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Instruction manual

DP 300 mobile dew point instrument



For measuring pressure, dew point and atmospheric dew point

in different applications:

- Compressed air plants (refrigeration/ adsorption dryer)
- Granulate dryers
- Medical gases
- Non corrosive gas, e.g. nitrogen, SF6...

Instrument conform to DIN EN 61326-1 and DIN EN 61010-1 CE

V 2-01-2011

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Notes on safety:

Please read prior operation.

- Do not exceed pressure range >50 bar with standard version.
- With special version up to 350 bar.
- Observe measuring ranges of the sensor.
- The probes are damaged if overheated.
- Observe maximal storage and transport temperature.

Warranty claims or calibration should be carried out by a qualified measurement and control engineering staff only.

Important:
Before installing briefly bleed the compressed air in order to remove condensate and particles. This prevents soiling the instrument DP 300.
Standing air leads to longer response times.

Introduction:

Keeping a specific dew point is requirement for a trouble free plant operation. The mobile dew point measuring instrument DP300 is the ideal service instrument in a handy case. It measures relative humidity, temperature and the dew point up to 50 bars, easy, fast without annoying cable.
With the optional PC software the measured data can be recorded in an Excel file and further parameters can be selected: ppm, g/m³, mg/m³, g/kg, atmospheric dew point.
Special version up to 350 bars.

We generally recommend using a measuring chamber.

Screw in the DP 300 in the measuring chamber, you can also use a diffusion tight Teflon Tube with fast coupling:

Advantage:

- Easy mounting and dismounting
- Fast response time

Measurable gases:

In general humidity can be measured in all non corrosive active gases. Please ask for more information.

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Container for the dry storage of the instrument

During the storage and the transport of the dew point meter the DP 300 should be inserted to the dry container.

The dry container prevents, that the sensor and the measuring chamber absorbes too much humidity.

Advantage of the dry container:

- Fast response time
- Sensor and measuring chamber are predried

The desiccant bags in the dry container should be changed, if the dew point is about -5°C. Please twist off the top cover and change the desiccant bags.
(2x desiccant bags 1/3 unit)



Operation DP 300



On/ Off to switch the instrument



Scroll function to select between °C dew point,
% RH or °C ambient temperature



Max/ Min to choose between the highest and lowest value since starting the instrument

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Technical data:

Measuring range:	-80….50 °C td -20….70°C 0….100 % RH Via SFA Software alternatively to the dew point further parameters can be displayed: ppm V/V, atmospheric dew point, g/m³, mg/m³, g/kg and °F.
Pressure range:	-1 up to 50 bar standard -1 up to 350 bar high pressure version
Display:	One line, resolution 0,1 Dew point (°C td) Relative humidity (% RH) Temperature (°C or °F) depending on the production setting
Display functions:	Min, Max, battery load
Output	Seriell Data Interface (SDI) for PC Software
Input:	Battery load only with CS mains unit possible
Accuracy:	± 0,5 °C td (-10...50°C td) Typical ± 2°C td at -40°C td
Power supply:	Internal rechargeable battery (4 x 1,5 NiMh AAA) for appr. 15 h operation Display Low Batt.: max. 2 hours remaining operation time
Online measurement:	with mains unit
Operating temperature:	-20...70°C measuring gas temperature 0...40 °C ambient temperature
EMC:	DIN EN 61326-1
Screw in thread:	G ½“ stainless steel
Housing:	Polycarbonat
Weight:	DP 300 - 340 g Measuring chamber - 125 g Dry container - 270 g

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Scope of delivery DP 300 Set:

	1. Dew point meter DP 300 up to 50 bar, including rechargeable battery Instruction Manual Inspection Certificate
	2. Mobile measuring chamber up to 16 bar with plug nipple
	3. Diffusion-tight teflon cable, length 1m, with quick coupling and plug nipple, addditional quick coupling with ½“ connection thread
	4. Power supply unit 24 VDC/110 - 240 VAC, 50 - 60 Hz for charging the battery and for long-term measurements with Euro plug
	5. Control and calibration set 11.3% RH
	7. Dry container with quick coupling
	7. Transport case

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Service/calibration/adjustment

According to DIN ISO certification of the measuring instruments we recommend to calibrate and if applicable to adjust the instrument regularly from the manufacturer.

Dear customer,

Thank you for your confidence. You have made the right choice by choosing a quality product. If you have reason for complaint we will repair any faults free of charge if it can be proven that they are manufacturing faults.
The fault should be reported immediately after it has been found and within the warranty time guaranteed by us.

Excluded from this warranty is damage caused by improper use and non adherence to the instruction manual.

The warranty is also cancelled once the instrument has been opened. This also is the case if the serial number has been changed damaged or removed.

The warranty time is 12 months for the instrument, 6 months for accessory parts. Warranty services do not extend the warranty time.

If in addition to the warranty service necessary repairs, adjustment or similar are carried out, the warranty service are free of charge but there is a charge for other services such as transport and packaging costs.

Other claims, especially those for damage occurring outside the instrument are not included unless responsibility is legally binding.

After sales service after the warranty time has elapsed

We are of course there for you after the warranty time has elapsed. Please call us.

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Order data:

Description:	**Order no.**
Set DP 300 consisting of:	**0600 6000**
• Dew point instrument DP300 up to 50 bar incl. battery	0560 6000
• Mobile measuring chamber up to 16 bar, plug nipple	0699 4490
• Diffusion-tight Teflon cable 1 m with fast coupling	0554 0003
• Power supply with Euro plug	0554 0001
• Control and calibration set 11,3 % RH	0554 0002
• Quick-lock coupling	0530 1101
• Dry container	0699 2500
• Transport case	0554 6002

Additional accessories not included in the set:

Dew point instrument DP300 up to 350 bar incl. storage battery	0560 6001
CS Service Software for DP 300 incl. PC connection set consisting of: - Power supply - USB cable Software adapter IF 100 - incl. software SFA 300 and CS Soft Professional - Connection cable DP 300 to IF 100	0554 2004
Precision calibration at -40°C dew point with ISO certificate	0699 3396
Measuring chamber for atmospheric pressure dew point	0699 3690
High pressure measuring chamber up to 350 bar (for special version DP 300 up to 350 bar)	0699 3590
Measuring chamber for granulate dryers for min. overpressure	0699 3490
High pressure measuring chamber for respiratory air bottles up to 350 bar (for special version DP 300 up to 350 bar)	0699 3790
Control and calibration set 33 % RH	0554 0004
Control and calibration set 75.3 % RH	0554 0005

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Humidity Reference Cells

For adjustment and calibration of humidity measuring instruments



Performance characteristics

- Reference cell for relative air humidity
- 7 versions with different salt fillings ranging from 11 % to 97 % RH
- High accuracy guaranteed by chemically straight salts
- Integrated Teflon membrane as separating barrier between salt solution and measuring chamber
- Optimized housing with favourable ratio of membrane surface to inner volume
- Transparent design for visual controllability of saturation and liquid level
- Temperature range from 0 to +50°C
- Made in Germany, 12 month warranty

Working principle

The humidity reference cells are used as humidity standards in order to provide stable humidity values for experiments or for calibration of measuring instruments. The achievable accuracy is within a deviation of 1 % RH.

The working principle is based on a saturated salt solution, that leads to a particular relative air humidity value prevailing directly above the solution.

The reference cells in addition contain a semi-permeable Teflon membrane (diaphragm) which separates the salt solution from the measuring area. The membrane is permeable for vaporous water molecules, but not for the salt solution or for liquid water. The humidity value in the measuring area corresponds to the relative air humidity above the salt solution. The membrane makes handling the cells much easier: the reference cells can be inserted upside down. There is no risk of the salt solution leaking out and thus spoiling the test item. Furthermore, the salt solution is protected against contamination coming from the outside. The active membrane area is rather large compared to the inside volume, which leads - after insertion of the test item - to quickly stabilizing humidity values.

The cells are mechanically stable and transparent. Thus, the humidity level and the air saturation can be monitored from the outside. The sensitive membrane is protected by a

plastic insert. The humidity curve in dependence on the temperature can be seen on the label of the containers. Temperature ranges goes from 0 to +50°C.

Durability

When applied correctly, the cells can be used for many years. If the liquid level changes, just send in the cells to our customer service for regeneration or for a refill.

Versions

The version offered is equipped with a 1/2“ inner thread that allows the compressed air probe or the instrument series FA 200 and FA 300 to be directly screwed in leak-proof. The reference cell is available with seven different salt solutions. The salts used are of the straightest laboratory quality. For an overview of the versions available, please refer to the back of this leaflet.

Further information can be made available upon request.

Fields of application

Due to the high accuracy, the reference cells are suitable for calibration of capacitive humidity measuring instruments. A service software, that makes adjustment and calibration with the measuring cell possible, is available for instrument series FA 300. The order no. for the service software package is 0554.2004. The complete package does also include an interface module, a mains unit and a connecting cable.

Further fields of application are humidity generators and moisturizing equipment for research and development purposes.

Humidity curve [%RH]

Filling, salt	5°C	10°C	15°C	20°C	25°C	30°C	35°C	40°C	45°C	50°C
Lithium chloride	11.26	11.29	11.30	11.31	11.30	11.28	11.25	11.21	11.16	11.10
Magnesium chloride	33.60	33.47	33.30	33.07	32.78	32.44	32.05	31.60	31.10	30.54
Magnesium nitrate	58.86	57.36	55.87	54.38	52.89	51.40	49.91	48.42	46.93	45.44
Sodium chloride	75.65	75.67	75.61	75.47	75.29	75.09	74.87	74.68	74.52	74.43
Potassium chloride	87.67	86.77	85.92	85.11	84.34	83.62	82.95	82.32	81.74	81.20
Potassium nitrate	96	95	94	93	92	91	89	88	85	82
Potassium sulphate	98	98	97	97	97	96	96	96	96	96

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Ordering information for Humidity Reference Cells

Filling, salt	relative humidity at 20°C	Order no.	Annotation
Lithium chloride	11.31	0554.0002	standard, ex stock
Magnesium chloride	33.07	0554.0004	standard, ex stock
Magnesium nitrate	54.38		upon request
Sodium chloride	75.47	0554.0005	standard, ex stock
Potassium chloride	85.11		upon request
Potassium nitrate	93		upon request
Potassium sulphate	97		upon request

Dew point overview

Lithium chloride (LiCl)										
temperature	**5 °C**	**10 °C**	**15 °C**	**20 °C**	**25 °C**	**30 °C**	**35 °C**	**40 °C**	**45 °C**	**50 °C**
relative humidity [%]	**11.26**	**11.29**	**11.30**	**11.31**	**11.30**	**11.28**	**11.25**	**11.21**	**11.16**	**11.10**
dew point [°tpd]	**-22.6**	**-18.7**	**-14.8**	**-10.9**	**-7.1**	**-3.3**	**0.5**	**4.2**	**7.9**	**11.6**

Magnesium chloride ($MgCl_2$)										
temperature	**5 °C**	**10 °C**	**15 °C**	**20 °C**	**25 °C**	**30 °C**	**35 °C**	**40 °C**	**45 °C**	**50 °C**
relative humidity [%]	**33.60**	**33.47**	**33.30**	**33.07**	**32.78**	**32.44**	**32.05**	**31.60**	**31.10**	**30.54**
dew point [°tpd]	**-9.6**	**-5.3**	**-1.0**	**3.3**	**7.5**	**11.7**	**15.8**	**19.9**	**24.0**	**27.9**

Sodium chloride (NaCl)										
temperature	**5 °C**	**10 °C**	**15 °C**	**20 °C**	**25 °C**	**30 °C**	**35 °C**	**40 °C**	**45 °C**	**50 °C**
relative humidity [%]	**75.65**	**75.67**	**75.61**	**75.47**	**75.29**	**75.09**	**74.87**	**74.68**	**74.52**	**74.43**
dew point [°tpd]	**1.1**	**5.9**	**10.7**	**15.5**	**20.3**	**25.1**	**29.9**	**34.6**	**39.4**	**44.2**

Potassium chloride (KCl)										
temperature	**5 °C**	**10 °C**	**15 °C**	**20 °C**	**25 °C**	**30 °C**	**35 °C**	**40 °C**	**45 °C**	**50 °C**
relative humidity [%]	**87.67**	**86.77**	**85.92**	**85.11**	**84.34**	**83.62**	**82.95**	**82.32**	**81.74**	**81.20**
dew point [°tpd]	**3.1**	**7.9**	**12.7**	**17.4**	**22.2**	**26.9**	**31.7**	**36.4**	**41.1**	**45.9**

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