The cut-off time has to be entered in seconds - maximum time is 999 seconds (about 15 minutes).</p>
<b>K-FACTOR</b> <b>4.1</b>	<p>With the K-factor, the flow meter pulse signals are converted to a flow rate. The K-factor is based on the number of pulses generated by the flow meter per selected measurement unit (SETUP 1.1), for example per liter. The more accurate the K-factor, the more accurate the functioning of the system will be.</p>
	<p>The setting allows a K Factor with up to 3 decimal places and 4 whole numbers eg; <b>1234.123</b></p>

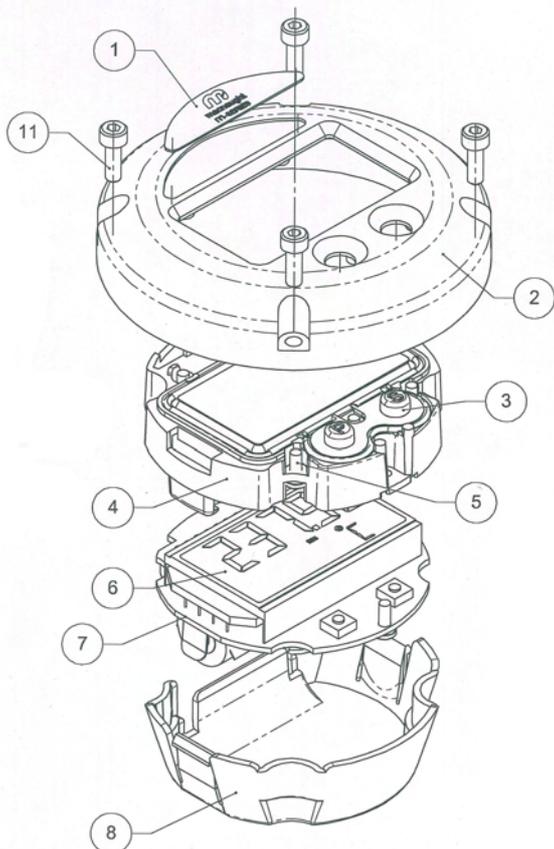
## Connections



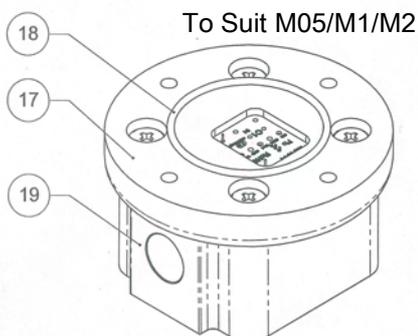
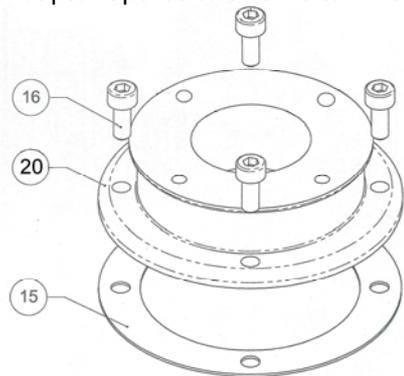
The DR unit can only accept a reed switch input, this sensor has been selected as the most common sensor and requires very little power with small effect on battery life.

The 2 position terminal block is not polarity conscious so the reed switch wires can be connected in any order.

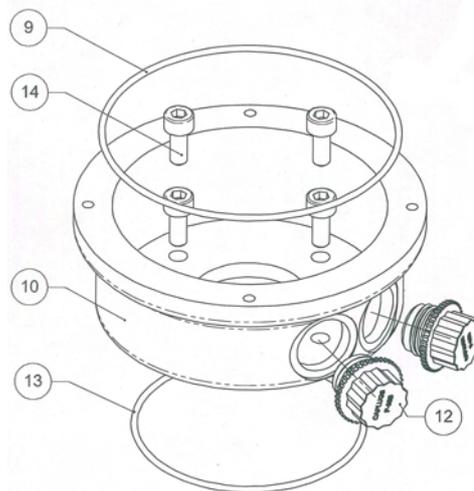
Connecting any other sensor type could cause damage to the electronics module



Adaptor Spares to suit M6 to M100



To Suit M05/M1/M2



Item.	Part No.	Qty	Description
1	DR004S	1	Label
2	DR001S	1	Front housing
3	DR011S	1	Button / Gasket moulded
4	DR009S	1	Upper PCB housing
5	N102S	6	Housing screw set M3 x 8 pan head taptite
6	DR007S	1	DR Electronics module (excluding battery)
7	DR012S	1	Battery (ER17505 Lithium 3.6V)
8	DR010S	1	Rear PCB housing
9	BS042S	1	NBR O'Ring
10	DR002MS	1	Rear aluminium housing (12mm conduit connections)
10	DR002NS	1	Rear aluminium housing (NPT conduit connections)
11	MS119S	4	Bolt SS SHCS M4 x 12mm
12	NA272S	2	M12 x 1.5 cap plug (Includes o'rings)
12	NA283S	2	3/8" NPT cap plug (Includes o'rings)
13	BS037S	1	NBR O'Ring
14	MS115S	4	Bolt SS SHCS M5 x 12mm
15	MS300S	1	Nitrile adapter gasket — Adaptor
16	MS115S	4	Bolt SS SHCS M5 x 12mm— Adaptor
17	DR006S	1	M05/M1/M2 Adaptor Cap
18	BS029S	1	Nitrile O'Ring
19			See M05/M1/M2 flow meter instruction manual
20	DR003S	1	Adaptor (M6/M10/M40/M50/M80/M100)

# TECHNICAL SPECIFICATION

## GENERAL

<b>Display</b>	
Type	High intensity reflective numeric and alphanumeric LCD, UV-resistant.
Digits	Seven 12mm (0.47") and seven 8mm (0.31"). Various symbols and measuring units.
Refresh rate	Flow Rate: once per second. Total: 8 times/second after key press to one second.

<b>Enclosures</b>	
General	Aluminium with Polycarbonate window, silicone and EPDM gaskets. UV stabilized and flame retardant material.
Control Keys	Two industrial micro-switch keys. UV-resistant silicone keypad.
Meter mount enclosures	Dimensions: 100mm diameter
Classification	IP67
Cable entry	Black Anodised

<b>Operating temperature</b>	
Operational	-20°C to +60°C (-4°F to +140°F).

<b>Power supply</b>	
Battery powered	Lithium battery - life-time depends upon settings - up to 3 years @ 20°C.

<b>Terminal connections</b>	
Type:	Terminal strip. Wire max. 1mm <sup>2</sup>

<b>Data protection</b>	
Type	Backup of all settings and running totals in flash memory.

<b>Environment</b>	
Electromagnetic compatibility	Compliant ref: EN 61326-1:2006, EN61010-1:2001

## INPUT

<b>Total / Batch total / Accumulated total</b>	
Digits	7 digits.
Units	L, m3, US-GAL, UK-GAL, US-bbl, UK-bbl, OIL-bbl.
Decimals	0 - 1 - 2 or 3.
Note	total and batch total can be reset to zero.

<b>Operator functions</b>	
Displayed functions	Flow Rate. Total (can be reset to zero by the operator). Batch total (can be reset to zero by the operator). Accumulated total (non resettable)

<b>Flow Meter</b>	
Type	reed-switch
Frequency	Total: minimum 0 Hz - maximum 120 Hz for total Flow Rate: 0.01 Hz – maximum 120Hz.
K-Factor	0000.001 - 9,999.999 pulses per unit of measure

<b>Flow Rate</b>	
Digits	7 digits.
Units	L, m3, US-GAL, UK-GAL, US-bbl, UK-bbl, OIL-bbl.
Decimals	0 - 1 - 2 or 3.
Time units	/sec - /min - /hr .