Sensors

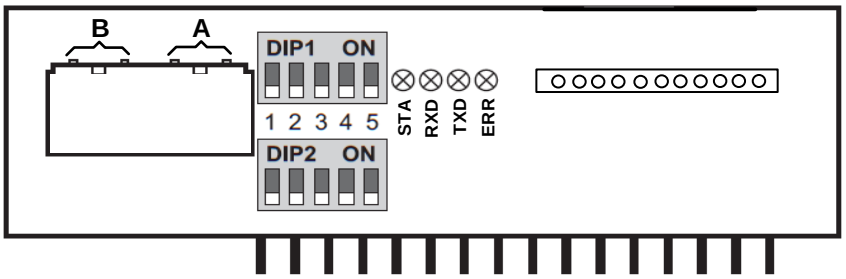
- **22DTH-..6..**
  Duct sensor humidity / temperature
- **22UTH-..60X**
  Outdoor sensor humidity / temperature
- **22DTM-..6**
  Duct sensor CO2 / humidity / temperature
- **22ADP-..6..**
  Differential pressure sensor

Contents

1. Operating elements for addressing and parametrization

1.1 RS-485 module

In addition to the basic board, each BACnet sensor is equipped with a RS-485 module.
The BACnet communication lines A (D +) and B (D -) are connected to the module. Furthermore, on the two DIP switches, the MAC address of the BACnet sensor can be selected and the communication parameters can be set.

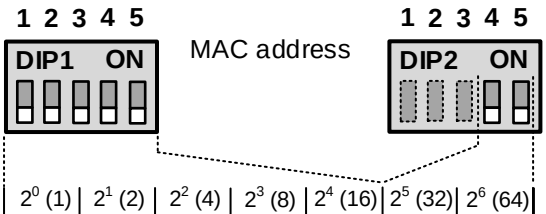


1.2 Functions of DIP switch 1 and DIP switch 2

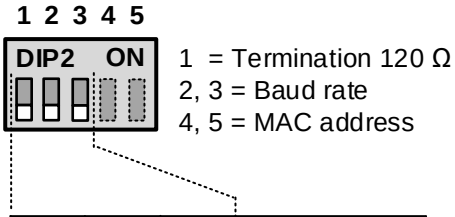
DIP switch **DIP1** (switch 1 - 5) is used to set the MAC address together with switch DIP2 (switch 4 & 5) binary coded in a range of 1…127 (address 0 is reserved and can't be set).

DIP switch **DIP2** (switch 1,2,3) is used to parametrize termination (120 Ω) and baud rate.

All DIP switches are factory set to the OFF position.



2^0 (1)	2^1 (2)	2^2 (4)	2^3 (8)	2^4 (16)	2^5 (32)	2^6 (64)	
1 DIP1	**2 DIP1**	**3 DIP1**	**4 DIP1**	**5 DIP1**	**4 DIP2**	**5 DIP2**	**Address**
OFF	OFF	OFF	OFF	OFF	OFF	OFF	**0**
ON	OFF	OFF	OFF	OFF	OFF	OFF	**1**
OFF	**ON**	OFF	OFF	OFF	OFF	OFF	**2**
ON	**ON**	OFF	OFF	OFF	OFF	OFF	**3**
OFF	OFF	**ON**	OFF	OFF	OFF	OFF	**4**
ON	OFF	**ON**	OFF	OFF	OFF	OFF	**5**
OFF	**ON**	**ON**	OFF	OFF	OFF	OFF	**6**
⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮
ON	**ON**	**ON**	**ON**	**ON**	**ON**	**ON**	**127**



1 DIP2	**2 DIP2**	**3 DIP2**	**Function**
OFF			Termination **OFF**
ON			Termination **ON**
	OFF	OFF	Baud rate **9'600**
	ON	OFF	Baud rate **19'200**
	OFF	**ON**	Baud rate **38'400**
	ON	**ON**	Baud rate **76'800**

1.3 LED Functions

The four LEDs on the RS-485 module show the actual operating status of the RS-485 module.

STA green — During normal operation the LED is flashing.
LED is turned ON during sensor initialization after Power ON of the device.

RXD orange — LED is turned ON if bus telegrams are received by the RS-485 module.

TXD orange — LED is turned ON if bus telegrams are sent by the RS-485 module.

ERR red — LED is turned ON in case of a faulty bus configuration or in case of internal errors.

2. Protocol Implementation Conformance Statement - PICS

General information

Date: 02.08.2022

Vendor Name: BELIMO Automation AG

Vendor ID: 423

Product Name: Sensor

Product Model number:
22DTM-16
22DTM-56
22DTH-16M
22DTH-56M
22UTH-160X
22UTH-560X
22ADP-164
22ADP-164L
22ADP-56Q
22ADP-56QB
22ADP-564L
22ADP-566L

Application Software Version: 2.3
Firmware Revision: 2.3

BACnet Protocol Revision: 1.14

Product Description:
Sensor device with BACnet MS/TP RS-485 Interface

BACnet Standard Device Profile: BACnet Smart sensor (B-SS)

BACnet Interoperability Building Blocks supported:
Data sharing - ReadProperty-B (DS-RP-B)
Data sharing - ReadPropertyMultiple-B (DS-RPM-B)
Data sharing - WriteProperty-B (DS-WP-B)
Data sharing – COV Unsubscribed-B (DS-COVU-B)
Device Management - DynamicDeviceBinding-B (DM-DDB-B)
Device Management - DynamicObjectBinding-B (DM-DOB-B)
Device Management - DeviceCommunicationControl-B (DM-DCC-B)

Segmentation Capability: No

Data Link Layer Options: MS/TP Master,
Baud rates 9'600, 19'200, 38'400, 76'800
Max. 32 nodes (without repeater)

Device Address Binding: No static device binding supported

Networking Options: None

Character Sets Supported: UTF-8

Depending on the sensor type and the version, not all the measured values and configuration parameters listed in this document are available. The values available for the respective sensor, can be taken from the respective sensor data sheet, or via the "Out of Service" flag of the corresponding object via BACnet.

Protocol Implementation Conformance Statement – PICS *(continued)*

Object processing

Object type	Optional properties	Writeable properties
Analog Input [AI]	COV Increment Description	COV Increment
Analog Value [AV]	Description	Present_Value
Device	Description Max Master Max Info Frames	Description

The specified maximum length of writable strings in the Device Object are based on single byte characters and support up to 32 characters.

3. BACnet objects description

Depending on the device type or version, not all measured values or configuration parameters listed in this document are available. Which values are available for your device can be found in the relevant device data sheet, or via the "Out of Service" flag of the corresponding object via BACnet.

3.1 Sensor values

Via the objects analog inputs AI [0] … AI [11] the various sensor measuring values can be read out.
→ Selection of unitary system SI or Imperial see description of object analog value AV [38].

Object type / Instance	Description	COV Increment	Values	Relinquish Default	Access
Device [x]	**Device Object**		-	-	R
AI [0]	**Value temperature** SI in °C and Imperial in °F	0…250 °C [0…480 °F]	-50 °C … +250 °C [-30 °F … +480 °F]	-	R
AI [1]	**Value relative humidity** in % RH	0…100 %	0…100% RH	-	R
AI [2]	**Value absolute humidity** SI in g/m³ and Imperial in gr/ft³	0…80 g/m³ [0…35 gr/ft]	0…80 g/m³ [0…35 gr/ft]	-	R
AI [3]	**Value enthalpy** SI in kJ/kg and Imperial in BTU/lb	0…85 kJ/kg [0…40 BTU/lb]	0…85 KJ/kg [0…40 BTU/lb]	-	R
AI [4]	**Value dew point** SI in °C and Imperial in °F	0…80 °C [0…200 °F]	-20 °C … +80 °C [0 °F … +200 °F]	-	R
AI [5]	**Value CO2** in ppm	0 … 5000 ppm	0…5000 ppm	-	R
AI [6]	**Value VOC** in %	0 … 100 %	0…100 %	-	R
AI [7]	**Value CO2 VOC Mix** in %	0 … 100 %	0…100 %	-	R
AI [8]	**Differential pressure 1** Selection **Pa** (SI) via 6th DIP switch (OFF) of sensor main board 22ADP cfm / m³/s / m³/h / Inch WC (Imperial) / Pa (SI) — ON / OFF 6 — S1 Selection **inchWC** (Imperial) via 6th DIP switch (ON) of sensor main board 22ADP	0 … 7000 Pa [0 … 28 inWC]	According to measuring range 22ADP (DIP switch)	-	R
AI [9]	**Volumetric flow 1** Selection **m³/h** (SI) via 6th DIP switch (OFF) of sensor main board 22ADP cfm / m³/s / m³/h / Inch WC (Imperial) / Pa (SI) — ON / OFF 6 — S1 If object analog value AV [41] is set to 0 or 1 a value in m³/h is shown. If object analog value AV [41] is set to 2 a value in m³/s is shown. Selection **cfm** (Imperial) via 6th DIP switch (ON) of sensor main board 22ADP	0...999'999 m³/s 0…999'999 m³/h [0…999'999 cfm]	0...999'999 m³/s 0…999'999 m³/h [0…999'999 cfm]	-	R
AI [10]	**Differential pressure 2** (@dual ADP only) Selection **Pa** (SI) via 6th DIP switch (OFF) of sensor main board 22ADP cfm / m³/s / m³/h / Inch WC (Imperial) / Pa (SI) — ON / OFF 6 — S2 Selection **inchWC** (Imperial) via 6th DIP switch (ON) of sensor main board 22ADP	0 … 7000 Pa [0 … 28 inWC]	According to measuring range 22ADP (DIP switch)	-	R
AI [11]	**Volumetric flow 2** (@dual ADP only) Selection **m³/h** (SI) via 6th DIP switch (OFF) of sensor main board 22ADP cfm / m³/s / m³/h / Inch WC (Imperial) / Pa (SI) — ON / OFF 6 — S2 If object analog value AV [41] is set to 0 or 1 a value in m³/h is shown. If object analog value AV [41] is set to 2 a value in m³/s is shown. Selection **cfm** (Imperial) via 6th DIP switch (ON) of sensor main board 22ADP	0...999'999 m³/s 0…999'999 m³/h [0…999'999 cfm]	0...999'999 m³/s 0…999'999 m³/h [0…999'999 cfm]	-	R

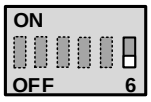
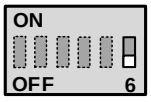
3.2 Offset and correction values

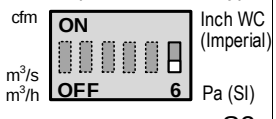
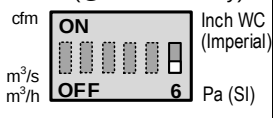
Via the objects analog outputs AV [0] … AV [5] offset and correction values for the individual measuring values can be defined.
→ Selection of unitary system SI or Imperial see description of object analog value AV [38].

Object type / Instance	Description	Values	Relinquish Default	Access
AV [0]	**Offset temperature** SI in °C and Imperial in °F	-3 °C … +3 °C [-6 °F … +6 °F]	-	R/W
AV [1]	**Offset relative humidity** in %	-5% RH … +5% RH	-	R/W
AV [2]	**Offset CO2** in ppm	-150 ppm … +150 ppm	-	R/W
AV [3]	**Offset VOC** in %	-15 % … +15 %	-	R/W
AV [4]	**Offset Differential pressure 1** cfm / m^3/s / m^3/h / Inch WC (Imperial) / Pa (SI) Selection **Pa** (SI) via 6th DIP switch (OFF) of sensor main board 22ADP Selection **inchWC** (Imperial) via 6th DIP switch (ON) of sensor main board 22ADP The values for inchWC are given in 1000ths. For example, to set the value 0.01 inchWC, 10 (1000*0.01 inchWC) must be written. S1	-50 Pa … +50 Pa [-0.2 inchWC … +0.2 inchWC]	-	R/W
AV [5]	**Offset Differential pressure 2** (@dual ADP only) cfm / m^3/s / m^3/h / Inch WC (Imperial) / Pa (SI) Selection **Pa** (SI) via 6th DIP switch (OFF) of sensor main board 22ADP Selection **inchWC** (Imperial) via 6th DIP switch (ON) of sensor main board 22ADP The values for inchWC are given in 1000ths. For example, to set the value 0.01 inchWC, 10 (1000*0.01 inchWC) must be written. S2	-50 Pa … +50 Pa [-0.2 inchWC … +0.2 inchWC]	-	R/W

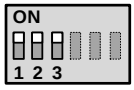
3.3 Upper /- lower limit of measuring values

Via the objects analog outputs AV [6] … AV [25] upper –/ lower limits of measuring values can be set in a certain range. Furthermore the scaling of the two analogue 0 - 10 Volt outputs of the sensor are defined via these objects analog outputs.
→ Selection of unitary system SI or Imperial see description of object analog value AV [38].

Object type / Instance	Description	Values	Relinquish Default	Access
AV [6]	**Lower limit temperature** SI in °C and Imperial in °F	-50 °C … +250 °C [-30 °F … +480 °F]	-	RW
AV [7]	**Upper limit temperature** SI in °C and Imperial in °F	-50 °C … +250 °C [-30 °F … +480 °F]	-	R/W
AV [8]	**Lower limit relative humidity** in %	0…100% RH	-	R/W
AV [9]	**Upper limit relative humidity** in %	0…100% RH	-	R/W
AV [10]	**Lower limit absolute humidity** in SI in g/m³ and Imperial in gr/ft³	0…80 g/m³ [0…35 gr/ft]	-	R/W
AV [11]	**Upper limit absolute humidity** SI in g/m3 and Imperial in gr/ft3	0…80 g/m³ [0…35 gr/ft]		R/W
AV [12]	**Lower limit enthalpy** SI in kJ/kg and Imperial in BTU/lb	0…85 KJ/kg [0...40 BTU/lb]	-	R/W
AV [13]	**Upper limit enthalpy** SI in kJ/kg and Imperial in BTU/lb	0..85 KJ/kg [0…40 BTU/lb]	-	R/W
AV [14]	**Lower limit dew point** SI in °C and Imperial in °F	-20 °C … +80 °C [0 °F … +200 °F]	-	R/W
AV [15]	**Upper limit dew point** SI in °C and Imperial in °F	-20 °C … +80 °C [0 °F … +200 °F]	-	R/W
AV [16]	**Lower limit CO2** in ppm	0…5000 ppm	-	R/W
AV [17]	**Upper limit CO2** in ppm	0…5000 ppm		R/W
AV [18]	**Lower limit VOC** in %	0…100 %	-	R/W
AV [19]	**Upper limit VOC** in %	0…100 %	-	R/W
AV [20]	**Lower limit CO2 VOC Mix** in %	0…100 %	-	R/W
AV [21]	**Upper limit CO2 VOC Mix** in %	0…100 %	-	R/W
AV [22]	**Lower limit volumetric flow 1** Selection **m³/h** (SI) via 6th DIP switch (OFF) of sensor main board 22ADP. cfm m³/s m³/h  Inch WC (Imperial) Pa (SI) S1 If object analog value AV [41] is set to 0 or 1 a value in m³/h is shown. If object analog value AV [41] is set to 2 a value in m³/s is shown. Selection **cfm** (Imperial) via 6th DIP switch (ON) of sensor main board 22ADP	0...999'999 m³/s 0…999'999 m³/h [0…999'999 cfm]	-	R/W
AV [23]	**Upper limit volumetric flow 1** Selection **m³/h** (SI) via 6th DIP switch (OFF) of sensor main board 22ADP cfm m³/s m³/h  Inch WC (Imperial) Pa (SI) S1 If object analog value AV [41] is set to 0 or 1 a value in m³/h is shown. If object analog value AV [41] is set to 2 a value in m³/s is shown. Selection **cfm** (Imperial) via 6th DIP switch (ON) of sensor main board 22ADP	0...999'999 m³/s 0…999'999 m³/h [0…999'999 cfm]	-	R/W

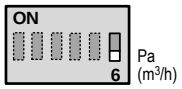
Object type / Instance	Description	Values	Relinquish Default	Access
AV [24]	**Lower limit volumetric flow 2** (@dual ADP only) Selection **m³/h** (SI) via 6th DIP switch (OFF) of sensor main board 22ADP.  If object analog value AV [41] is set to 0 or 1 a value in m³/h is shown. If object analog value AV [41] is set to 2 a value in m³/s is shown. Selection **cfm** (Imperial) via 6th DIP switch (ON) of sensor main board 22ADP	0...999'999 m³/s 0…999'999 m³/h [0…999'999 cfm]	-	R/W
AV [25]	**Upper limit volumetric flow 2** (@dual ADP only) Selection **m³/h** (SI) via 6th DIP switch (OFF) of sensor main board 22ADP  If object analog value AV [41] is set to 0 or 1 a value in m³/h is shown. If object analog value AV [41] is set to 2 a value in m³/s is shown. Selection **cfm** (Imperial) via 6th DIP switch (ON) of sensor main board 22ADP	0...999'999 m³/s 0…999'999 m³/h [0…999'999 cfm]	-	R/W

Limit differential pressure 1+2
Pressure range can be set with DIP switch 1-3 of sensor main board 22ADP. For the specific values, please refer to the product data sheet of the respective device.

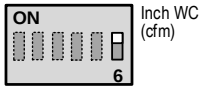


Selection of **Pa** (SI) via 6th DIP switch (OFF) of sensor main board 22ADP.

S1 + S2



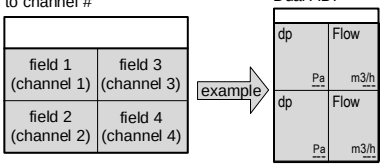
Selection **InchWC** (Imperial) via 6th DIP switch (ON) of sensor main board 22ADP.



3.4 Selection of sensor channels of measuring values

Via objects analog outputs AV [26] … AV [37] the individual measured values can be assigned to channels. This can be used to assign the two analog outputs to the corresponding measured value (channel # 1 = AOU1, channel # 2 = AOU2). In addition, 4 fields of the LCD display (optional) can be assigned to measured values by using the corresponding channel #.

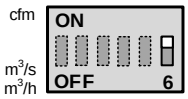
Default Settings		Object type / Instance	Description	Relinquish Default	Access
Channel temperature	**Default value channel #**	AV [26]	**Selection channel #** **Valid values 1, 2, 3 or 4** The channels with channel #1 and #2 are output both via BACnet objects analog inputs AI [0] … AI [9] and via the analog outputs AOU1 and AOU2. **4 fields of the LCD display** (optional) can be assigned to measured values by using the corresponding channel #. Unused channels are set to zero. Assignment LCD fields to channel # field 1 (channel 1) | field 2 (channel 2) field 3 (channel 3) | field 4 (channel 4) Example 22DTM-..Sensors CO2 ppm 1278 | Temp °C 23.7 rH % 63	-	R/W
Sensor 22DTH-..6..	**2 (AOU2)**				
Sensor 22UTH-..60X	**2 (AOU2)**				
Sensor 22DTM-..6	**2 (AOU2)**				
Sensor 22ADP-..6..	0				
Channel relative humidity	**Default value channel #**	AV [27]		-	R/W
Sensor 22DTH-..6..	**1 (AOU1)**				
Sensor 22UTH-..60X	**1 (AOU1)**				
Sensor 22DTM-..6	**3**				
Sensor 22ADP-..6..	0				
Channel absolute humidity	**Default value channel #**	AV [28]		-	R/W
Sensor 22DTH-..6..	0				
Sensor 22UTH-..60X	0				
Sensor 22DTM-..6	0				
Sensor 22ADP-..6..	0				
Channel enthalpy	**Default value channel #**	AV [29]		-	R/W
Sensor 22DTH-..6..	0				
Sensor 22UTH-..60X	0				
Sensor 22DTM-..6	0				
Sensor 22ADP-..6..	0				
Channel dew point	**Default value channel #**	AV [30]		-	R/W
Sensor 22DTH-..6..	0				
Sensor 22UTH-..60X	0				
Sensor 22DTM-..6	0				
Sensor 22ADP-..6..	0				
Channel CO2	**Default value channel #**	AV [31]		-	R/W
Sensor 22DTH-..6..	0				
Sensor 22UTH-..60X	0				
Sensor 22DTM-..6	**1 (AOU1)**				
Sensor 22ADP-..6..	0				
Channel VOC	**Default value channel #**	AV [32]		-	R/W
Sensor 22DTH-..6..	0				
Sensor 22UTH-..60X	0				
Sensor 22DTM-..6	0				
Sensor 22ADP-..6..	0				
Channel CO2 VOC Mix	**Default value channel #**	AV [33]		-	R/W
Sensor 22DTH-..6..	0				
Sensor 22UTH-..60X	0				
Sensor 22DTM-..6	0				
Sensor 22ADP-..6..	0				
Channel differential pressure 1	**Default value channel #**	AV [34]		-	R/W
Sensor 22DTH-..6..	0				
Sensor 22UTH-..60X	0				
Sensor 22DTM-..6	0				
Sensor 22ADP-..6..	**1 (AOU1)**				
Sensor 22ADP-..6.. (dual ADP)	**1 (AOU1)**				
Channel volumetric flow 1	**Default value channel #**	AV [35]		-	R/W
Sensor 22DTH-..6..	0				
Sensor 22UTH-..60X	0				
Sensor 22DTM-..6	0				
Sensor 22ADP-..6..	**2 (AOU2)**				
Sensor 22ADP-..6.. (dual ADP)	**3**				

Channel differential pressure 2	**Default value channel #**				
Sensor 22DTH-..6..	0	AV [36]	Assignment LCD fields to channel # / Dual ADP 	-	R/W
Sensor 22UTH-..60X	0				
Sensor 22DTM-..6	0				
Sensor 22ADP-..6..	0				
Sensor 22ADP-..6.. (dual ADP)	**2 (AOU2)**	AV [37]		-	R/W
Channel volumetric flow 2	**Default value channel #**				
Sensor 22DTH-..6..	0				
Sensor 22UTH-..60X	0				
Sensor 22DTM-..6	0				
Sensor 22ADP-..6..	0				
Sensor 22ADP-..6.. (dual ADP)	**4**				

Channel Selection # Valid values 1, 2, 3 or 4
The channels with channel #1 and #2 are output both via BACnet and via the analog outputs AOU1 and AOU2.
4 fields of the LCD display (optional) can be assigned to measured values by using the corresponding channel #.

3.5 Sensor configuration

Via objects analog outputs AV [38] … AV [44] the required unitary system (SI or Imperial) can be selected and further Sensor parameters can be chosen.

Object type / Instance	Description	Values		Relinquish Default	Access
AV [38]	**Selection of the unitary system** (SI or Imperial) Note: For sensors with differential pressure / volumetric flow (22ADP), this value is only readable and is instead set via the 6th DIP switch (ON = Imperial / OFF = SI)  	1 = SI		-	R/W
		2 = Imperial			
AV [39]	**Height above sea level** Input always in in m and not in ft	1… 5000 m 330 (default)		-	R/W
AV [40]	**Input k-factor volumetric flow 1** according to manufacturer's (without unit)	scaling factor: 0.1 Input: 3 … 50'000 15'000 (default) k-value: 0.3 … 5000		-	R/W
AV [41]	**Selection off the fan manufacturer 1**, volumetric flow (The fan model has influence on the formula to calculate the volumetric flow)	Rosenberg Comefri Gebhart Nicotra	0 (default)	-	R/W
		Ziehl-Abegg EBM-Papst AIR-CONCEPTS	1		
		Fläkt-Woods	2		
AV [42]	**Input k-factor volumetric flow 2**(@dual ADP only) according to manufacturer's (without unit)	scaling factor: 0.1 Input: 3 … 50'000 15'000 (default) k-value: 0.3 … 5000		-	R/W
AV [43]	**Selection off the fan manufacturer 2** (@dual ADP only), volumetric flow (The fan model has influence on the formula to calculate the volumetric flow)	Rosenberg Comefri Gebhart Nicotra	0 (default)	-	R/W
		Ziehl-Abegg EBM-Papst AIR-CONCEPTS	1		
		Fläkt-Woods	2		
AV [44]	**Response time for volumetric flow 1**	4…30 s		-	R/W
AV [45]	**Response time for volumetric flow 2** (@dual ADP only)	4…30 s		-	R/W

AV [85]	**Zeroing differential pressure 1**	0 = No zeroing		-	R/W
		1 = Start zeroing			
AV [86]	**Zeroing differential pressure 2** (@dual ADP only)	0 = No zeroing		-	R/W
		1 = Start zeroing			

Equations of Manufacturers

Each manufacturer has its own Equation, k factor range and unit of Equation (see tables). By selecting a manufacturer AV [41] / AV [43] and corresponding plant-specific k factor AV [40] / AV [42] correct settings for each manufacturer will be automatically in use.

Manufacturer	Equation	k factor range	Unit
Fläkts Woods	$q = \frac{1}{k} \cdot \sqrt{\Delta P}$	0.3...99	m^3/s
Rosenberg	$q = k \cdot \sqrt{\frac{2 \cdot \Delta P}{\rho}}$	37...800	m^3/h
Nicotra-Gebhardt	$q = CPFN \cdot \sqrt{\frac{2 \cdot \Delta P}{\rho}}$	10...1500	m^3/h

Manufacturer	Equation	k factor range	Unit
Ziehl-Abegg	$q = k \cdot \sqrt{\Delta P}$	10...1500	m^3/h
Comefri	$q = k \cdot \sqrt{\frac{2 \cdot \Delta P}{\rho}}$	10...2000	m^3/h
EBM - Papst	$q = k \cdot \sqrt{\Delta P}$	10...1500	m^3/h
Gebhardt	$q = k \cdot \sqrt{\frac{2 \cdot \Delta P}{\rho}}$	50...4700	m^3/h

Note: If the unitary system is set to Imperial the output is shown in objects analog input AI [9] in cfm

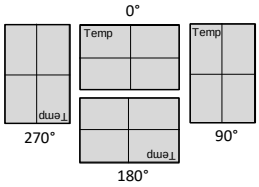
3.6 General device information

Via objects analog outputs AV [46] … AV [51] general device information can be read out or can be written.

Object type / Instance	Description	Values	Relinquish Default	Access
AV [46]	**Offset device ID** Valid range: 0…4194175 Device ID = Offset device ID + MAC address	-	-	R/W
AV [47]	**Unconfirmed COV**	0 = disabled 1 = enabled	-	R/W
AV [48]	**Minimum output voltage** in volt [V]	0 …10 V	-	R/W
AV [49]	**Operating hours** [h]	uint32_t (0… 4294967295)	-	R
AV [50]	**Set a maintenance time in hours** [h] after which sensor shall be checked (After countdown time has expired a new countdown value in hours [h] has to be set.	uint32_t (0…999'999 h)	-	R/W
AV [51]	**Set a visual inspection time** in hours [h] after which sensor shall be checked (After countdown time has expired a new countdown value in hours [h] has to be set.	uint32_t (0… 999'999 h)	-	R/W

3.7 LCD display configuration

Via objects analog outputs AV [52] … AV [67] display parameters of the optional LCD can be adjusted and the values to be displayed can be specified.

Object type / Instance	Description	Values	Relinquish Default	Access
AV [52]	**Enable LCD**	0 = disabled 1 = enabled	-	R/W
AV [53]	**Brightness LCD**	0…100 %	-	R/W
AV [54]	**Rotation LCD** 	0 = 0° 1 = 90° 2 = 180° 3 = 270°	-	R/W
AV [55]	**Enable LCD traffic light function**	0 = disabled 1 = enabled	-	R/W
AV [56]	**Enable symbol maintenance on LCD** If the countdown time (set value of AV [50] has expired the symbol will be shown on the LCD display.	0 = disabled 1 = enabled	-	R/W
AV [57]	**Enable symbol inspection time on LCD** If the countdown time (set value of AV [51] has expired the symbol will be shown on the LCD display.	0 = disabled 1 = enabled	-	R/W
AV [58]	**Enable LCD channel 1**	0 = disabled 1 = enabled	-	R/W
AV [59]	**Enable LCD channel 2**	0 = disabled 1 = enabled	-	R/W
AV [60]	**Enable LCD channel 3**	0 = disabled 1 = enabled	-	R/W
AV [61]	**Enable LCD channel 4**	0 = disabled 1 = enabled	-	R/W
AV [62]	**Channel assignment for traffic light function.** Input AV [26] to AV [35] (example: channel temperature AV [26])	-	-	R/W
AV [63]	**Traffic light function color range 1** Definition of color of LCD back lightning	0 = off 1 = green 2 = yellow 3 = red 4 = blue 5 = magenta 6 = cyan 7 = white	-	R/W
AV [64]	**Traffic light function color range 2** Definition of color of LCD back lightning		-	R/W
AV [65]	**Traffic light function color range 3** Definition of color of LCD back lightning		-	R/W
AV [66]	**Setting for threshold (range 1 → 2)** for color change of LCD back lightning. The value input is done in the basic unit based on the value of objects analog inputs AI [0] … AI [9]	-	-	R/W
AV [67]	**Setting for threshold (range 2 → 3)** for color change of LCD back lightning. The value input is done in the basic unit based on the value of objects analog inputs AI [0] … AI [9]	-	-	R/W