

# HG 60 OIL CONTROL GUN WITH ELECTRONIC PRESET

INSTRUCTION MANUAL



## INTRODUCTION

Thank you for purchasing a Macnaught HG60 Preset oil control gun. The Macnaught oil control gun has been designed to accurately dispense, measure and control oil flow. The control gun is suitable 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 to fulfil all your fluid handling needs.

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

**Note: Batteries are not pre-fitted and are included separately inside the box. Please refer to “Battery Replacement” on page 3 for correct procedure.**

## 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.

This oil control gun is not designed for in-line installation. Do not install with a shut-off valve on the outlet side of the meter. Such an installation could result in damage to the meter housing cover.

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

Do not exceed the maximum working pressure of 10350 kpa / 1500 psi / 103 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 each 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 pressing the lever on your oil control gun. Refer to parts listing on page 6 and 7.

## ASSEMBLY

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

### Outlet Nozzle

The outlet nozzle can be fitted either “inline” (forward) or on the outlet port “pistol style” located under the gun.

The long outlet tube should be used for the “inline” option.

The short adaptor should be used ( instead of the long outlet tube) when using the “pistol style” option.

**Note:** Use the threaded Plug supplied to seal the outlet port not in use.

## OUTLET NOZZLE OPERATION

When fluid flows through the gun the outlet nozzle will automatically open. When the fluid flow stops the outlet nozzle will automatically shut.

## HANDLE OPERATION

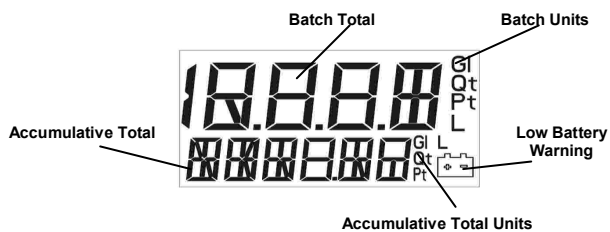
To latch the handle, press the lever, push the button and then release lever.

To release the latch in manual mode simply press and release lever.

When the gun is in auto mode (Model HG60 only) the lever will release automatically once the preset volume has been dispensed.

**Note:** Do not obstruct or stop the lever from releasing automatically.

## METER INTRODUCTION



## Operating mode description

**Sleep Mode:** To minimise battery consumption the meter can be set to revert to sleep mode if left idle for more than 2 minutes, and will automatically “power up” if the RESET button is pressed or there is flow through the meter.

The meter can be set to reset the batch total to zero on wake up (see options setting).

**Manual Mode:** For manual operation.

**Auto Mode:** For auto shut off operation (**HG60 only**)

**Reset-able Mode:** Displays the re-settable accumulative total.

**Options Setting:** Provides access to meter settings.

- Option 1 = Sleep mode (Sleep / No Sleep)
- Option 2 = Batch reset to zero (Yes / No)

## OPERATION OF BUTTONS

The control buttons can be used in two ways:-

**Press** – Press and release the button.

**Double click** – Press and release the button twice quickly

## TOTALIZERS

There are three totalizers built in to your meter.

1) **Reset-able batch total:** Displays the current volume dispensed. To reset batch total press the RESET button.

2) **Non reset-able accumulative total** is located below the batch total and displays the total volume the meter has dispensed.

3) **Reset-able accumulative total** is hidden from view and is used to track daily, weekly, or monthly usage.

## RESET ACCUMULATIVE TOTAL



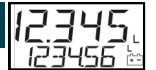
Note: If not in manual mode, press the RESET button for 5 seconds to return to manual mode.

2) Double click the RESET button (the display will enter the reset-able total area).

3) To reset the reset-able total, press the RESET button.

4) The display will return to manual mode after 5 seconds or if the RESET button is double clicked..

## MANUAL OPERATION



Press the gun lever to control oil flow through the gun.

A) The top display shows the current dispensed volume and can be reset by pressing RESET.

B) The Bottom display shows the non reset total.

## AUTO MODE (HG60)



In auto mode the meter can be programmed to automatically shut after having dispensed the preset volume.

**To Use Auto Mode :**

1) Press AUTO button to enter auto mode.  
(The display will show the last volume dispensed)

2) To change volume press either the 10, 1 or 0.1 buttons to enter the required volume.

3) To dispense the preset volume, press and latch the lever.

4) To reset the volume to zero press RESET.

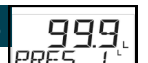
**How to select a Pre-Programmed Volume:**

1) There are five preset volumes stored during Manufacture which can be changed at any time as required.

2) Press the AUTO button. Each press of the AUTO button will cycle you through the preset volumes.

**NOTE:** The **HG60** Preset model will automatically shut off at the required volume.

## CHANGE THE PROGRAMED VOLUMES



1) Select any preset volume. ( e.g PrES 1 will appear).

2) Adjust the volume by using the 10, 1, 0.1 buttons.

3) Save the new value by pressing and holding the AUTO button for 5 seconds.

**Note:** The display will flash to indicate the new value has been stored.

## CHANGE THE UNITS SETTING:



1) If not in manual mode, Press RESET for 5 seconds to return to manual mode.

2) Press and hold down RESET for 5 seconds. The display will change to the units setting.

3) Press RESET to cycle through the units setting options.

### Batch Total

Litre  
Pint  
Quart  
Gallon

### Accumulative Total

Litre  
Gallon  
Gallon

4) Stop at the required units, press and hold down RESET for 5 seconds to save and return to manual mode.

### VIEW FACTORY SETTINGS



1) In the manual mode, press and hold down RESET for 5 seconds to enter the units setting.

2) Press and hold down RESET for 10 seconds.

**Note:** After 5 seconds the display will return to manual mode, after a further 5 seconds will change to the factory settings mode.

3) Press RESET to cycle through the factory settings.

- 1) Model number
- 2) Electronic hardware release
- 3) Software release
- 4) Serial number
- 5) Manufacture number
- 6) K factor
- 7) Field calibration factor

4) Press RESET for 5 seconds to return to manual mode.

### OPTIONS SETTING



1) In manual mode press the CAL button (located under the calibration screw on the underside of the gun), for 5 seconds, Refer item 18 page 7.

Note: Press the CAL button to cycle through the 2 options.

Press the RESET button to change the option setting.

- Option 1 = Sleep mode (Sleep / No Sleep)  
Option 2 = Batch reset to zero (Yes / No)

### FIELD CALIBRATION



Field calibration will allow a +/- 5% adjustment to the calibration.

1) In manual mode press the CAL button (located under the calibration screw on the underside of the gun) for 5 seconds to enter the option setting. Refer item 18 page 7.

2) Press the CAL button for 5 seconds to enter the Calibration setting.

Note: The calibration factor should read between 95 - 105

### To reset the factor to 100

3) Press the CAL button for 5 seconds, F CAL will flash.

4) Press the CAL button and RESET button at the same time.

### To calibrate

- 1) Follow field calibration steps 1,2 and 3.
- 2) Dispense a volume of 5 to 20 litres.
- 3) Accurately measure the dispensed volume.
- 4) Enter actual volume into the meter by using the 10, 1, 0.1 buttons. The AUTO button is used to adjust the 0.01 value.
- 5) Press and hold down the CAL button for 5 seconds. The new field calibration factor will now be displayed.
- 6) Press RESET for 5 seconds to save setting and return to manual mode.

### Low Battery

The battery segment will flash when the battery is low and needs replacing.

The gun will not operate in auto mode when the battery is low, although the gun can still be used in manual mode.

**Important:** When the battery segment starts flashing replace the battery as soon as possible, use only Alkaline AA Batteries. Carbon batteries will give reduced life.

### Battery replacement:

- 1) Remove the protective rubber boot (1).
- 2) Remove the battery cover screw (5) located near the inline (forward) outlet port and remove the battery cover.
- 3) Replace the two AA batteries, note the battery direction label inside the housing.
- 4) Inspect the battery cover seal for damage and replace if necessary.
- 5) Replace battery cover and tighten screw.

### Error signal

If an error is detected in the meter operation, the following error code will appear on the display.

- Err1 – Sensor error  
Err2 – Auto shut off failure  
Err3 – Flow rate too high  
Err4 – Calibration error

**To reset the meter after an error signal press the RESET button.**

### MAINTENANCE



### CAUTION

**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 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 hose from the inlet swivel (31).
- B) Unscrew and remove swivel (31) and washer (29) and o'ring (30) from the control gun inlet. Clean or replace the strainer (37) and o'ring (38).



### CAUTION

**The swivel is under spring tension.**

- C) Slide off the handle cover (28).
- D) Remove valve spring (27), seal/valve body assembly (25,26) and plunger (24).

## HG60 Lever, latch plate and Valve Removal

A) With the use of a suitably sized pin punch carefully remove the latching plate pin (22), spring (23) and latching plate (21). (The pin should be removed from the opposite side from the latch spring).

B) Use a 2.5mm Allen key and remove the 2 handle screws (32).

C) Remove lever (34).

D) Remove the washer (20), "O"Ring (19), then push the valve cam (16) from the gun body (15), and remove "O"Ring (19).

## HG60 CONTROL HANDLE REASSEMBLY

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

**Note:** Lightly lubricate the valve cam before assembly.

B) Place "O"Ring (19) onto valve cam (16).

**Note:** The cut out section in the middle of the camshaft must face the inlet swivel (31).

C) Replace the valve cam (16) into the body (15) (Note the orientation shown on the assembly drawing). Fit the second "O"Ring (19) and washer (20).

D) Slide lever assembly (34) into position and replace the two Allen screws (32). (Use Loctite or similar sealant).

**Note:** The latch plate pin should be fitted from the auto button side of the gun.

E) Slide the latching plate (21) into position, push the latch pin (22) through the lever and part of the way through the latch plate assembly.

F) Insert the latch spring (23) (The outside leg of the spring must point down and face away from the meter).

G) Carefully press the latch pin (22) into position.

H) Clip inside leg of the latch spring (23) under the location tab on the latch plate.

I) Replace plunger (24).

**Note:** The end hole in the plunger cage must face the meter.

J) Assemble the seal/valve body (25,26), and spring (27) and replace into the gun body.

**Note:** Install the spring, small end first.

K) Replace handle sleeve (28).

L) Replace washer (29), o'ring (30) swivel assembly (31), then screw firmly into place. (Use Loctite or similar sealant).

## METER DISASSEMBLY

1) Unscrew the swivel assembly (31) two complete turns to allow easy disassembly and assembly of the meter and remove boot (1).

2) Remove battery cover screw (5), the battery cover (7) and batteries (9).

3) Remove the three Phillips screws (11) and the calibration port screw (18) from the underside of the meter.

4) Carefully remove the computer module (2) from the module housing (10).

**Note:** The computer module is non repairable and will need to be replaced if damaged.

5) Remove the two Phillips screws (3) from inside the module housing (10) and remove the latch release assembly (4).

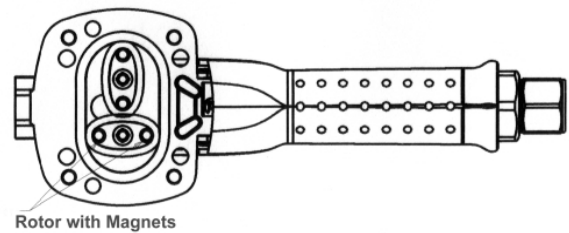
6) Remove the four Allen screws (17) from the underside of the meter and remove the module housing (10).

7) Remove the rotors (13) and the body 'o' ring (14).

## METER REASSEMBLY

1) Clean and inspect all parts. Replace any suspect, worn or damaged components.

2) Replace rotors (13). ( Refer to Fig 1 )



(Fig 1)

**Note:** Ensure the rotor with the magnets is assembled with the magnets facing up and positioned on the correct side of the meter. Both rotors must also be positioned at 90deg to each other ( Refer Fig 1 ).

To check rotor operation, turn either rotor. If the rotors are not in mesh correctly or do not move freely, remove one of the rotors and replace it correctly at 90deg to the other rotor. Recheck the operation of the rotors.

3) Replace the gun body 'o'ring (14).

4) Carefully position the module housing (10) on top of the gun body (15), replace and tighten the four Allen screws (17).

5) Replace the latch release assembly (4), and screw into position.

6) Ensure the handle latch is working correctly.

7) Test the oil control gun for correct operation.

**Note:** If the handle latch is not operating correctly loosen the four Allen screws (17) and re-position the module housing (10) until correct lever operation is obtained, then re-tighten the Allen screws (17).

8) Press the lever (34) and replace the computer module (2).

9) Replace and tighten the three Phillips head screws (11) and calibration port screw (18).

10) Replace the two AA Alkaline batteries (9). (use the directions on the label found inside the battery housing for correct battery orientation).

11) Replace battery cover assembly (6,7,8) and tighten the screw (5).

12) Firmly tighten the swivel assembly (31).

13) Replace the boot (1).

14) Test oil control gun for correct operation.

## TROUBLE SHOOTING GUIDE

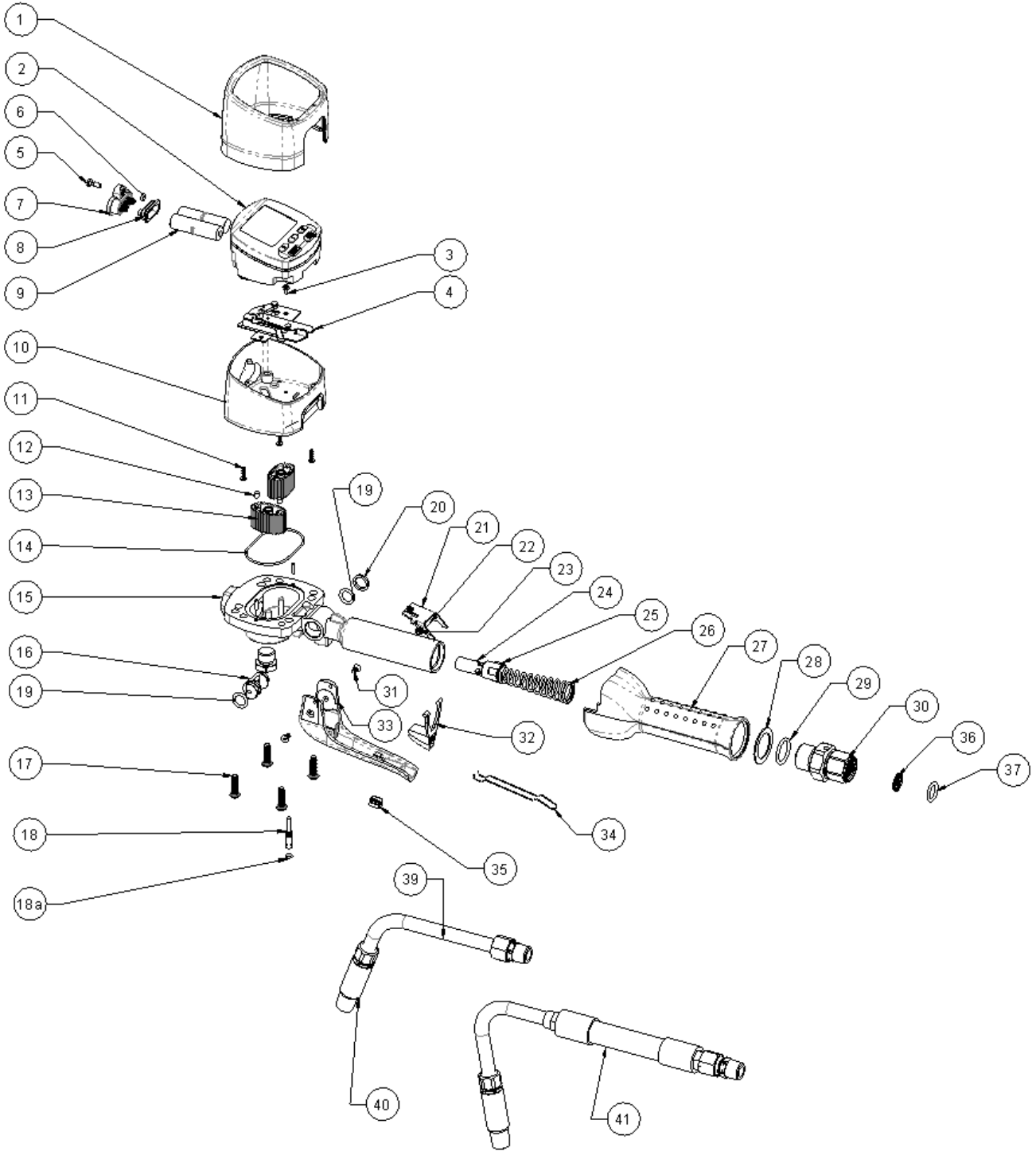
TROUBLE	CAUSE	REMEDY
No fluid passing through the meter	a) Blocked strainer	a) Clean or replace strainer
	b) Dirt particles jamming the rotors	b) Dismantle meter assembly and clean ( refer to meter disassembly )
	c) Damaged plunger seal	c) Replace damaged plunger seal
The meter is not registering fluid output	a) Flat battery	a) Replace battery
	b) No signal from the magnets	b) Check magnets and replace rotors if required
	c) Damaged computer module	c) Replace computer module
Meter display reads Err 1	Sensor error	Press the reset button to reset the computer. (If the error repeats, check the magnets in the rotor)
Meter display reads Err 2	Auto shut off error (HG60only) ( latch failed to release in 0.5 seconds )	Check the latch release lever operation. Ensure the handle is not being physically restricted from closing (Manually release the lever to stop the flow).
Meter display reads Err 3	Flow rate to high	Adjust the flow rate to 1–30 l/mim ( 0.26-8 US gal/min ) Eliminate air from the system
Meter display reads Err 4	Calibration error (Correction greater than 5%)	Press the reset button to reset the computer
		<b>Note: Always press the reset button to reset the computer</b>
Constant oil leak from the nozzle	Damaged plunger seal (25)	Replace plunger seal ( check for damage )
Intermittent drip from the nozzle	Dirt in the nozzle (40)	Remove the nozzle and blow out any dirt particles, replace if necessary.
Oil leak from the lever assembly area	Damaged o’rings (19)	Replace damaged o’rings
Oil leak from between the body casting and the computer module casting	Damaged o’ring (14)	Replace damaged o’ring
Low flow rate	Blocked strainer (37)	Replace strainer
Oil leaking from the swivel inlet	Damaged o’ring or swivel	Replace damaged o’ring or swivel

**Note: To reset the computer, remove then replace the batteries.**

## SPARE PARTS LIST

ITEM	DESCRIPTION	QTY	OVEHAUL KIT	SPARES KIT
1	BOOT STD	1		HG381BKS
1	BOOT BLUE	1		CS4E
1	BOOT GREEN	1		
1	BOOT RED	1		
1	BOOT YELLOW	1		
2	PRESET MODULE	1		
3	SCREW	2	HG50-1K	HG340AS
4	LATCH RELEASE ASSY	1		
5	BATTERY COVER SCREW	1	HG50-1K	HG390AS
6	O-RING	1	HG50-1K	
7	BATTERY COVER	1		
8	BATTERY COVER INSERT	1	HG50-1K	
9	AA ALKALINE BATTERY	2		HG309S
10	HOUSING, MODULE	1		HG380S
11	SCREW	3	HG50-1K	HG005S
12	MAGNET	4		
13	OVAL GEAR SET	2		
14	O-RING	1	HG50-1K	
15	GUN BODY	1		HG003S
16	VALVE CAM	1	HG50-1K / HG50-2K	
17	SCREW	4	HG50-1K	
18	CALIBRATION SCREW	1	HG50-1K	HG374S
19	O-RING	2	HG50-1K / HG031-1K / HG50-2K	
20	WASHER	1		
21	LATCH PLATE ASSY	1		HG350AS
22	LATCH PIVOT PIN	1	HG50-1K	
23	SPRING	1	HG50-1K / HG50-2K	
24	PLUNGER	1		HG032S
25	VALVE BODY/SEAL	1	HG50-1K / HG031-1K	
26	VALVE SPRING	1	HG50-1K / HG031-1K / HG50-2K	
27	HANDLE SLEEVE	1		HG004BKS
28	WASHER	1		
29	O-RING	1		
30	SWIVEL BSP	1		HG040AS
30	SWIVEL NPT	1		HG043AS
31	SCREW	2	HG031-1K / HG50-2K	
32	PUSH BUTTON	1		HG023S
33	LEVER LATCHING	1		HG011AS
34	BUTTON SPRING	1		HG022S OR HG023S
35	LEVER PLUG	1		
36	MESH	1	HG50-1K / HG031-1K	
37	O-RING	1	HG50-1K / HG031-1K	
38	OUTLET ADAPTOR	1		HG511S
39	RIGID TUBE EXT	1		HGREX
40	AUTO NOZZLE	1		HGNZL
41	FLEXI EXTENSION	1		HGFNZ

# HG60 PARTS DIAGRAM



NOZZLE ASSEMBLIES

## SPECIFICATIONS:

<b>Accuracy:</b>	+ - 0.5% (of Reading) (ISO100 @ 10 l/min)
<b>Flow Range:</b>	1-30 l/min ( 0.26 – 8 US gal/min)
<b>Maximum Pressure:</b>	103.50 BAR / 10350kPa / 1500 PSI
<b>Pressure Loss:</b>	1Bar/ 100kPa / 14.4PSI @ 12 l/min (3.2 US gal/min) with calibration fluid (6 Centipoise Viscosity) without extension.
<b>Weight:</b>	1.16kg ( 2.55lbs)
<b>Swivel Inlet:</b>	½" BSPT or ½" NPT
<b>Outlet:</b>	3/8" NPT
<b>Operating Temperature:</b>	-0 to +50 degrees Celsius (320 – 1220 degrees F)
<b>Storage Temperature:</b>	-10 to +60 degrees Celsius (14 – 140 degrees F)
<b>Battery:</b>	2 x 1.5Volt AA Batteries ( Alkaline batteries are essential for HG60 version)
<b>Wetted Parts:</b>	Aluminium, Acetal, Steel, Nitrile Rubber
<b>Fluid Compatibility:</b>	Engine Oil, Diesel Oil, Automatic Transmission Fluid, Anti-freeze / Anti-Boil Mixture. (Maximum Viscosity SAE140)
<b>Dimensions:</b>	25.8cm (10inch) Long x 9.5 cm ( 3.7inch) High, 11cm(4.33inch) wide (Dimensions without extension)



**Macnaught Pty Limited**

ABN 66 000 075 785

41-49 Henderson Street  
Turrella NSW 2205 Sydney Australia  
Postal Address PO Box 90  
Amcliffe NSW 2205 Sydney Australia

**T:** +61 2 9567 0401

**F:** +61 2 9597 7773

**W:** [www.macnaught.com.au](http://www.macnaught.com.au)

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