

TROUBLE SHOOTING GUIDE

FOR BATCH CONTROLLER / ROTA PULSE FLOW METER SYSTEMS

PROBLEM	POSSIBLE CAUSE	SUGGESTED SOLUTION
•No power to batch controller or displays not on	<ul style="list-style-type: none"> •Blown fuse or holder not tightened •+12vdc and O.V. shorted •No main power supply 	<ul style="list-style-type: none"> •Check fuse, tighten fuse holder (at rear of controller) •Check pulse cable from DCD to RPFS meter •Check power supply, check wiring
•Pulse fails at start of batch (1.5 seconds after)	<ul style="list-style-type: none"> •Check calibration (K-factor) setting •Seized paddlewheel •Solenoid valve not opening •Restriction or service gate valve closed •Empty water tank •Pump not turning •Pump foot valve failed •Signal cable cut, bad joint at JB, oxidised cable- leakage •RPFS not positioned in pipe •The insertion end of sensor is warped, squeezing its jaws together and seizing the paddlewheel. •RPFS Flowmeter faulty 	<ul style="list-style-type: none"> •000 calibration -pulsefails. Make sure a calibration value is set, three switch shafts -H,T,U- located at rear top left of controller •Remove RPFS, inspect; clean with acid, check axle/bushes make sure paddlewheel spins freely •Check and service solenoid valve. Use voltmeter to check that output control voltage is 240vac(N & C, pins 7&9) when pushing start button. •Open gate valve •Check water level •Check and service pump •Empty pipe, install non-return valve, or service valve. •Check signal cable for 12VDC at junction box near RPFS meter. If no power, cable cut or oxidised- repair/replace. Unwire RPFS, take upto batchroom, remove extension cable and hardwire RPFS direct into the Batch controller (P,+,-), spin wheel should count on display, if so, then extension cable or connections at JB faulty, if no counts & 12vdc present then RPFS faulty •Check RPFS slots are in keyway position, lock cap secured Paddlewheel not inserted into flow stream •File out pipe adapter fitting, or file inside of sensor jaws, to ensure that paddlewheel has left-right play on axle. •Replace with new RPFS
•Pulse fails during batch cycle	<ul style="list-style-type: none"> •Flowrate too slow •Pipe buildup restricting flow •Paddlewheel problem 	<ul style="list-style-type: none"> •Open restriction gate valve, or increase flowrate pulse fail timing capacitor (see service guide). Pipe diameter too big for flow •Cleanout pipelines, calcium buildup on pipewalls -recycle systems •Calcium buildup on wheel, soak in diluted acid. Worn bushes.
•Display digits count slowly after batch complete	<ul style="list-style-type: none"> •Non return valve faulty (jammed open) •Solenoid valve not properly closed 	<ul style="list-style-type: none"> •Clean, service or replace •damaged seal, faulty solenoid
•Batch target display counter counts past batch selection	<ul style="list-style-type: none"> •Flowrate too fast excessive overflow 	<ul style="list-style-type: none"> •Turn down gate valve to restrict flowrate or set preact (overflow deduct) function to compensate •Reduce delivery pipe diameter •service solenoid valve, check air pressure
•Intermittant overflow past batch select or water does not stop	<ul style="list-style-type: none"> •Faulty solenoid valve not closing properly, insufficient air pressure 	
•Wet loads, more water collected than indicated •Dry loads, less water collected than indicated	<ul style="list-style-type: none"> •Paddlewheel bushes worn •Wheel dirty, flowing overrange •Requires recalibration test 	<ul style="list-style-type: none"> •Check paddlewheel •Replace with new paddlewheel, recalibrate •Set new calibration figure, rear switches (See calibration guide for details -ME995-7 brochure)
•Controller starts counting when power switched on	<ul style="list-style-type: none"> •Active and contact power drive short circuited 	<ul style="list-style-type: none"> •Contactor fused due to excessive current draw from pump •Relay fused due to excessive current draw on solenoid coil - install higher current rated contactor or install contactor
•Controller- FL(flow), LM(limit), and or CD(contact drive) LEDs on	<ul style="list-style-type: none"> •Controller malfunction, IC failure Diagnostic warning 	<ul style="list-style-type: none"> •Replace controller or call for service and advise

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.
2. When checking flowmeter, reset the ManuFlo controller. Remove the flow sensor and spin the paddlewheel. Check that the ManuFlo controller has registered a number of counts on its display. If so, the electrical connections are probably OK. If no counts are registered, check that 12VDC is supplied to the flow sensor. If supplied, then switch off the ManuFlo controller and replace the RPFS flow sensor.
3. The flow sensor paddlewheel is jammed, damaged etc. (For servicing, refer to the flow sensor brochure).

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.

If in further doubt, contact your local representative, or ManuFlo on phone +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).

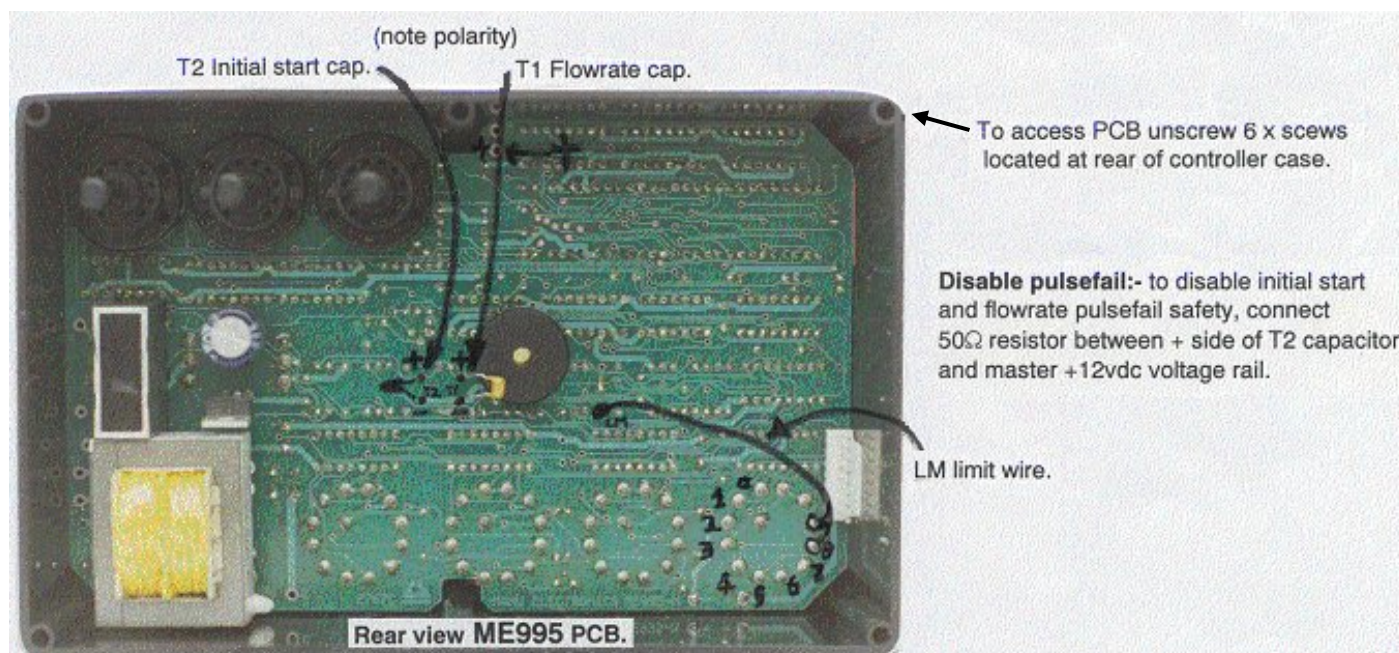
Standard factory set values are T2: 1µF capacitor, T1: 0.02 µF capacitor.
Use the following tables to change factory set values.

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)



ME188 aluminium face Batch Controller – service adjustments

To access PCB unscrew 6 x screws located at rear of controller case.

Standard factory set values are 1 microfarad cap for 1.5 seconds initial start, 0.02 microfarad for 30 Hz flowrate timing. Use the following tables to change factory set values:

Table 1. INITIAL START TIMING

Capacitor value	Extra timing (seconds)
1 microfarad	1.5 seconds
2	3.0
3.3	4.1
4.7	5.8

Table 2. FLOWRATE TIMING

Capacitor value	Frequency Hz. (pulses per second)
0.01 microfarad	25 Hz.
0.02	20 Hz.
0.03	15 Hz.
0.1	07 Hz.
0.2	03 Hz.
1.0	0.2Hz.

