

Using the Shaw AcuDew Dewpoint Transmitter

RJN Rev 9, 240402



The AcuDew Dewpoint Transmitter is a two wire, loop powered 4-20mA device. It provides the User the ability to measure dewpoint or trace moisture content in applications ranging from monitoring driers in compressed air systems to verifying fuel supply lines have been properly purged before filling rocket engines.

The AcuDew is used in pharmaceutical manufacturing, semicon production, space-tech, plastics blow molding and injection molding, calibration houses, glass manufacture, consumer packaging, petrochemical/ refinery/ NatGas/ LPG, National Laboratories, as well as a variety of general manufacturing applications.

To accommodate the wide variety of applications, the AcuDew is available in many ranges and can be coupled with a wide variety of display/ control modules and sampling systems.

The AcuDew may be inserted directly into a process (insitu) or can be used in an extractive sampling system. It can be used in atmospheric pressure, positive pressure (pressure dewpoint) or vacuum applications.



AcuDew measuring pressure dewpoint temperature

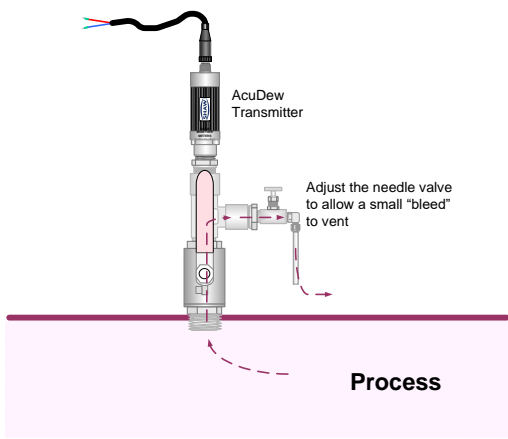


Figure 1 Using the CAM module

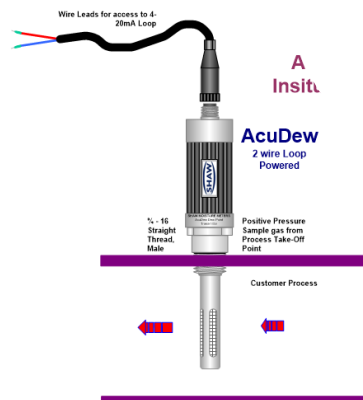


Figure 2 Direct insertion (insitu)



Choosing extractive or insitu sampling. As mentioned above, the AcuDew may be inserted directly into a process (insitu) or can be used in an extractive sampling system. There are advantages to both methods:

Insitu measurement (Insert the AcuDew probe directly into the process take-off point):

Advantages	Disadvantages
Lower cost to install	Dew point is affected by pressure, so if the process pressure fluctuates, so will the dew point reading
No need to dispose of sample gas	Can be affected by process contaminants: liquids, particulates, oil
Measures pressure dew point	The sensor can get damaged at temperatures above 55C
Fast response	You need to completely de-pressurize the process to gain access to the probe during service
	There is no ability to account for the process pressure value unless you include the AcuTrak hygrometer module. Programming the process pressure value with the AcuTrak module allows you to also display the correct values for PPMv and PPMw.

Extractive measurement (using the sensor holder or CAM module):

Advantages	Disadvantages
The sensor always operates at atmospheric pressure and assures stable, consistent readings even when the process pressure fluctuates	Extracted gas must be disposed of. This is not a problem for compressed air systems, but special venting measures are required for hazardous gases
You can mount the probe in an area with easy access and viewing	Sampling systems may add some costs
You can couple the sensor with sampling systems designed to remove contaminants that can damage the sensor	The sensor can get damaged at temperatures above 55C
With the CAM module, installation cost is low and the probe is easily isolated from the process for servicing. No need to de-pressurize the process	Extractive sampling adds a few seconds to sample response time in comparison to insitu
You can reduce the temperature of hot process gases to near ambient to protect the sensor	

Using the AcuDew with the sensor holder (positive pressure flow)

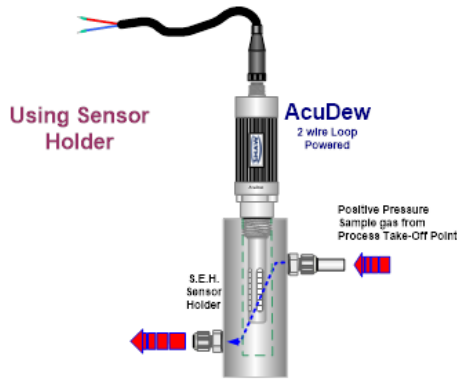


Figure 3 Customer provides pressure and flow control

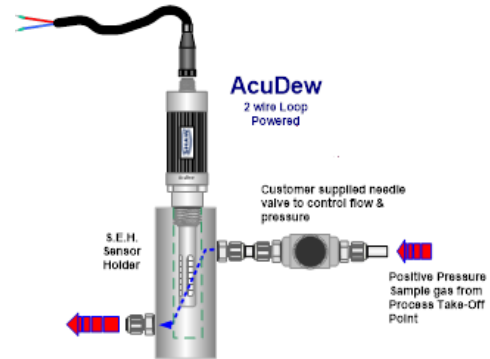


Figure 4 Using a needle valve to control flow

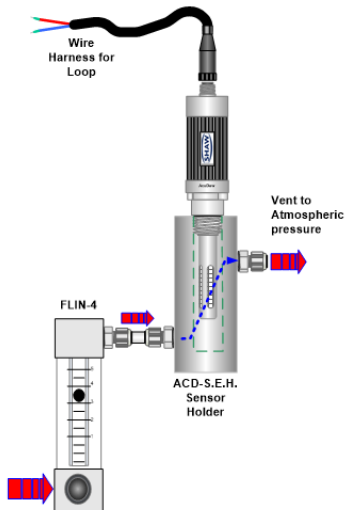


Figure 5 Using the Shaw Flowmeter/ valve to control flow

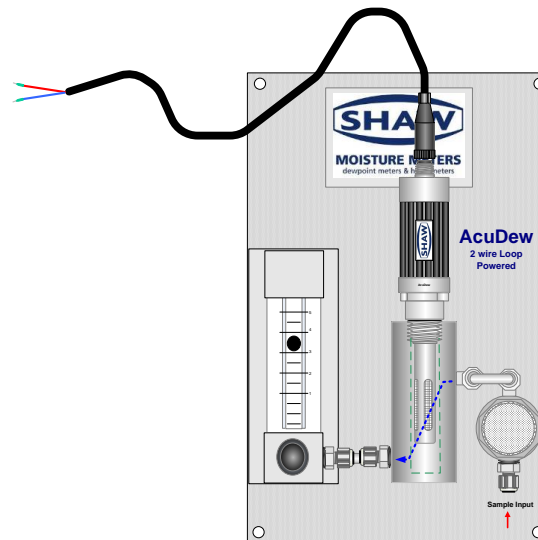


Figure 6 Using the SU4 sampling panel

How to order the Shaw AcuDew Dewpoint Transmitter

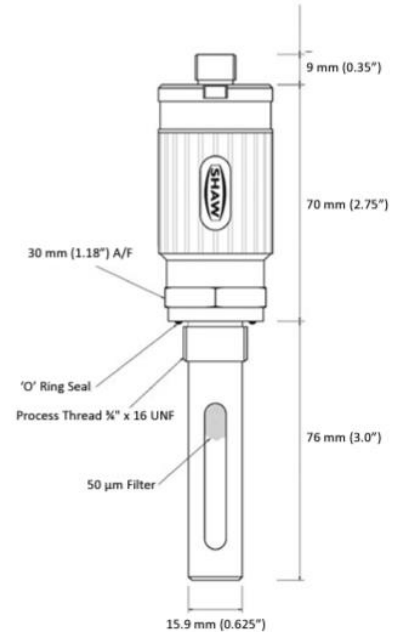


- 2 wire, Loop Powered, 4-20mA Transmitter
- Multiple ranges are available
- Can be mounted directly into the process takeoff point or mounted remote for extractive sampling
- Supplied ready to use with a Certificate of Calibration traceable to National and International Humidity Standards and 2 meters of cable
- AutoCal calibration feature
- Open/short circuit detection
- Weatherproof rating IP66 (NEMA 4X)
- Fully compatible with the single channel displays: Model AcuLoop, Model AcuVu, Model AcuTrak and SU4 Sample System



AcuDew - Range

RANGE			
ZD	-100 to +20C	-148F to +68F	0-23,000 PPMv
HD	-65 to +20C	-85F to +68F	0-23,000 PPMv
P Purple	-100C to 0C	-148F to +32F	0-6000 PPMv
GO Gold	-120 to -20C	-184F to -4F	0.1ppb-1000ppm
G Grey	-80C to 0C	-112F to +32F	0-6000 PPMv
R Red	-80C to -20C	-112F to -4F	0-1000 PPMv
B Blue	-80C to +20C	-112F to +68F	0-23,000 PPMv
MP	0.1 to 100.0 PPMv	0.1 PPMv resolution	
LP	0.01 to 10.0 PPMv	0.01 PPMv resolution	
GH	0.01 to 10.0 g/m ³	0.01 g/m ³ resolution	
LB	0.1 to 100.0 Lbs/ MMSCF	0.1 lb/MMSCF resolution	



We recommend using the SEH sensor holder to extract a gas sample from the process to flow past the AcuDew.

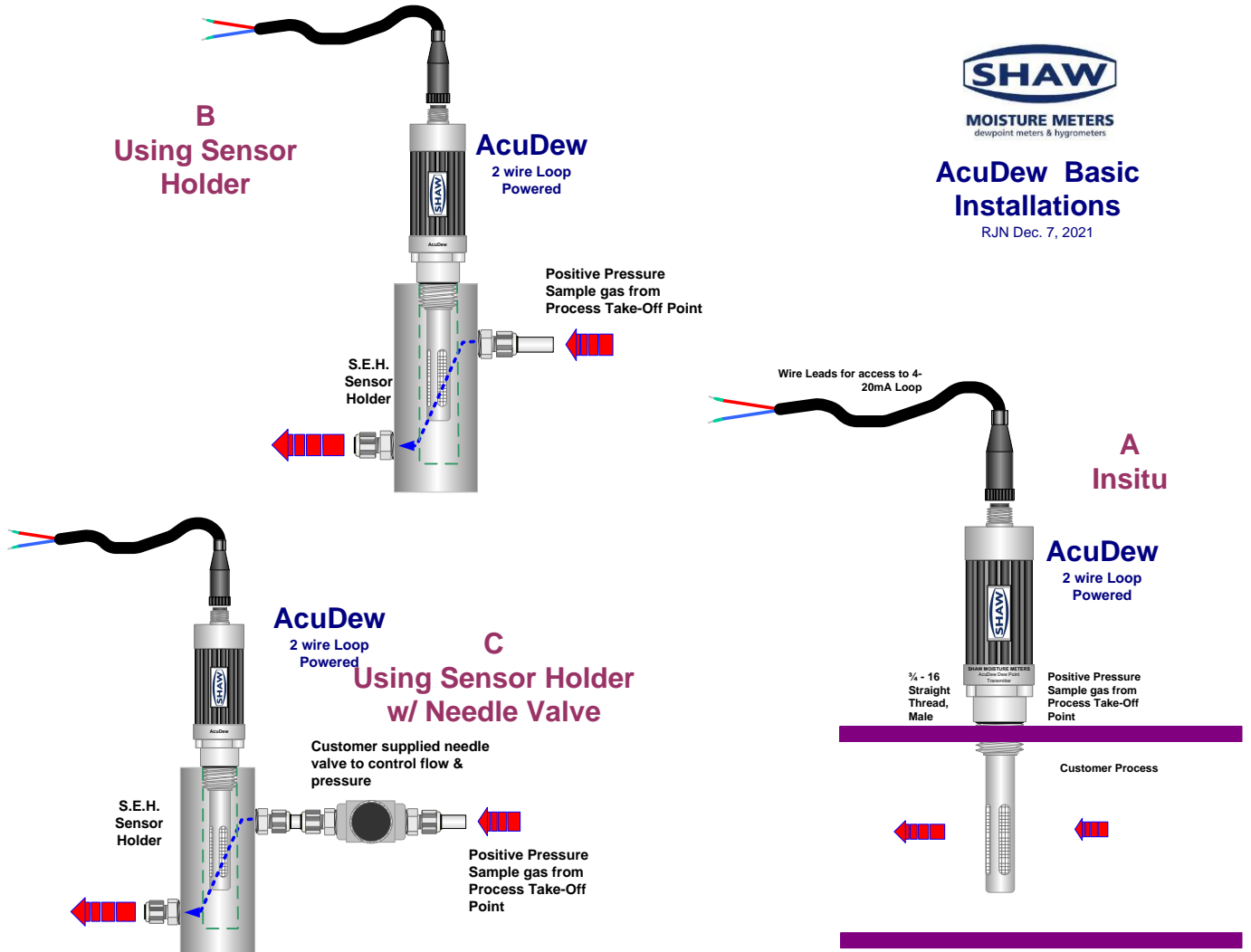
To Order the SEH, **SEH – ACD- F**

"F" : SEH Sensor Holder Fittings	
4	1/4 " Tube Fitting
8	1/8" Tube Fitting
6	6 mm Tube Fitting



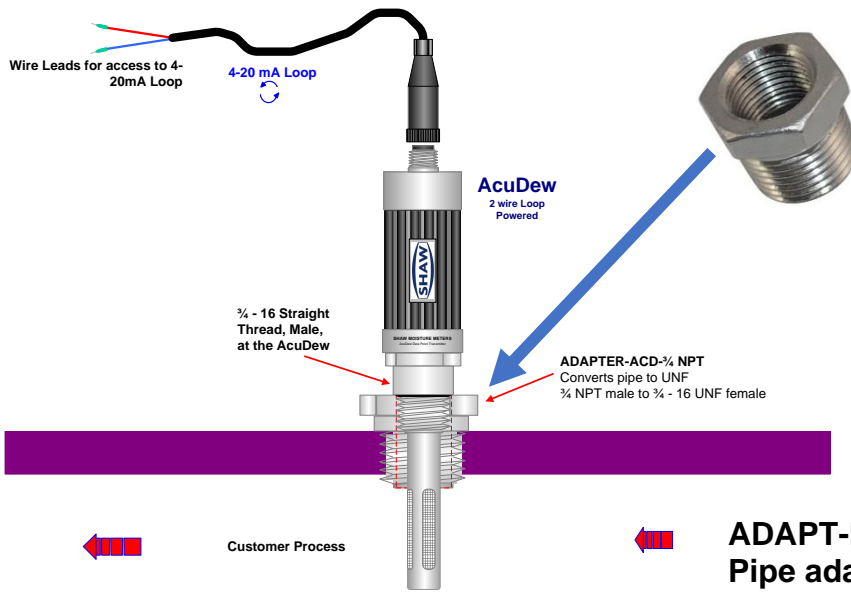
AcuDew Basic Installations

RJN Dec. 7, 2021



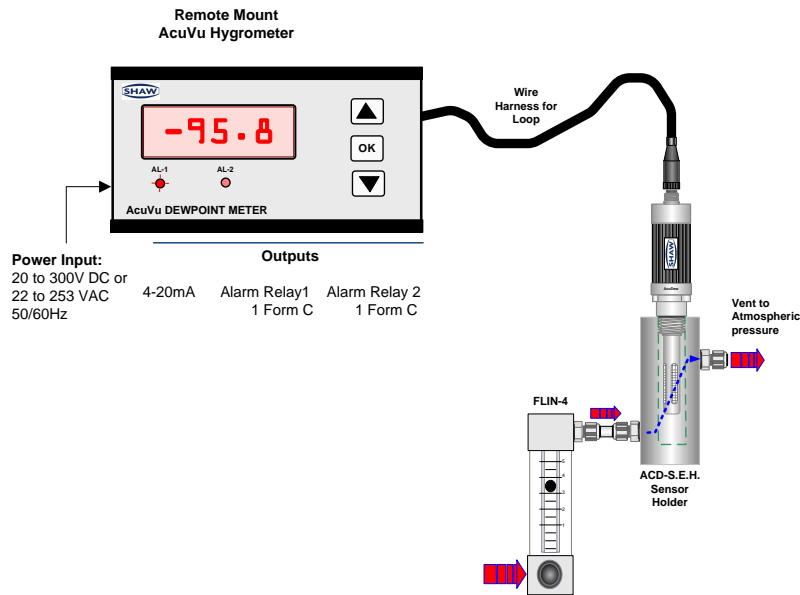
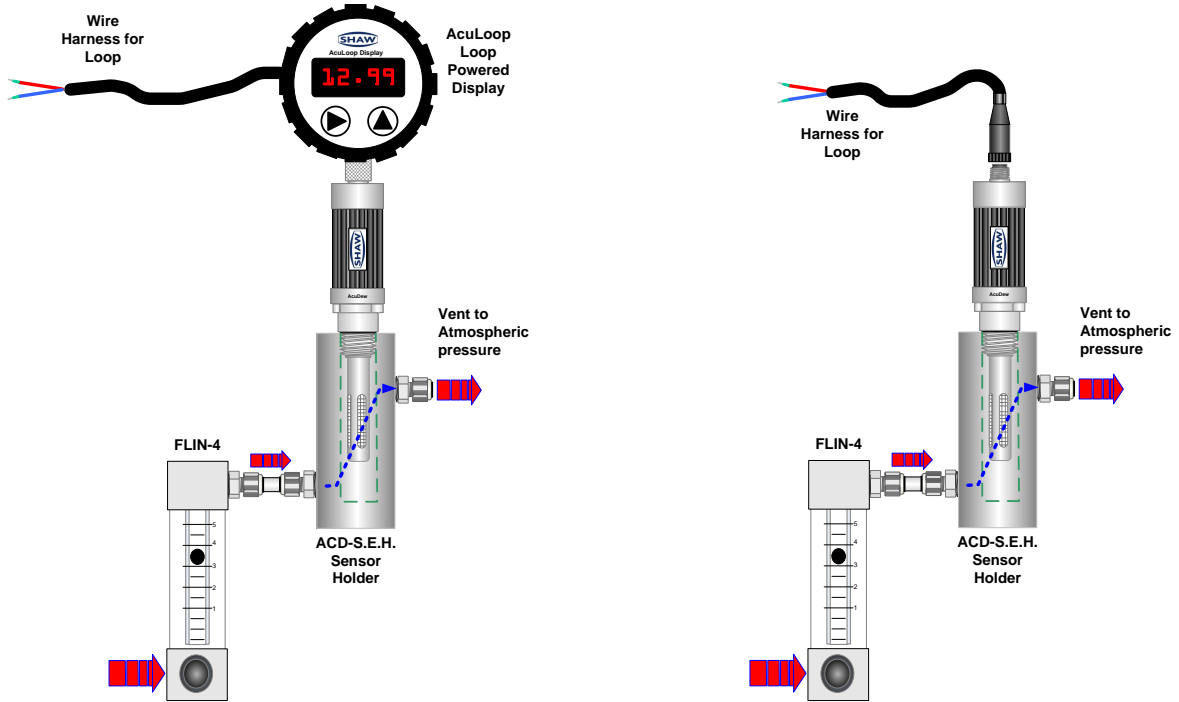


**Sanitary Clamp flange adapter
KF-25 or KF-40 mates to the
AcuDew Transmitter**
Clamp and seal not included



**ADAPT-NPT-ACD
Pipe adapter to the AcuDew Transmitter**

Using the FLIN rotameter w/ needle valve to reduce flow and pressure entering the Sensor Holder (flow through head)



SU4 Sampling panel for the AcuDew

Designed for compressed gas sampling

- The SEH sensor holder has threads to match the AcuVu
- Available with Medium Pressure Regulator or High Pressure Regulator
- Includes high quality SS pressure regulator, valved sample flowmeter (0-10 LPM), and SS fittings.

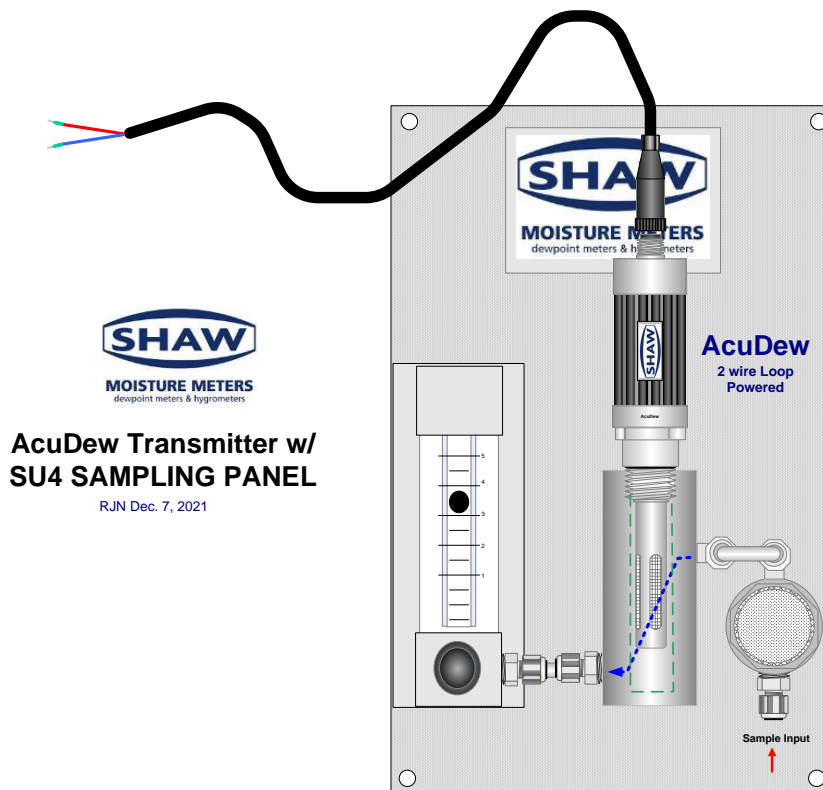
How to Order:

Follow the model guide below. There is no additional cost for fitting size.

SU4 - **ACD** - **PREG** - **F**

Choose PREG	Description
SU4-ACD-Me	Medium Pressure (200 BAR/ 2900 PSI)
SU4-ACD-Hi	High Pressure (400 BAR/ 5800 PSI)

Choose Fitting	
4	1/4 " Tube Fitting
8	1/8" Tube Fitting
6	6 mm Tube Fitting



The AcuDew transmitter ordered separately

**AcuDew Transmitter w/
SU4 SAMPLING PANEL**

RJN Dec. 7, 2021

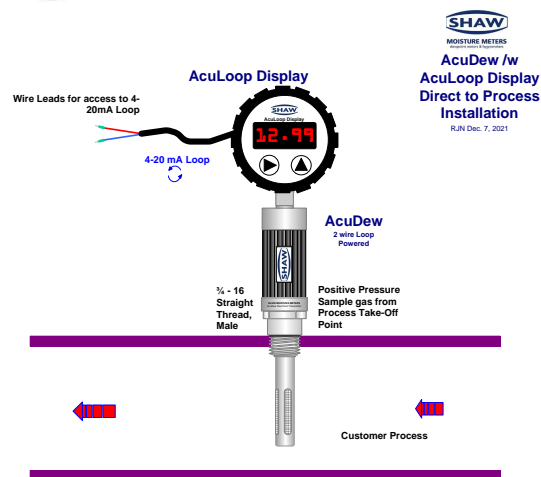
AcuLoop Plug-in Display for the AcuDew

Easy to install and lightweight, this large, four digit, LED, plug in display is easily supported onto the body of the AcuDew dewpoint transmitter. The AcuLoop connects via the robust M12 connector of the AcuDew dewpoint transmitter, which continues the 4-20mA loop through the AcuLoop display module. The AcuLoop retransmits the AcuDew 4-20 mA loop at the electrical port on the back of the display module. External power required. Because only 4 digits are available to display, we recommend setting the AcuLoop to display dewpoint C or F when measuring at 100 PPM or drier.

AcuLoop - Range - Units



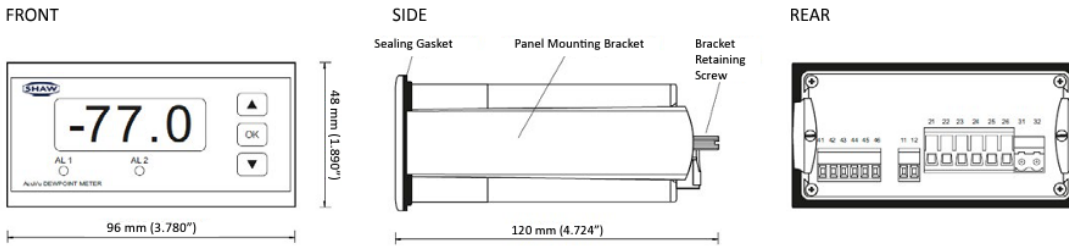
	RANGE		
ZD	-100 to +20C	-148F to +68F	0-23,000 PPMv
HD	-65 to +20C	-85F to +68F	0-23,000 PPMv
P Purple	-100C to 0C	-148F to +32F	0-6000 PPMv
GO Gold	-120 to -20C	-184F to -4F	0.1ppb-1000ppm
G Grey	-80C to 0C	-112F to +32F	0-6000 PPMv
R Red	-80C to -20C	-112F to -4F	0-1000 PPMv
B Blue	-80C to +20C	-112F to +68F	0-23,000 PPMv
MP	0.1 to 100.0 PPMv	0.1 PPMv resolution	
LP	0.01 to 10.0 PPMv	0.01 PPMv resolution	
GH	0.01 to 10.0 g/m ³	0.01 g/m ³ resolution	
LB	0.1 to 100.0 Lbs/ MMSCF	0.1 lb/MMSCF resolution	



Displayed Units	
C	C Dewpoint
F	F Dewpoint



General Assembly Diagram



AcuVu Hygrometer for the AcuDew Transmitter

- Provides local display of Dewpoint
- Repeats the 4-20 mA output for customer interface
- Provides (2) Alarm relay outputs.

How to Order:

Choose range setting of the AcuVu to match the Transmitter Range. Select the units to be displayed

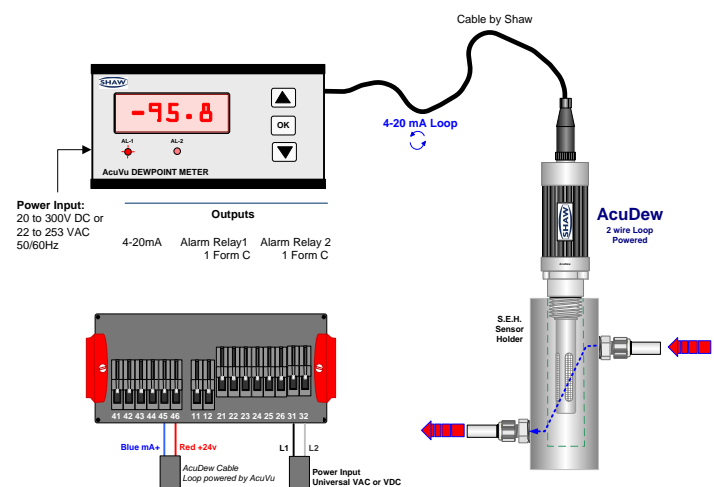
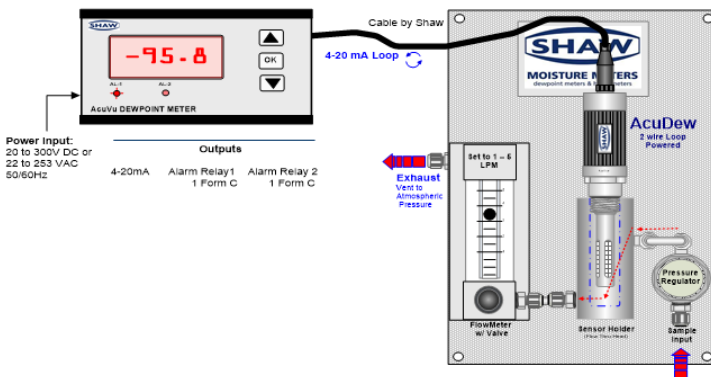
AcuVu - **Range** - **Units**

RANGE			
ZD	-100 to +20C	-148F to +68F	0-23,000 PPMv
HD	-65 to +20C	-85F to +68F	0-23,000 PPMv
GO Gold	-120 to -20C	-184 to -4F	0.1ppb to 1000ppm
P Purple	-100C to 0C	-148F to +32F	0-6000 PPMv
G Grey	-80C to 0C	-112F to +32F	0-6000 PPMv
R Red	-80C to -20C	-112F to -4F	0-1000 PPMv
B Blue	-80C to +20C	-112F to +68F	0-23,000 PPMv
MP	0.1 to 100.0 PPMv	0.1 PPMv resolution	
LP	0.01 to 10.0 PPMv	0.01 PPMv resolution	
GH	0.01 to 10.0 g/m ³	0.01 g/m ³ resolution	
LB	0.1 to 100.0 Lbs/ MMSCF	0.1 lb/MMSCF resolution	

Displayed Units	
C	C Dewpoint
F	F Dewpoint

Notes:

1. When setting to display units other than C or F, please note the AcuVu assumes the sensor is at 1 ATM.
2. There is no provision to program the process pressure into the AcuVu.
3. The AcuVu has a universal power input: VAC or VDC



AcuTrak Inline Hygrometer

The AcuTrak incorporating two independent, fully programmable alarm relays and with a 4-20 mA analog output, this single channel display includes onboard pressure dewpoint calculations, user selectable units **and RS485 serial communications.**



*AcuDew sold separately

AcuTrak Hygrometer for the AcuDew Transmitter

How to Order:

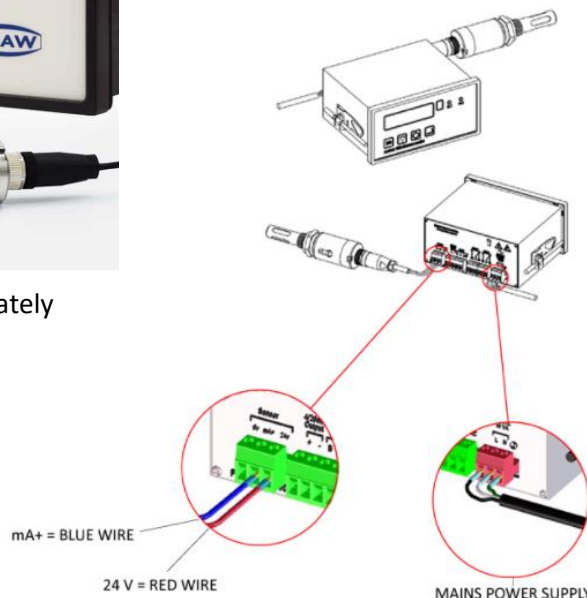
Choose range setting of the AcuTrak to match the Transmitter Range. Select the units to be displayed

AcuTrak - **Range** - **Units** - **Power**

	RANGE		
ZD	-100 to +20C	-148F to +68F	0-23,000 PPMv
HD	-65 to +20C	-85F to +68F	0-23,000 PPMv
GO Gold	-120 to -20C	-184F to -4F	0.1ppb-1000ppm
P Purple	-100C to 0C	-148F to +32F	0-6000 PPMv
G Grey	-80C to 0C	-112F to +32F	0-6000 PPMv
R Red	-80C to -20C	-112F to -4F	0-1000 PPMv
B Blue	-80C to +20C	-112F to +68F	0-23,000 PPMv
MP	0.1 to 100.0 PPMv	0.1 PPMv resolution	
LP	0.01 to 10.0 PPMv	0.01 PPMv resolution	
GH	0.01 to 10.0 g/m ³	0.01 g/m ³ resolution	
LB	0.1 to 100.0 Lbs/ MMSCF	0.1 lb/MMSCF resolution	

Displayed Units	
C	C Dewpoint
F	F Dewpoint
P	PPMv
b	PPBv
g	Grams/ m ³
L	Lbs/ MMSCF
≡	PPMw

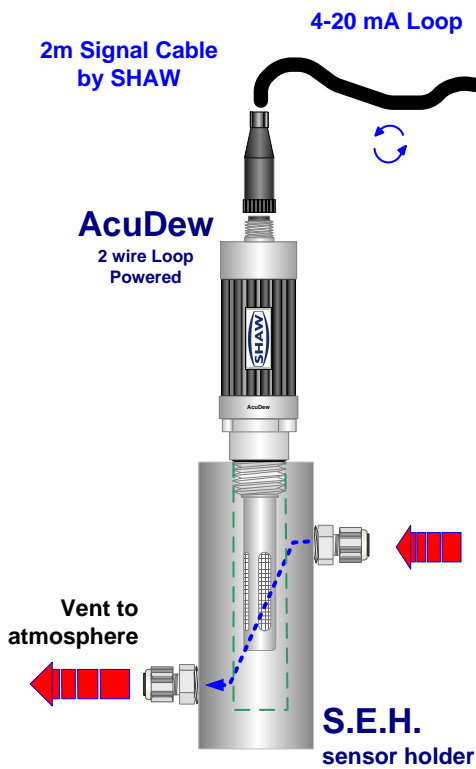
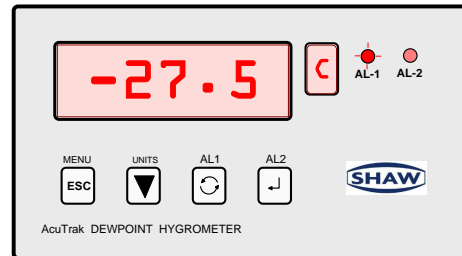
POWER Input	
AC	90-230 VAC
DC	24 VDC



Notes:

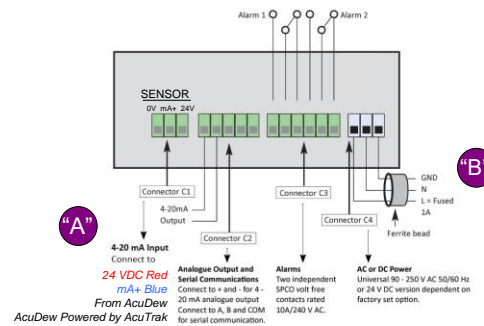
1. You can program process pressure and temperature with the AcuTrak
2. Programming the process pressure automatically calculates the units of measurement such as PPMw at process pressure.
3. You can program the molecular weight of the background gas.
4. The AcuTrak provides an analog 4-20mA output as well as RS485 serial.

AcuTrak Hygrometer

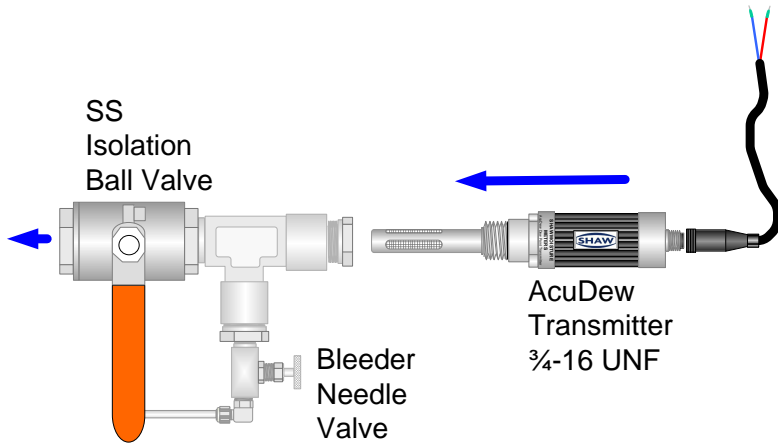


VAC Power
L N GND

Power Input:
24V DC or
90 to 250 VAC 50/60Hz
(must specify at ordering)



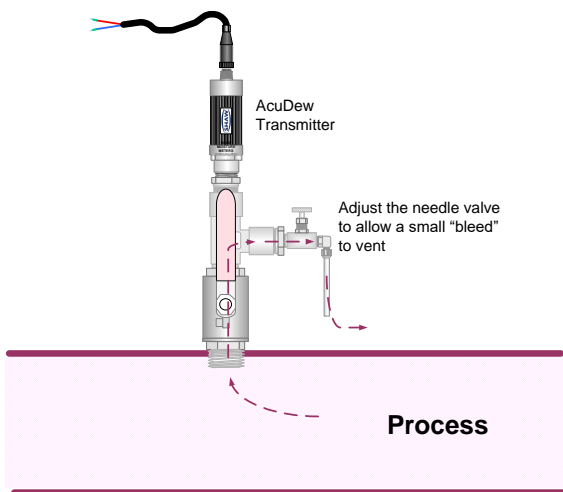
CAM module Installation and Use



The CAM module allows you to measure the dewpoint of the measured process at pressure. It connects to the process via $\frac{3}{4}$ NPT. There are no attitude restrictions.

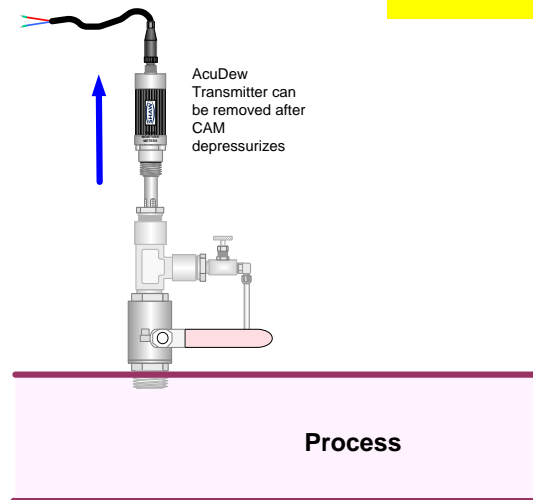


Ensure the ball valve is closed (handle is perpendicular to the transmitter) and the CAM is depressurized before removing the transmitter



NORMAL OPERATION:

First Time use- ensure the venting needle valve is fully closed and the transmitter is fully seated before applying pressure to the process. Open the isolation ball valve. Slowly open the venting needle valve so that a small bleed (just a trickle) of process gas is noted at the vent tube. Once set, you should not have to readjust the venting needle valve.



Removing the transmitter from service:

Close the isolation ball valve. Allow the CAM to vent until completely depressurized. Once completely vented, you may remove the transmitter from the CAM. Please tag the CAM module "do not open ball valve unless the transmitter is fully installed". We recommend that you install a $\frac{3}{4}$ -16 UNF plug in the open port of the CAM until the transmitter has been reinstalled.

Short Length AcuDew

In 2021, the Shaw AcuDew loop powered dewpoint transmitter replaced the Shaw SDT transmitter. The sensor probe portion of the AcuDew is a longer version of the SDT. If you are transitioning from the SDT to the AcuDew, please note the following design differences:

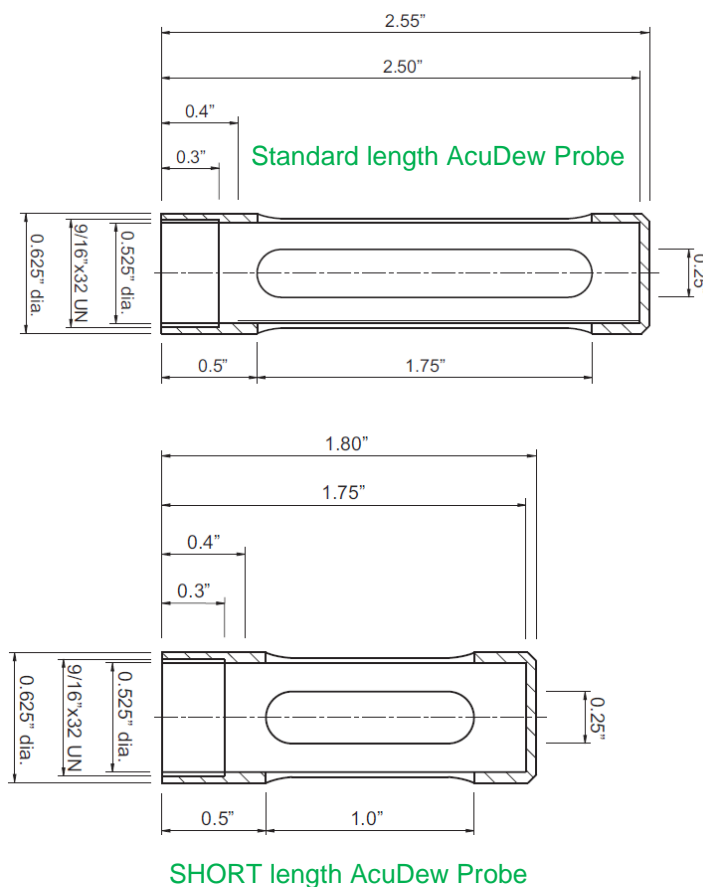
	AcuDew	SDT
Cable Terminations	IP66/NEMA 4X rated, M12 five pin cable connector at the transmitter and the other end terminated with bootlace ferrules	IP66/NEMA 4X rated, size C, DIN EN 175301 connector at the transmitter and other end terminated with bootlace ferrules
Resolution	0.005 mA	0.016 mA
Length (without connector)	155mm	131 mm

For those OEM customers whose equipment design was based on the shorter length transmitter probe, we still offer the AcuDew with a shorter length sensor. The Short Length AcuDew (from sensing tip to electrical connection) measures 131 mm (0.87 inches shorter than the standard).

For the dimensions of the probe portion that is inserted into the process port, see the figure to the right-

The Short length AcuDew is custom made to order and incurs a slightly higher price and longer delivery time (adds about 1-2 weeks to our standard delivery).

RJN 072423-B



Accessories:



**3' long VAC Power Cord
for the Superdew3, AcuTrak
or AcuVu**

3 conductor, 3 pronged, 18 AWG, 15
AMP rated for 120 VAC



PRV SS Pressure
Regulator
complete with
fittings

ADAPT-NPT-ACD

SS Pipe Adapter
3/4" NPT male to 3/4"-16 UNF



FLIN SS
Flowmeter
complete with
fittings & valve

Filter, Coalescing

comes equipped with Swagelok compression fittings



Filter, Particulate



KF25-ACD SS KF25 flange
modified to mount the
AcuDew Transmitter (glove
box applications). Available
in KF-40 also.



EasyLog Current USB Data Logger:

- 4-20mA Current Loop capture
- Connection Via two Screw Terminals
- USB Interface for Set-up and Data Download to **PC**