OUMAN 5-CDPT

5-channel differential pressure transmitter

Change measuring channel.

Press the button

1

The LED indicates which channel pressure difference is displayed

Show

Flow or pressure difference?

To change, press the button

2

If the flow is selected, a point in the middle of the screen is blinking

Measuring channel calibration

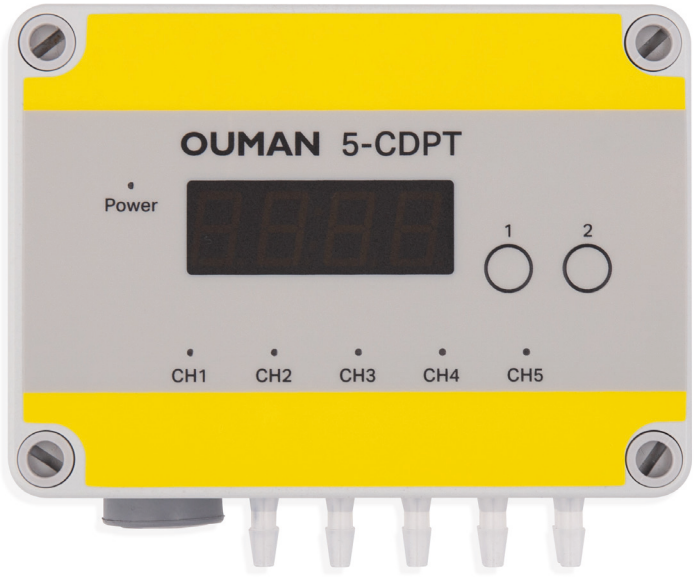
Press the button

2

for 3 seconds

The display shows CAL, when the zero point is calibrated.

The 5-CDPT is a differential pressure transmitter with 5 measurement channel and communicates via the Modbus RTU bus.



- The device is ideal for pressure measurements of a modern compact air handling unit.
- When using a 5-channel device, you can get all the most important pressure measurements with one device, which simplifies installation.
- The flow difference over the fan, for example, can also be calculated from the pressure difference of each measuring channel. For this purpose, the device has ready-made calculation formulas from the most common fan manufacturers.
- Selecting the correct formula and entering the K-value will show the current flow in display and also in the readable register.

Modbus registers

All registers are type 16-bit holding registers.

Register	Parameter	Register type	Address format	Value	Range	Factory setting
READ ONLY						
Registers 3001-3005: You can read the pressure difference per channel.						
3001	**Pressure** meas. channel 1	R	Signed	-1000... 1000	-1000... 1000 Pa	
3002	**Pressure** meas. channel 2	R	Signed	-1000... 1000	-1000... 1000 Pa	
3003	**Pressure** meas. channel 3	R	Signed	-1000... 1000	-1000... 1000 Pa	
3004	**Pressure** meas. channel 4	R	Signed	-1000... 1000	-1000... 1000 Pa	
3005	**Pressure** meas. channel 5	R	Signed	-1000... 1000	-1000... 1000 Pa	
Registers 3006-3010: You can read the flow per channel.						
3006	**Air flow** meas. channel 1	R	Signed	-1000... 1000	-1000... 1000 l	
3007	**Air flow** meas. channel 2	R	Signed	-1000... 1000	-1000... 1000 l	
3008	**Air flow** meas. channel 3	R	Signed	-1000... 1000	-1000... 1000 l	
3009	**Air flow** meas. channel 4	R	Signed	-1000... 1000	-1000... 1000 l	
3010	**Air flow** meas. channel 5	R	Signed	-1000... 1000	-1000... 1000 l	
READ/WRITE						
Register 4001: Response time of measurement output. This will eliminate pressure difference disturbance (turbulence) to the measurement.						
4001	Response time	RW	Unsigned	0...20	0...20 s	4
Registers 4002-4006: Measurement state: measurement of channel in use / not in use						
4002	Measurement state channel 1	RW	Unsigned	0...1	On...Off	1
4003	Measurement state channel 2	RW	Unsigned	0...1	On...Off	1
4004	Measurement state channel 3	RW	Unsigned	0...1	On...Off	1
4005	Measurement state channel 4	RW	Unsigned	0...1	On...Off	1
4006	Measurement state channel 5	RW	Unsigned	0...1	On...Off	1
Registers 4007-4016 Pressure range: You can adjust measurement output max- and min limit per channel.						
4007	Pressure range low limit Channel 1	RW	Signed	-1000...0	-1000...0Pa	-1000
4008	Pressure range high limit Channel 1	RW	Signed	0... 1000	0... 1000Pa	1000
4009	Pressure range low limit Channel 2	RW	Signed	-1000...0	-1000...0Pa	-1000
4010	Pressure range high limit Channel 2	RW	Signed	0... 1000	0... 1000Pa	1000
4011	Pressure range low limit Channel 3	RW	Signed	-1000...0	-1000...0Pa	-1000
4012	Pressure range high limit Channel 3	RW	Signed	0... 1000	0... 1000Pa	1000
4013	Pressure range low limit Channel 4	RW	Signed	-1000...0	-1000...0Pa	-1000
4014	Pressure range high limit Channel 4	RW	Signed	0... 1000	0... 1000Pa	1000
4015	Pressure range low limit Channel 5	RW	Signed	-1000...0	-1000...0Pa	-1000
4016	Pressure range high limit Channel 5	RW	Signed	0... 1000	0... 1000Pa	1000

Register	Parameter	Register type	Address format	Value	Range	Factory setting
READ/WRITE						
Register						
4017	Zeroing function Channel 1	RW	Unsigned	0...1	On...Off (bounches off, when done)	
4018	Zeroing function Channel 2	RW	Unsigned	0...1	On...Off (bounches off, when done)	
4019	Zeroing function Channel 3	RW	Unsigned	0...1	On...Off (bounches off, when done)	
4020	Zeroing function Channel 4	RW	Unsigned	0...1	On...Off (bounches off, when done)	
4021	Zeroing function Channel 5	RW	Unsigned	0...1	On...Off (bounches off, when done)	
Register 4022 Zeroing function all channels: Calibrates (zeroing) all channels at once						
4022	Zeroing function all channels	RW	Unsigned	0...1	On...Off (bounches off, when done)	
Registers 4023-4027 Measurement offset: Measurement output offset per channel, if you want to adjust measurement output in device side						
4023	Measurement offset Channel 1	RW	Signed	-100... 100	-100...100 Pa	0
4024	Measurement offset Channel 2	RW	Signed	-100... 100	-100...100 Pa	0
4025	Measurement offset Channel 3	RW	Signed	-100... 100	-100...100 Pa	0
4026	Measurement offset Channel 4	RW	Signed	-100... 100	-100...100 Pa	0
4027	Measurement offset Channel 5	RW	Signed	-100... 100	-100...100 Pa	0
Registers 4028-4032 Airflow formula: Selecting of fan manufacturer specific formula. The formula is used for calculating flow with help of pressure difference measurement.						
4028	Airflow formula enum Channel 1	RW	Unsigned	0...7	0=Ziehl-Abegg(l/s), 1=Ziehl-Abegg, 2=Ebm-papst, 3=Fläktwoods, 4=Rosenberg, 5=Nicotra, 6=Comefri, 7=Gebhardt	0, value as (m^3/h)
4029	Airflow formula enum Channel 2	RW	Unsigned	0...7		
4030	Airflow formula enum Channel 3	RW	Unsigned	0...7		
4031	Airflow formula enum Channel 4	RW	Unsigned	0...7		
4032	Airflow formula enum Channel 5	RW	Unsigned	0...7		
Registers 4033-4037 Airflow formula K value: Setting K value for selected flow measuring formula						
4033	Airflow formula K value Channel1	RW	Unsigned	3...47000	0,3 ... 4700,0. Actual limits depends on Airflow formula Fläktwoods: 0.3 ... 99 Rosenberg: 37 ... 800 Comefri: 10 ... 2000 Nicotra, Ziehl-Abegg Ebm-papst: 10 ... 1500 Gebhardt: 50 ... 4700	60
4034	Airflow formula K value Channel 2	RW	Unsigned	3...47000		60
4035	Airflow formula K value Channel 3	RW	Unsigned	3...47000		60
4036	Airflow formula K value Channel 4	RW	Unsigned	3...47000		60
4037	Airflow formula K value Channel 5	RW	Unsigned	3...47000		60

DIP switches

Device address	DIP 1 2 3 4 5 6
1	
2	
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31	
...	

Device addresses: set with DIP switches 1-6

1 2 3 4 5 6

If the switches 1-6 are OFF, Modbus communication is not in use

If the DIP 1 is ON, device address is odd.
When device address is odd the bus speed is recognised always automatically.

If the DIP 1 is OFF, device address is even and baud rate is 9600.

Parity: The bus parity is set with help of DIP switches 7 and 8.

7 8	Parity
	Odd
	Even
	No parity

Terminal resistor and biasing resistors

The device uses a galvanically isolated RS-485 network as a physical interface. Only one device at a time can write in to the network, the other devices are listening. For this reason there are situations when no device writes in to the network but they all are listening. The biasing resistors ensure that the network remains stable in this situation. This is especially important if the network is long and if there is external interference.
Terminal resistors and biasing resistors must be taken into use in two (and only two) devices per network. The devices in question must be positioned at both ends of the network. If this device is first or last device in the network, take the resistors into use.

T BIAS

T: Terminal resistor

BIAS: Bus biasing (pull-up D+/A)

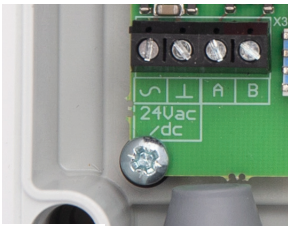
BIAS: Bus biasing (pull-down D-/B)

T BIAS	Terminal (T) and biasing reisistors (BIAS)
	Terminal resistor and biasing resistors are not in use
	Terminal resistor is in use
	Biasing reisistors are in use

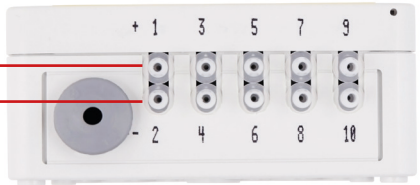
1 2 3

Connection

First set the switches to meet the requirements of the system.
Then connect the operating voltage 24V AC or DC to terminals (~ and ⊥) and bus cable to terminal **A** and **B** according to markings on the terminals.



Connecting the measuring hoses



Each measuring channel has a **+** and **–** connection

- For example, measuring the pressure difference between the fans, connect the suction to the **-** and pressure to the **+**.
- If a ready-made hose set (5-CDPT hose set) is used, the numbering of the connections (figure) can also be used and the corresponding numbered hoses can be connected to them.

FLOW CALCULATION			
Fan manufacturer	Calculation formula	k value	Unit
Fläktwoods	$q = \frac{1}{k} \cdot \sqrt{\Delta P}$	0.3 ... 99	m³/s
Rosenberg Comefri	$q = k \cdot \sqrt{\frac{2 \cdot \Delta P}{\rho}}$	Rosenberg: 37 ... 800 Comefri: 10 ... 2000	m³/h
Nicotra	$q = CPFN \cdot \sqrt{\frac{2 \cdot \Delta}{\rho}}$	10 ... 1500	m³/h
Gebhardt	$q = k \cdot \sqrt{\frac{2 \cdot \Delta P}{\rho}}$	50 ... 4700	m³/h
Ziehl-Abegg Ebm-papst	$q = k \cdot \sqrt{\Delta P}$	10 ... 1500	m³/h
Ziehl-Abegg Ebm-papst	$q = k \cdot \sqrt{\Delta P} \cdot \frac{1000}{3600}$	10 ... 1500	l/s

TECHNICAL INFORMATION	
Dimensions:	width 130 mm, height 110 mm, depth 57 mm
Weight:	295 g
Protection class:	IP 34
Operating temperature:	-25 ... 40 °C (24 h environment temperature 35 °C)
Power required:	1 W
Operating voltage:	24 Vac/Vdc
Total error band *)	± 2%
Long-term stability	± 0.25 %
Measuring range:	-1000 ... 1000 Pa
Communication protocol:	Modbus
Bus speed:	Auto
Warranty:	2 years
APPROVALS	
EMC-directive	2014/30/EU and 2014/53/EU
Interference tolerance	IEC 61000-6-1
Interference emissions	IEC 61000-6-3
Low voltage directive	2014/35/EU

*) Total Error Band: The maximum deviation from the ideal transfer function over the entire compensated temperature and pressure range. Includes all errors due to offset, full scale span, pressure non-linearity, pressure hysteresis, repeatability, thermal effect on offset, thermal effect on span, and thermal hysteresis.

The enclosed marking on the additional material of the product indicates that this product must not be disposed of together with household waste at the end of its life span. The product must be processed separately from other waste to prevent damage caused by uncontrolled waste disposal to the environment and the health of fellow human beings. The users must contact the retailer responsible for having sold the product, the supplier or a local environmental authority, who will provide additional information on safe recycling opportunities of the product. This product must not be disposed of together with other commercial waste.

We reserve the right to change the specification without prior notification