Manual

DKS GmbH — Engineering & Vertrieb

AQUATRACE® ATT520Ex(d) transmitter 0-500 ppm$_V$ | 0 - 20.000 ppb$_V$

Trace Moisture Measurement in corrossive gases

Measuring cell with separately transmitter electronics in Ex(d) housing and ia-measuring cell (with ZENER-barrier

Special design electronics and measuring cell separated

I. General Information

The AQUATRACE® ATT520Ex (d) model is perfectly for use in potentially explosive areas

With our ATT520Ex(d) we present our new ATT520 trace moisture transmitter in a flameproof enclosure. He works on the basis of our proven P_2O_5 sensors and can therefore be used in all gases, except NH3 and HF. The large number of design variants enables precise adaptation to your task.

In the range of 0 - 500 ppm_V | 0 - 20,000 ppb_V (depending on the measuring range variant) you get an analog output signal of 4 - 20 mA or 0-10V. The transmitter can be adapted or configured to the specific application conditions via a serial interface RS232/ RS485

II. Technical Data

Product:	AQUATRACE® ATT520Ex - Ex (d) -Transmitter for the determination of trace moisture in the measuring range 0-500 ppm $_v$ | 0-20,000 ppb - ATEX certified **Ex II 2G Ex d IIC T6** or **IECEx (on request)**

Performance specifications

Measuring range:	0-500 ppm $_v$ | 0-20,000ppb, dew point –100 ° C - 20 ° C, ranges other than standard available on request
Accuracy:	PPM: +/- 2% of the display value, at least 0.4 ppm $_v$ | PPB: +/- 2% of the display value, at least 10 ppb $_v$
Response time:	Dry to wet: T90 <5 sec; Wet after dry: T90 <15 min
Repeatability:	PPM: +/- 0.01 ppm | PPB: +/- 5 ppb
Calibration:	traceable calibration certificate
advertisement	1.8 "TFT LCD 128x160 pixels, white

Electrical specifications

Output signal:	4-20 mA or 0-10 V, RS232, RS485
Outgoing signal:	[ppm], [ppb] and [° C dp] (dewpoint only via digital interface and display)
Scaled range analog output:	PPM: 0-500 ppm$_v$ | PPB: 0-20,000 ppb$_v$
Power supply:	19-26 V DC
Power consumption:	maximum 0.4 A.
conformity	CE, EN 61000-4-2, EN 61000-4-3, EN 61000-4-4, EN 55011, EN ISO 12100, ATEX and IECEx certified

Operating conditions

Operating temperatur:	-10 to 65 ° C
Storage temperature:	-10 to 65 ° C
Flow rate:	Ensuring constant flow rate !!!
Operating pressure:	0-10 bar absolute

Mechanical specifications

|	
Protection class:	IP66
Housing material:	Aluminum
Sensor:	separate measuring cell with sensor with **Ex II 2G Ex Ia IIC T4 Gb** , ceramic with Pt-layer
Process connection:	Measuring cell with 1/4 '' NPT gas inlet and gas outlet, measuring cell with bayonet lock
Electrical connections:	Measuring cell Ex (i) to transmitter electronics Ex (d): M8-5pin on cable clamp (blue cable bushing), Ex-cable
Weight:	~ 3 kg

II. Technical Data

Dimensions Measuring Cell and Connectors:

D=40mm

Lenght=145mm

Process-Connection: 2x 1/4" NPT (Gas-in / Gas –out)

Dimenesions Ex(d) housing
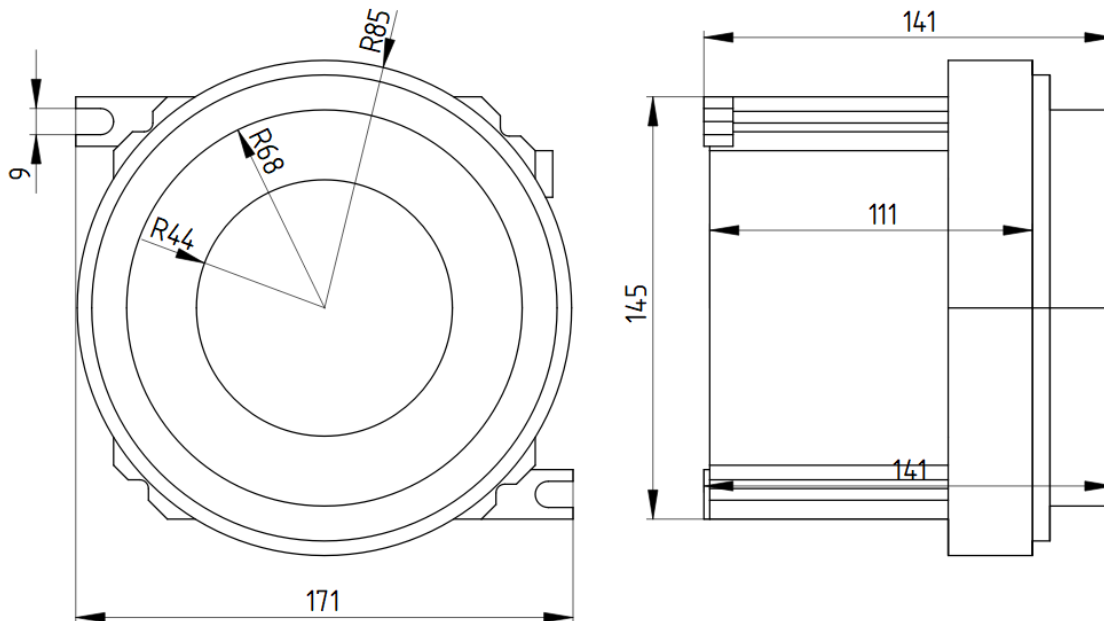
AQUATRACE ® ATT520Ex transmitter   **Order code as an example: ATT520Ex.C.D.B.S.K**

Transmitter version	
Current signal 0-20mA	C
Voltage signal 0-10V	V
Display	D
Measuring cell with bayonet lock	B
Measuring cell made of V2A material	S
or measuring cell made of PVDF material	P
Sensor design	
ZrO2 with Pt interdigital structure	K
Glass with Pt winding	G
Ceramic carrier with Pt winding	KP

III. Installation

(1)   Gas-side connection depending on the configuration of the measuring point

-Sensor with protective cap for flange connection

-Sensor with bayonet in the reaction chamber

(2)   Electrical connection according to PIN assignment

ATTENTION: wrong connection can destroy the device!

First coating by carefully applying a thin electrolyte film (Orthophosphoric acid - **CAUTION:** risk of chemical burns!). We recommend applying 40 vol% dilution with a brush. Excess acid should be carefully dabbed off with lint-free blotting paper.

(4)   Visualization of the sensor status, communication or parameterization via serial interface (see example point IV.)
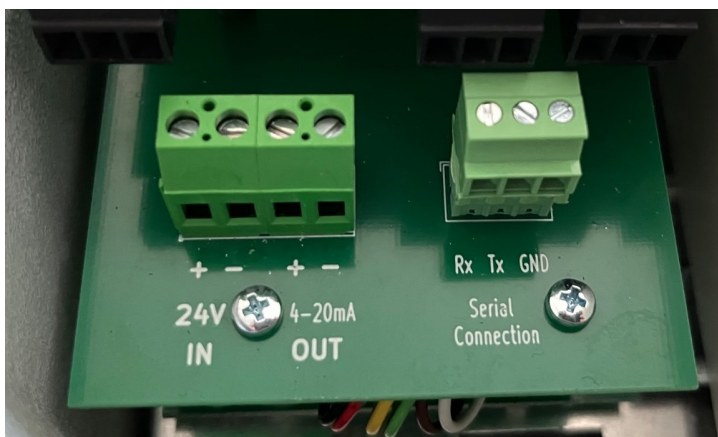
Connectors - Power & Communication

Power-Connection: 24 VDC (+/-)

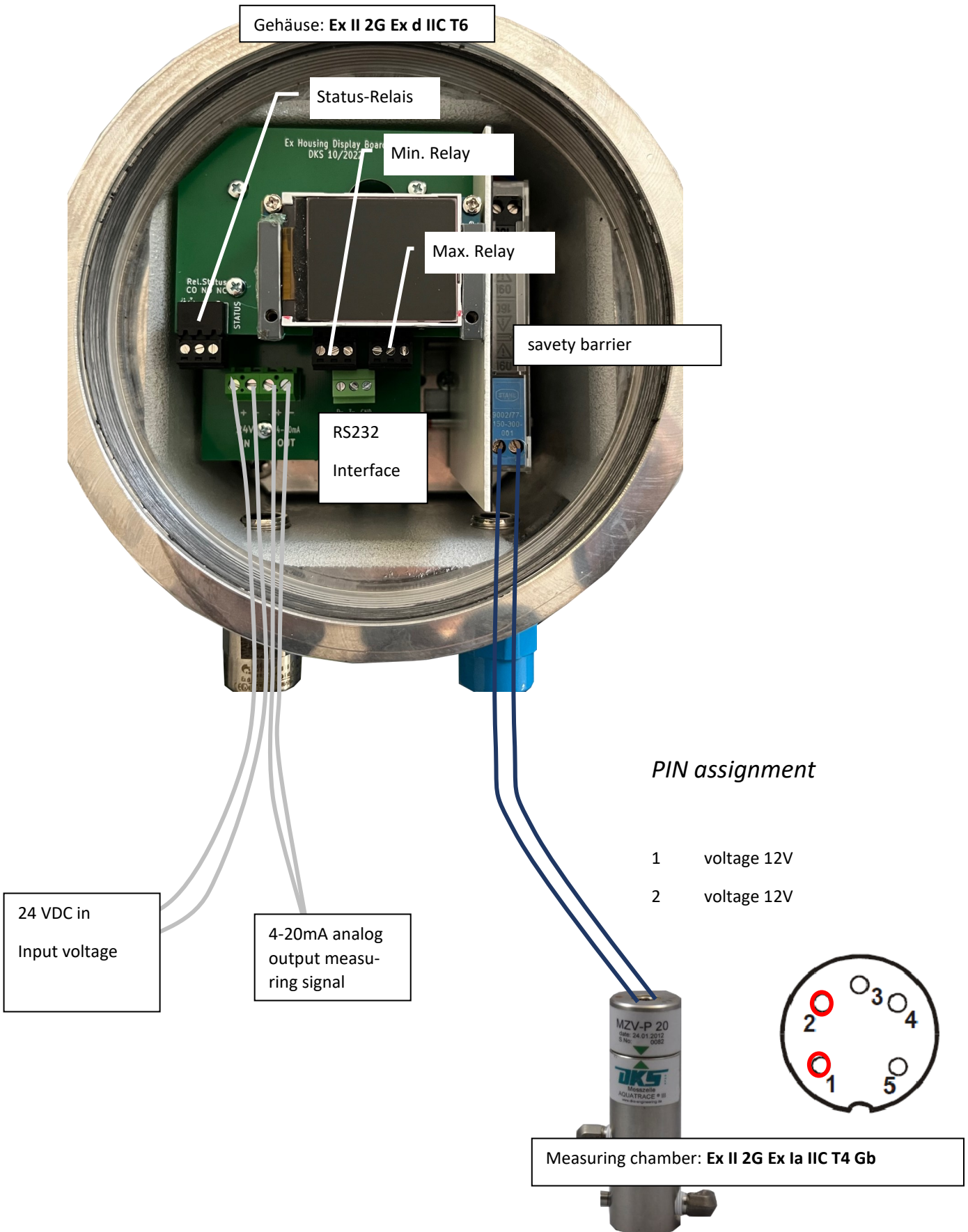Analog out: 4-20 mA

Serial (only for Service): Rx | Tx | GND

(3)   DC (only) Relais-Board Connection

Min-Relay (Rel.Min)	Max-Relay (Rel.Max)	Status-Relay (Rel. Status)
CO … Common	CO … Common	CO … Common
NO … Normaly Open	NO … Normaly Open	NO … Normaly Open
NC … Normaly Close	NC … Normaly Close	NC … Normaly Close

III. Installation

AQUATRACE® ATT520EXd Connection plan

Gehäuse: **Ex II 2G Ex d IIC T6**

Status-Relais

Min. Relay

Max. Relay

savety barrier

RS232 Interface

24 VDC in

Input voltage

4-20mA analog output measuring signal

PIN assignment

1   voltage 12V

2   voltage 12V

MZV-P 20

Measuring chamber: **Ex II 2G Ex Ia IIC T4 Gb**

IV. RS232 - Serial interface

Utility program for communication transmitter - PC: ATTsc_DKS_ RS232.exe on USB stick
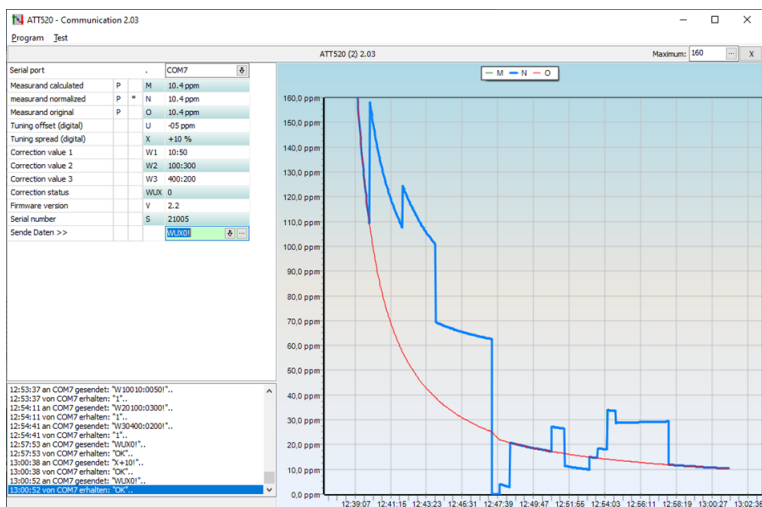
Example:

After starting the program, the serial COM port must be selected, e.g. Example "COM 5".

R in column 2 means reading this value once - clicking in a row reads this value once again

P in column 2 means constant polling of this value is active. By double-clicking in a line, polling can be activated or deactivated

Upper left quadrant: Parameter representation:

N original measured value (adjusted from MSC / DKS to hardware)

M Output value that can be influenced by parameters U and X This value is output at the analog output

U Customer parameter "offset"

Setting range -999 ppm to +999 ppb Entry e.g. U + 099! Enter

Deactivate: Enter U + 00! Enter

X customer parameter "increase"

Setting range -99% to +99% entry e.g. X-10! Enter

Deactivate: Enter X + 00! Enter

V firmware version

Always enter parameters as capital letters and values always as 2 digits !!

Calculation of the output value: M = (1 + (X / 100)) * N + U

The lower left quadrant shows the logbook.

Right half of the picture: temporal representation (chart) of the output values "N" (red) and "M" (blue)

Scaling the X axis: fixed 20min.

Y axis scaling: automatically dynamic

Zooming the time axis: Drag the mouse pointer to the left of the desired section with the left mouse button pressed. Release the mouse button - the selected section is displayed

Back normal view: move from right to left in the chart with the mouse button pressed.

IV. RS232—Serial interface

Querys:

O?	Original value - original value without correction
N?	normalized value - O with offset or support points
M?	Measured value - digital output of the analog value
D?	dew point temperature
U?	offset ppm
X?	offset %
v?	firmware version
ID?	hardware model designation
S?	serial number
dm?	measuring range
W0/1/2/3?	bases
WUX?	correction mode
H?	temperature

Commands:

U Example: U+00! Range: -99 - +99

X Example: X-99! Range: -99 - +99

dm Example: dm500! Range: ppb 1-20ppm 10-500

W1/2/3 Example: ppm: W11000:2000! Range: 0000-5000

                   ppb: W213000:15000! Range: 00000-20000

WUX0   no offset/span and no breakpoints active

WUX1   bases active

WUX2   Offset/Span active

CL!   delete all corrections

IV. RS232—Serial interface

?	Description	Example
O	original value	O 339.7 ppm
N	normalized value	N 339.7 ppm
M	DAC value ppm	M 339.7 ppm
D	Dew Point value (calculated)	D -31.4 °C
U	Offset ppm	U +00 ppm
X	Offset %	X +00 ppm
V	Version	V 0.2
S	Serial number	S 20005
C	Percentage control of current output	C 100 %
W..	Base W1/W2/W3/W0 = all bases	W10000:0000
WUX	correction mode 0 none active | 1 bases active | 2 Offset/Span active	WUX 1
H	Temperature	H 20°C
ID	Hardware model designation	ID ATT520
Min	Minimum threshold (alarm relay 1)	Min 100
Max	Maximum threshold (Alarm Relay 2)	Max 500

LED-Conditions:

LED lights up red   - run-in range (measurement over 1 Ω)   at ppm approx. 700 - 20000 ppm

at ppb approx. 150 - 20000ppm

LED flashes red   - overheating (measured temperature is over 70°C for 1 minute)

LED lights up green   - measuring range   at ppm 0 - 700 ppm (measurement over 160 Ω)

at ppb approx. 30 - 150 ppm (measurement over 47 Ω)

LED solid blue   - ppb range (measure above 1000Ω) 0 - 30ppm

V. Sensor cleaning and re-coating

Please read this section carefully. Note that you are working with an acid. Safety goggles and protective gloves are strongly recommended.

(a)   Disconnect the connector from the transmitter housing

(b)   Open the measuring chamber depending on the design

(c)   Remove the sensor, unscrew the protective cap if necessary

(d)   Carefully rinse the sensor under running water

(e)   Carefully clean and dry the sensor with lint-free blotting paper

(f)   Let the sensor air dry for a few minutes

   If possible, check that the cleaned sensor shows "0 ppm". Repeat cleaning if necessary

(g)   Wet the sensor sufficiently with orthophosphoric acid

(h)   Possibly carefully dab off excess acid

   Attention: No acid should get into the reaction space!

(i)   Insert the sensor into the reaction space in reverse order

(j)   Connect the plug

(k)   Put the transmitter back into operation and follow the "running-in process" on the LED and, if necessary, via a serial interface - this can take 15 - 30 min. last!

IV. Cleaning tips

◊　The frequency of sensor cleaning depends on the operating conditions. The operator should gather his own experience or contact us.

◊　A first plausibility check of the current measured values often helps.

◊　Extreme care and cleanliness are required when handling the sensor element.

◊　Our experience is that a coating can deliver plausible measurement results for up to 24 months.

◊　We recommend a new coat after 6 months at the latest.

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