

TROUBLE SHOOTING GUIDE

FOR ELECTROMAGNETIC FLOWMETER SYSTEMS

WITH BATCH CONTROLLER:-

PROBLEM	POSSIBLE CAUSE	SUGGESTED SOLUTION
•No power to batch controller or displays not on	•Blown fuse or holder not tightened •No main power supply	•Check fuse, tighten fuse holder (at rear of controller) •Check power supply, check wiring
•No or incorrect power to magflow	•DC power insufficient (DC units only) •No main power supply (AC units)	•Use voltmeter to measure or check wiring •Check power supply, check wiring
•Pulse fails at start of batch (1.5 seconds after)	•Check calibration (K-factor) setting •Solenoid valve not opening •Restriction or service gate valve closed •Empty liquid tank •Pump not turning •Pump foot valve failed •Signal cable cut, bad joint at JB, •Magflow not properly earthed to pipe	•000 calibration -pulsefails. Make sure a calibration value is set, three switch shafts -H,T,U- located at rear top left of controller •Check and service solenoid valve, check output control voltage is 240vac(N & C, pins 7&9) when pushing start button •Open gate valve •Check liquid level •Check and service pump •Empty pipe, Install non-return valve •Check signal cable (pulse and ground) for continuity at junction box near magflow meter, If cut or oxidised- repair/replace •Check earthing straps are connected to steels pipes and or to S/S earthing(s). Then connect to a master earth in plant.
•Pulse fails during batch cycle	•Flowrate too slow •Pipe buildup restricting flow	•Open restriction gate valve, or increase flowrate pulse fail timing capacitor (see service guide). •Cleanout pipelines, calcium buildup on pipewalls -recycle systems
•Display digits count slowly after batch complete	•Non return valve faulty (jammed open) •Solenoid valve not properly closed •Magflow not properly earthed to pipe	•Clean, service or replace •damaged seal, faulty solenoid •Check earthing straps are connected to steels pipes and or to S/S earthing(s). Then connect to a master earth in plant. (especially mags with no inbuilt earthprobe).

AT this point if all of the above suggestions fail to rectify problem, then electromagnetic flowmeter may require replacement due to faulty electronics or moisture in flowtube coils.

If magflow is a Magmaster remote version with cable wired between sensor and display/signal processor head then cabling may need to be checked.

Below for UIC/A interfac ecards, ME51C interface cards, ME2000 or ME995-7 conditions:-

•Batch target display counter counts past batch selection	•Flowrate too fast excessive overflow	•Turn down gate valve to restrict flowrate or set preact (overflow deduct, inflight) function to compensate •Reduce delivery pipe diameter near end of line. •service solenoid valve, check air pressure
•Intermittant overflow past batch select or liquid does not stop	•Faulty solenoid valve not closing properly, insufficient air pressure	
•Wet loads, more liquid collected than indicated	•Pulses to fast for computer input •calibration error •probes insulated with buildup	•change pulse parameter on pulsedivider card and PLC input. •Check calibration value controller, interface card or PLC. •Clean magflow tube
•Dry loads, less liquid collected than indicated	•Requires recalibration test	•Set new calibration figure, rear switches or interface card (See data sheet calibration guide for specific product)

Sequential fault finding and rectification

1. If a another ManuFlo controller (any model) is available, simply unplug doubtful unit and plug in exchange unit. If the new unit is also not operating correctly, then the problem is isolated to the pulse flowmeter or wiring.

System overbatch problem

1. Selector knob batch dials on ManuFlo Batch Controller may not be positioned correctly, and therefore not correspond to rotary switch numeric values.
2. To test, set all numbered dials to the zero position 0000. Then press the RESET toggle. The alarm should beep momentarily - this will indicate correct alignment of dials. If alarm does not beep, this indicates incorrect alignment of number dials. To rectify, remove the grey colored cap from dial, unscrew knob and pull knob off. Check that the exposed switch shaft's flat (black) side is horizontal. If not, then turn to horizontal and refit the numbered dial knob to the zero number setting. Also check the calibration and preact knob settings which are located at the rear of the controller
3. If the Batch Controller is found to be operating correctly, then proceed to checking and testing the flowmeter components.

In further doubt, contact your local representative, or ManuFlo on ph +61 2 9938 1425 or 9905 4324.

SERVICE ADJUSTMENTS

to safety timings and limits for ME995 preset batch controllers.

INITIAL START (T2): Once the START toggle is pressed, the controller allows a standard 1.5 seconds for pulses to arrive from the flowmeter. If there are no pulses within the 1.5 second time period, the controller will shut down the output voltage drive, and turn on the Pulse Fail LED and alarm warnings. In some applications, the 1.5 second delay may not be long enough, due to slow opening solenoids or slow pressure buildup pumps etc. The initial start time period can be increased by soldering a tantalum capacitor in parallel with the standard capacitor found on the rear of the Printed Circuit Board (PCB). See Table 1 and diagram below, for values and location on the PCB.

FLOWRATE (T1): If pulses do arrive within the allocated initial start time, the controller then locks the pulserate safety. Most ManuFlo Batch Controllers have a standard 30 counts per second (30Hz) pulserate safety setting. If the pulses from the flowmeter drop below 30Hz, the controller will shut down the output voltage drive, and turn on the Pulse Fail LED and alarm warnings. The 30Hz standard setting is typical with water dispensing systems using RPFS-P paddlewheel flowmeters, where if the flowrate drops below 30 counts per second the pulse fail safety will activate e.g. 50mm pipe diameter section (20 pulses/Litre), 30 Hz = 1.5 Litres/sec minimum flowrate required. If flow drops below 1.5 Litres/sec, the pulsefail will activate. The equation is:

$$\text{Pulsefail frequency (Hz)} = (\text{Pulses/Litre}) \times (\text{minimum flowrate of pipe diameter in Litres/sec})$$

The flowrate (frequency Hz) minimum setting can be adjusted by soldering a capacitor in parallel with the standard capacitor found on the PCB. See Table 2 and diagram below, for values and location on the PCB.

Note: The flowrate safety timing is changed if required by very low flowrate applications, or when using flowmeters other than the most commonly used RPFS-P paddlewheel pulse output flowmeters. When controller/flowmeter systems are ordered, we supply the safety timing setting to suit your chosen flowmeter, thus always providing the safest possible watchdog system.

LIMIT (LM): The maximum permissible batch limit is determined by the factory-set internal limit value. The factory setting is always at the maximum value. The limit setting can be reduced by simply desoldering the limit lead wire (connected to the rear of rotary switch solder pads) and resoldering the wire to set the desired quantity (see diagram below).

Standard factory set values are T2: 1µF capacitor, T1: 0.02 µF capacitor.
Use the following tables to change factory set values.

Table 1. INITIAL START TIMING (T2)

Extra Capacitor value	Extra timing
1 µF	1.5 seconds
2 µF	3.0 seconds
3.3 µF	4.1 seconds
4.7 µF	5.8 seconds

Table 2. FLOWRATE TIMING (T1)

Total Capacitor value	Frequency Hz (pulses per second)
0.01 µF	30 Hz (RPFS-P)
0.02 µF	25 Hz
0.03 µF	20 Hz (low flowrate MES20)
0.1 µF	07 Hz
0.2 µF	03 Hz
1.0 µF	0.2 Hz (PSM20-T flowmeters)

