

ACDPH

CIRCULAR MOTORISED DAMPER
WITH DIFFERENTIAL PRESSURE
CONTROL

Modbus register map



MODBUS REGISTER MAP

INPUT REGISTERS					
		Data type	Description	Raw data range	Values
1	Damper position angle	unsigned int	Actual damper position angle	0–900	900 = 90 °C
2			Reserved, returns 0		
3			Reserved, returns 0		
4			Reserved, returns 0		
5	Operating mode	unsigned int	Selected Operating Mode	0–3	0 = Overwrite 1 = Differential Pressure 2 = Volume Flow Rate 3 = Air Velocity
6			Reserved, returns 0		
7	Zero position calibration status	unsigned int	Indicates a zero position calibration status	0–1	0 = OK 1 = Problem, zero position calibration recommended
8	Encoder status	unsigned int	Indicates a problem in the encoder circuit	0–1	0 = OK 1 = Encoder problem
9	Optical sensor status	unsigned int	Indicates a problem in the optical sensor circuit	0–1	0 = OK 1 = Optical sensor problem
10	Actuator status	unsigned int	Indicates a failure in DC motor driver circuit	0–1	0 = OK 1 = Problem
11	Differential pressure	unsigned int	Measured differential pressure	0–1.000	100 = 100 Pa
12			Reserved, returns 0		

INPUT REGISTERS

		Data type	Description	Raw data range	Values
13	Volume flow rate	unsigned int	Air Volume flow rate in m ³ /h. The value in this register is equal to the K-factor (holding register 62) of the motor / fan multiplied by square root of measured differential pressure. If K-factor is not known, volume flow rate is calculated from a duct cross sectional area (122,71 cm ² or 201,06 cm ²) multiplied by air flow velocity (Pitot air velocity (holding register 64) should be enabled and Pitot tube connected)	ACDPH-125 = 0–530 ACDPH-160 = 0–860	100 = 100 m ³ /h
14	Air velocity	unsigned int	Measured air velocity. Active only if holding register 64 is set to 1	0–120	100 = 10,0 m/s
15			Reserved, returns 0		
16			Reserved, returns 0		
17	Calculated maximum of volume flow rate	unsigned int	The maximum possible volume flow rate calculated from the selected K-factor or the duct cross sectional area (ACDPH-125 = 122,71 cm ² , ACDPH-160 = 201,06 cm ²)	ACDPH-125 = 0–530 ACDPH-160 = 0–860	100 = 100 m ³ /h
18	Air pressure/ volume/velocity span flag	unsigned int	Flag indicates that measured air pressure, volume or velocity is outside set setpoint span values. Set to '1' when the measured value is outside the pressure, volume or velocity setpoint span defined in holding registers 23, 24, 31, 33, 38 and 39.	0–1	0 = Pressure / Volume / Velocity setpoint ok 1 = Pressure/Volume/Velocity setpoint out of span
19	Air pressure/ volume/velocity alarm flag	unsigned int	Flag indicates that measured air pressure, volume or velocity is outside set setpoint alarm values. Set to '1' when the measured value is outside the pressure, volume or velocity setpoint alarm set defined in holding registers 21, 22, 27, 29, 36 and 37.	0–1	0 = Pressure/Volume/Velocity setpoint inside alarm range 1 = Pressure/Volume/Velocity setpoint out of alarm range
20			Reserved, returns 0		
21	Pressure sensor fault	unsigned int	Indicates a failure in pressure sensor element	0–1	0 = Sensor OK 1 = Sensor Fault

Note: The input registers can be read via the Modbus command: "Read input registers".

HOLDING REGISTERS						
		Data type	Description	Raw data range	Values	Factory default values
1	Device slave address	unsigned int	Modbus device address	1–247		1
2	Modbus baud rate	unsigned int	Modbus communication baud rate	0–6	0 = 4.800 3 = 38.400 6 = 230.400 1 = 9.600 4 = 57.600 2 = 19.200 5 = 115.200	2
3	Modbus parity	unsigned int	Parity check mode	0–2	0 = 8N1 1 = 8E1 2 = 8O1	1
4	Device type	unsigned int	Device type. Read only		ACDPH-125 = 7.001 ACDPH-160 = 7.003	
5	HW version	unsigned int	Hardware version of the device. Read only	XXXX	0x0100 = HW version 1.0	
6	FW version	unsigned int	Firmware version of the device, read only	XXXX	0x0100 = FW version 1.0	
7			Reserved, returns 0			
8	Modbus safety timeout	unsigned int	Activated after time with no Modbus communication.	0–60	0 = no timeout 60 = 60 minutes	0
9	Modbus network resistor termination (NBT)	unsigned int	Set device as end device of the line / or not by connecting NBT	0–1	0 = NBT disconnected 1 = NBT connected	0
10	Modbus registers reset	unsigned int	Resets Modbus Holding registers to default values. When finished this register is automatically reset to '0'	0–1	0 = Idle 1 = Reset Modbus Registers	0
11			Reserved, returns 0			
12			Reserved, returns 0			
13			Reserved, returns 0			

HOLDING REGISTERS						
		Data type	Description	Raw data range	Values	Factory default values
14	Damper position angle overwrite	unsigned int	Damper position angle overwrite (Available when Overwrite operating mode is enabled in HR 61)	0—900	900 = 90 °	0
15—16			Reserved, returns 0			
17			Reserved, returns 0			
18			Reserved, returns 0			
19	Test damper functionality	unsigned int	Test functionality of actuator damper	0—1	0 = Idle 1 = Testing functionality	0
20	Reset damper to zero position	unsigned int	Reset to damper 0° position	0—1	0 = Idle 1 = Active	0
21	Minimum pressure setpoint alarm	unsigned int	Minimum pressure setpoint alarm, cannot be set higher than Differential Pressure setpoint	0—Differential Pressure span minimum	100 = 100 Pa	0
22	Maximum pressure setpoint alarm	unsigned int	Maximum pressure setpoint alarm, cannot be set lower than Differential Pressure setpoint	Differential Pressure span maximum—1.000	100 = 100 Pa	1 000
23	Minimum pressure setpoint span	unsigned int	Minimum pressure setpoint span, cannot be set higher than Differential Pressure setpoint	0—Differential Pressure setpoint	100 = 100 Pa	0
24	Maximum pressure setpoint span	unsigned int	Maximum pressure setpoint span, cannot be set lower than Differential Pressure setpoint	Differential Pressure setpoint—1.000	100 = 100 Pa	1 000
25	Differential Pressure setpoint	unsigned int	Setpoint - Desired differential pressure	0—max max: 1.000	100 = 100 Pa	0
26			Reserved, returns 0			
27	Minimum Volume Flow Rate setpoint alarm	unsigned int	Minimum volume flow setpoint alarm, cannot be set higher than Volume flow setpoint.	0—Volume flow span minimum	100 = 100 m ³ /h	0

HOLDING REGISTERS

		Data type	Description	Raw data range	Values	Factory default values
28			Reserved, returns 0			
29	Maximum Volume Flow Rate setpoint alarm	unsigned int	Maximum volume flow setpoint alarm, cannot be set lower than Volume flow setpoint	ACDPH-125 = Volume flow span max—530 ACDPH-160 = Volume flow span max—860	100 = 100 m ³ /h	ACDPH-125 = 530 ACDPH-160 = 860
30			Reserved, returns 0			
31	Minimum Volume Flow Rate setpoint span	unsigned int	Minimum volume flow setpoint span, cannot be set higher than Volume flow setpoint	0—Volume flow setpoint	100 = 100 m ³ /h	0
32			Reserved, returns 0			
33	Maximum Volume Flow Rate setpoint span	unsigned int	Maximum volume flow setpoint span, cannot be set lower than Volume flow setpoint	ACDPH-125 = Volume flow setpoint—530 ACDPH-160 = Volume flow setpoint—860	100 = 100 m ³ /h	ACDPH-125 = 530 ACDPH-160 = 860
34			Reserved, returns 0			
35	Volume Flow Rate SetPoint	unsigned int	Set Point - Desired Volume Flow Rate	ACDPH-125 = 530 ACDPH-160 = 860	100 = 100 m ³ /h	0
36	Minimum air velocity setpoint alarm	unsigned int	Minimum air velocity setpoint alarm, cannot be set higher than Air Velocity setpoint	0—Air Velocity span minimum	100 = 10,0 m/s	0
37	Maximum air velocity setpoint alarm	unsigned int	Maximum air velocity setpoint alarm, cannot be set lower than Air Velocity setpoint	Air Velocity span maximum—120	100 = 10,0 m/s	120
38	Minimum air velocity setpoint span	unsigned int	Minimum air velocity setpoint span, cannot be set higher than Air Velocity setpoint	0—Air Velocity setpoint	100 = 10,0 m/s	0
39	Maximum air velocity setpoint span	unsigned int	Maximum air velocity setpoint span, cannot be set lower than Air Velocity setpoint	Air Velocity setpoint—120	100 = 10,0 m/s	120
40	Air Velocity setpoint	unsigned int	Setpoint - desired Air velocity	0—120	100 = 10,0 m/s	0
41—56			Reserved, returns 0			

HOLDING REGISTERS						
		Data type	Description	Raw data range	Values	Factory default values
57	Kp	unsigned int	Proportional Gain	1–30		10
58	Ti	unsigned int	Integration Period	1–1.000	10 = 1s	40
59			Reserved, returns 0			
60	Control direction	unsigned int	Movement direction of the blade.	0–1	0 = CW 1 = CCW	0
61	Operating Mode Selection	unsigned int	Selection of Operating Mode	0–3	0 = Overwrite 1 = Differential Pressure 2 = Volume Flow Rate 3 = Air Velocity	1
62	K-factor	unsigned int	K factor according to the motor / fan specification	0–1.000		0
63			Reserved, returns 0			
64	Pitot air velocity	unsigned int	Enables Air Velocity Readout. 0 = air velocity readout is disabled, 1 = air velocity readout is enabled and is visible in input register 14. Pitot tube needed (PSET-PTX-200)	0–1	0 = Disabled 1 = Enabled	0
65			Reserved, returns 0			
66			Reserved, returns 0			
67			Reserved, returns 0			
68			Reserved, returns 0			
69			Reserved, returns 0			
70	Recalibrate pressure sensor	unsigned int	Recalibrate differential pressure sensor	0–1	0 = Inactive 1 = Active	0
71–91			Reserved, returns 0			
92	Altitude	unsigned int	Current altitude	0–5.000	1.000 = 1.000 m	0

HOLDING REGISTERS						
		Data type	Description	Raw data range	Values	Factory default values
93	Start-up timer	unsigned int	Start-up period before setting alarm and span flags. During this period the alarm and span limits are not compared with the measured pressure / air volume / air velocity and alarm flag and span limit flag registers will remain '0' during this period.	0—1.000	100 = 100 s	60 s
94			Reserved, returns 0			
95			Reserved, returns 0			
96			Reserved, returns 0			
97			Reserved, returns 0			
98			Reserved, returns 0			
99			Reserved, returns 0			
100			Reserved, returns 0			

Note: The holding registers can be managed via the following Modbus commands: "Read Holding Registers", "Write Single Register" or "Write Multiple Registers".

The free Sentera configuration and monitoring software 3SModbus can be downloaded via: <https://www.sentera.eu/en/3SModbus>