



# AcuVu

Single Channel Inline Hygrometer

## Instruction Manual

Issue 1

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# 1 Unpacking your Shaw Moisture Meters AcuVu

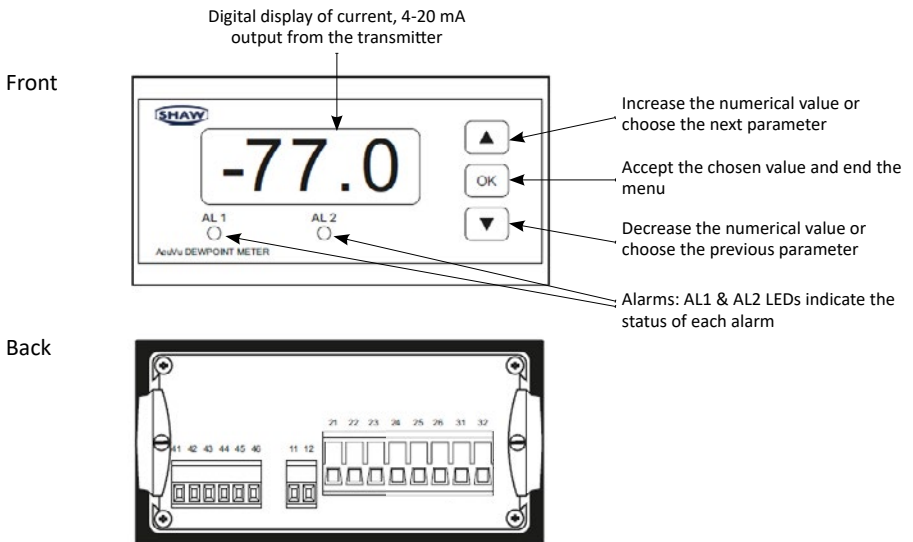
Please examine the AcuVu for any damage or mishandling. If any damage is evident please notify the carrier and the Shaw Moisture Meters representative from where this unit was purchased.

You should have received (if ordered):

- 1 AcuVu instrument
- 1 instruction manual
- 1 pressure dewpoint circular calculator

**If anything is missing please contact your distributor immediately.**

## 2 General Information



A 4 digit, 14 segment LED indicator with a programmable front keypad. Programmed to the range of the Model AcuDew dewpoint transmitter and relay ON/OFF indication. The alarm set points can be adjusted by use of the front keys.

## 3 Safety Information

Read the safety information **BEFORE** installation.

### 3.1 Warning

This device is designed for connection to hazardous electric voltages. To avoid the risk of electric shock and fire, the safety instructions of this manual must be observed and followed. Hazardous voltages may be present on instrument terminals. The equipment must be installed by suitably qualified personnel and the instrument must be mounted in a position that provides protection behind the panel to at least IP20. When mounted in front panels, the included rubber packing must be mounted between the panel cut-out and the display front to obtain IP65 (NEMA 4) ingress protection.

### 3.2 Isolation

Mounting and connection of the instrument should comply with national legislation for mounting of electric materials.

The power supply terminals and associated internal circuitry are isolated from all other parts of the equipment in accordance with EN61326-1:2013-1 for connection to a Category II supply (Pollution Degree 2). Any terminals or wiring connected to the input or output, which are accessible in normal operation, must only be connected to signals complying with the requirements for Safety Extra Low Voltage (SELV) circuits.

Descriptions of Input/Output and supply connections are shown in the block diagram on the top label.

The mains supply to the instrument must be protected by an external one amp fuse (maximum 10 amp) and a suitable switch or circuit breaker, which should be near the instrument.

**Note:** *The instrument contains no user serviceable parts.*

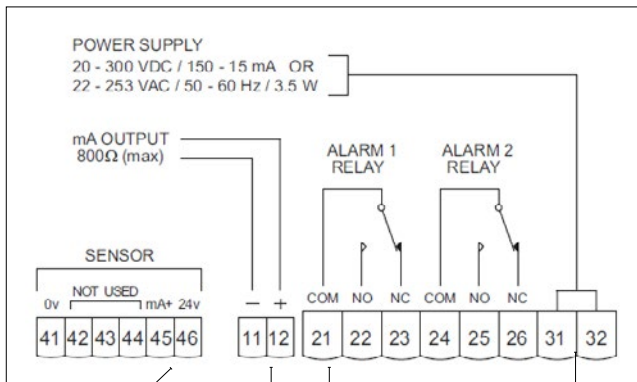
## 4 Installation

### 4.1 Installing the Instrument to the Panel

Make a cut-out in the donor panel 92.0/92.8 x 45.0/45.6 mm (1/2 DIN). The maximum panel thickness is 10 mm. If an effective IP65 weatherproof seal is required, the minimum recommended panel thickness is 1.6 mm. Pass the instrument case through the cut-out in the donor panel and slide the panel clamp over the instrument from the back. Tighten the retaining screws until the instrument is clamped securely in position. The screws must be tightened sufficiently to affect a seal between the front of the donor panel and the back of the instrument bezel but never over tightened.

### 4.2 Instrument Wiring

Wire the AcuVu as per *figure 1.1* below.



*figure 1.1*

#### AcuDew Interface

Pins 45 and 46 - Connect to mA and 24 V for AcuDew, ENSURE the red wire connects to 46.

#### Analogue Output

Connect to + and - for 4 - 20 mA analogue output.

#### Alarms

Two independent fully programmable switched contacts rated 2 A @ 250 V AC/ 1 A @ 24 V DC

#### AC or DC Power

Connect the power supply to the two green terminal blocks marked 31 and 32. Universal 22 - 253 V AC 50/60 Hz or 20 - 300 V DC.

### 4.3 Power Supply

The AcuVu can be powered by either a 22 - 253 V AC or 20 - 300 V DC supply. Connect the required supply cable to the appropriate terminals as shown in *figure 1.1*.

### 4.4 Alarm and Output Cable Connectors

Connect the required cables to the appropriate terminals as shown in *figure 1.1*.

**Note:** The normally open and normally closed relay contact positions.

Ensure that the wire is fully inserted and that no loose strands are exposed.

### 4.5 Transmitter Cable

Connect the AcuDew dewpoint transmitter cable as shown in *figure 1.1*. Route the transmitter cable to the intended site of the transmitter.

### 4.6 Analogue Output

Connect the required cables to the appropriate terminals as shown in *figure 1.1*.

**Note:** Ensure the correct polarity and the maximum load specification are strictly observed for the analogue outputs.

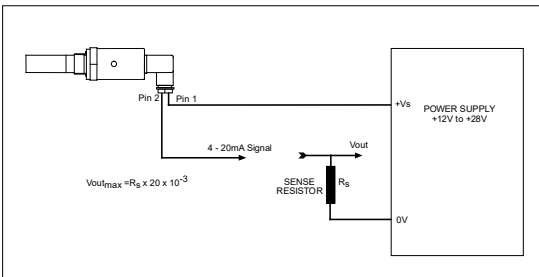
#### PLEASE NOTE:

- The power supply to the instrument must be protected by a 1A fuse.
- A local isolation switch is advisable for ease of isolation during maintenance to reduce the possibility of electric shock or damage to the instrument.
- The power supply ground GND terminal must be wired to a suitable permanent ground point.
- Cables should be properly supported and segregated.

### 4.7 Wiring the AcuDew

The AcuDew is a 2 wire, 4 - 20 mA transmitter. Typical electrical connection to generate a voltage output is shown below.

**Note:** the maximum value for  $R_s$  in this circuit can be calculated by the formula:



$$R_s \text{ max} = [40 \times (V_s - 7)] \Omega$$

If the wiring resistance is expected to be more than a few percent of the value of  $R_s$ , then this resistance must be taken away from the answer to get the maximum usable value of  $R_s$ .

## 5 Default Instrument Configuration

When configuring the display, you are guided through all parameters. You can choose the settings which suit the application. For each menu there is a scrolling help text which is automatically shown in the display. This starts after five seconds if no key has been activated. Configuration is carried out by using the three function keys:

- Will increase the numbered value or choose the next parameter.
- Will decrease the numerical value and choose the previous parameter.
- Will accept the chosen value and end the menu.

Once the configuration has been entered the display will show "----". Press and hold  to return to the previous menu or return to the default state without saving or changing parameters. If no key is activated for two minutes the display will return to the default state without saving the changed values or parameters.

The standard factory settings are as follows:

- The instrument will display the moisture content in °C dewpoint
- Both alarms are set to trigger when rising above the upper limit
- The output span is set to 4 - 20 mA
- The 4 - 20 mA output is set to the full span of the selected range
  - e.g. 4 mA = -80 °C
  - 20 mA = 20 °C
- All security codes are defaulted to 0000

## 6 Commissioning

Switch on the instrument power. The display will read **SE.BR**. This is the 'Sensor Wire Break' display condition.

## 7 Configuring the AcuVu Hygrometer

### 7.1 Range

The RANGE settings are according to the chosen transmitter range.

### 7.2 Output

The default setting is for the output to cover the full operating span of the selected range e.g. 4 mA to equal -100 °C and 20 mA to equal 0 °C.

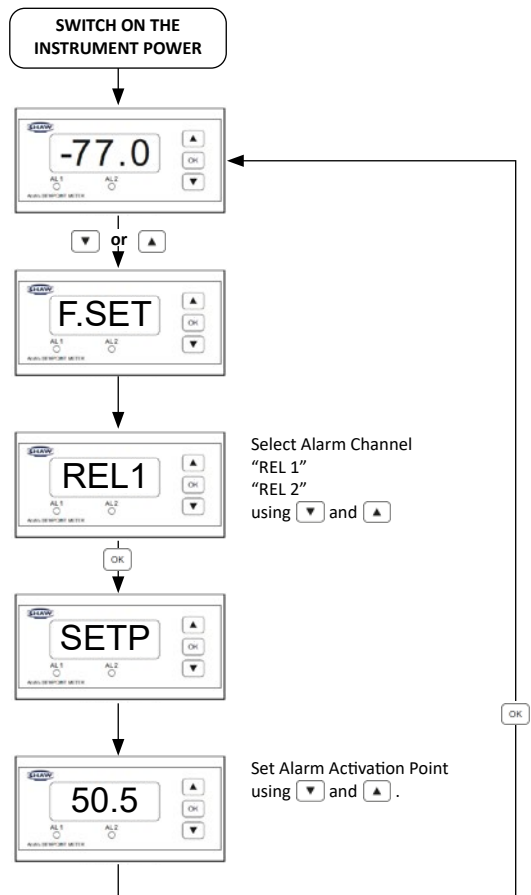
### 7.3 PASS

The PASS option allows the user to alter the security password used to protect the setup menu. Whilst PASS is displayed use and keys to enter the subroutine. The instrument now displays 0000. Use and keys to enter the new password. Press .

### 7.4 AL1 and AL2

The AL1 and AL2 option allows the user to set up two independent alarms. Trip point, direction of trigger' relay enable status, latching status and hysteresis can be set within this option.

To activate the quick alarm settings screen, press or . The LED now displays 'F.SET' followed by a selection menu for AL1 or AL2 relay. Using the or key, scroll to select the required alarm and press the . The instrument displays the message 'SETP' before displaying the current set point.



- Increase set point
- Decrease set point
- Save and exit the menu



## 8 Normal Operation of the AcuVu

In normal operation, the AcuVu will display the current moisture value of the connected transmitter. The value is displayed in the currently selected engineering units, which is indicated by the small LED and updated once per second.

The alarm LEDs (AL1 and AL2) will light whenever an alarm condition occurs and only turn off when the alarm condition clears.

Remote signalling of an alarm condition is provided by two internal changeover relays that trigger at the same time as the LEDs.

## 9 Faults/Errors

If the sensor is short-circuited, the transmitter will produce a constant 20.75 mA output.

If the sensor is open-circuited, the transmitter will produce a constant 20.50 mA output.

## 10 Guarantee

All SHAW products are guaranteed for two years from the date of purchase, some exclusions are as follows:

Removing protective guard from any sensor, subjecting sensor to shock or black list gases e.g. caustic and acidic gases like ammonia and chlorine, tampering with any internal electronics and applying incorrect supply voltage to meters, subjecting to excessive flow rate, contaminants and general misuse.

If you suspect a fault which you feel needs to be attended to under guarantee please contact us for assistance hopefully to help fault find and effect a remedy and if this is not successful to give precise instructions for the return for inspection.

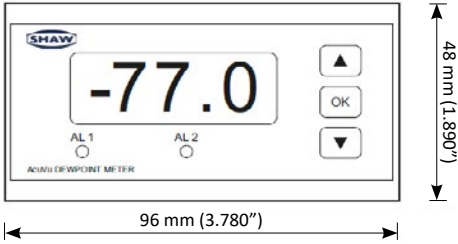
No equipment will be replaced or repaired without having been returned for inspection either to ourselves or an authorised distributor.

# 11 Specification

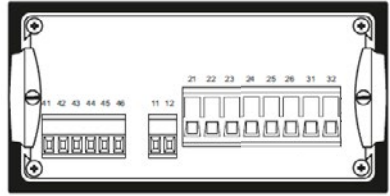
<b>Electromagnetic Compatibility (EMC)</b>	EMC Directive 2004/108/EC Complies with BS EN 61326																		
<b>Low Voltage Directive</b>	73/23/EEC EN 61010-1																		
<b>Power Consumption</b>	3.5W Maximum																		
<b>Alarm Relays</b>	Two independent fully programmable switched contacts. Rated 2 A @ 250 V AC / 1 A @ 24 V DC																		
<b>Annunciators</b>	AL1 and AL2 LEDs on front panel indicate status of each alarm																		
<b>Alarm &amp; Range Limits</b>	<table><thead><tr><th></th><th>Upper Limit</th><th>Lower Limit</th></tr></thead><tbody><tr><td>°C dewpoint</td><td>20.0</td><td>-120.0</td></tr><tr><td>°F dewpoint</td><td>68.0</td><td>-184.0</td></tr><tr><td>P (ppm)</td><td>9999</td><td>0.001</td></tr><tr><td>b (ppb)</td><td>9999</td><td>0.150</td></tr><tr><td>L (lb/MMSCF)</td><td>1000</td><td>0.010</td></tr></tbody></table>		Upper Limit	Lower Limit	°C dewpoint	20.0	-120.0	°F dewpoint	68.0	-184.0	P (ppm)	9999	0.001	b (ppb)	9999	0.150	L (lb/MMSCF)	1000	0.010
	Upper Limit	Lower Limit																	
°C dewpoint	20.0	-120.0																	
°F dewpoint	68.0	-184.0																	
P (ppm)	9999	0.001																	
b (ppb)	9999	0.150																	
L (lb/MMSCF)	1000	0.010																	
<b>Output Signal</b>	Linear 4-20 mA or 0-20 mA fully isolated																		
<b>Load (max)</b>	20 mA / 800 Ω / 16 V DC																		
<b>Isolation Voltage, Test/Operation</b>	2.3 kV AC / 250 V AC																		
<b>Operating Voltage</b>	22-253 V AC or 20-300 V DC																		
<b>Operating Pressure</b>	From 1 kPa (0.01 barA) to maximum 35,000 kPa (350 barA) for the AcuDew dewpoint transmitter																		
<b>Operating Humidity (External)</b>	Maximum - 95% RH non-condensing																		
<b>Temperature Range</b>	Electronics -20 °C to +60 °C Sensor -20 °C to +50 °C																		
<b>Enclosure</b>	½ DIN panel mount ABS case																		
<b>Dimensions (HxWxD)</b>	48 x 96 x 120 mm																		
<b>Cut Out Dimensions</b>	44.5 x 91.5 mm (½ DIN)																		
<b>Weight</b>	230 grams																		
<b>Warm Up Time</b>	5 seconds																		
<b>Weatherproof Classification</b>	Front panel only - IP65 (NEMA 4)																		
<b>Display</b>	4 digit, 14 segment LED indicator, red characters 13.8 mm (h). Factory configured to display: °C, °F, ppm(v) or ppb(v)																		
<b>Fault Conditions</b>	Short circuit: transmitter produces a constant 20.75 mA output Open-circuited: transmitter produces a constant 20.50 mA output.																		
<b>Mechanical Warranty</b>	24 months in case of faulty workmanship and defective parts																		
<b>Compatible with</b>	SHAW AcuDew dewpoint transmitter																		

# 12 Appendix A - AcuVu General Assembly Diagram

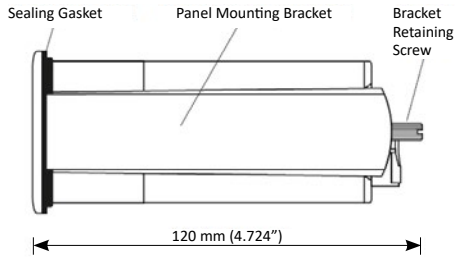
FRONT



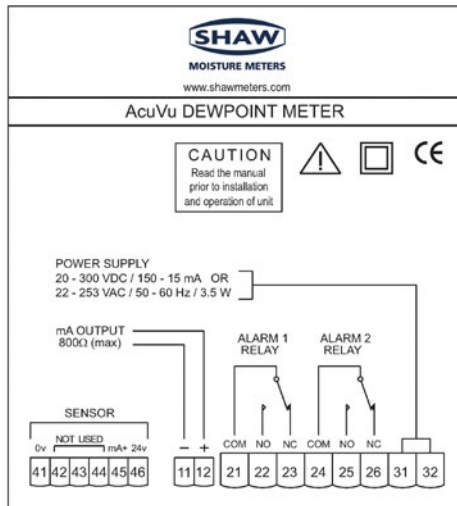
REAR



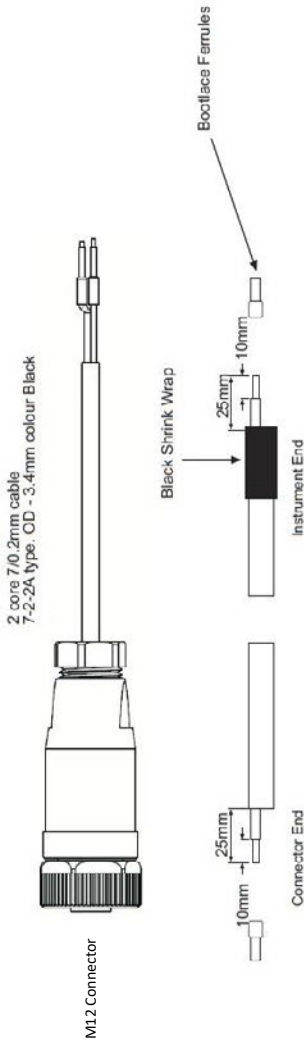
SIDE



# 13 Appendix B - AcuVu Wiring Instruction



# 14 Appendix C - AcuDew Cable Assembly

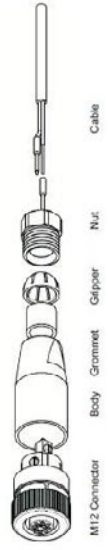


- 1) Strip back 25 mm of outer sleeve.
- 2) Place 30 mm of Black shrink sleeve over outer sleeve, overlap 2 inner cores.
- 3) Strip back 10 mm of sleeve from each core.
- 4) Place the Ferrules over the wire core and solder.

- 1) Strip back 25 mm of outer sleeve.
- 2) Strip back 10 mm of sleeve from each core.
- 3) Place the ferrules over the wire core and solder, trim the excess wire.
- 4) Put the wire through the nut, gripper, grommet and into the body of the connector.
- 5) Locate Ferrules in contacts and tighten screws as per table below.



Connector Pin	Wire	Signal
1	Red	+ve
2	Blue	4-20mA
3	Nc	
4	Nc	



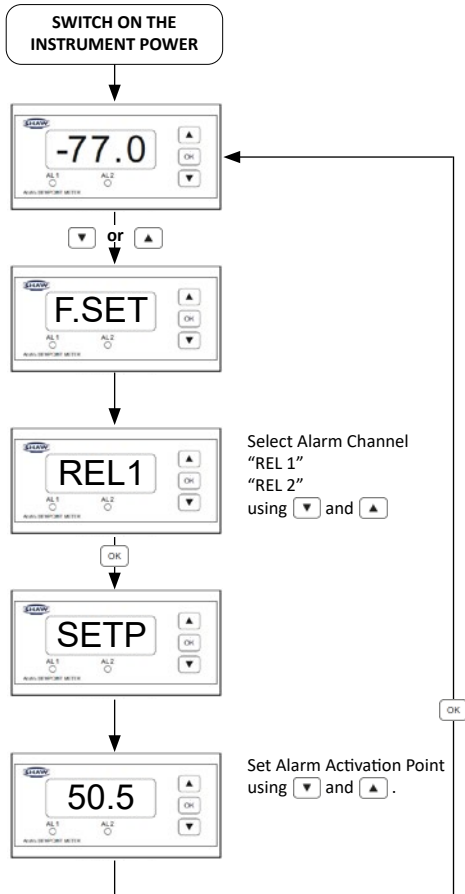
## 15 Appendix D - Default Instrument Configuration

The AcuVu is configured to default factory settings. To review or alter the settings, please see table below.

<p><b>Configuration</b></p>	<p>Configuration is carried out using the three function keys.</p> <ul style="list-style-type: none"> <li><input type="button" value="▲"/> will increase the numerical value or choose the next parameter.</li> <li><input type="button" value="▼"/> will decrease the numerical value or choose the previous parameter.</li> <li><input type="button" value="OK"/> will accept the chosen value and end the menu.</li> </ul> <p>Contains submenus as follows. The defaults are:</p> <ul style="list-style-type: none"> <li>• Setting 4-20 mA range (high/low)</li> <li>• Decimal point</li> <li>• Alarm 1</li> <li>• Alarm 2</li> <li>• Analogue output settings</li> </ul>
<p><b>Sensor Range</b></p>	<p>The span is set to the full range of the instrument supplied. 4-20 mA can be set against -1999 to 9999.</p>
<p><b>Analogue Output</b></p>	<p>Contains submenus to allow the user to fully configure the analog output.</p> <p>Defaults are:</p> <ul style="list-style-type: none"> <li>• Output span is set to 4 - 20 mA</li> <li>• Output range is set to the full span of the selected moisture range e.g. 4 mA = -100 °C and 20 mA = 0 °C</li> </ul>
<p><b>Alarms</b></p>	<p>Contains submenus to fully control behaviour of two independent alarms.</p> <p>Defaults are:</p> <ul style="list-style-type: none"> <li>• Both alarms set points are set to 0 or full scale</li> <li>• Both alarms are set to trigger when rising above the upper limit</li> <li>• The relays are de-energized in a non event state</li> <li>• The alarms events are not latching</li> <li>• The alarm hysteresis is set to 0.1 °C or the equivalent in other units</li> </ul>
<p><b>Password</b></p>	<p>Using a password will stop access to the menu and parameters.</p> <p>Defaults are:</p> <ul style="list-style-type: none"> <li>• No default password is set</li> </ul>

# 16 Appendix E - AcuVu Alarm Setup Menu and Password Setup Menu

## Alarm Setup



## Password Setup

