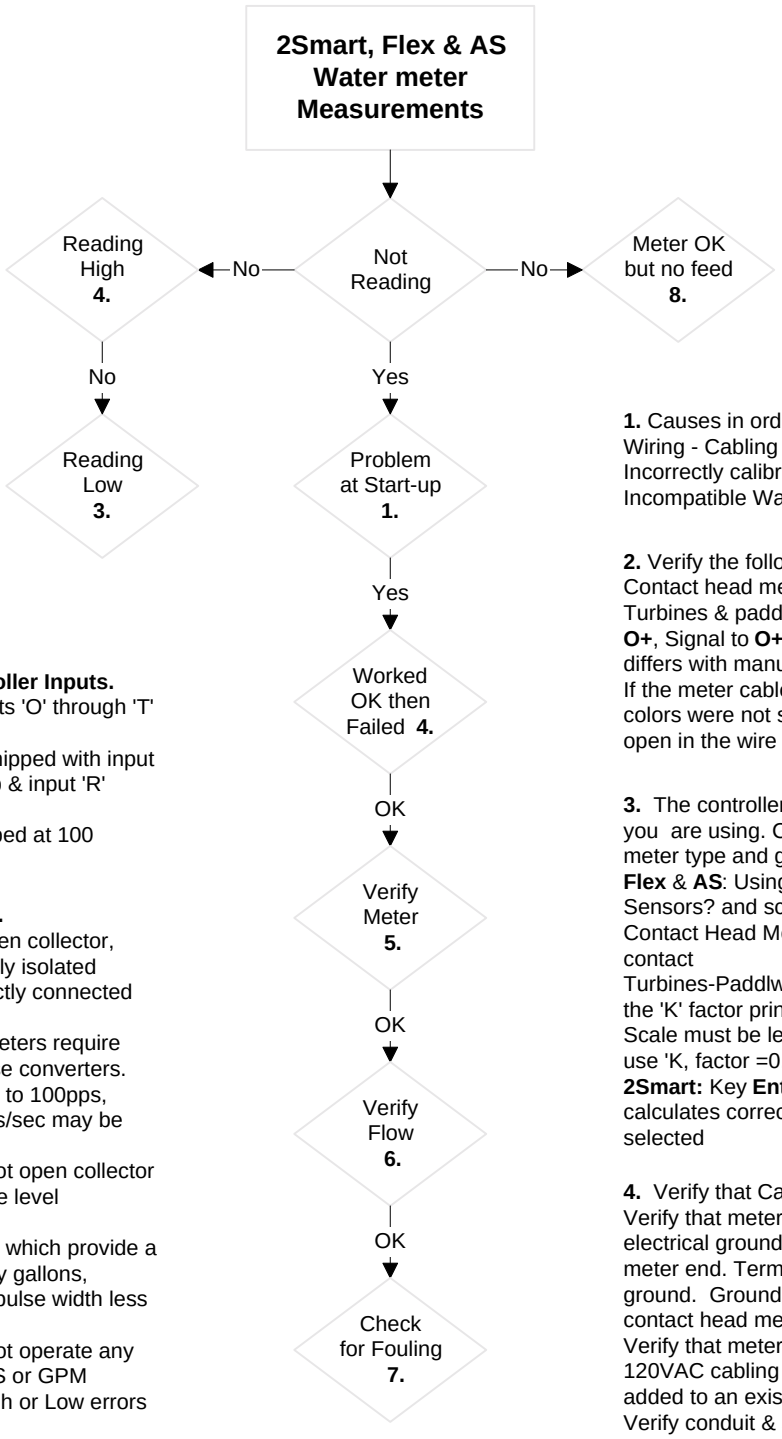
Troubleshooting# 05

Revised 01/12/01

TR_0105.vsd



Water Meter Controller Inputs.

1. Water meter inputs 'O' through 'T' are identical.
2. Controllers are shipped with input 'O' Tower1 Make-up & input 'R' Tower2 Make-up.
3. 'O' & 'R' are shipped at 100 Gallons/contact.

Water Meter Types.

1. Contact head, open collector, open drain & optically isolated meters may be directly connected to controllers.
2. 4-20mA output meters require external rate-to-pulse converters.
3. Pulse streams up to 100pps, 100Hz, 100 contacts/sec may be measured.
4. Pulses that are not open collector or 12-24VDC require level converters.
5. Electronic meters which provide a pulse every so many gallons, requires Scale=1 if pulse width less than 120mSec.
6. **WARNING:** Do not operate any meter below it's FPS or GPM minimum rating. High or Low errors will occur.

1. Causes in order of frequency:
Wiring - Cabling Faults - See **2**. & **4**.
Incorrectly calibrated sensor - See **3.**
Incompatible Water Meter - See **Water Meter Types**.

2. Verify the following: (Valid for meters **O**' thru '**T**')
Contact head meters connect to terminal **O+** & **O-**.
Turbines & paddlewheels connect: 12VDC power to **O+**, Signal to **O+** & Common to **O-**. Color coding differs with manufacturer.
If the meter cable has been extended, verify that colors were not switched and/or connections are not open in the wire nut splices. See **4**.

3. The controller needs to know which water meter you are using. Calibration tells the controller both meter type and gallons/contact or pulses/gallon.
Flex & **AS**: Using the TV remote, Select Calibrate Sensors? and scroll to target meter, key Enter.
Contact Head Meters: Scale=0, K Factor = Gallons/ contact
Turbines-Paddlwheels: Scale= pulses/gallon which is the 'K' factor printed on the meter & 'K' factor=1. Scale must be less than 255. For pulses/galon >255, use 'K, factor =0.5 and Scale = 50% of pulses/gallon
2Smart: Key **Enter 2 3** & select **1** or **2**. Controller calculates correct pre-scaling if Other Turbine selected

4. Verify that Calibration has not been changed.
Verify that meter cable shield is connected to electrical ground at the controller ends & open at the meter end. Terminals **O-** through **T-** are electrical ground. Grounding is usually only a problem with contact head meters.
Verify that meter cabling is not in the same conduit as 120VAC cabling or that 120VAC cabling has not been added to an exisitng conduit.
Verify conduit & splice location not wet or water filled

5. Contact Head: Disconnect the meter. Every time you jumper **O+** & **O-**, you'll see Gallons increase. Reconnect meter cable & disconnect at meter. Every time you short circuit meter cable ends you'll see Gallons increase. If both steps OK, meter is faulted. Verify pick-up location in meter head.
Paddlewheel: Measure 5VDC from **O+** to **O-**. Measure less than 5VDC when meter measuring. Actual value will vary with meter & pulse rate. Typically 4.6 to 3.5VDC.

6. Force a bleed by changing setpoints. Bleed water meters will read within several minutes. Make-up meters will not measure until the float trips the make-up valve.

7. Fouling usually only occurs when meters are operated wet/dry. If paddlewheel or turbine, remove the sensor & spin paddlewheel. Verify gallons measured. Do no install bleed meters downstream of bleed solenoid/valve. Do not install meters on bleeds with high debris loads - Y strainers will block & will not be serviced.

8. See **Troubleshooting#06**,
Pump - Valve - Solenoid Problems& Alarms