English

Instruction and Operation Manual

S217 OEM IO-Link

Compact Dew Point Transmitter

Dear Customer,

Thank you for choosing our product.

The operating instructions must be read in full and carefully observed before you start up the device. The manufacturer cannot be held liable for any damage which occurs as a result of non-observance or non-compliance with this manual.

Should the device be tampered with in any manner other than a procedure which is described and specified in the manual, the warranty is void and the manufacturer is exempt from liability.

The device is destined exclusively for the described application.

SUTO offers no guarantee for the suitability for any other purpose. SUTO is also not liable for consequential damage resulting from the delivery, capability or use of this device.

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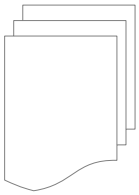
1 Safety instructions



Please check if this instruction manual matches with the product type.

Please observe all notes and instructions indicated in this manual. It contains essential information which must be observed before and during installation, operation and maintenance. Therefore this instruction manual must be read carefully by the technician as well as by the responsible user / qualified personnel.

This instruction manual must be available at the operation site of the dew point sensor at any time. In case of any obscurities or questions, regarding this manual or the product, please contact the manufacturer.

WARNING!

Compressed air!

Any contact with quickly escaping air or bursting parts of the compressed air system can lead to serious injuries or even death!

- Do not exceed the maximum permitted pressure range (see sensors label).
- Only use pressure tight installation material.
- Avoid that persons get hit escaping air or bursting parts of the instrument.
- The system must be pressureless during maintenance work.

WARNING!

Voltage used for supply!

Any contact with energized parts of the product, may lead to an electrical shock which can lead to serious injuries or even death!

- Consider all regulations for electrical installations.
- The system must be disconnected from any power supply during maintenance work.
- Any electrical work on the system is only allowed by authorized qualified personal.

ATTENTION!

Permitted operating parameters!

Observe the permitted operating parameters, any operation exceeding this parameters can lead to malfunctions and may lead to damage on the instrument or the system.

- Do not exceed the permitted operating parameters.
- Make sure the product is operated in its permitted limitations.
- Do not exceed or undercut the permitted storage and operation temperature and pressure.

General safety instructions

- It is not allowed to use the product in explosive areas.
- Please observe the national regulations before/during installation and operation.

Remarks

- It is not allowed to disassemble the product.
- Always use spanner to mount the product properly.

ATTENTION!

Measurement values can be affected by malfunction!

The product must be installed properly and frequently maintained, otherwise it may lead to wrong measurement values, which can lead to wrong results.

Storage and transportation

- Make sure that the transportation temperature of the sensor is between -30 ... +70°C.
- For transportation it is recommended to use the packaging which comes with the sensor.
- Please make sure that the storage temperature of the sensor is between -10 ... +50°C.
- Avoid direct UV and solar radiation during storage.
- For the storage the humidity must be <95% rH, no condensation.

2 Registered trademarks

SUTO®	Registered trademark of SUTO iTEC
MODBUS®	Registered trademark of the Modbus Organization, Hopkinton, USA
HART®	Registered trademark of the HART Communication Foundation, Austin,USA
IO-Link®	Registered Trademark of the PROFIBUS Nutzerorganisation e.V., Germany

3 Application

The SUTO S217 OEM IO-Link Compact Dew Point Transmitter provides reliable and long term stable dew point monitoring in industrial applications. The newly developed device features improved signal and stability in demanding industrial applications.

It’s designed for OEM applications in desiccant and refrigeration dryers.

The measured dew point is output via the IO-Link signal. The parameters such as physical units, can be set ex factory.

4 Features

- Small size makes it ideal for dryer installations
- Measures dew points down to –60ºC Td
- IO-Link communication interface
- IP65 casing provides robust protection in rough industrial environment
- Very fast response time ensures safe and reliable indication whenever dew points are out of valid ranges
- Can be installed directly into dryers through G 1/2” thread
- High accuracy of 1 … 2ºC Td dew point
- Withstands condensation
- M12 Connector

5 Technical data

5.1 General

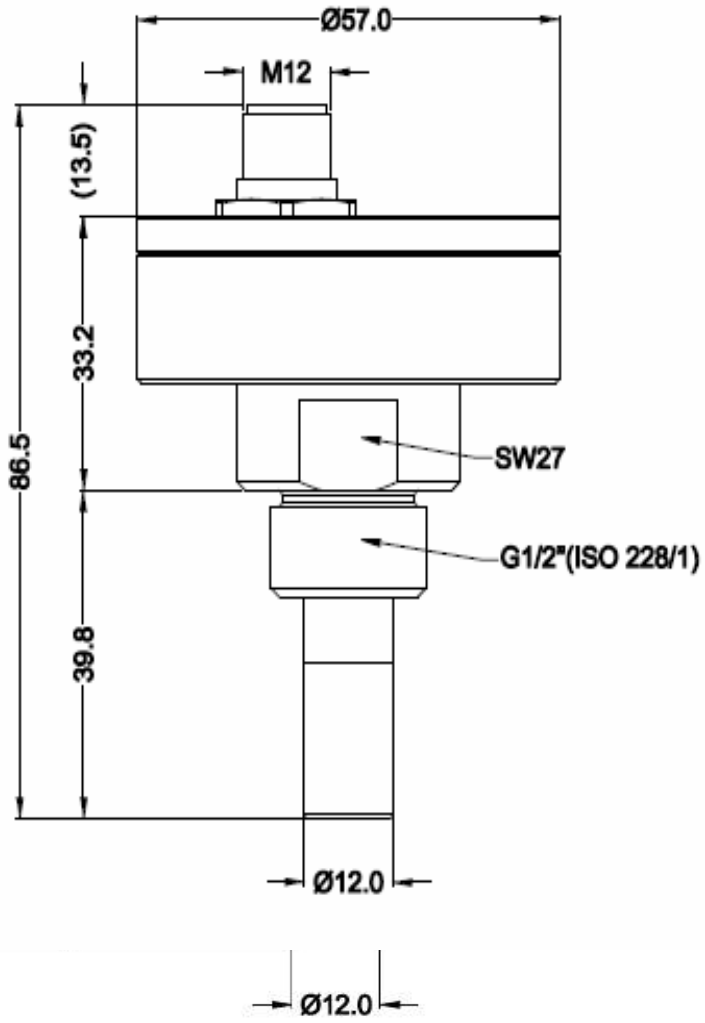
CE		
Measuring range (model depending)	-60 ... +20°C Td -20 ... +50°C Td	
Accuracy	±1ºC Td [-5 … +50ºC] ±2ºC Td [-60 … -5ºC]	
Pressure range	-0.1 ... 5.0 MPa -0.1 ... 35 MPa (optional)	
Power supply	12 ... 30 VDC	
Measured gas	Non-corrosive gases	
Ambient temperature	-20 ... +50°C	
Ambient humidity	0 ... 100% rH	
Transport temperature	-30 ... +70°C	
Response time t_{90} (@ 4 l/min)	-40°C Td - > -20°C Td: 20 seconds 0°C Td - > -40°C Td: 120 seconds	
Output signal	IO-Link	
	IO-LINK Revision	V1.1
	Bitrate	COM1
	Minimum Cycle Time	40 ms
	SIO Mode Supported	No
Connection	M12 connector, 5-pole (M12 plug included)	
Casing	Process connection: stain-less steel Casing: Al alloy	
Classification	IP65	
Process connection	G ½” thread (ISO 228/1)	
Sensor protection	Stainless steel sinter filter pore size <30 µm	
EMC	According to IEC 61326-1	

5.2 Accuracy

Stated accuracy under following conditions:

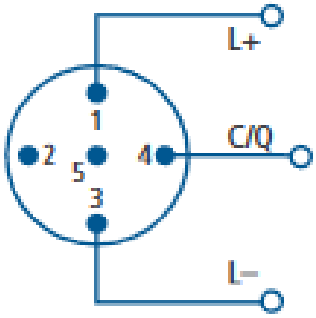
- Ambient / process temperature 23 ± 3°C
- Ambient humidity <95% rH, no condensation
- Airflow > 2 l/min at sensor tip

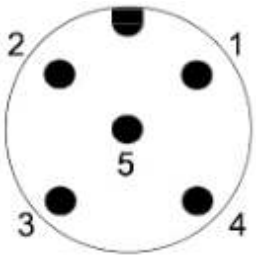
6 Dimensional drawing



7 Electrical connection

M12 connector





Pin assignment

Pin 1	L+
Pin 2	Not used
Pin 3	L-
Pin 4	C/Q (IO-Link)
Pin 5	Not used

8 IO-Link Interface

8.1 TD

Vendor ID	1490
Vendor Name	SUTO iTEC
Vendor Text	www.suto-itec.com
Vendor URL	www.suto-itec.com
Device ID	1038

8.2 Communication

IO-LINK Revision	V1.1
Bitrate	COM1
Minimum Cycle Time	40 ms
SIO Mode Supported	No

8.3 Features

Block parametrization	Yes
Data storage	Yes

8.4 Process Data

Name	Description / Beschreibung	Data type	Bit Offset	Bit Length	Resolution	Unit
Dew point	Pressure dew point temperature value	Float32T	0	32	0.1	°F Td, °C Td
Temperature	Temperature value	Float32T	32	32	0.1	°F, °C
Alternative Humidity unit	Alternative value with humidity unit	Float32T	64	32	0.1	°C Td, °F Td, mg/m³, mg/m³ atm. °C Td atm. °F Td atm.
					0.01	g/m³, g/m³ atm., ppm(V)
					0.001	% rH,g/kg

8.5 ariables

Name	Description	Index	Subindex bitOffset	Data Type	Length	Access Rights	Default	Value Range	Unit
Standard Command		2	Sub 0	UIntegerT	8bit	WO		(130) Restore Factory Setting (240) IO-Link 1.1 system test command 240, Event 8DFE will appear (241) IO-Link 1.1 system test command 241, Event 8DFE will disappear (242) IO-Link 1.1 system test command 242, Event 8DFF will appear (243) IO-Link 1.1	

								system test command 243, Event 8DFF will disappear	
Device Access Lock		12	Sub 0	RecordT	16bit	RW			
Data Storage Lock			bitOffs 1	BooleanT	1 Bit		(0)		
Vendor Name		16	Sub 0	StringT	max 12	RO	SUTO iTEC		
Vendor Text		17	Sub 0	StringT	max 18	RO	www.suto-itec.com		
Product Name		18	Sub 0	StringT	max 6	RO	S217		
Product ID		19	Sub 0	StringT	max 6	RO	S217		
Product Text		20	Sub 0	StringT	max 24	RO	Dew point sensor IO-LINK		
Serial Number		21	Sub 0	StringT	max 8	RO	12345678		
Hardware Version		22	Sub 0	StringT	max 5	RO	1.00		
Firmware Version		23	Sub 0	StringT	max 5	RO	V1.0		
Application Specific Tag		24	Sub 0	StringT	max 16	RW	S217-123456		
Device Status		36	Sub 0	UIntegerT	8bit	RO	(0) Device is OK		
Detailed Device Status		37	Sub 0	StringT	max 5	RO	00 00 00 h		
FOU2	OUT 2 behaviour in case of fault	532	Sub 0	UIntegerT	8bit	RW	(4) OFF	(2) ON (4) OFF	
Temperature unit	Selection of the	551	Sub 0	UIntegerT	8bit	RW	(1) °C	(1) °C (2) °F	

	temperature unit								
Dewpoint alternate unit	Selection of dew point sensor alternate unit	553	Sub 0	UIntegerT	8bit	RW	(3) %	(3) % (4) °C Td (7) mg/m³ (8) g/kg (9) g/m³ (30) ppm(V) (31) °C Td atm. (54) g/m³ atm. (55) mg/m³ atm.	
DPStaticPressure	Dew point sensor static pressure, unit is fixed as bar(g)	554	Sub 0	Float32T	4 byte	RW	6.0	0.0-100.0	

8.6 Events

Code	Name	Type	Description
35856 d / 8C 10 h	Process variable range over-run	Warning	Process data uncertain
35888 d / 8C 30 h	Process variable range under-run	Warning	Process data uncertain
36350 d / 8D FE h	Test Event 1	Warning	Event appears by setting index 2 to value 240, Event disappears by setting index 2 to value 241
36351 d / 8D FF h	Test Event 2	Warning	Event appears by setting index 2 to value 242, Event disappears by setting index 2 to value 243

8.7 Error Types

Error Code	Name	Description
32768 d / 80 00 h	Device application error - no details	Service has been refused by the device application and no detailed information of the incident is available
32785 d / 80 11 h	Index not available	Access occurs to a not existing index
32786 d / 80 12 h	Subindex not available	Access occurs to a not existing subindex
32800 d / 80 20 h	Service temporarily not available	Parameter is not accessible due to the current state of the device application
32803 d / 80 23 h	Access denied	Write access on a read-only parameter
32816 d / 80 30 h	Parameter value out of range	Written parameter value is outside its permitted value range
32819 d / 80 33 h	Parameter length overrun	Written parameter length is above its predefined length
32820 d / 80 34 h	Parameter length underrun	Written parameter length is below its predefined length
32821 d / 80 35 h	Function not available	Written command is not supported by the device application
32898 d / 80 82 h	Application not ready	Read or write service is refused due to a temporarily unavailable application

9 Installation

Before installing the device, please make sure that all components listed below are included in your package.

Qty	Description	Item No.
1	S217 OEM IO-Link Compact Dew Point Transmitter	Model specific (See section 9.3.)
1	M12 Plug	No P/N
1	Instruction manual	No P/N
1	Calibration certificate	No P/N

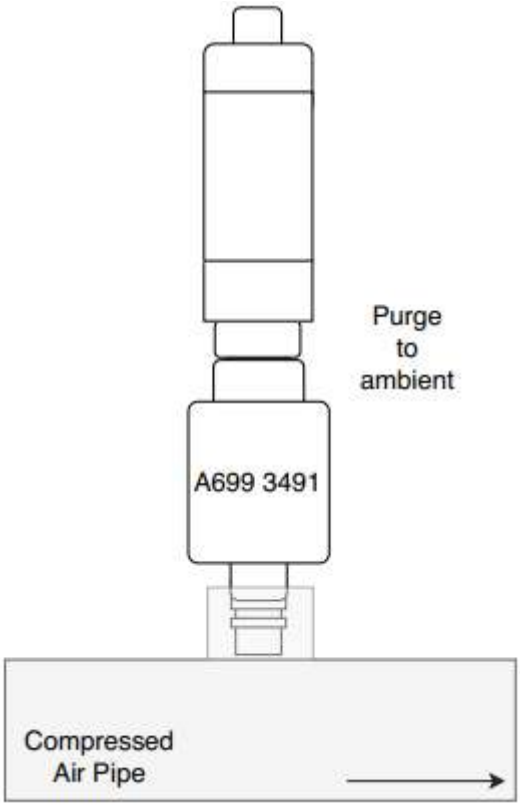
9.1 Installation requirements

The flowing air or gas must pass the sensor tip for a proper measurement. This can be realized with a measurement chamber. For a installation without measuring chamber you need to concern the installation depth which is described in the next chapter.

9.2 Installation procedure

The following steps explain the procedure of an appropriate installation.

Installation with the measurement chamber A699 3491



1. Mount the device on the measurement chamber by using the G1/2” connection.

2. Make sure the device is tightly sealed, therefore the sealing ring on the device must be used.

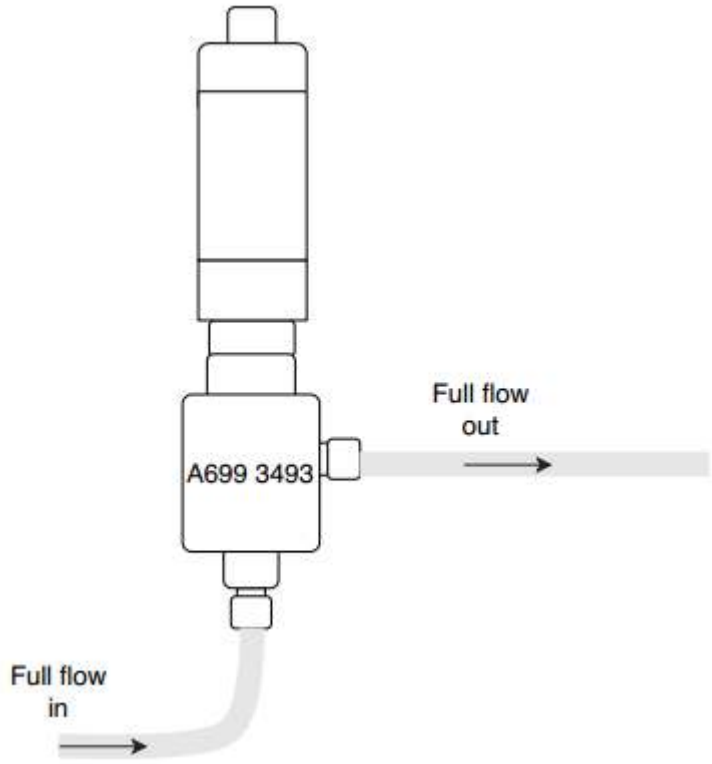
3. Connect the measuring chamber to the compressed air system using a quick connector. Make sure the device is screwed on the chamber before connecting. The measurement chamber will create a purge flow.

Installation with the by-pass measurement chamber A699 3493

For the model A699 3493, there are two installation methods:
Method 1: Full pass through by-pass installation
This method is to be used when the full air flow is passing through the measuring chamber.

1. Connect the inlet of the chamber using a 6 mm teflon hose to your system.
   Note: The full flow must pass the measuring chamber. Ensure a certain flow rate to get fast response time.
2. Connect the outlet of the chamber to your system using the 6 mm hose quick connector.

See below figure for details.

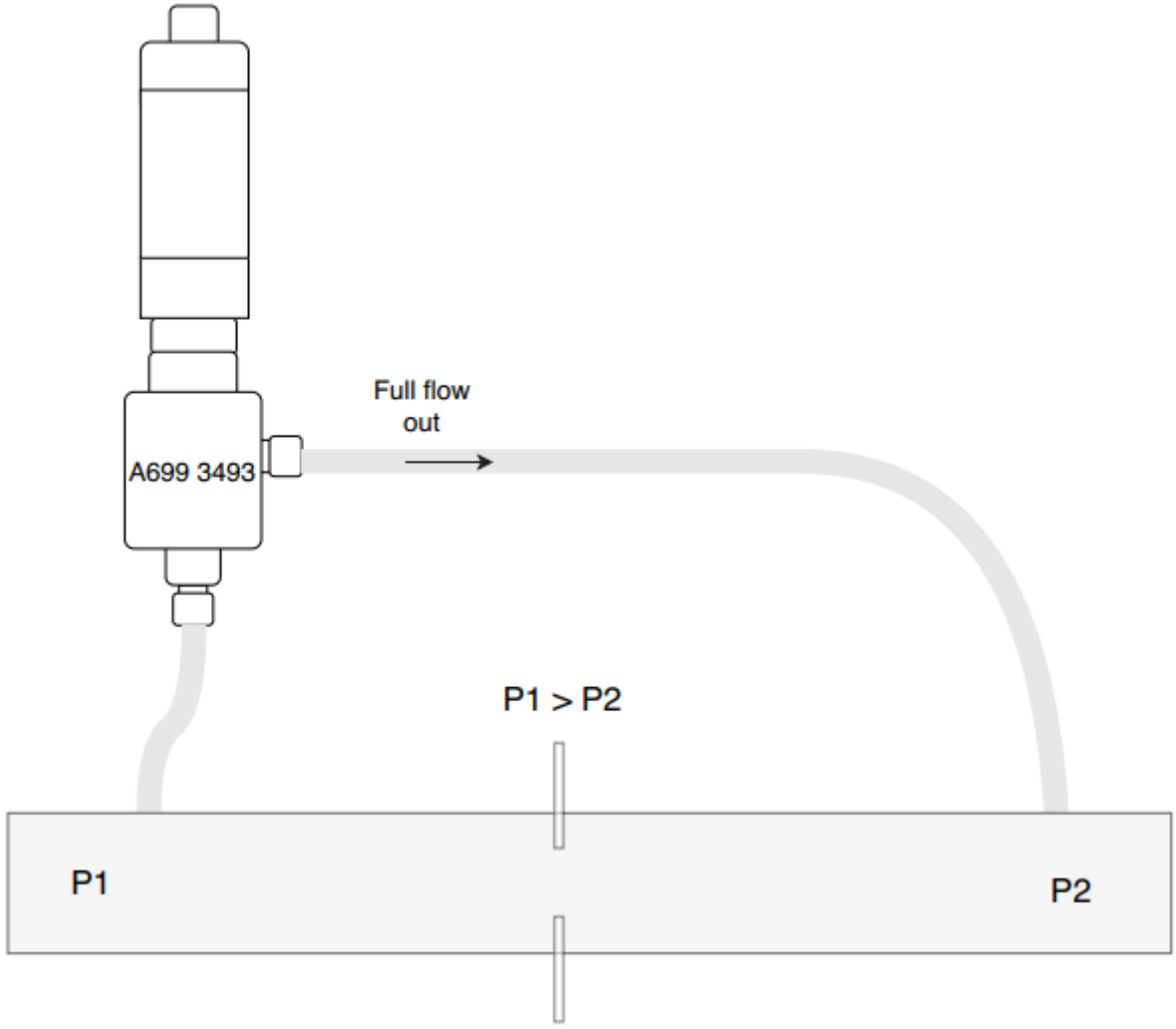


Method 2: By-pass installation

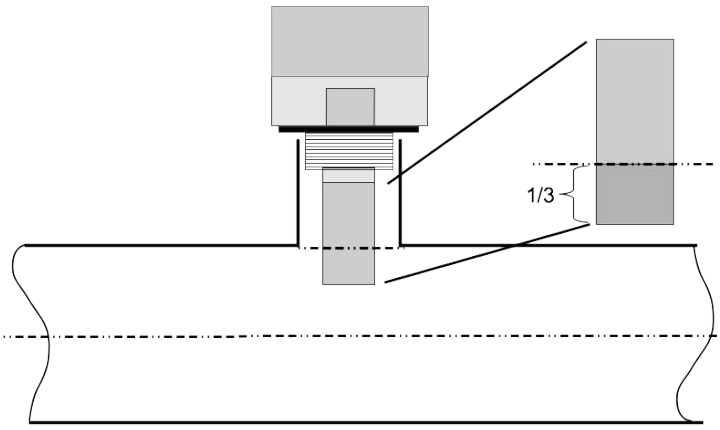
Note : In order to use the measurement chamber in a by-pass you must ensure a pressure difference between P1 and P2 as indicated in the picture below.

1. Connect the inlet of the chamber to your pipe system.
2. Connect the outlet of the chamber to your pipe system where the pressure is known to be lower than the inlet pressure.

Note : The pressure difference P1 > P2 is needed to create a by-pass flow through the chamber. If there is no pressure difference between P1 and P2, there will be no flow through the chamber and therefore the response time will be very slow or the device will not even respond at all to the dew point changes.



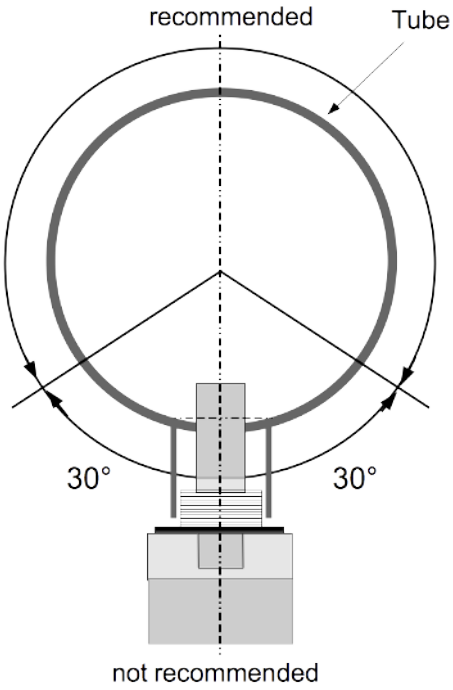
Installation of the device without measurement chamber



Full flow installation. The sensor is in the pipe.

- Install the sensor only if the system is pressureless.
- Not less than 1/3 of the sensor tip should be inside of the pipe. For this please check the size of the nozzle.
- The inner thread must be G 1/2”.

Remarks



Please install the sensor only in the recommended area like you can see in the picture. An upside down installation is not permitted. Please consider that the distance to the vertical level must be >30°.

Removal of the device

To remove the device unscrew the device from the measurement chamber or from the nozzle. Please observe that the system is pressureless when the device is removed.

9.3 Order information

Order no.	Description
S699 2180	S217 OEM Compact Dew Point Transmitter, IO-Link, -60 ... +20 °C Td, G1/2" thread, 5.0 MPa, M12 connector, including M12 plug
S699 2181	S217 OEM Compact Dew Point Transmitter, IO-Link, -20 ... +50 °C Td, G1/2" thread, 5.0 MPa, M12 connector, including M12 plug
A1390	S217, customized measuring range
A1391	S217, high pressure option 35 MPa (350 bar)
A699 3491	Measuring chamber for easy installation in compressed air system up to 15 bar
A699 3493	Measuring chamber bypass type (in and out 6 mm hose connection)

10 Calibration

The device is calibrated ex work. The exact calibration date is printed on the certificate which is supplied together with the device. The accuracy of the device is regulated by the on site conditions, parameters like oil, high humidity or other impurities can affect the calibration and furthermore the accuracy. However we recommend to calibrate the instrument at least once per year. The calibration is excluded from the instruments warranty. For this please contact the manufacturer.

11 Maintenance

Please observe from time to time the sinter cap. If it appears to be dirty, it is recommended to replace it for this please contact the manufacturer.

ATTENTION!

Contaminated filters can lead to longer response time and to wrong measurements.

12 Disposal or waste

Electronic devices are recyclable material and do not belong in the household waste.
The sensor, the accessories and its packings must be disposed according to your local statutory requirements.
The dispose can also be carried by the manufacturer of the product, for this please contact the manufacturer.

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