CONTHERM SCIENTIFIC LTD

TECHNICAL MEMORANDUM **PRODUCT : PLCS**
No : 0001

==========

FROM: Russell Kirkwood **DATE :** 12/9/90
TO: ALL AGENTS

==========

SUBJECT: PLCS Wet Sensor to Capacitive sensor upgrade

To upgrade an earlier PLCS controller and sensor box to use the new capacitive humidity probe, the following are required:

A) The controller must be vers206 or later.
B) A new eprom (Vers300 for CO2, Vers400 for others) with appropriate settings must be fitted to the old controller.
C) The compensation resistor must be changed inside the controller if it is a CO2 controller (390K & 470K) resistors.
D) A ZP10a PCB with the new sensor must be fitted to the sensor box and calibrated.
E) The wiring connections on an early interface PCB must be altered to supply the power to the ZP10a PCB.
F) A digital meter, wet & dry bulb hygrometer or similar and ZP10a calibration capacitors (121pf, 161pf) will also be required.

ENSURE ALL POWER TO CABINET IS OFF!

1) **CONTROLLER**

Open up the controller and replace the old eprom with the new version, and replace the compensation resistor (R51 - 150K) adjacent to pins 7 & 8 of IC2 with two resistors in series (390K & 470K) to equal 860K in total.

2) **SENSOR BOX**

Remove the screws from the end caps and open up the sensor box. Remove the water bottle from the side of the sensor box and unsolder the RED & WHITE wire from the tagstrip, remove the wet wick sensor.

Mount the ZP10a PCB to the sensor box lid using two 4mm screws and nuts, ensure the underside of the ZP10a PCB does not touch the aluminium casing of the sensor box.

Solder the wires from the ZP10a PCB to the tagstrip. RED & WHITE to the same place as the previous sensor, the GREEN wire to the EARTH lug on the tagstrip and the GREY wire to the spare grey wire coming from the 13way cable. (The RED wire is +5 volts, the GREY wire is -5 volts and the GREEN wire is an earth) The output from the ZP10a sensor goes to the interface PCB via the WHITE wire.

3) **INTERFACE PCB** - (Old style without changeover jumper pins)

Disconnect the RED & WHITE wires from the interface PCB (terminals 38 & 37).
Reconnect the WHITE wire to terminal 38
There should now not be any wire on terminal 37.

CONTHERM SCIENTIFIC LTD

TECHNICAL MEMORANDUM **PRODUCT : PLCS**
No : 0001

==========

FROM: Russell Kirkwood **DATE :** 12/9/90
TO: ALL AGENTS

==========

SUBJECT: PLCS Wet Sensor to Capacitive sensor upgrade
(Continued)

Connect the RED wire to the output of the +5volt regulator (The original red wire will have to be extended to do this), the +5volt regulator is the 7805 IC on the heatsink nearest the main transformer, and the output lead is the one nearest the transformer.

Connect the GREY wire from the 13 way cable (previously unused) to the output of the -5 volt regulator, (the wire will need to be extended).

The -5 volt regulator is the IC marked 7905 and is towards the centre of the interface PCB adjacent to test point tg, the output of this regulator is the pin going to the transformer side of resistor R9 (560ohm)

These two connections will provide power to the ZP10a PCB.

The modifications are now complete and the capacitive probe should be calibrated to give the correct readout of relative humidity.

4) **CALIBRATION**

Apply power to the cabinet and allow to stabilise for a few minutes, if there is an alarm (probably 5---) ignore it.

Place a calibration instrument into the cabinet (wet & dry bulb or similar) and read the relative humidity, (usually done initially with the cabinet fan running but the timer set to OFF so that the cabinet will not attempt to control, and the door can be left ajar while calibrating). Measure the voltage at the ZP10a PCB on the resistor adjacent to output #1 (this output has NO wire in it), the black meter probe goes onto any ground terminal on the tagstrip (green wires).

Lets assume the reading is 0.28 volts. (MUST be between 0.0 & 1.00 volts else the ZP10a PCB is not calibrated).

The voltage reading relates DIRECTLY to the %RH, ie 0.28 volts = 28% RH. Now using the CENTRE calibration potentiometer on the PLCS Controller (the RH Cal pot) adjust this potentiometer until the PLCS Controller reads the same as your digital meter IE 28% RH.

When there is correlation between the PLCS and the digital meter READ the %RH from your calibration instrument (wet & dry bulb or similar) and the carefully ADJUST the GREEN TRIMMER CAPACITOR on the ZP10a PCB until the PLCS indicates the correct %RH.

Close the cabinet door and allow to stabilise then recheck the readings on the PLCS and calibration instrument, readjust as necessary.

Calibration is now complete and the cabinet, controller, sensor box should be closed up and the cabinet run at the normal operational settings.

NB: The tagstrip connections should be sprayed with a clear plastic sealant when all modifications are complete.

If any problems are encountered check that the power supply voltages and connections to the ZP10a PCB are correct.