

**DKS** GmbH  
*Engineering & Vertrieb*  
**SmartDPT 4-20mA 2-wire Dewpoint  
 Transmitter**

**Instruction Manual (v 0.2 01.01.2015)**



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## **SAFETY**

The manufacturer has designed this equipment to be safe when operated using the procedures detailed in this manual. The user must not use this equipment for any other purpose than that stated. Do not apply values greater than the maximum value stated.

This manual contains operating and safety instructions, which must be followed to ensure the safe operation and to maintain the equipment in a safe condition. The safety instructions are either warnings or cautions issued to protect the user and the equipment from injury or damage. Use competent personnel using good engineering practice for all procedures in this manual.

## **ELECTRICAL SAFETY**

The instrument is designed to be completely safe when used with options and accessories supplied by the manufacturer for use with the instrument.

## **PRESSURE SAFETY**

DO NOT permit pressures greater than the safe working pressure to be applied to the instrument. Refer to the Technical Specifications.

## **ABBREVIATIONS**

The following abbreviations are used in this manual:

kP	pressure unit (= 100 kP or 0.987 atm) gauge
°C	degrees Celsius
°F	degrees Fahrenheit
DC	direct current
g	grams
µm	micrometer
m/sec	meters per second
mA	milliampere
max	maximum
mm	millimetres
MPa	megapascal
PPM(V)	parts per million by volume
RH	relative humidity
T	temperature
V	Volts
Ω	Ohms
Ø	diameter

## **1. INTRODUCTION**

The SmartDPT dewpoint transmitter has been manufactured, tested and calibrated to the highest available standards and should be in good working order, ready for installation into a gas measurement application. If there are any questions about the instrument or how to install and operate it, please contact a DKS GmbH representative.

## Features

The SmartDPT is a continuous on line 4-20mA 2-wire dewpoint transmitter for the measurement of moisture content in air and other non-corrosive gases. The key features are:

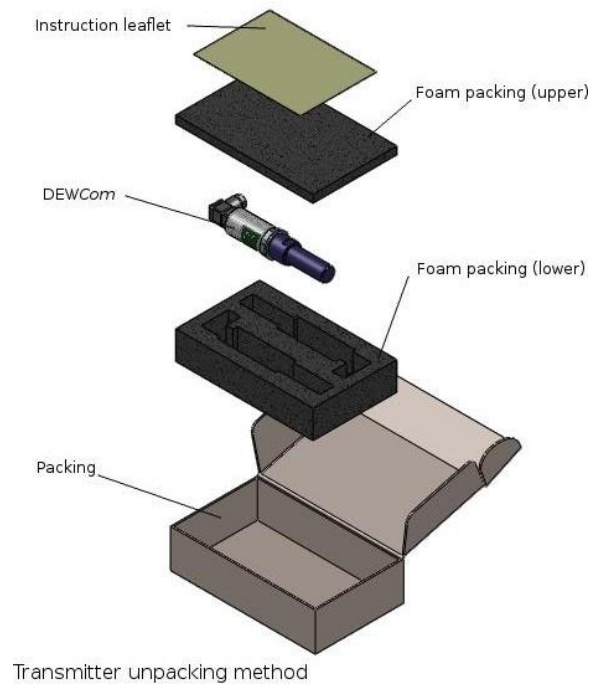
- 4-20 mA 2-wire loop powered connection
- Dewpoint OR parts per million (moisture content) in volume (PPM(V) measurements
- Accuracy  $\pm 2^{\circ}\text{Cdp}$
- Repeatability  $\pm 0.5^{\circ}\text{Cdp}$
- Dewpoint values traceable to international standards
- Excellent detector element protection
- Rugged stainless steel construction
- Fully interchangeable

## 2. INSTALLATION

### Unpacking the Instrument

On delivery, please check that all the following standard components are in the packing box:

- SmartDPT Transmitter
- Certificate of Calibration
- Connector (for transmitter/cable)
- Packing note
- Any additional items listed in the packing note

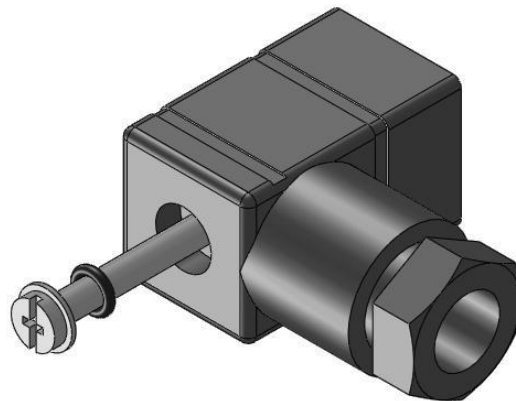


### **Preparation of the Transmitter Cable**

The transmitter cable is NOT supplied as standard. A cable can be obtained by contacting DKS GmbH.

Cable connection to the SmartDPT transmitter is made via the removable connector. Removing the central screw enables the connector terminal block to be removed from the outer housing by using a small screwdriver to lift it clear.

For the transmitter to work properly, and to achieve best performance, the transmitter cable must be connected to the transmitter's connector as shown in the drawing below:



Connector terminal block removal

*NOTE:* The drawing below shows the identity of the connector terminals and wiring connections of the cable manufactured by DKS GmbH:

### **Cable Connection**

When installing the connector, and to insure that full ingress protection is achieved, the retaining screw (with the O-ring and washer) must be tightened to a minimum torque setting of 3.5 Nm. The transmitter cable used must have a minimum diameter of 4.5mm.

### **Electrical Schematic**

*NOTE:* The screen/shield should be connected for best performance to avoid electromagnetic and electrical interference.

### **Transmitter Mounting**

Prior to installation of the transmitter, unscrew and remove the black plastic transportation guard and retain for future use. The transmitter's detector element is protected by a sintered stainless-steel filter guard. Avoid finger contact with the filter-guard.

The SmartDPT can be mounted into either a flow-through transmitter sampling block (optional) or directly inserted into a pipe or duct.

The recommended gas flow rate, when mounted in the optional sampling block, is 0.5 to 5 NI/min). However, for direct insertion applications, the permitted gas velocity is 0-10 m/sec).

*NOTE:* Install the transmitter by screwing into its location by the 5/8"- 18 UNF mounting thread using a spanner on the hexagonal flats only. DO

NOT grip and twist the transmitter by its cylindrical body when installing.

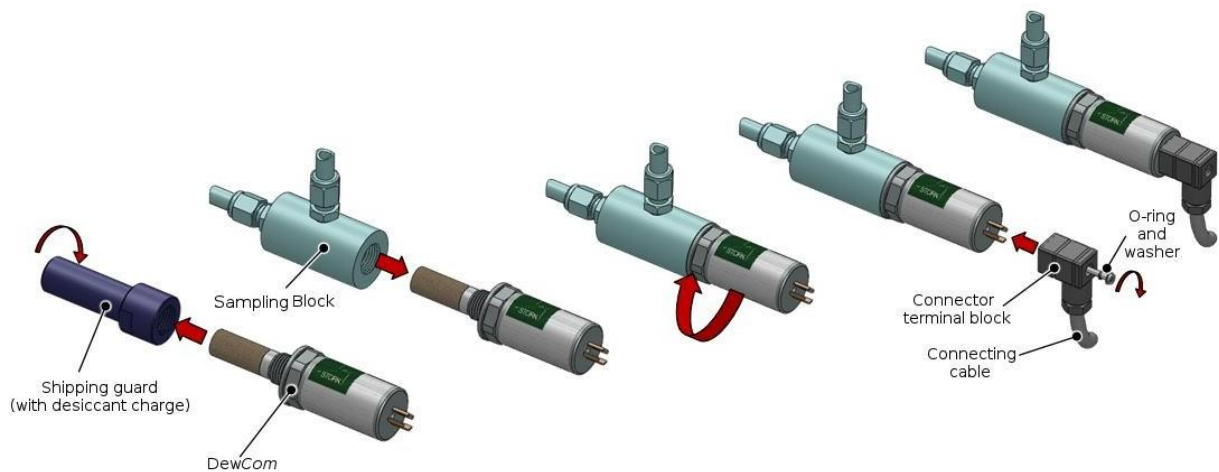
Tighten the transmitter to a torque setting of 30Nm

### Transmitter Mounting - Sampling Block (Optional)

The following procedure must be carried out by a qualified installation technician.

To mount the transmitter into the sampling block proceed as follows:

1. Insure that the black plastic transportation guard has been removed from the probe end of the transmitter. Under no circumstances should the sintered stainless steel guard be handled with the fingers.
2. Screw the transmitter into the sampling block and tighten to a minimum torque setting of 30 Nm using the flats of the hexagonal nut and not the transmitter's cylindrical body.
3. Attach the transmitter cable/connector assembly to the plug located on the base of the transmitter and tighten the retaining screw.



Transmitter mounting - Sampling Block

### Transmitter Mounting - Direct to pipe or duct

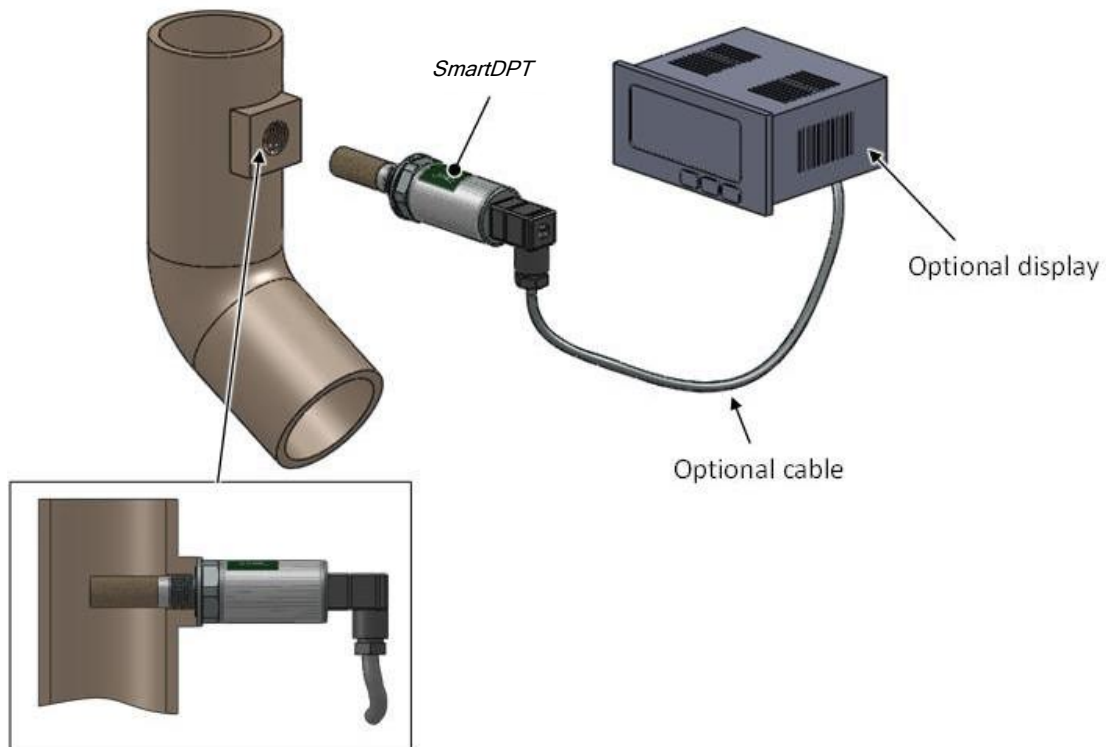
The transmitter may be directly mounted into a pipe or duct.

Do not mount the transmitter too close to the bottom of a bend where any condensate in the pipeline might collect and saturate the probe.

The pipe or duct will require a thread to match the transmitter body thread. For circular pipework, to insure the integrity of a gas tight seal, a mounting flange will be required on the pipe in order to provide a flat surface to seal against.

The following procedure must be carried out by competent personnel.

1. Insure that the black plastic transportation guard has been removed from the probe end of the transmitter.  
Under no circumstances should the stainless steel transmitter filter-guard be handled with the fingers.
2. Screw the transmitter into the pipe. Tighten enough to obtain a gas tight seal. (Torque will depend upon the pipeline material.) NOTE: Do not overtighten or the thread on the pipe may be stripped.



Transmitter mounting - pipe or duct

### 3. OPERATION

Operation is very simple assuming the following installation techniques are adhered to:

#### Sampling Hints

**Be Sure the Sample is Representative of the Gas Under Test:**

The sample point should be as close to the critical measurement point as possible. Also, never sample from the bottom of a pipe as entrained liquids may contaminate the detector element.

**Minimize Dead Space in Sample Lines:**

Dead space causes moisture entrapment points, increased system response times and measurement errors, as a result of the trapped moisture being released into the passing sample gas and causing an increase in partial vapor pressure.

**Remove Any Particulate Matter or Oil from the Gas Sample:**

Particulate matter at high velocity can damage the transmitter detector element and similarly, at low velocity, may 'blind' it and reduce its response speed. If particulate, such as degraded desiccant, pipe scale or rust is present in the sample gas, use an in-line filter, as a minimum level of protection. For more demanding applications DKS GmbH can offer a range of sampling system options.

**Use High Quality Sample Tube and Fittings:**

DKS GmbH recommends that, wherever possible, stainless steel tubing and fittings should be used. This is particularly important at low dew points since all materials have hygroscopic properties and adsorb moisture on the tube walls, slowing down response and, in extreme circumstances, giving false readings. Stainless steel has the lowest hygroscopic properties of any material. For temporary applications, or where stainless steel tubing is not practical, use high quality thick walled PTFE tubing. No other plastic tube material is suitable!

**Position Transmitter away from Heat Source:**

It is recommended, as good instrumentation practice, that the transmitter be placed away from any heat source to avoid adsorption/desorption.

**4. MAINTENANCE**

**Calibration**

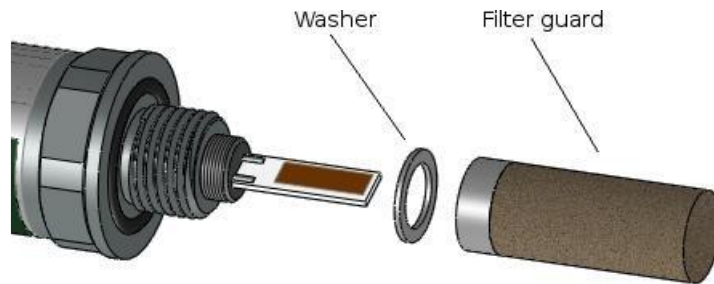
Routine maintenance of the SmartDPT is confined to regular re-calibration by exposure of the SmartDPT to sample gases of known moisture content to ensure that the stated accuracy of the SmartDPT is maintained. Calibration services traceable to international standards are provided by DKS GmbH and by other calibration laboratories.

DKS GmbH offers a variety of re-calibration and exchange transmitter programs to suit specific needs. A DKS representative can provide detailed, custom advice.

**Transmitter Filter-Guard Replacement**

The transmitter is fitted with a sintered stainless-steel filter guard. This provides <20µm protection to the detector element. The guard should be changed if the surface becomes discolored.

When replacing the guard, care should be taken to handle the guard by the bottom part only. Replacement guards can be obtained by contacting DKS GmbH.



<b>Performance</b>		
Measurement Range (Dew Point)	-100 to +20°C dew point	
Accuracy (Dew Point)	±2°C dew point	
Response Time	1 min to T95 (dry to wet)	
Repeatability	0.5°C dew point	
Calibration	Traceable 7 point calibration certificate	
<b>Electrical Specification</b>		
Output Signal	4-20 mA (2-wire) current source, configurable over the entire range Dew point -100 to + 20°C -148 to +68°F 0,01-23,000 ppm(V) ppm(V) output or non-standard dew point range may be specified at time of order	
Supply voltage	8 - 36 V DC	
Load Resistance	Max 660 Ω @ 24 V 160 Ω @ 12 V	
Current Consumption	20mA max	
CE marked		
<b>Operating Specifications</b>		
Operating Temperature	-40 to +60°C	
Operating Humidity	0-100% RH	
Operating Pressure	40 MPa (450 Barg) max	
Flow Rate	0.2 to 5 NI/min mounted in standard sampling block; 0 to 10 msec-1 direct insertion	
Temperature Coefficient	Temperature compensated across operating temperature range	
<b>Mechanical Specifications</b>		
Ingress Protection Sensor	IP65	
Housing Material	Stainless steel	
Dimensions	114m x 30mm dia	
Weight	170g	
Filter	20µm sintered guard	
Interchangeability	Fully interchangeable without need to set or calibrate on site	
Fault Conditions (factory programmed)	Condition	Output
	Fault	23mA (or 3,5mA, programmable)
	Under-range dew point	4mA
Over-range dew point	20mA	

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