

Instruction sheet



511-3892 instruction sheet

- A Installation
- B Electrical
- C Commissioning



Produces a pulse output the frequency of which is proportional to the flow through the device. A set of four restriction jets (supplied) one of which may be inserted into the entry port to provide a lower flow range.

- Suitable for many liquids including water and most fuels
- Connections for 8mm dia. hoses
- Reliable and accurate
- Supplied with 2M (approx) of cable.
- Flow ranges from 50 mL/Min to 10 L/Min.

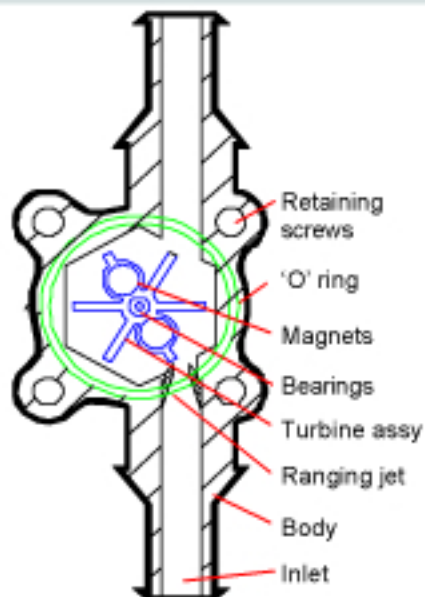
Note: when used in automotive applications, the formation of vapour should be minimised by fitting the sensor between the fuel pump and the carburettor, but before any pressure regulator. The device should be mounted vertically if vapour is likely to form.

The pipe work must be designed in such a way as to eliminate reverse flow, and the liquid pass through the meter in the direction of the arrow. The meter should be installed in a position that prevents it from draining down as on start-up serious damage could result by "impacting" an empty flowmeter with a high velocity fluid stream. The fluid should be clean and homogenous. In all cases an upstream filter of at least 80 microns **must** be fitted. It is recommended that before the flowmeter is installed in the line a "dummy" section of pipe is inserted and the system flushed. This is to eliminate any debris in that section of the line. The pipe must not stress the body of the meter and should be fully supported either side with appropriate isolation valves and in some cases a by-pass valve. On initial start-up increase the flow slowly to ensure no over speeding of the meter occurs as the air is forced from the line. This is best achieved by monitoring the flow rate and ensuring that a 50% over-range is not exceeded. **Never blow a flowmeter with an airline.** Care should be taken to ensure that no air enters the system (e.g. leaky pump gland) or that no cavitations takes place. With a volatile liquid we recommend at least twice the vapour pressure plus 1 Bar as the operating pressure. The user must ensure that the materials of construction are compatible with their fluid. We accept no responsibility for material compatibility, it is the users responsibility.

Technical specification

| Jet | Flow L/Min | Linearity % FSD | Typical FS Freq. Hz. | Approx 'K' Factor |
|----------------------------|------------|-----------------|--|-------------------|
| 1mm | 0.05-0.5 | 2.0 | 142 | 17000 |
| 2mm | 0.05-1.5 | 2.0 | 175 | 7000 |
| 3mm | 0.15-4.5 | 1.5 | 260 | 3500 |
| 4mm | 0.18-6.5 | 1.5 | 230 | 2100 |
| No jet | 0.2-10 | 1.0 | 235 | 1420 |
| F.S. Pressure drop | | | 1 Bar @ 1cSt | |
| Working pressure | | | 10 Bar | |
| Temperature range body | | | -25 to +125 °C | |
| Repeatability | | | 0 to 60°C Display | |
| Sensor to sensor variation | | | ±0.25% | |
| Supply voltage | | | ±5% | |
| Current consumption | | | 8 to 12 V d.c. | |
| Output | | | 40 mA (typical) | |
| Output low | | | 5v pulse | |
| Rise & fall times | | | 100mV max. | |
| Wetted materials | | | 2uS max | |
| | | | PVDF, sapphire & Viton. Ceramic magnet | |

The principle of operation is very simple. A jet of liquid is directed at a free running Pelton wheel turbine in a specially shaped chamber. The rotation of the rotor is detected with a Hall effect sensor. The output frequency of these pulses is directly proportional to flow rate and the total number of pulses the total volume passed. The bearing material is sapphire as this gives a long trouble free life to the meter. The non-metallic construction means that these meters may be used with aggressive chemicals and ultra-pure water. Very strong acids will damage the ceramic magnet.



It is recommended that all "signal" cables are run separately to power lines and switched inductive loads and are located well away from inverters and other "noisy" apparatus. Always use sound wiring practice.

Electrical characteristics

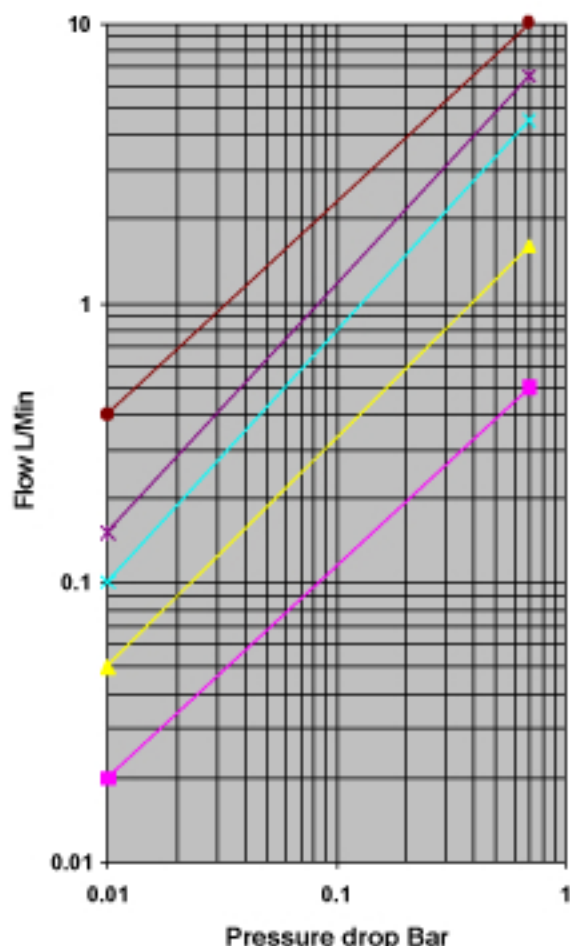
Hall effect sensors

| | |
|-------------------|--------------|
| Supply | 8-12Vdc |
| Temp range | -40 to 125°C |
| Rise & fall times | 1.5µs max |
| Supply current | 7.5mA typ. |
| Switch current | 10mA max |

Display electronics

The display electronics must not exceed 60 °C.

Pressure drop Vs flow rate for model suffix number



If problems occur during commissioning always check the fundamentals first:

Is the flowmeter/instrument the correct one for the installation?

Is the power connected to the meter and the instrument, and is it turned on?

Is the instrument set/wired correctly? I/P port, pulse type, frequency span, units etc.

Where possible check the O/P from the flowmeter with an oscilloscope before proceeding

Was the line flushed prior to installing the meter?

Was the flow increased slowly?

Is the meter blocked?

If you cannot find a solution ask your supplier for technical support.

Inserting the ranging jet

There are four ranging jets that may be inserted into the inlet to alter the flow capacity of the meter. Once a jet is inserted it cannot be easily removed without damaging it or the flowmeter bearings. Care should be taken in selecting the correct jet as more than one may not be used. Consider the chart to the left and select what flow range is required at what pressure drop, more than one flowmeter may be suitable for the flow rate. For best accuracy choose the jet that has the highest permissible pressure drop as the meter performance will generally be better than a jet with the lowest pressure drop. Use a large diameter punch between 5.5 & 6mm and drive the jet firmly home until it hits a stop.

Connections



Flying lead

| | |
|-------|---------|
| Black | 0 Volts |
| Red | +8-12V |
| Blue | Output |

Programming the flowmeter

Buttons Display



Description




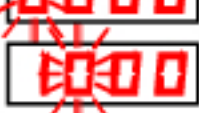
In normal operation when the meter is showing flow rate the "colon" in the centre flashes. The "unit" and time base are independently determined in the calibration routine, e.g. cc/sec, grams/minute, litres/Hour etc.



If "both" is selected in the menu the left hand button will change the display to total and then back to rate. The right hand button can be selected to reset the totaliser. The "unit" is the same as the rate meter but the decimal point position may differ.

If both buttons are pressed together for four seconds the meter enters program mode and a request is made to enter a PIN. The display flashes between the two words "Pin" & "no". If no PIN has been entered a press of the left key will advance the program to the next step. The default PIN is 0000.

If a PIN is required the display changes with the left hand digit flashing zero. The right hand button increments the number, when the required number is reached the left hand button moves the flashing digit to the right. Each digit or location can be cycled until the number you require is reached. Holding the left hand button for 3 seconds then enters the PIN chosen and advances the program. To exit the programming at any time press both keys together for 4secs.






This gives the option of changing the PIN. The left key by-passes this option. If the right key is pressed the existing PIN will be displayed. The method of changing the display is as above with the right hand key changing the number and the left hand key changing the digit being altered. A three second press and hold on the left hand key advances the program.




This function allows the user to self calibrate the indicator by passing a pre-determined amount through the flowmeter. The electronics records the number of pulses received, calculates the pulses per "unit" as the 'K' factor and enters it in the "SCL Fact" section later in the programming. This number may be edited later if required. Any "unit" may be used, grams, cc, litres etc. This "unit" is used for both total & rate displays. The right hand key enters the volume selection routine & increments the required amount of liquid through pre-set values, 0.1 0.25 0.5 1.0 5.0 10 & 20. Before this program is continued the flowmeter must be primed and ready to discharge the pre-set amount. The larger the amount the more accurate the calibration. When the left hand key is pressed the internal counter counts the number of pulses received until the counter is stopped. The display shows "run" until no further pulses are received or the left button pressed (e.g. against a measuring cylinder) and then it shows "stop" to show the count is completed. To proceed press the left key.





This function permits the user to select the display function, three options are available. When the right key is pressed the display changes to the previously selected option. Further presses of the key cycle through the options, flow rate only "rate", totaliser only "tot" and switchable between rate and total "both" using the left hand key in the run mode. The right key cycles the options and the left hand one advances the program to the next section.





This sets the decimal place for the totaliser. When the right key is pressed the display changes to the previously set position, repeated presses cycles the display through the options 0000 000.0 00.00 & 0.000. These are decimals of the chosen "unit". The left hand key advances the program.

