

HG 100 -75



HIGH FLOW OIL CONTROL GUN WITH ELECTRONIC FLOWMETER

macnaught

INSTRUCTION MANUAL

Introduction

Thank you for purchasing a Macnaught HG100 dispensing gun complete with IM75 meter, flexible extension and non-drip nozzle. The Macnaught oil dispensing gun and meter has been designed for use with engine oil, gear oil, automatic transmission fluid, anti-freeze/anti-boil and compatible fluids.

Macnaught also manufacture a complete range of ratio oil pumps and retractable oil hose reels, greasing equipment and accessories, to fulfil all your fluid handling or greasing requirements.

Please read and retain this instruction manual to assist you in the operation and maintenance of this quality product.

GENERAL INFORMATION

This manual assists you in operating and maintaining your new oil control gun. The information contained will help you ensure many years of dependable performance and trouble free operation.

Please take a few moments to read through this manual before installing and operating your new oil control gun. If you experience problems with this product, refer to the trouble shooting sections of this manual. If you require further assistance please contact your local Macnaught distributor or authorised Macnaught service centre.

IMPORTANT INFORMATION



**READ THIS INFORMATION
CAREFULLY BEFORE USE.**

Your safety is important to us. Please read and follow all safety instructions listed inside.

Some of these instructions alert you to the potential for personal injury. "Cautions" listed throughout this manual advise of potential practices or procedures which may cause damage to your equipment.

Ensure all operators have access to adequate instructions about safe operating and maintenance procedures.

Do not exceed the maximum working pressure of 10500 kpa / 1500 psi / 105 bar.



CAUTION

Do not hit the oil control gun if it fails to operate. Refer to "trouble shooting guide" or return the unit to your nearest authorised service centre.

Never point the nozzle at yourself or anyone else.

Never exceed the pressure rating of any component installed in the System.



Before every use check all hoses for signs of wear, leaks or loose fittings. Tighten all fluid connections regularly and replace weak or damaged hoses.

Before attempting any repairs or maintenance of this product firstly disconnect the air supply from the oil pump, then release the oil line pressure by squeezing the lever on your oil control gun.

ASSEMBLY

Use Teflon tape (or suitable thread sealant) when connecting the oil control gun to an oil hose.

MANUAL NOZZLE OPERATION

With the nozzle pointing away from you turn the nozzle tip clock-wise to open.

With the nozzle pointing away from you turn the nozzle tip anti-clockwise to close.

HANDLE OPERATION

Ensure the manual nozzle is open before operating the handle.

To latch the handle, squeeze the lever, push the latch button on the rear of the gun and then release lever.

To release the latch in simply squeeze and release lever.

METER OPERATION

IM75 ELECTRONIC REGISTER DISPLAY BUTTON

Each press of the **DISP** button will allow you to scroll through the meter options

Reset-able Batch Total
Reset-able Accumulative Total
Non Reset-able Accumulative Total
Flow rate

RESET BUTTON

The **RESET** button allows you to reset the Batch Total or the Reset-able Accumulative Total to zero.

To reset either the Batch total or Reset-able Accumulative total. Press the **DISP** button to scroll to either the Batch or Reset-able total. When the required total is displayed. Press **RESET** to zero the totalizer.

FLOWRATE

This display option shows the flow rate of the fluid passing through the meter.

SLEEP MODE

If NO flow goes through the meter for 60 seconds the display will go into sleep mode (Blank). The display will automatically wake if the buttons are pressed or flow occurs.

BATTERY REPLACEMENT

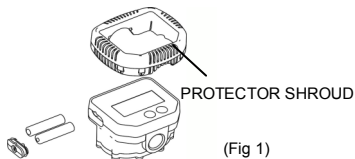
All data will be saved when the batteries are removed.

Note: Replace the batteries as soon as the battery indicator on the LCD is displayed.



- 1) Remove the plastic protector shroud from the meter body. (fig 1)
- 2) Remove the battery cover.
- 3) Replace the 2 x (AAA) Alkaline batteries. (Refer to the front of the meter for correct battery orientation).
- 4) Replace the battery cover and re-fit the plastic shroud.

Note: Only use Alkaline batteries.



Before carrying out any maintenance, disconnect the air supply to the pump and release the fluid pressure in the system by pressing the lever on the control gun.

Inspect your metered oil control gun daily for any signs of damage. Replace any damaged parts or components as required.

CONTROL HANDLE DISASSEMBLY

Use a clean bench to carry out maintenance.

- A) Remove the oil delivery hose from the control gun inlet swivel (14).
- B) Unscrew and remove swivel (14) from the control gun inlet.

- C) Carefully unscrew the valve cap (20), remove the valve spring (19) and valve stem assembly (15,16,17) from the gun body (8).

- D) Remove the Gun Handle (9).

CONTROL HANDLE REASSEMBLY

- A) Clean and inspect all parts for wear or damage. Replace any suspect, worn or damaged components.

Note: Lightly lubricate all o-rings and seals before assembly.

- B) If required, carefully place new o-rings (16,17,18) onto valve stem (15).

Note: o-ring (16) has a green dot and is different to the 2 o-rings (17).

- C) Re-fit the gun handle (9).

- D) Carefully insert the valve stem assembly(15,16.17) into the gun body (8).

- E) Replace the valve spring (19), then replace the valve cap.

Note: Ensure the valve spring locates around the nipple on the underside of the valve cap.

- F) Replace the swivel assembly (14).

Note: After assembly ensure the control gun handle operating correctly.

MANUAL NOZZLE MAINTENANCE

- 1) Using a spanner and strap wrench, unscrew the nozzle cap (1) from the nozzle body (6).

Note: All the nozzle seals must be replaced if the nozzle is disassembled.

- 2) Remove all the old seals from the nozzle body (6).
- 3) Inspect the nozzle cap (1) and nozzle body (6) for damage. Replace if found to be damaged.
- 4) Replace all the nozzle seals (2,3,4,5).
- 5) Lightly lubricate the seals, then reassemble nozzle.

METER DISASSEMBLY

Note: The electronic computer module is non-repairable. The meter will need to be replaced if found to be damaged or faulty.

- 1) Remove the 8 x socket head screws (22) from the meter cover (23).
- 2) Remove the meter cover (23) and o'ring (24).
- 3) Remove both rotors (25).
- 4) Clean and inspect all parts. Replace any suspect, worn or damaged components.

METER REASSEMBLY

NOTE: Ensure the rotor with the magnets is assembled on the same side as the batteries. The magnets in the rotor must face towards the electronic display.

- 1) Replace both rotors (25) so as they are at 90o to each other (see Fig 2). Check the rotor rotation by turning either of the rotors. If the rotors are not in mesh correctly or do not rotate freely remove one of the rotors and replace it correctly at 90o to the other rotor. Re-check the operation of the rotors.

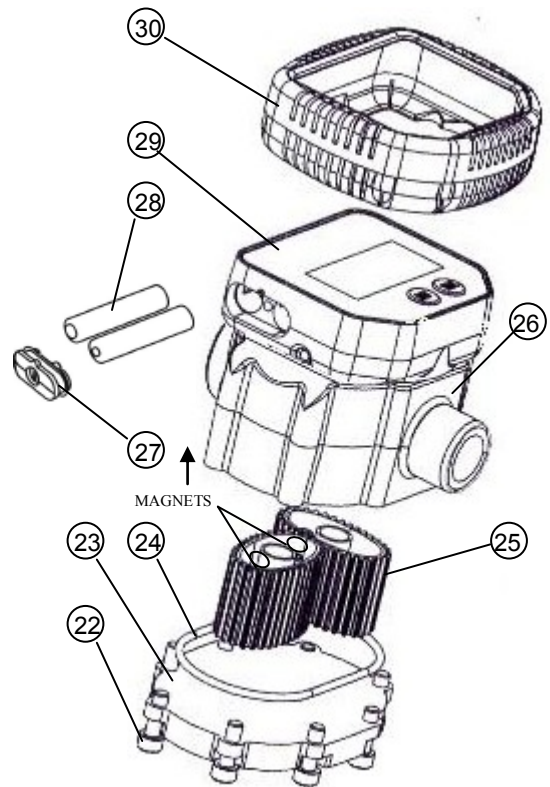
2) Lightly grease the o'ring (24) and place it on the meter body.

3) Clean the meter cover plate (23) and place it on the body. Take care not to damage the o'ring (24).

4) Install the 8 screws (22) and tighten in a diagonal pattern to 2nm (1.5 ft. lb). Visual check the cap has been pulled down evenly.

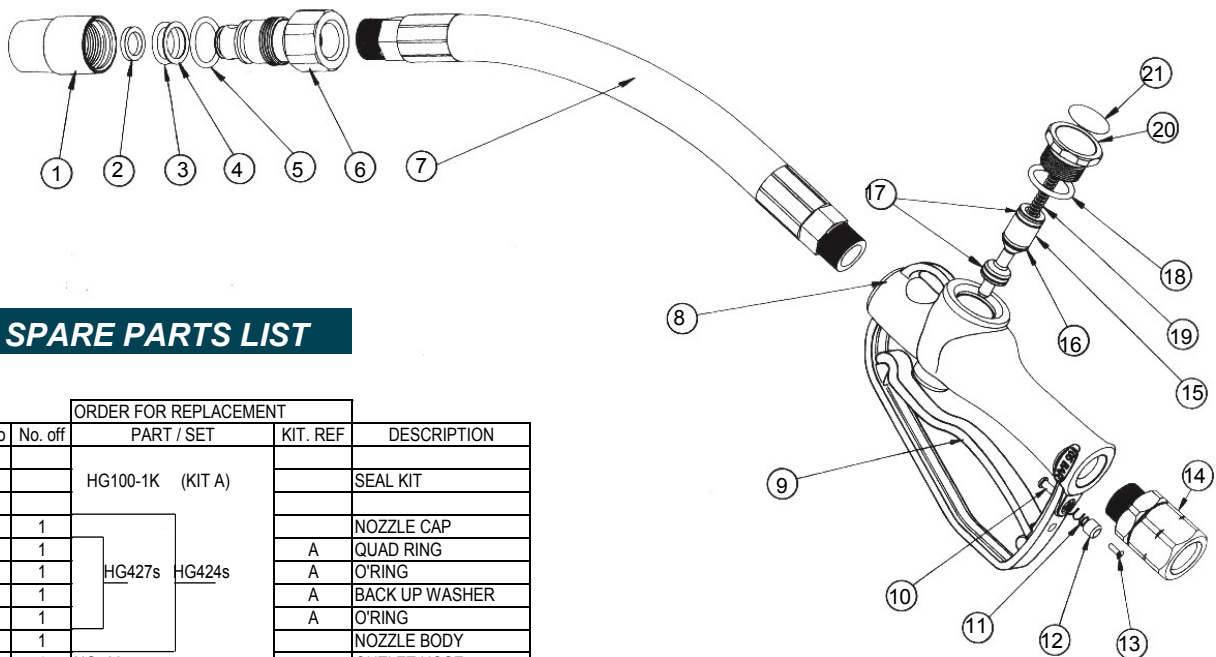
5) Test the meter by turning the rotors with a finger or by applying low air pressure (No more than a good breath) to the inlet port of the meter. This will confirm the meter is operating correctly.

IM75 PARTS DIAGRAM



IM75 SPARE PARTS LIST

ITEM	PART NO	No. off	ORDER FOR REPLACEMENT		DESCRIPTION
			PART/SET		
1	MS277	8		IM152s	SCREWS
2	IM152	1			METER COVER PLATE
3	BS147	1		ME022s	O'RING SEAL
4	ME022	2			ROTOR SET
5	IM151	1			METER BODY
6	IM060A	2	IM060As		BATTERY COVER
7	IM066	1	IM066s		BATTERIES
8		1	N/A		ELECTRONIC MODULE
9	IM071	2	IM071BKS = (BLACK)		PROTECTIVE SHROUD
9	IM071	1	IM071BUS = (BLUE)		PROTECTIVE SHROUD
9	IM071	1	IM071GRS = (GREEN)		PROTECTIVE SHROUD
9	IM071	1	IM071RDS = (RED)		PROTECTIVE SHROUD
9	IM071	1	IM071YLS = (YELLOW)		PROTECTIVE SHROUD



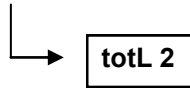
HG 100 SPARE PARTS LIST

ITEM	PART No	No. off	ORDER FOR REPLACEMENT		DESCRIPTION
			PART / SET	KIT. REF	
			HG100-1K (KIT A)		SEAL KIT
1	HG424	1			NOZZLE CAP
2	NX208	1			A QUAD RING
3	BS212	1		HG427s	A O'RING
4	HG427	1		HG424s	A BACK UP WASHER
5	BS214	1			A O'RING
6	HG425	1			NOZZLE BODY
7	HG423	1	HG423s		OUTLET HOSE
8	HG410	1	HG410s		GUN BODY
9	HG411	1	HG411s		GUN HANDLE
10	HG414	1			LATCH PIN
11	HG416	1	HG414s		LATCH SPRING
12	HG415	1			LATCH CAP
13	MS437	1			LATCH SCREW
14	HG421A	1	HG421s		SWIVEL (BSP)
14	HG422A	1	HG422s		SWIVEL (NPT)
15	HG412	1			VALVE STEM
16	HG428	1			A O'RING (Green Dot)
17	BS113	2	HG412s		A O'RING
18	BS122	1			A O'RING
19	HG417	1			A VALVE SPRING
20	HG413	1	HG413s incl items 18 & 21		VALVE CAP
21	HG418	1			LABEL

PROGRAMING DETAILS

The electronic module has been set up as follows:-

- a) Ensure the meter is awake before trying to enter the programming mode.
- b) If the meter goes into sleep mode during programming, it will automatically return to operating mode.
- c) To access the programs and settings, hold down the **RESET** button for 5 seconds



- d) To scroll through the setting options press the **DISP** button.

NOTE: Details for changing individual options .

For example to change the units setting on the batch total turn to item 2 - 21

2. TOTALS



- 21 change batch total (units)
- 22 change batch total (decimal point)
- 23 change resetable accumulative total (units)
- 24 change resetable accumulative total (decimal point)
- 25 change non-resetable accumulative total (units)
- 26 change non-reset accumulative total (decimal point)
- 27 change "K" factor

3. FLOWRATE



- 31 change flowrate (units)
- 32 change flowrate (decimal point)
- 33 change flowrate (time base setting)
- 34 set the amount of signal pulses to calculate flowrate
- 35 set minimum flow rate

4. DISPLAY



- 41 set sleep mode
- 42 change display (wake up default setting)
- 43 set sleep time

5. CALIBRATION



- 51 calibration adjustment

6. CONFIGURATION



- 6 configuration details

7. DIAGNOSTICS



- 71 diagnostic mode

2. TOTALS SETTINGS

totL2

21 BATCH TOTAL = unit 21 (set units)

- Press and hold down **RESET** for 5 seconds until "totL2" appears.
- Press **RESET** "unit 21" will appear.
- Press and hold down **RESET** for 2 seconds (program will appear)
- Press **RESET** to scroll through the settings (ltr, gal, qrt) to the desired units
- Press and hold down **RESET** until "program" disappears to accept setting.
- Press "**RESET**" for five seconds to return the meter to the operating mode.

22 BATCH TOTAL = dEC 22 (set decimal point)

- Press and hold down **RESET** for 5 seconds until "totL2" appears.
- Press **RESET** twice "dEC 22" will appear.
- Press and hold down **RESET** for 2 seconds (program will appear).
- Press **RESET** to set the decimal point to 1st, 2nd, 3rd or no decimal place. (e.g. 11111.1 = 1 decimal place).
- Press and hold down **RESET** until "program" disappears to accept setting.
- Press **RESET** for five seconds to return the meter to the operating mode.

23 RESETABLE ACCUM TOTAL = unit 23 (set units).

- Press and hold down **RESET** for 5 seconds until "totL2" appears.
- Press **RESET** 3 times "unit 23" will appear.
- Press and hold down **RESET** for 2 seconds (program will appear).
- Press **RESET** to scroll through the settings (ltr, gal, qrt) to the desired units
- Press and hold down **RESET** until "program" disappears to accept setting.
- Press **RESET** for five seconds to return the meter to the operating mode.

24 RESETABLE ACCUM TOTAL = dEC 24 (set decimal point)

- Press and hold down **RESET** for 5 seconds until "totL2" appears.
- Press **RESET** 4 times "dEC 24" will appear.
- Press and hold down **RESET** for 2 seconds (program will appear).
- Press **RESET** to set the decimal point to 1st, 2nd, 3rd or no decimal place (e.g. 11111.1 = 1 decimal place).

e) Press and hold down **RESET** until "program" disappears to accept setting.

f) Press **RESET** for five seconds to return the meter to the operating mode.

25 NON-RESET ACCUM TOTAL = unit 25 (set units)

- Press and hold down **RESET** for 5 seconds until "totL2" appears.
- Press **RESET** 5 times "unit 25" will appear.
- Press and hold down **RESET** for 2 seconds (program will appear)
- Press **RESET** to scroll through the settings (ltr, gal, qrt) to the desired units.
- Press and hold down **RESET** until "program" disappears to accept setting.
- Press **RESET** for five seconds to return the meter to the operating mode.

26 NON-RESET ACCUM TOTAL = dEC 26 (set decimal point)

- Press and hold down **RESET** for 5 seconds until "totL2" appears.
- Press **RESET** 6 times "dEC 26" will appear.
- Press and hold down **RESET** for 2 seconds (program will appear).
- Press **RESET** to set the decimal point to 1st, 2nd, 3rd or no decimal place (e.g. 11111.1 = 1 decimal place).
- Press and hold down **RESET** until "program" disappears to accept setting.
- Press **RESET** for five seconds to return the meter to the operating mode.

27 "K" FACTOR = kFac 27 (normal setting is 112.00 pulses)

- Press and hold down **RESET** for 5 seconds until "totL2" appears.
- Press **RESET** 7 times "kFac 27" will appear.
- Press and hold down **RESET** for 2 seconds (program will appear).

To change the 'K' factor, press **RESET** (digit will flash), to change digit press **RESET**.

Press **DISP** to scroll to the next number. Press **RESET** to change the value.

To change the decimal point, press **DISP** until it is in the required position. Press **RESET** to set the decimal point.

- Press and hold down **RESET** until "program" disappears to accept setting.
- Press **RESET** for five seconds to return the meter to the operating mode.

3. FLOW RATE

rAtE 3

31 UNITS = unit 31 (set units)

- Press and hold down **RESET** for 5 seconds until "totL2" appears.
- Press the **DISP** button 1 time to reach "rAtE 3".
- Press **RESET** "unit 31" will appear.
- Press and hold down **RESET** for 2 seconds (program will appear).
- Press **RESET** to scroll through the settings (ltr, gal, qrt) to the desired units.
- Press and hold down **RESET** until "program" disappears to accept setting.
- Press **RESET** for five seconds to return the meter to the operating mode.

32 DECIMAL POINT = dEC 32. (decimal point setting)

- Press and hold down **RESET** for 5 seconds until "totL2" appears.
- Press the **DISP** button 1 time to reach "rAtE 3".
- Press **RESET** twice "dEC 32" will appear.
- Press and hold down **RESET** for 2 seconds (program will appear).
- Press **RESET** to set the decimal point to 1st, 2nd, 3rd or no decimal place (e.g. 11111.1 = 1 decimal place).
- Press and hold down **RESET** until "program" disappears to accept setting.
- Press **RESET** for five seconds to return the meter to the operating mode.

33 TIME = tiME 33 (rate time base)

- Press and hold down **RESET** for 5 seconds until "totL2" appears.
- Press the **DISP** button 1 time to reach "rAtE 3".
- Press **RESET** 3 times "tiME 33" will appear.
- Press and hold down **RESET** for 2 seconds (program will appear).
- Press **RESET** to set time base (seconds, minutes, hours).
- Press and hold down **RESET** until "program" disappears to accept setting.
- Press **RESET** for five seconds to return the meter to the operating mode.

34 NUMBER OF PULSES = nuM 34

(Number of pulses used to calculate flowrate)

Note: When there is fluctuating flowrate present increasing the number will give a more accurate flowrate reading. (number range is 0 - 299).

- Press and hold down **RESET** for 5 seconds until "totL2" appears.
- Press the **DISP** button 1 time to reach "rAtE 3".
- Press **RESET** 4 times "NUM 34" will appear.
- Press and hold down **RESET** for 2 seconds (program will appear and the digit will flash). To change press **RESET**.

e) Press **DISP** to go to the next digit. To change press **RESET**.

f) Press and hold down **RESET** until "program" disappears to accept setting.

g) Press **RESET** for five seconds to return the meter to the operating mode.

35 FLOW = Cut 35 (Set minimum measurable flowrate)

This value is the maximum time (sec) to measure the number of pulses set in nuM34.

a) Press and hold down **RESET** for 5 seconds until "totL2" appears.

a) Press and hold down **RESET** for 5 seconds until "totL2" appears.

b) Press the **DISP** button 1 time to reach "rAtE 3".

c) Press **RESET** 5 times "Cut 35" will appear.

d) Press and hold down **RESET** for 2 seconds (program will appear and the digit will flash). To change press **RESET**.

e) Press **DISP** to go to the next digit. To change press **RESET**.

Note : Total number 999.9.

f) Press and hold down **RESET** until "program" disappears to accept setting.

g) Press **RESET** for five seconds to return the meter to the operating mode.

4. DISPLAY

diSP4

41 SLEEP MODE = SLP 41 (set sleep mode)

a) Press and hold down **RESET** for 5 seconds until "totL2" appears.

b) Press the **DISP** button 2 times to reach "diSP 4".

c) Press **RESET** "SLP41" will appear.

d) Press and hold down **RESET** for 2 seconds (program will appear).

e) Press **RESET** to select sleep setting (no sleep, sleep).

f) Press and hold down **RESET** until "program" disappears to accept setting.

g) Press **RESET** for five seconds to return the meter to the operating mode.

42 UNIT = unit 42 (set default display)

Note: The display will reset to the default units after a time which is set in time 43. If no units are set, the display will remain as selected.

a) Press and hold down **RESET** for 5 seconds until "totL2" appears.

b) Press **RESET** 2 times "unit 42" will appear.

c) Press and hold down **RESET** for 2 seconds (program will appear).

d) Press **RESET** to select required display (batch, reset total, total, rate, blank).

e) Press and hold down **RESET** until "program" disappears to accept setting.

f) Press **RESET** for five seconds to return the meter to the operating mode.

43 TIME = tiME 43 (time to revert to default display)

- a) Press and hold down **RESET** for 5 seconds until “**totL2**” appears.
- b) Press the **DISP** button 2 times to reach “**tiME 43**”
- c) Press and hold down **RESET** for 2 seconds (program will appear).
- d) Press **RESET** to select default time (5-20 seconds)
- e) Press and hold down **RESET** until “**program**” disappears to accept setting.
- f) Press **RESET** for five seconds to return the meter to the operating mode.

5. CALIBRATION

CALI 5

Note: Provides calibration adjustment up to +/- 5% of reading. You will need to calculate the percentage adjustment you require. If the meter is reading over you will need to enter a minus figure. If the meter is reading under you will need to enter a plus figure.

Step 1. Reset the batch reading to zero.

Step 2. Dispense at least 5 litres, using a constant flow rate, into a graduated calibrated container.

Step 3. Take the reading from the IM75.

Step 4. Calculate the % error as follows.

$$\% \text{ error} = ((\text{container volume} - \text{IM50 volume}) / \text{container volume}) * 100$$

Step 5. Enter the % error into the meter as calculated, if the value is negative enter a negative number.

51 CALIBRATION = CALI 51 (adjust calibration +/- 5%)

- a) Press and hold down **RESET** for 5 seconds until “**totL2**” appears.
- b) Press the **DISP** button 3 times to reach “**CALI 5**”.
- c) Press **RESET** “**CALI 51**” will appear.
- d) Press and hold down **RESET** for 2 seconds (program will appear and the first digit will flash)
- e) Press **RESET** to change number.
Press **DISP** to change the decimal point position, or go to the next number.
Press the **RESET** button to set the negative value.
- f) Press and hold down **RESET** until “**program**” disappears to accept setting.
- g) Press **RESET** for five seconds to return the meter to the operating mode.

6. CONFIGURATION

CONF 6

6 CONFIGURATION = CONF 6 (configuration details)

- a) Press and hold down **RESET** for 5 seconds until “**totL2**” appears.
- b) Press the **DISP** button 4 times to reach “**CONF 6**”
- c) Press **RESET** “**MOD**” plus model number will appear.
- d) Press **RESET** “**REL**” plus hardware release number will appear.

e) Press **RESET** the screen will flash between “**SOFT**” and the software release no’s (at 2 second intervals).

f) Press **RESET** the screen will flash between “**SEr**” and the 6 figure serial number (at 2 second intervals).

g) Press **RESET** “**MAN**” plus manufacturer number.

h) Press **RESET** the screen will flash between “**CONFIG**” and the configuration number (at 2 second intervals).

i) Press **RESET** for five seconds to return the meter to the operating mode.

7. DIAGNOSTICS

dIA 7

71 DIAGNOSTICS = dIA 7 (diagnostic mode)

- a) Press and hold down **RESET** for 5 seconds until “**MEtr 1**” appears.
- b) Press the **DISP** button 5 times to reach “**dIA 7**”.
- c) Press **RESET** “**dIA 71**” will appear.
- d) Press and hold down **RESET** for 2 seconds (Program will appear then all the segments should be displayed).
- e) Press the **DISP** button “**diSP**” (to check that the display button is working properly).
- f) Press the **RESET** button “**RESEt**” (to check that the reset button is working properly).
- g) Press and hold down **RESET** for 2 seconds (Program will disappear (check the condition of the reed switch).

Note: The display shows (**Hxx rYY**) when fluid flows through the meter. YY is the sensitivity of the reed switch.

The condition of the reed switch can only be checked when there is liquid flowing through the meter. The reed switch should be reading between 50 - 80.

h) Press **RESET** for five seconds to return the meter to the operating mode.

TROUBLE SHOOTING GUIDE

HG100 CONTROL GUN

TROUBLE	CAUSE	REMEDY
Constant oil leak from the nozzle	Damaged o'ring (16,17)	Replace damaged o'ring
Intermittent drip from the nozzle	Nozzle open or damaged	1) Remove the nozzle and blow out any dirt particles. 2) Close nozzle fully or replace the nozzle seals.
Oil leak from valve stem area	Damaged o'rings (16,17 or 18)	Replace damaged o'rings
Oil leaking from the swivel inlet	Damaged swivel	Replace swivel

IM75 METER

TROUBLE	CAUSE	REMEDY
No fluid passing through the meter	a) Dirt particles jamming the rotors	a) Dismantle meter assembly and clean
The meter is not registering fluid output	a) Flat battery	a) Replace battery
	b) No signal from the magnets	b) Check magnets and replace rotors if required
	c) Damaged computer (reed switch unit)	c) Replace meter
Meter not accurate	a) Flow rate outside recommended flow rate	a) Adjust flow rate to
	b) "K" factor incorrect	b) Re-set "K" factor to factory setting (112.00 pulses)

HG100-IM75 SPECIFICATIONS

Accuracy	+ / - 0.5% of Reading
Type	Oval Gear
Maximum Working Pressure	10350kPa / 1500psi / 103.5 Bar
Suitable for use with :	Engine Oil, Diesel Oil, Automatic Transmission Fluid (Maximum Viscosity SAE140), Ethelene Glycol Based Anti-Freeze / Anti-Boil mixture (Max 50% w ater)
Wetted Materials	Acetal, Aluminium, Steel, Nitrile Rubber
Battery Type	2 x AAA Alkaline
Resettable Totalizer	999999 (ltr or gal)
Non-Resettable Totalizer	999999 (ltr or gal)
Maximum Temperature	55 deg C (131 deg F)
Minimum Temperature	-5 deg C (23 deg F)



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