

## Precipitation Detector

The WSX53 is a very robust electronic precipitation detector which is designed for controlling many systems where there is need to respond to external weather conditions.

Such systems include

- Building Automation
- Plant Automation
- Commercial and Residential Homes
- Weather Centres
- Sprinkler Control
- Agricultural use, etc.
- De-icing and drying systems

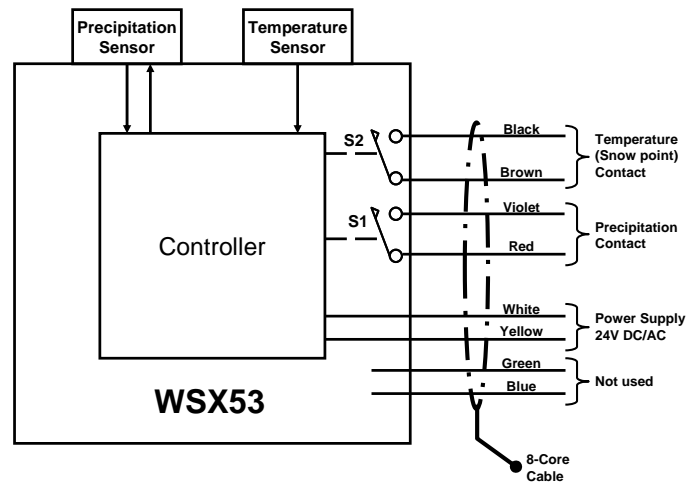
It may be required to activate things such as

- Blowers
- Heaters
- Boilers
- Door or window closers
- Shutters, or other items in response to the external weather conditions.

With its wide operating temperature range and IP66 enclosure it is suitable for use in many inhospitable situations.

The detector consists of two essential parts. There is a humidity sensor which senses any precipitation without discrimination i.e. rain, snow, hailstone, sleet are all detected the same.

The humidity sensor is complemented by an ambient temperature sensor which is used to sense snow point and thus discriminate between rain on the one hand and snow, sleet or hailstone on the other. Precipitation at or



**Figure 1 WSX53 - Functional diagram**

below snow point is interpreted as "Snow".

The WSX53 is fully self contained and requires only the application of 24V DC or AC power supply to be operational. Its outputs are a pair of volt-free contacts which are totally independent of each other.

One set of contacts (S1) is closed if the precipitation sensor detects any precipitation, i.e. when there is water or moisture on it. Otherwise it remains open. To make sure that the sensor still works in case of dry precipitation (hailstone and dry ice), it has a built in heater which maintains the sensor's temperature always above freezing point. This means the sensor is always kept clear and no frozen water or ice is allowed to accumulate on it over a long period of time.

The other set of contacts (S2) is closed when the controller senses an ambient temperature below snow point.

Otherwise, the contacts remain open.

### **Sensor**

The WSX53 has a proprietary design sensor combining

an ingenious design with a special drive algorithm to ensure long sensor life.

## Output Configuration

Each set of contacts will independently sense either precipitation (S1) or Snow Point Temperature (S2). To sense only frozen water (snow or hailstone), connect S1 and S2 in series. To sense either or SPT, connect S1 and S2 in parallel.

## Time Delay

The two contacts, S1 and S2, have a post operative delay time. The delay timer can be activated by setting two switches inside the control housing to be either 0 (no delay), 15 minutes, 30 minutes or 45 minutes. Following the end of detection of precipitation or snow point temperature, the contacts would normally open immediately. However, with the delay timer set, the contacts will be kept closed for the duration of the delay timer. The time delay switches determine the delay time for both the precipitation and snow point contacts (S1 and S2) although the two contacts can start and end their delay at different times depending on when they are de-activated by external events.

The delay feature is useful in situations where the weather is very unstable such as in several short bursts of rain interrupted by brief periods without rain. Thus it can be

ensured, for example, that shutters are not constantly being opened and shut or that heaters are left on long enough to have dried the previous precipitation, etc.

## Mounting

The WSX53 can be mounted in two different ways. First, it can be mounted on a conduit pole or mast using the integral M20 conduit mounting adaptor through which the interface cable exits. To mount the WSX53 in this way, remove the hexagonal cable gland attachment by unscrewing it from the mounting adaptor on the detector. The conduit will then screw directly into the adaptor in place of the cable gland.

Alternatively, it can be mounted on a vertical flat surface using four mounting screws. The lid of the WSX53 will have to be removed to gain access to these four mounting holes which are hidden beneath it.

In either mounting position, it should be ensured that the WSX53 is mounted such that the precipitation sensor is upright and vertical. Ensure that there is no obstruction around it that could interfere with precipitation reaching it. Also, it is best to avoid exposing the temperature sensor under the detector to direct sunshine as this may give a false temperature indication.

It may be necessary to lengthen the cable wires by splicing them. Make sure they are well insulated after splicing.

## Testing the WSX53

You may want to test that your WSX53 is working or not prior to installation. This is very easily carried out as follows.

You will need the following;

- A power source of 24V AC/DC 5W
- A digital multimeter set to continuity range

**Table 1 - Switch setting for time delay**

Delay (minutes)	Switch Setting	
	S1	S2
0 (Default)	Off	Off
15	On	Off
30	Off	On
45	On	On

- Aerosol freezer (available from most electronic component distributors).
  - Cotton swabs
1. Connect the yellow and white wires to the 24V power source and switch on.
  2. Check that there is an open circuit between
    - a. Black and brown wires
    - b. Red and violet wires
  3. Moisten the cotton swap and apply a drop or two of water on the precipitation sensor. You will hear a “click” as the precipitation relay energises. Confirm this by checking for continuity between the red and violet wires.
  4. Now spray the temperature sensor with the aerosol freezer for a couple of seconds each time until you hear a “click” indicating that the snow point relay has energised. Confirm this by checking for continuity between the black and brown wires.
  5. Wipe off any water from the precipitation sensor and the precipitation relay will de-energise (unless the timer has been set in which case it will de-energise after the set time has elapsed).
  6. The snow point relay will similarly de-energise once it warms up above the snow point temperature..

### Taking care of your WSX53

The WSX53 is designed for outdoor operation and should provide you with many years of trouble free operation if taken care of properly. It should not be thrown about or subjected to excessive shocks. In particular, the humidity sensor should not be subjected to any abrasion or abrasive substance. If any dirt film accumulates on the sensor, this could affect reliable operation of the detector. In this case, rinse the sensor with warm soapy water and gently wipe dry with cotton swabs. It is recommended that this process is carried out at least once every 12 months.

Table 2

<b>Specification</b>				
<u>Parameter</u>	<u>Quantity</u>	<u>Unit</u>	<u>Tol</u>	<u>Comment</u>
Power Supply	24	V	±10%	AC/DC
Power Consumption	5	W	---	
Contacts rating	3	A	Max	@ 230V AC
Enclosure rating	IP66		---	
Operating Temperature	-40 to +60	°C	---	
Snow point setting	3.5	°C	±0.5	
Dimensions	82 x 80 x 55	mm	---	
Weight	275	g	±5	Including trailing cable

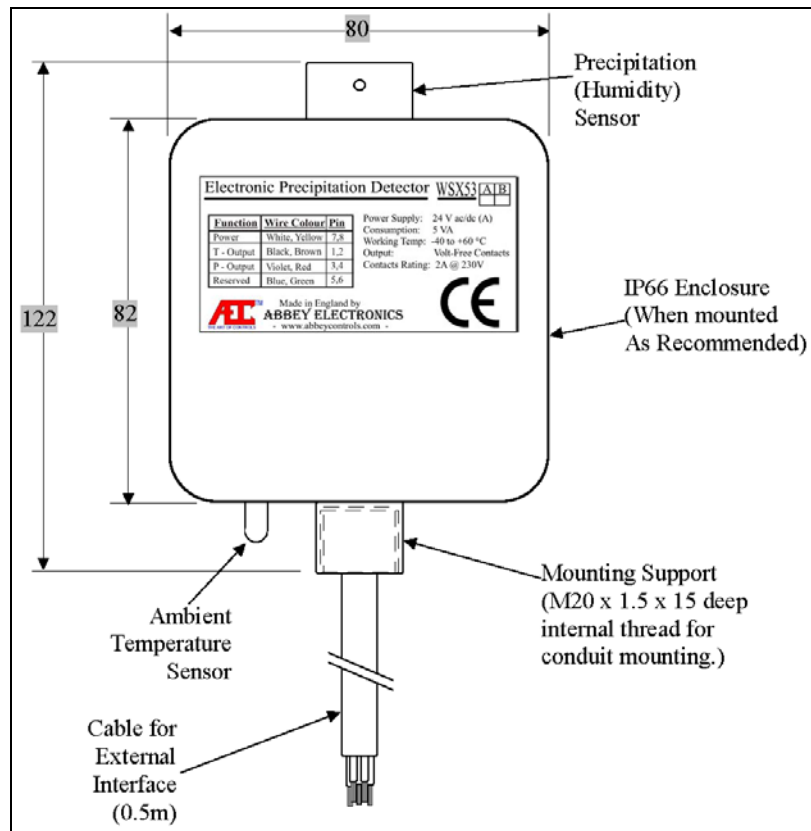


Figure 2 WSX53

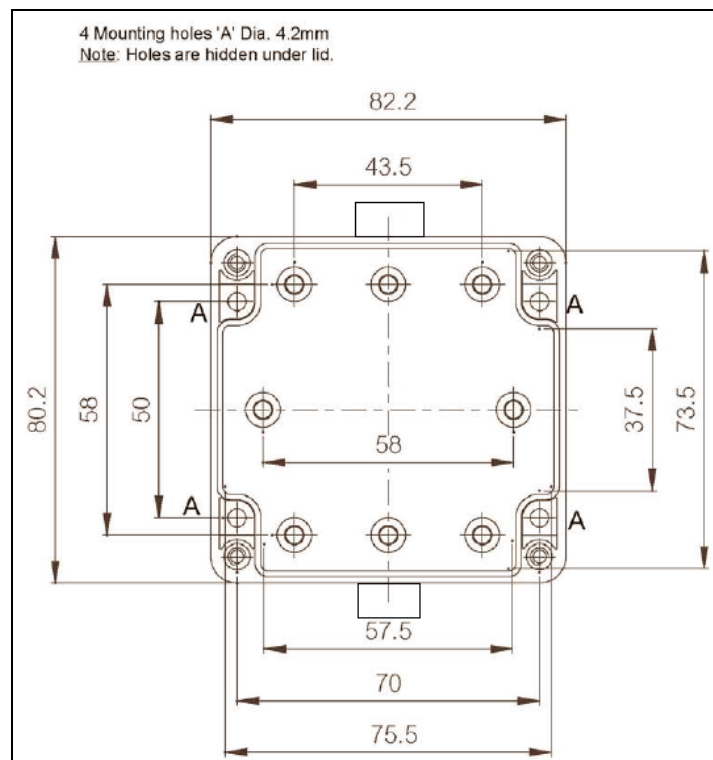


Figure 3 Surface-mounting holes details - remove lid to reveal holes.