PREMASGARD® 814x - Modbus

**Multifunctional duct sensors and measuring transducers
for humidity, temperature, pressure, differential pressure and volume flow,
incl. mounting flange and connection set,
calibratable, with Modbus connection**

Modbus

S+S REGELTECHNIK

Maintenance-free microprocessor-controlled **PREM**ASGARD® **814x - Modbus** (Series) with Modbus connection, in an impact-resistant plastic housing with quick-locking screws, connection nozzles for pressure hose (Ø 6 mm), plastic sinter filter (exchangeable), optionally with / without display, to exactly detect the relative humidity (0...100% RH) and the temperature (−35...+80 °C) in ducts and to measure the differential pressure (max. ± 7000 Pa) in air. International system of units SI (default) can be switched to Imperial (via Modbus). Incl. mounting flange and connection set **ASD-06** (2 m connecting hose, two pressure port nipples, screws).

The pressure sensor is applied to measure positive, negative or differential pressure in clean air and gaseous media. It is used in the clean room, medical and filter technology, ventilation and air conditioning ducts, spray booths, large-scale catering facilities, for filter monitoring and level measurement or for triggering frequency converters.

A long-term stable, **digital humidity and temperature sensor** and a **pressure sensor** with piezoresistive measuring element guarantee exact measurement results. These measurands are used to internally calculate the following parameters that can be retrieved via Modbus: temperature, relative humidity, dew point, absolute humidity, mixture ratio, enthalpy (ignoring atmospheric air pressure), differential pressure, volume flow, air density.

Innovative Modbus sensor with galvanically separated RS485-Modbus-interface, selectable bus termination resistance, DIP switch for setting the bus parameters and bus address in current-free state, internal LEDs for telegram status display, two separate push-in terminals and large three-line display (illuminated; with customised programming in the 7-segment and dot-matrix range). The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

PREMASGARD® **814x - Modbus**

TECHNICAL DATA

|	
Power supply:	24 V AC (± 20 %) and 15...36 V DC
Power consumption:	< 4.8 W / 24 V DC typical; < 6.8 VA / 24 V AC typical
System of units:	**SI** (default) or **Imperial** (switchable via Modbus)
Data points:	differential pressure [Pa] [inWC], volume flow [m³/h] [CFM], temperature [°C] [°F], relative humidity [% RH], dew point [°C] [°F], absolute humidity [g/m³] [gr/ft³], mixing ratio [g/kg] [gr/lb], enthalpy [kJ/kg] [Btu/lb], air density [kg/m³] [lb/ft³]

HUMIDITY & TEMPERATURE

|	
Sensors:	**digital humidity sensor with integrated temperature sensor,** low hysteresis, high long-term stability
Sensor protection:	**plastic** sinter filter, Ø 16 mm, L = 35 mm, exchangeable (optional **metal** sinter filter, Ø 16 mm, L = 32 mm)
Measuring range, humidity:	0...100 % RH
Operating range, humidity:	0...95 % RH (without dew formation)
Accuracy in humidity:	typically **± 2.0** % (20...80 % RH) at +25 °C, otherwise ± 3.0 %
Measuring range, temperature:	−35...+80 °C
Accuracy in temperature:	typically ± 0.2 K at +25 °C

PRESSURE

|	
Type of pressure:	differential pressure
Pressure connection:	with **connection nozzles** for pressure hose Ø 6 mm (optional on request with **quick** connect for PVC fabric pressure hose Ø 6 mm)
Measuring range, pressure:	**−500... +500 Pa** or **−7000...+7000 Pa** depending on the type of device, see table
Accuracy, pressure:	**Typ 8148** (500 Pa): typically ± 13 Pa at +25 °C **Typ 8147** (7000 Pa): typically ± 105 Pa at +25 °C compared to the calibrated reference device
Above- / below-pressure:	max. ± 50 kPa
Zero point offset:	± 10 % of final value
Hysteresis:	0.3 % of final value
Linearity:	< ± 1 % of final value
Temp. drift values:	± 0.1 % per °C
Long-term stability:	± 1 % per year
Medium:	clean air and non-aggressive, non-combustible gases
Media contacting parts:	Brass, Ni, thermoset plastic, Si, epoxy, RTV, BSG, UV silicone gel
Media temperature:	−20...+50 °C (temperature-compensated 0...+50 °C)

Display screen
(SI or Imperial)
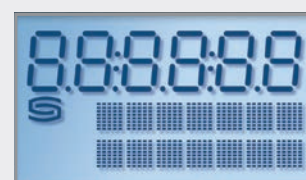
Modbus
Tyr 2
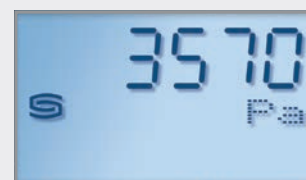
Pressure [Pa] [inWC]
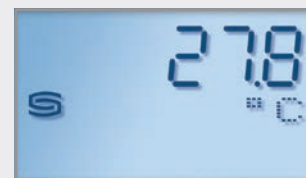
Temperature [°C] [°F]
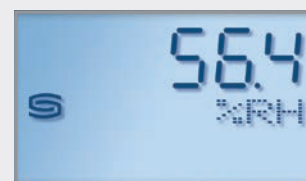
Humidity [% RH]

Volume flow rate [m³/h] [CFM]

Programmable
display screen

Modbus
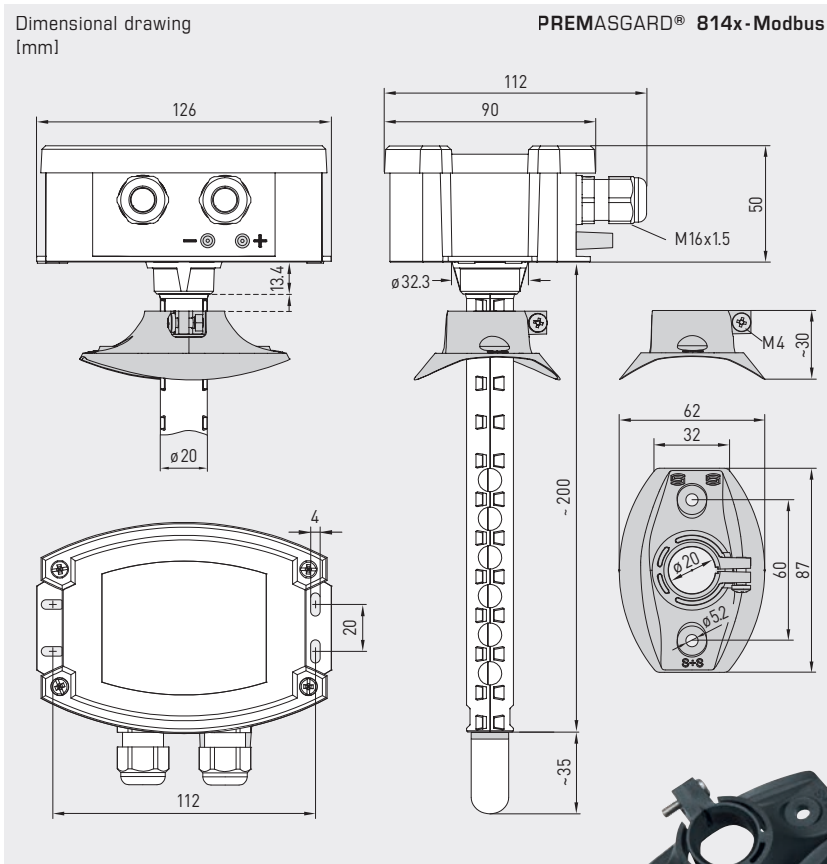Tyr 2

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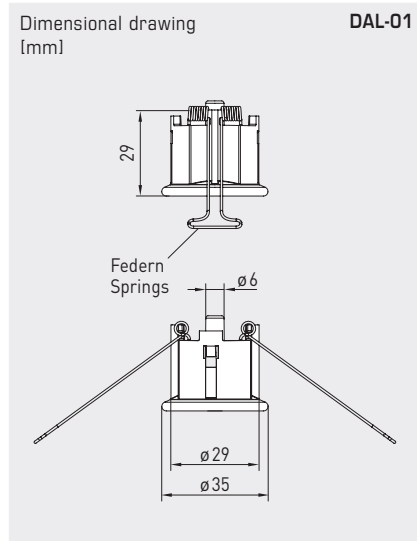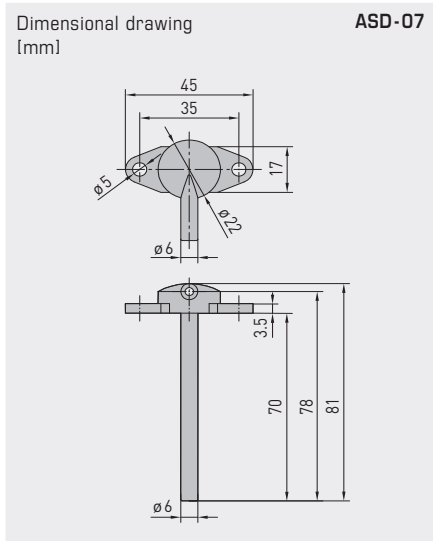calibratable, with Modbus connection

S+S REGELTECHNIK

Dimensional drawing [mm]

PREMASGARD® **814x-Modbus**

M16x1.5

126 · 90 · 112 · 50 · 13.4 · ø20 · ø32.3 · M4 · ~30 · ~200 · ~35 · 62 · 32 · 60 · 87 · ø20 · ø52 · 4 · 20

PREMASGARD® **814x-Modbus**
with display

SI IMP

Device version
with **M12 connector**
(optional on request)

MFT-20-K
Mounting flange,
plastic

TECHNICAL DATA   (continued)

Communication:	**Modbus** (RTU cable)
Bus interface:	RS 485, **galvanically isolated**
Baud rate:	9600, 19200, 38400 Baud
Bus protocol:	Modbus (RTU mode), address range 0...**247** adjustable
Signal filtering:	4 s / 32 s at temperature / humidity 0 s / 1 s / 10 s at pressure
Ambient temperature:	−30...+70 °C
Electrical connection:	0.2 - 1.5 mm², via push-in terminal
Cable connection:	**cable gland**, plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) **or** **M12 connector** according to DIN EN 61076-2-101 (optional on request)
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	126 x 90 x 50 mm (Tyr 2)
Protective tube:	**PLEUROFORM**™, material: polyamide (PA6), with torsion protection, Ø 20 mm, NL = 235 mm (optional 100 mm), v_{max} = 30 m/s (air) (on request, optional stainless steel **V2A** (1.4301), Ø 16 mm)
Process connection:	via mounting flange made of plastic (included in the scope of delivery)
Protection class:	III (according to EN 60 730)
Protection type:	IP 65 (according to EN 60 529) housing only! (PLEUROFORM IP 30)
Standards:	CE-conformity according to EMC Directive 2014 / 30 / EU
Optional:	three-line **display with illumination,** programmable, cut-out approx. 70 x 40 mm (W x H), for display actual humidity, actual temperature and ACTUAL pressure (cyclic) or a selectable parameter (static) or an individually programmable display value
ACCESSORIES	see table
ASD-06	**connection set** (nipple straight) (included in the scope of delivery)
MFT-20 K	**mounting flange** plastic (included in the scope of delivery)

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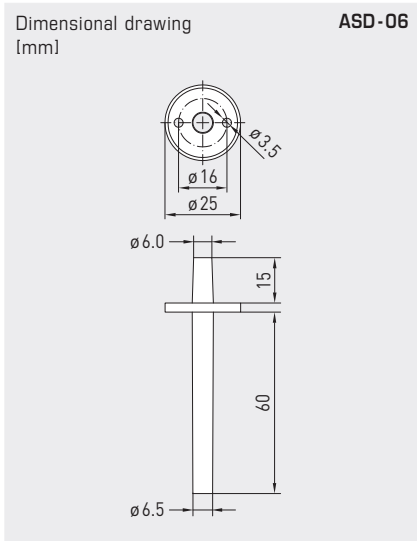calibratable, with Modbus connection

Modbus

S+S REGELTECHNIK

Dimensional drawing [mm] **ASD-06**

Dimensional drawing [mm] **ASD-07**

Dimensional drawing [mm] **DAL-01**

Federn
Springs

ASD-06
Connection set

ASD-07
Connection nipple

DAL-01
Pressure outlet

Mounting diagram **PREMASGARD® 814x-Modbus**

(A)   (B)   (C)   (D)

TYPES OF MONITORING:

Pressure connections at the pressure switch
are marked with
P1 (+) for higher pressure and
P2 (–) for lower pressure.

(A) Below-atmospheric pressure
P1 (+) is not connected,
but open to the atmosphere
P2 (–) connected to inside of duct

(B) Filter
P1 (+) connected upstream of filter
P2 (–) connected downstream of filter

(C) Ventilator
P1 (+) connected downstream of ventilator
P2 (–) connected upstream of ventilator

(D) Volume flow
P1 (+) dynamic pressure,
connected in flow direction
P2 (–) static pressure, connected free of
dynamic pressure components

Switchable system of units

Measurements / Data points	SI (default)	→	Imperial
Differential pressure	[Pa]	→	[inWC]
Volume flow	[m³/h]	→	[CFM]
Temperature	[°C]	→	[°F]
Humidity	[%RH]	→	[%RH]
Dew point	[°C]	→	[°F]
Absolute humidity	[g/m³]	→	[gr/ft³]
Mixture ratio	[g/kg]	→	[gr/lb]
Enthalpy	[kJ/kg]	→	[Btu/lb]
Air density	[kg/m³]	→	[lb/ft³]

Measuring ranges	SI (default)	→	Imperial
Type 8148	−500...+500 Pa	→	−2.0...+2.0 inWC
Type 8147	−7000...+7000 Pa	→	−28...+28 inWC
Type 814x	−35...+80 °C	→	−31...+176 °F
Type 814x	0...100 %RH	→	0...100 %RH
Alternative parameters are calculated internally.			

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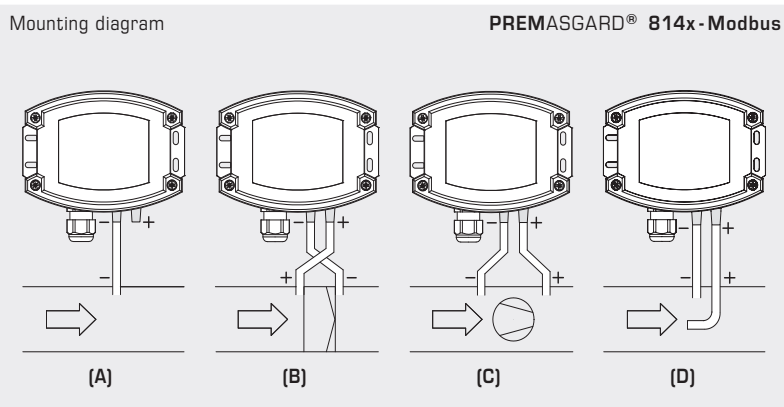calibratable, with Modbus connection

Schematic diagram   PREMASGARD® 814x-Modbus

PREMASGARD® 814x-Modbus
with display

Schematic diagram labels:

- auto zero
- Plug for display
- mode B — ON DIP B 1 2 3 4 5 6
- mode A — ON DIP A 1 2 3 4 5 6 7 8
- offset — Pa, r.H., °C
- 4 B / 3 A / 2 GND / 1 U+ / shield
- B 8 / A 7 / GND 6 / U+ 5 / shield

DIP A: Bus address
DIP B: Bus parameters (Baud rate, parity...)

Telegram indicator Reception (LED green) Error (LED red)

LED (internal status)
Reset button
Offset correction
Shielding
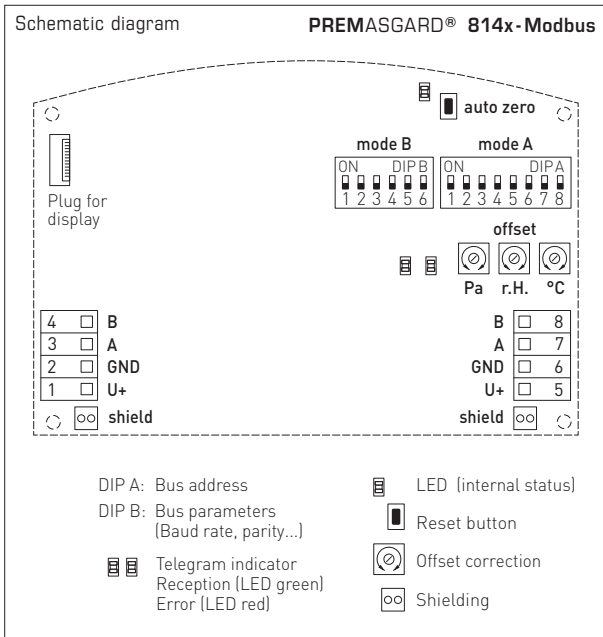
SF-K
Plastic sinter filter
(standard)

SF-M
Metal sinter filter
(optional)

stainless steel protective tube
(optional on request)

PREMASGARD® 814x-Modbus	Multifunctional duct sensor for humidity, temperature, pressure, differential pressure and volume flow rate, *Deluxe*						
Type / WG02	Measuring ranges Pressure	Humidity	Temperature	Output	Display	Item no.	Price
Type 8148	**± 500 Pa**						
PREMASGARD 8148-Modbus	−500...+500 Pa	0...100 % RH	−35...+80°C	Modbus		1301-8144-0910-20V	**553,07 €**
PREMASGARD 8148-Modbus **LCD**	−500...+500 Pa	0...100 % RH	−35...+80°C	Modbus	■	1301-8144-4910-20V	**604,00 €**
	Equipped as standard with automatic zero point calibration						
Type 8147	**± 7000 Pa**						
PREMASGARD 8147-Modbus	−7000...+7000 Pa	0...100 % RH	−35...+80°C	Modbus		1301-8144-0950-200	**488,96 €**
PREMASGARD 8147-Modbus **LCD**	−7000...+7000 Pa	0...100 % RH	−35...+80°C	Modbus	■	1301-8144-4950-200	**540,52 €**
Extra charge:	**with optional automatic zero point calibration** (please specify in your order)						**77,73 €**
Optional:	Cable connection with **M12 connector** according to DIN EN 61076-2-101					on request	
	shortened protective tube **PLEUROFORM**™, NL = 100 mm					on request	
Note:	System of units **SI** (default) or **imperial** (can be changed via Modbus).						
ACCESSORIES							
KA2-Modbus	**Communication adapter** (USB/RS485) for system connection					1906-1200-0000-100	**229,23 €**
LA-Modbus	**Line termination device** (with terminating resistor) as an active bus termination					1906-1300-0000-100	**85,49 €**
ASD-06	**Connection set** (included in the scope of delivery), consisting of 2 connection nipples (straight) made of ABS, 2 m PVC hose (soft, UV-resistant) and 4 screws					7100-0060-3000-000	**8,18 €**
ASD-07	**2 connection nipples** (at 90° angle) made of ABS					7100-0060-7000-000	**8,18 €**
DAL-01	**Pressure outlet** for ceiling or in-wall installation (e.g. in clean rooms)					7300-0060-3000-001	**38,31 €**
SF-M	**Metal** sinter filter, Ø 16 mm, L = 32 mm, exchangeable, stainless steel **V4A** (1.4404)					7000-0050-2200-100	**45,34 €**
MFT-20-K	**Mounting flange**, plastic (included in the scope of delivery)					7000-0031-0000-000	**10,24 €**
	For further information see last chapter!						