

### **The Wet and Dry Bulb Installation.**

The construction and installation of the wet and dry bulb is critical to the overall accuracy of the system.

A 0.1C error in reading between the wet and dry bulb can in the worst part of the curve at temperatures approaching 0C can cause up to approximately a 1.5% error in relative humidity.

Typical conditions leading to errors in the wet and dry bulb temperatures are listed below. This list is designed as a possible indication of error only as conditions can vary widely between different installations.

- (1) Mismatch between Pt100 RTD sensors or any other sensors.  
-It is recommended that band 5 Pt100 sensors be used to minimise this error.
- (2) Mismatch in the lead resistance of the conductors between the wet and dry bulb and the IN-HWD.
- (3) Incorrect installation of the wet bulb covering.  
-Loose fitting, too short, too long, too thick or too thin.
- (4) A dirty or contaminated wet bulb covering.
- (5) Contamination of the water wetting the wet bulb covering.
- (6) Insufficient air flow, or the water reservoir obstructing the air flow.  
-Air flow should be typically 3~10m/s. Lower air speeds are permissible with bulbs of smaller diameter.
- (7) Moisture or heat generation from the wet bulb water reservoir.  
-If the reservoir has a continuous supply of water entering it, the flow should be regulated so that the tank water can be within 2C of the air temperature. If this is not possible it may be necessary to coil the water supply piping before entering the tank).
- (8) Effects from radiant heat.
- (9) Heating caused by a fan or motor etc.
- (10) Heating caused by direct sunlight.  
-Place the unit in a shaded location.
- (11) Before taking measurements ensure the wet and dry bulb have been exposed long enough to the atmosphere being measured.

### **Correction for Pressure Effects.**

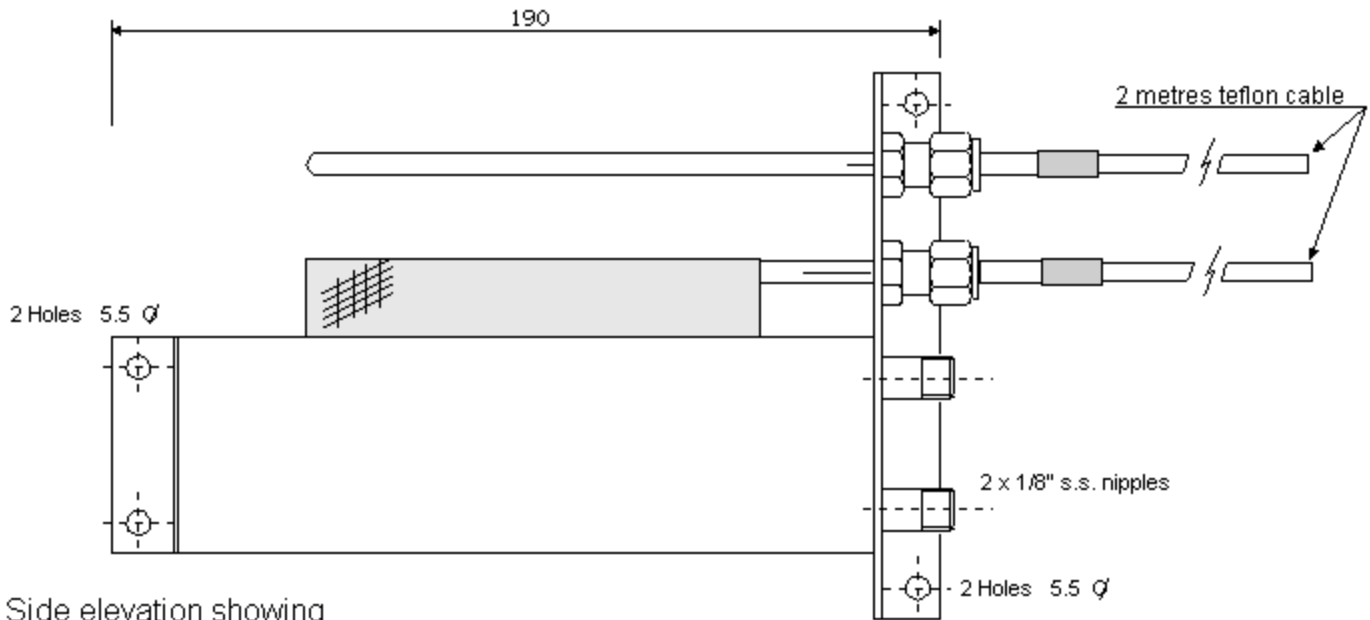
Table of corrections for pressure effects on relative humidity.

**Wet bulb Depression from the dry bulb is 10°C for all values of dry bulb temperature Below.**

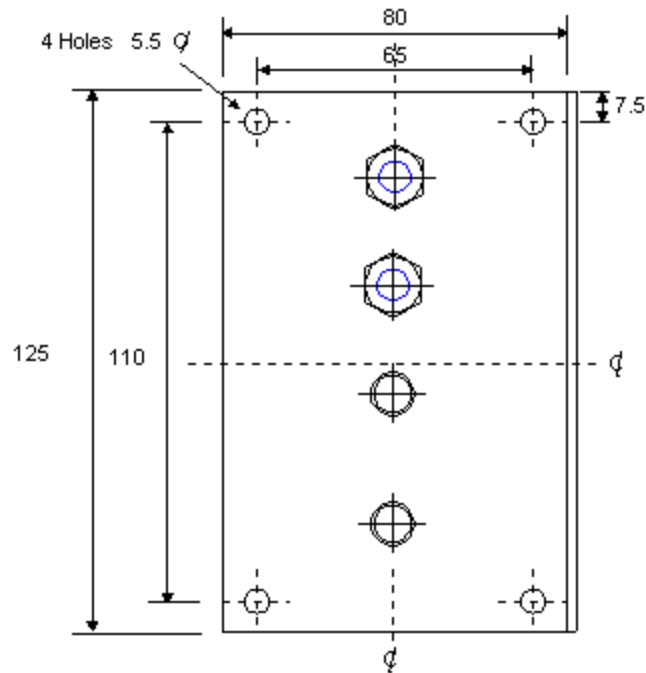
Dry bulb Temperature	Pressure kPa					
	90.0	95.0	100.0	101.3	105.0	110.0
10C	6.1%	3.4%	0.7%	0.0%	-2.0%	-4.7%
20C	3.2%	1.7%	0.3%	0.0%	-1.1%	-2.5%
30C	1.7%	0.9%	0.2%	0.0%	-0.6%	-1.4%
40C	1.0%	0.5%	0.1%	0.0%	-0.4%	-0.8%
50C	0.6%	0.3%	0.0%	0.0%	-0.2%	-0.5%
60C	0.3%	0.2%	0.0%	0.0%	-0.2%	-0.3%
70C	0.2%	0.1%	0.0%	0.0%	-0.1%	-0.2%
80C	0.1%	0.0%	0.0%	0.0%	-0.1%	-0.2%
90C	0.1%	0.0%	0.0%	0.0%	-0.1%	-0.1%
100C	0.0%	0.0%	0.0%	0.0%	-0.1%	-0.1%

Eg. For a dry bulb reading of 20C with a depression of 10C the relative humidity at 101.3kPa is 23.6%RH. Therefore at a pressure of 110.0kPa the true RH would be: 23.6 – 2.5 = 21.1%.

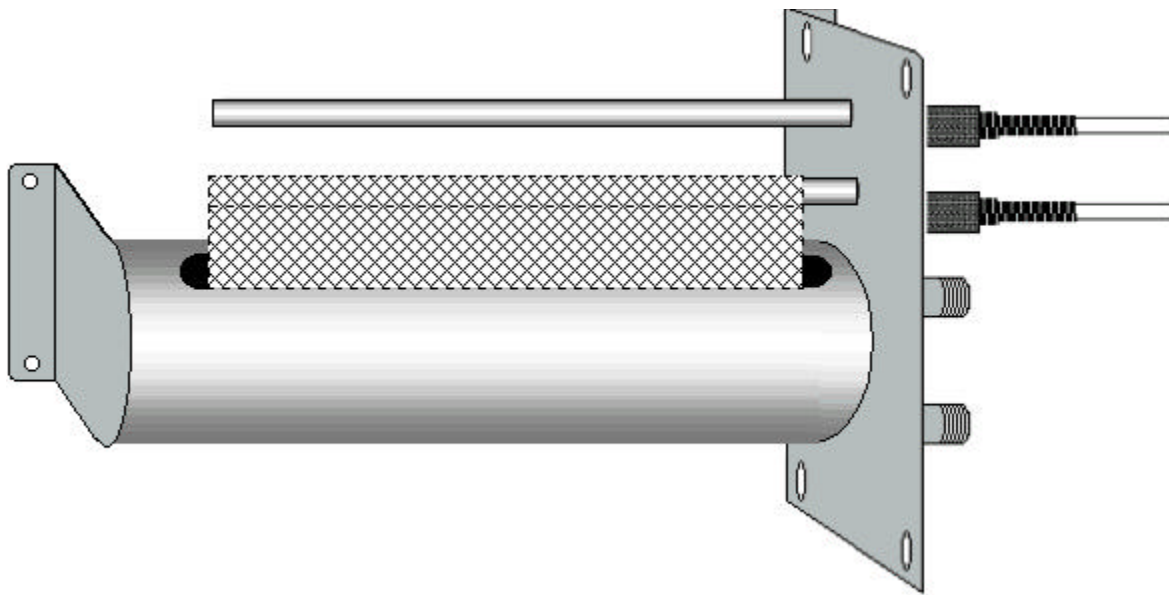
# WDT-DW



Side elevation showing wall mount fixings



End elevation showing duct mount fixings (cutout 96 x 52mm)



***Quality Assurance Programme.***

The modern technology and strict procedures of the ISO9001 Quality Assurance Programme applied during design, development, production and final inspection grant the long term reliability of the instrument.

Notes:

- (1) Be sure to fit a restricter into the water supply line (needle valve), so as only a dribble of water flows out.
- (2) It is very important that the water temperature entering the tank is the same as the surrounding atmosphere. The easiest way to achieve this is to run extra small bore (0.25") or smaller pipe in the area by the Humidity tank so as by the time the water enters the tank, the water temp has equalized.
- (3) Place the WDT-DW humidity tank in an area of good air flow (between 2 & 10 meters per second).