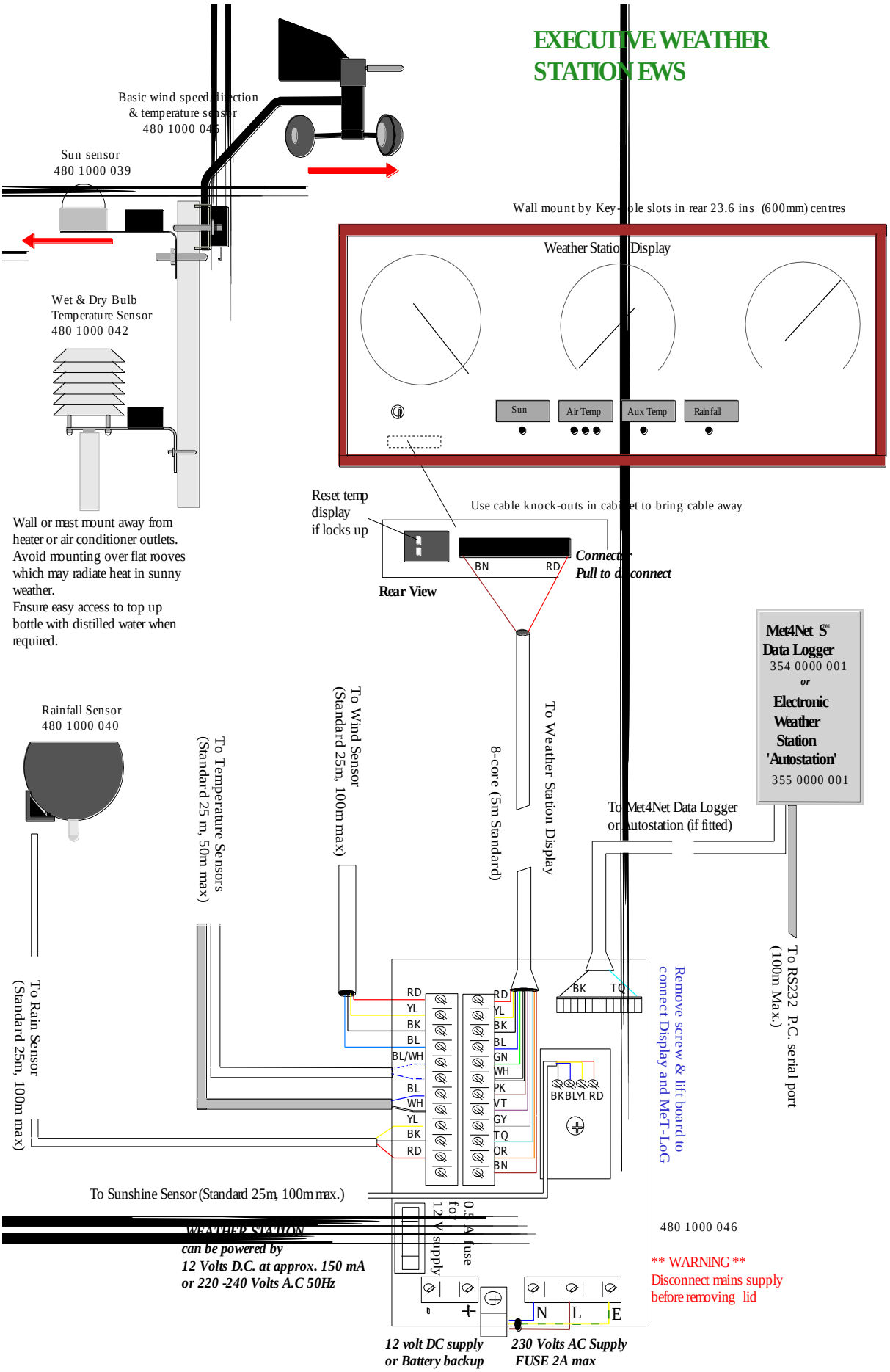
Executive Weather Station EWS

INSTALLATION & OPERATING INSTRUCTIONS

!WARNING!

Front panels PETG
Clean with damp cloth or
anti-static plastics cleaner
DO NOT USE ABRASIVES

EXECUTIVE WEATHER STATION EWS



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SPECIFICATION

Display unit size: 687 wide x 342mm high x 70mm deep
Display parameters:
Wind direction: Analogue read-out 4 cardinal points sub-divided into 5 degree increments, electronically damped.
Accuracy: ± 10 degrees, resolution > 10 degrees
Wind speed: Analogue read-out with gust indicator pointer, calibrated 0- 90 mph, 0-80 knots and Beaufort scale.
Alternative kph and metres/second scales are available (see Model Numbers on front sheet)
Accuracy: ± 5% or 3 knots
Barometer: Analogue read-out with set pointer reset, range 950 -1050 mBar (28 -31 inches Hg)
Temperature: LCD digital read-out in degrees F or C, selectable via push buttons
Range - 40 to + 50° C (- 40 to + 120° F), resolution 0.1° C
Rainfall: LCD digital read-out in 0.01mm increments
Accuracy: ± 5% (5ml of water = 1mm rainfall), resolution 0.01mm auto-sensing
Sunshine duration: LCD digital read-out in 0.01 hour increments
Accuracy: ± 5%, resolution 0.01 hours (36 seconds)
Wet & dry bulb (Auxiliary temperature): LCD digital read-out with humidity sensor fitted with radiation screen.
Relative Humidity and dew point readings are taken from chart provided.

SENSORS

Roof-mounted wind speed and direction sensor, temperature sensor, sunshine duration sensor with mounting clamps for easy installation on mast diameter 25 – 50mm. Remaining sensors wall or post mounted (see installation details with product)
Data cable length: 25m standard pre-wired (additional cable lengths are available when ordering).
Materials: sensor assemblies utilise anodised aluminium alloy, stainless steel, nylon, injection moulded polypropylene anemometer cups.
Compass provided to align wind sensor arm to North and sunshine sensor to South.

POWER SUPPLY

220 – 240Vac 50Hz or 110Vac 60Hz moulded plug-in power supply unit. Alternative 12Vdc may be Customer supplied.

OPTIONAL EXTRAS

Gust alarm: Audible alarm set to adjustable maximum
Wind speed x 2: Facility to double recording scale (used for exposed sites)
Met4Net 'S' Data logger Part No. 354 0000 001: to PC RS232 serial port connectivity or via USB serial port adaptor cable (separately purchased from Instromet Ltd. Part No. 269 1002 001)
Software:
Met4Net ® bespoke software for data recording Part No. 356 0000 001.
Mounting Kits: Aluminium masts 36" long x 1½" diameter
Mast couplers for joining two masts i.e.6'
Wall bracket with mast clamps
} Part No. 480 1000 096
or Roof/slate mounted mast kit for non-chimney dwellings Part No. 480 1000 097
Autostation: Automatic Weather Station & Met4Net ™ software Part No. 355 0000 001/002/003 for 240V/110V/220V respectively.

instromet ™

ISOQAR QUALITY ASSURED APPROACHABLE — UKAS QUALITY MANAGEMENT 026
Certificate No. 3459/02

Products are all subject to availability and our continued product development means specifications may change at any time

INSTALLATION INSTRUCTIONS

Sensor wiring

The cables should be connected to the individual sensors via the terminal block on the sensor bracket. This can be accessed by removing the black cover, where a wiring identification label will be found.

Roof Top Wind Sensor
This unit should be mounted on a mast of 25-50mm(1-2") diameter (suitable mast mounting solutions are available from Instromet sales), as high and as far away as possible from chimneys, roof peaks, buildings, trees and transmitter aerials which may cause wind turbulence or interference. Where possible the roof top wind sensor should be mounted at least 2 metres above roof peaks and be secured in position with the arm pointing accurately to the NORTH using the compass alignment guide provided. The cardboard guide should be removed following alignment by loosening the junction box securing screw. Ensure screw is subsequently re-tightened.
The cable from the roof top wind sensor should be run down to the junction box, making sure it is properly secured. *Please note*! This cable should not be run in close proximity to power or transmitter cables. If it is necessary to shorten the cable please do this when connecting the cable to the junction box.
WARNING: Under no circumstances should the wind sensor junction box cover or the terminal block inside be sealed in any way as it is designed to breathe.

Rainfall Sensor- *see separate page for siting and installation details.*
The rainfall sensor measures the amount of rain passing through it and therefore does not need to be emptied. It is very sensitive, measuring as little as 0.01mm which represents a single large raindrop.

Sunshine Sensor
The sensor is designed to be mounted on a mast of between 25 & 50mm diameter. The mast (usually the wind sensor mast) should be sited where trees, buildings etc will not cause a shadow at any time of day throughout the year. It must be remembered that the sun rises and sets on the horizon which in mid-summer can be NE or NW (depending upon latitude) and only rises to a low angle in mid-winter.
The sensor is best mounted near the top of the wind sensor mast, above any aerials etc and pointed approximately South (North in the Southern hemisphere) to avoid shadows.
The sunshine sensor functions by comparing sunlight to shadow; when the ratio exceeds a pre-determined threshold, the sun is deemed to be shining and the counter will count up one increment every 36 seconds (0.01 hour).
Setting threshold. This is pre-set at the factory and should not normally require adjustment. However, should minor alterations be required due to the glass dome becoming dirty, the small pre-set on the daughter board can be adjusted.

Wet & Dry Bulb Temperature Sensor
This unit can be wall or mast mounted. It should be fitted where there is free movement of air and away from heater /ventilation outlets, chimneys, warm walls and flat roofs etc. The length of the cable affects the calibration and therefore should not, if possible, be shortened or lengthened.
The cable is connected in the junction box with the white cable connected to the AIR TEMP terminals and the grey to the AUX TEMP. terminals as per the drawing.

Junction Box & Power Supply
This unit allows the wiring from the sensors to be terminated away from the main display cabinet and a single multi-core cable to be wired to the display. Five metres (15 ft) of cable are supplied which may be shortened if required. Increasing its length may cause inaccuracies in the temperature read-outs.
To avoid water travelling down cables into the junction box it is important to ensure that the cables drop below the junction box at some point preferably in the form of a 'U' bend. This will allow any water travelling down the cables to drip off.
The mains power supply is wired to this unit and care should be taken to ensure that the correct fuse is used i.e. 2 - 5Amp.

The Sunshine Control circuitry is housed in this unit on a separate 'daughter' printed circuit board which must be removed to allow access to terminals below. Unscrew the board from the master board and fold over carefully to avoid damage to the small inter-board cables and connector. Similar care should be exercised when replacing the board to ensure the correct connections are made. This board should not normally require adjustment.

Display Unit
The illuminated display unit should be wall mounted by the two key-hole slots in the back panel 600mm centres. The cable may be either channelled into the wall or brought out the side of the cabinet by using the cable knock-out holes at each side and at the bottom of the cabinet. Please make sure no dust gets into the display unit**.**
The display unit is connected to the junction box by a 12-core cable. When connecting please ensure that the cable is connected colour to colour as per the label and installation drawing.

OPERATING INSTRUCTIONS

Barometric Pressure
Calibration of the barometer is achieved by adjustment of the screw head on the barometer movement, accessible through a hole in the back panel.
This adjustment is best carried out when pressure is high and stable. A reading from your local Airport, Meteorological Station or Weather Forecast will be essential.

Gust Pointer
Rotate the gust knob anti-clockwise until it connects with the wind speed pointer. It will now be carried up to show the maximum speed.

RESET KEY
In order to Reset the Rainfall, Sunshine and Temperatures displays it is necessary to insert the reset key and rotate clockwise. This avoids unauthorised resets.

Outside Temperature
The LCD temperature display shows the outside temperature at the roof top sensor. Celsius or Fahrenheit display may be selected by pressing the lowest of the buttons on the left side of the cabinet.

Humidity and Dew Point
Celsius readings should be selected by pressing the bottom button. Readings of both the DRY & WET bulb (Aux Temperature) temperatures are logged. These figures are then compared with the table supplied to give values of Humidity and Dew Point.

Rainfall
The Rainfall display shows the amount of rainfall since last reset in 0.01(1 hundredth) of mm.
Reset (see RESET KEY above) is accomplished by pressing Rain reset button.

Sunshine
The sunshine display shows the hours of sunshine (in 0.01 hour divisions) since it was last reset.
Reset (see RESET KEY above) is accomplished by pressing the Sun reset button.

Time/Temperature (If *fitted*)
The current time is displayed with the button in the normal position (out) when depressed
Internal Temperature is displayed.
Time Set - press the appropriate button at the rear of the display to forward the displayed time. Note: - a few seconds will elapse after the buttons are depressed before the display responds, this avoids accidental reset.

LCD Displays
The LCD displays have a back up battery to allow for accidental loss of power whilst still maintaining the records of temperature. Under normal usage the battery should last at least 2 years. Should the
display reduce in contrast when the power is off, a replacement AA Alkaline battery is easily fitted by disconnecting the power supply and removing the back panel.
Important - Should the LCD display lock up, ie. numbers are fixed or strange, slide the switch at the rear of the display unit to OFF for 30 seconds, then slide back to ON. This should cure the problem. If not repeat the operation.

Troubleshooting Guide.

You've installed your Weather Station and find that despite careful attention to detail, it does not work as expected. The following notes may assist in getting your Weather Station working.

Nothing appears to work.

Check that the power supply is turned on at the wall socket. Check power cable correctly wired to the correct terminals in the Junction Box. Remember; The LCD displays will appear to be functioning even without mains power as they have a back-up battery within.

Wind Direction wrong

If Wind Direction gives the wrong reading, check that the wind sensor has been mounted to point North. If the pointer is permanently displaying a Northerly or North
North East wind direction then the wind sensor is not connected to the instrument or is incorrectly wired. Note that if the wind sensor is incorrectly wired then neither wind speed nor direction will work.

Wind Speed not working

Check anemometer cups are turning freely and if so wiring is correct (particularly the *blue* wire from the Wind Sensor) and the cable not damaged.

Temperature display flashing LLL.

This indicates that the temperature probe is not connected to the instrument. Check that the *green and white* wires from the wind sensor are correctly connected to the appropriate terminals.

Temperature display locked on a fixed temperature.

The display may have locked up during installation. Other indications are that none of the buttons located at the side of the instrument will have any effect on the display. This can sometimes happen and can be corrected as follows:-

Remove the Display from the wall (if wall mounted), to the left of the connector there is a small slide switch with two white buttons, slide these to the right to the *off* position. Leave for one minute, during which time the display(s) should go blank. Now slide the switches to the ON position (to the left). If this procedure fails to cure the problem repeat the procedure once more, waiting a little longer before sliding the switches to the ON position.

Temperature reading inaccurate
If the temperature reading is only 1 or 2 degrees out then the display can be recalibrated as follows:-

Remove the display from the wall by lifting the unit and pulling forward.
Remove the back by undoing the four screws.

At the back of the temperature displays there are small presets with a screw driver-slot. Adjust this with a small screw-driver to give correct display.

If the cable to the Wind/Temperature has been extended, the accuracy of the temperature will be reduced, and although this can be adjusted as above, extremes of temperature may show other errors.

If temperature reading is very inaccurate, showing HHH or LLL, check wiring to the junction box; - see installation instructions) and cable.

Barometer showing incorrect pressure.

The barometer may need adjusting to the pressure at your location. First obtain a pressure reading from a reliable nearby source such as an airfield or local met office. Having done this locate the adjustment screw visible through the back panel and using a small screwdriver turn the adjusting screw until the pressure reading is the same as that obtained locally. Do not attempt to turn the screw more than one turn in either direction.

Sunshine not being recorded.

Check all connections to junction box.
Check daughter printed circuit board in junction box is correctly aligned at the connector (can be seen by looking between the boards).
Sensitivity control incorrectly adjusted. Rotate the pre-set anti-clockwise to increase sensitivity.

Rainfall not being measured.

Check that the rain sensor has not become blocked with leaves or bird droppings etc.

Check also the sensor is mounted horizontally.

Very slowly put 5mL of water (a medicine spoon) into the Rain Sensor and check water is coming out of the bottom tube a drip at a time. If so this should give a reading of approximately 1.00 mm on digital display (ensure reset before starting).

If it still does not work check that the sensor has been wired correctly and the cable is not damaged. If wired underground check that rodents have not chewed through the cable.

RAIN SENSOR MAINTENANCE & TROUBLESHOOTING

The Instromet Rain Gauge will provide superb performance and super sensitivity with a resolution of only 0.01 mm. Unfortunately, this sensitivity comes at a small price – the need for regular cleaning of the funnel and filters. The frequency of this cleansing will to a large extent depend on the locality of the site. In very dusty areas, in times of predominantly dry weather, the gauge may well have to be cleaned once a month whereas cleaner areas may only require attention twice a year.

1. **Cleaning the gauge**

Before any tests are carried out the gauge must be checked for cleanliness.

Remove the sensor from the wall/post bracket by pulling it up off the bracket. **Beware; -** the funnel may have filled with water so there is a danger of spillage!

Pull out the filter post, which, if fitted, will reveal either a red filter sponge or a wire gauze disc filter. The sponge can be removed, preferably, with a pair of tweezers or small screwdriver. The wire gauze will have to be prised out carefully with again a small screwdriver.

At this point it would be advisable to wash the funnel and filters out with warm water and detergent, a small brush will be useful here.

It should now be possible to see a very small hole (less than 1 mm diameter) in the centre of the funnel bottom. If not clear a piece of wire (e.g. a paper clip straightened out or a medium sized sewing needle) should be pushed through any mire that may have stuck to the bottom.

If the unit has a clear tube fitted at the bottom it will be worth looking at the condition of this. If it is looking generally clear then no further action will be required. If, however, the clarity of the tube is severely impaired by algae then running water with diluted bleach or other cleansing fluid through it several times will be worthwhile. Beware; do not allow the diluted bleach to come in to contact with your skin or clothes.

Once all is clean and water will pass through the gauge replace the filters and re-mount the gauge on its bracket. Check again that water passes through by emptying a teaspoon full of water into the funnel. It may take a minute or two but water should eventually drip out of the bottom.

2. Testing the gauge

Be sure to reset the Rainfall counter to zero before each test

Assuming that water has passed through satisfactorily as above, the unit can now be tested for accuracy.

What is required is to drip 5 ml of water into the funnel over a period of approximately one minute to simulate the rate of normal rainfall. Introducing large amounts of rainfall in one go will result in inaccurate results.

5ml of water introduced should produce a reading of 1.00 mm

A 5 or 10 mm syringe is ideal as a measuring device as the water can be measured accurately and dispensed slowly. Alternatively, although less accurate, a 5ml medicine spoon will do the same job although controlling the rate at which the water is dispensed will be difficult.

Fault Finding

If the testing above results in no readings being recorded then the following procedures will assist in locating the source of the problem.

Identify where the cable from the rain sensor is connected within the building be it to a junction box or to the back of the display itself. Disconnect the Yellow wire (White if screened cable) from the sensor.

Reset the counter.

With a short piece of wire connected to the Yellow terminal (make sure terminal screw is tight) short circuit several times to the Red terminal that also leads to the Rain gauge.

This should result in a count on the display. If not; repeat the test ensuring that the power is on and if still no success the problem will lie in the display or cable/connections leading from the junction box to the display.

If the display counter has now advanced from zero then the cause of the problem will be due to either the integrity of the cable or connections, or the rain gauge itself. **Reconnect the yellow wire**.

To test the cable it must first be disconnected from the gauge. Remove the small securing screw from the base of the gauge bowl and separate the two halves around the equator.

Identify and unplug the cable from the printed circuit board.

Ensure yellow wire is properly reconnected, power is on and Reset the counter.

Using a short piece of wire (a paper clip suitably bent will suffice) short out several times the **Yellow and Red wires on the cable**. The wire link can be pushed into the appropriate holes on the connector if fitted. This should result in a count of several digits on the Rain display. If not, the cable is suspect and needs to be thoroughly checked. If the cable is buried beware of rodents who may have bitten through it.

If a count is recorded then the problem is almost certainly the gauge itself. Inspect the printed circuit board for corrosion and damage to the clear tube if fitted. If nothing obvious is observed then introduce a small amount of water into the funnel and watch to see if it emerges in discreet droplets – be sure to keep the funnel top horizontal while carrying out this test. If the water does not emerge correctly try cleaning unit again.

If all fails call service department **01692 502800** or return the sensor to us for checking or replacement.

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