PREMASREG® **716x**

S+S REGELTECHNIK

Ⓓ Bedienungs- und Montageanleitung

Druck-Messumformer/-Schalter/-Wächter
für Volumenstrom, Differenzdruck, Filterüberwachung und Flüssigkeits-Niveauerfassung, incl. Anschluss-Set

Ⓖⓑ Operating Instructions, Mounting & Installation

Pressure measuring transducer/swtich/control switch
for volume flow, differential pressure, filter monitoring and liquid level detection, incl. connection set

Ⓕ Notice d'instruction

Convertisseur de mesure de pression/ pressostat
pour débit volumique, pression différentielle,
contrôle de filtrage et détection de niveau de liquide,
y compris kit de raccordement

Ⓡⓤ Руководство по монтажу и обслуживанию

Измерительный преобразователь/реле давления/
реле контроля давления для объемного расхода,
разности давлений, контроля работы фильтров и измерения
уровня жидкости, вкл. комплект соединительных деталей

PREMASREG® **716x**
LCD

PREMASREG® **716x-Q**
LCD

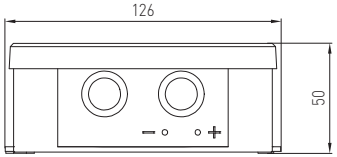
5 JAHRE GARANTIE
★★★★★
5 YEARS WARRANTY
MADE IN GERMANY

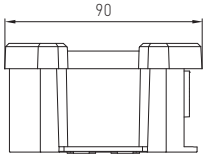
S+S REGELTECHNIK GMBH
THURN-UND-TAXIS-STR. 22
90411 NÜRNBERG/GERMANY
FON +49(0)911/51947-0
mail@SplusS.de
www.SplusS.de

CARTONS ET EMBALLAGE PAPIER À TRIER

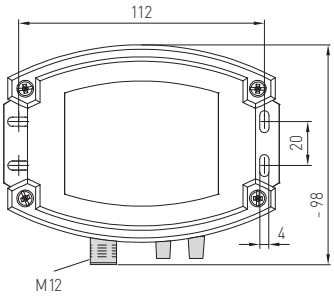
Maßzeichnung
Dimensional drawing
Plan coté
Габаритный чертеж

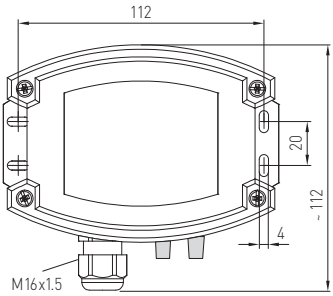
PREMASREG® **716x**



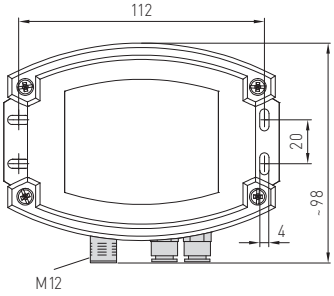


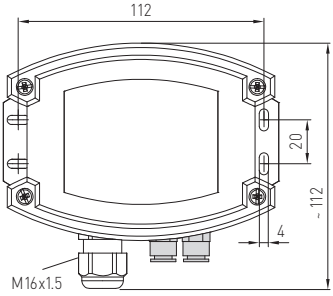
Druckanschluss-Stutzen (standardmäßig)
Pressure port nozzles (standard)
Manchon de refoulement (de série)
Штуцер для подвода давления (в качестве стандартного оснащения)





Schnell-Steckanschluss (optional)
Quick connect (optional)
Raccord rapide (en option)
Быстроразъемное (опция)





Gehäuse mit **M12-Steckverbinder**
Housing with **M12 connector**
Boîtier avec **connecteur M12**
Корпус с **разъемом M12**

Gehäuse mit **Kabelverschraubung**
Housing with **cable gland**
Boîtier avec **presse-étoupe**
Корпус с **резьбовым кабельным вводом**

The electronic **PREM**ASREG® **716x** pressure sensor and switch is equipped with measuring functions for volume flow, differential pressure, filter monitoring and liquid level detection based on pressure measurement in clean air. The devices with a housing made from impact-resistant plastic, with **cable gland** or **M12 connector** according to DIN EN 61076-2-101 and with metal pressure port nozzles (quick connect optional) are fitted with one switching output, one continuous output and one backlit display for setting the switching point and displaying the ACTUAL values. The piezoresistive measuring element guarantees a high degree of reliability and accuracy.

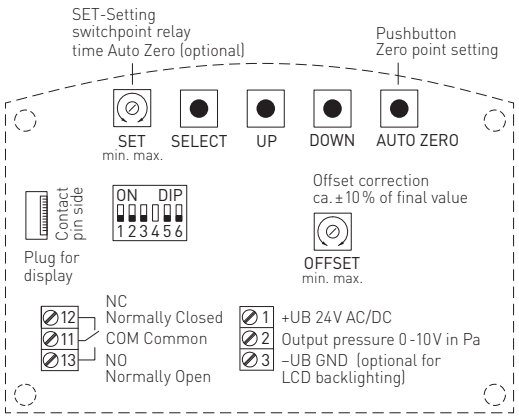
This pressure sensor is used in clean room, medical and filter technology, in ventilation and air conditioning ducts, in spray booths, in large-scale catering facilities, for filter monitoring and level measurement or for triggering frequency converters. The medium measured is air (non-precipitating), or other gaseous, non-aggressive, non-combustible media.

It has a manual zero point pushbutton and an offset potentiometer for final value correction. Parameter entry is menu-based and is easy to perform using three buttons with the help of the display. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible. A connection set **ASD-06** (2 m connection hose, two pressure nipples, screws) is included in the scope of supply.

TECHNICAL DATA

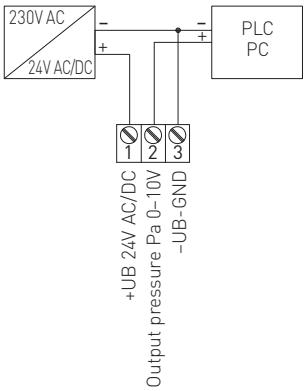
Power supply:	24 V AC / DC (± 10 %) and 15...36 V DC
Load resistance:	R_L > 5 kOhm
Power consumption:	< 1.5 VA / 24 V DC, < 2.8 VA / 24 V AC
Measuring function:	**Volume flow, differential pressure, filter monitoring, fill level** (adjustable)
Measuring ranges:	**10...100**% (adjustable)
Type of pressure:	differential pressure
Pressure connection:	equipped as standard with metal connection **nozzles** for pressure hose Ø 6 mm, optionally with **quick** connect made from stainless steel for PVC fabric pressure hose Ø 6 mm (external diameter)
Medium:	clean air and non-aggressive, non-combustible gases
Media temperature:	–20...+50 °C
Accuracy:	**Type 7161** (1000 Pa): typically ± 5 Pa **Type 7165** (5000 Pa): typically ± 25 Pa compared to the calibrated reference device
Sum of linearity+hysteresis:	< ± 1 % of final value (pressure)
Temp. drift values:	± 0.1 % / °C
Positive / negative pressure:	max. ± 10000 Pa
Signal hysteresis:	± 1 % of final value (pressure) 10 Pa / 50 Pa
Signal filtering:	**switchable 1 s / 10 s** (via DIP switches) and small value suppression < 1 %
Output:	0-10 V 1 changeover contact (24 V), 1 A ohmic load
Connection type:	3-wire connection
Electrical connection:	0.14-1.5 mm², via plug-in screw terminal
Cable connection:	**cable gland**, plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) **or** **M12 connector** (male, **12-pin**, A-code) according to DIN EN 61076-2-101
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), cover for display is transparent!
Housing dimensions:	126 x 90 x 50 mm (Typ 2)
Air humidity:	< 95 % r. H., non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	**IP 65** (according to EN 60 529) in the built-in state
Standards:	CE conformity according to EMC Directive 2014 / 30 / EU, according to EN 61326-1, according to EN 61326-2-3
Equipment:	**display with illumination,** three-line, cutout approx. 70 x 40 mm (W x H), for displaying the **volume flow, differential pressure, contamination degree** or **level** and for setting the **switchpoint, K factor, measuring range limits** and other settings
K factor:	**1 to 3000** (adjustable)
Units:	**m³/s, m³/min, m³/h, l/s, l/min, l/h, %, cm** (adjustable)
Max. value displayed:	999999
ACCESSORIES	see table

Schematic diagram **PREM**ASREG® **716x-U/W**

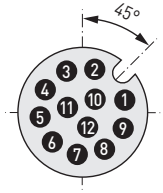


DIP switch 4 is not assigned!

3-wire-connection **PREM**ASREG® **716x-U/W**



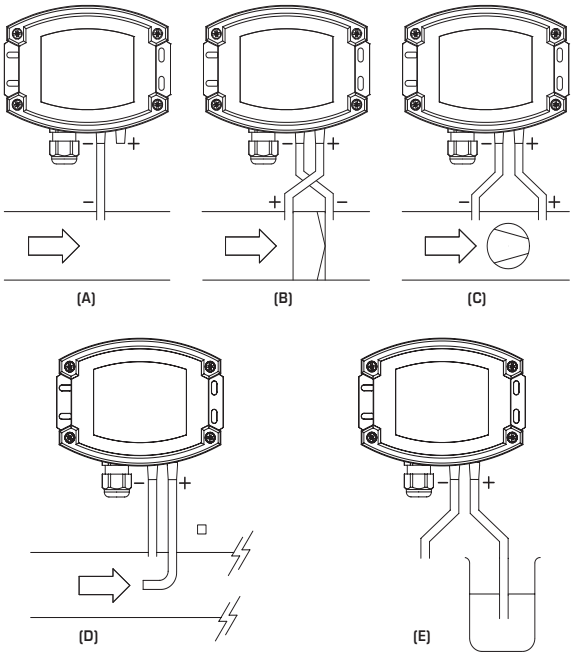
Pin assignment (M12) **PREM**ASREG® **716x-U/W**



1. +UB 24 V AC / 15...36 V DC
2. Output pressure 0-10 V [Pa]
3. free
4. –UB GND
5. free
6. free
7. COM Common
8. NC Normally Closed
9. NO Normally Open
10. free
11. free
12. free

PREMASREG® **716x**		Pressure measuring transducers / switches/monitors for volume flow, differential pressure, filter monitoring and liquid level detection, *Deluxe* (with cable gland or M12 connector)			
Measuring Range Pressure / Volume Flow		**Type / WG02**	**Output**	**Display ● = Q**	**Item No.**
0...1000 Pa		**Typ 7161**			
k = 3000	**94800 m³/h**	PREMASREG 7161-UW LCD	0-10 V 1x Changeover contact	■	1302-7161-4161-200
		PREMASREG 7161-UW **Q** LCD	0-10 V 1x Changeover contact	● ■	2004-6132-4100-021
0...5000 Pa		**Typ 7165**			
k = 3000	**212100 m³/h**	PREMASREG 7165-UW LCD	0-10 V 1x Changeover contact	■	1302-7161-4171-200
		PREMASREG 7165-UW **Q** LCD	0-10 V 1x Changeover contact	● ■	2004-6132-4100-031
Housing variant "Q":		Cable connection with **M12 connector** (male, **12-pin**, A-code)			
Multi-range switching:		The **pressure ranges** depend on the device type and can be set via DIP switches.			
Extra charge:		**with optional quick connect** for PVC fabric pressure hose Ø 6 mm			
ACCESSORIES					
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
ASD-07		**2 connection nipples** (at 90 degree angle) made of plastic, ABS			7100-0060-7000-000
WS-03		**Weather and sun protection hood**, 200 x 180 x 150 mm, stainless steel **V2A** (1.4301)			7100-0040-6000-000

Mounting diagram



TYPES OF MONITORING:

(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

(E) Level:
P1 (+) Connection submerged in medium
P2 (–) Connection is open to the atmosphere

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

Function types

Volume flow rate

$$V = k \cdot \sqrt{\Delta p}$$

V = Volume flow in m^3/h
k = K factor 1...3000
Δp = Differential pressure in Pa

Differential pressure

$$\Delta p = p_+ - p_-$$

Δp = Differential pressure in Pa
p_+ = higher pressure
p_- = lower pressure

Filter contamination

$$S = 100\% \cdot \Delta p \div p_{Filter}$$

S = Contamination degree in %
Δp = Differential pressure in Pa
p_{Filter} = differential pressure filter replacement in Pa

Level display

$$h = \Delta p \div (\rho \cdot g)$$

h = Fill level height in cm
Δp = Differential pressure in Pa
ρ = Density 700...1300 in kg/m^3
g = 9.81 m/s^2

Measuring range mode (Mode selectable)	**DIP 1**
Unidirectional (0...+MR) (default)	OFF
Bidirectional (–MR...+MR)	**ON**

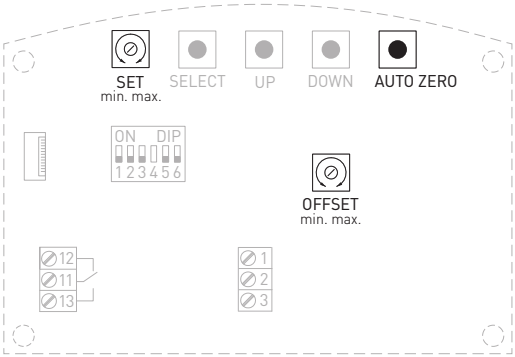
Small value suppression (measured values < 1% of end value (pressure) = 0)	**DIP 2**
Deactivated (default)	OFF
Active	**ON**

Relay (Function adjustable)	**DIP 3**
Deactivated (default)	OFF
Active (display shows switching point)	**ON**

Measurement signal filtering (Time interval selectable)	**DIP 5**
10 s (default)	OFF
1 s	**ON**

Service mode (display adjustable)	**DIP 6**
Standard (according to configuration) (default)	OFF
Service (differential pressure in Pa)	**ON**

Setting the offset:



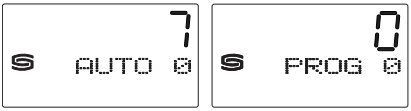
Automatic offset correction:

1. The device must be operative for at least 60 minutes before zero point setting is started.
2. Connect pressure inputs P (+) and P (–) with a hose. (differential pressure between the connections = 0 Pa).
3. To set the zero point, press the **AUTO ZERO** pushbutton for 10 seconds without interruption.

By pressing the pushbutton, a countdown of approx. 10 seconds is started. The yellow LED is flashing and the countdown is shown on the display.

After the countdown period has elapsed, zero point calibration takes place. This is indicated by continuous light of the LED, and on the display by switching from "AUTO 0" to "PROG 0".

Note: When releasing the pushbutton during countdown (counter > 0), zero point setting is immediately aborted!



Manual offset adjustment:

The offset potentiometer functions in addition to and independently of the automatic setting of the zero point.

With the **OFFSET** potentiometer, a deviation outside of the zero point can be aligned.

The range for adjustment is approx. ± 10 % of the pressure range.

Automatic zero point calibration (optional):

A zero point calibration is carried out cyclically via an internal valve.

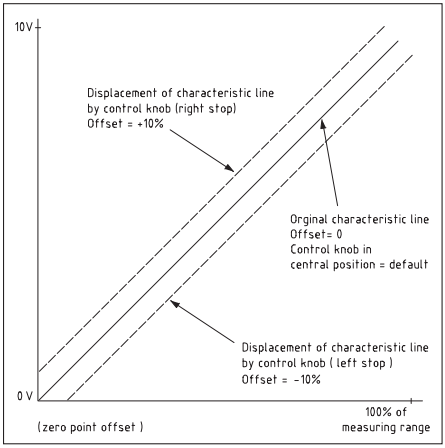
The cycle time can be set between 15 minutes and 24 hours using the **SET** potentiometer.

During the automatic calibration, the output value remains at its last pressure value.

PREMASREG® **716x**
(Range: 0...+ xx Pa)

After successful zero point calibration, the output voltage is 0 V at 0 Pa pressure difference (with the offset knob in central position)!

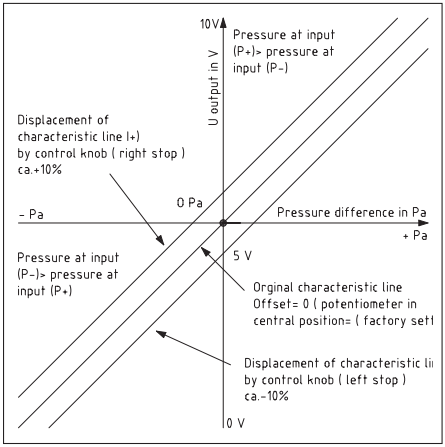
Output voltage 0...10 V
for pressure difference from 0 Pa to final value



PREMASREG® **716x**
(Range: - xx ...+ xx Pa)

After successful zero point calibration, the output current is 5 V at 0 Pa pressure difference (with the offset knob in central position)!

Output voltage 0...10 V
for pressure difference - ΔP... +ΔP

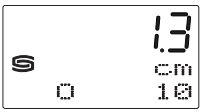


Display readout:

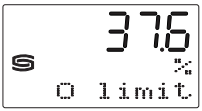
The first line of the display shows the measured **ACTUAL value** for volume flow rate, pressure, contamination degree, or level.

The second line shows the corresponding **unit** (e.g.: Pa, m^3/h, %, cm).

In the third line, the **switching status of the relay** (circuit completed/empty) with the corresponding set value can be read.



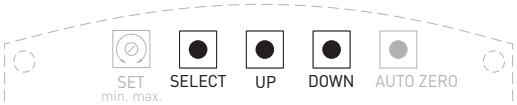
If the set value can no longer be represented, the "**limit**" designation is issued instead of the value.



If the switching function is deactivated (DIP 3 = OFF), the third line remains blank empty.

On devices fitted with a valve, the third line is used to **display the time remaining** until the next automatic zero point correction (optional).

Configuring the measuring function:



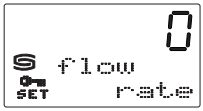
Setup button assignment:

SELECT	Pressing for more than 5 seconds => switches to setup mode A short push following thereafter => switches to the next input value respectively terminates setup mode
UP ▲	(arrow pointing up) increases the input value. Keeping it depressed increases the increment step by step by which the parameter is increased.
DOWN ▼	(arrow pointing down) decreases the input value. Pressing for longer increases the increment step by step by which the parameter is decreased.

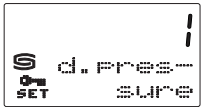
Setting the function type

Press the **SELECT** pushbutton to activate setup mode.

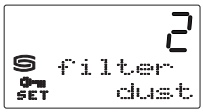
Use the two **UP** and **DOWN** pushbuttons to select the desired function type (formulas for the function types, see page 11).



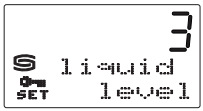
Type 0:
Volume flow rate



Type 1:
Differential pressure



Type 2:
Filter contamination



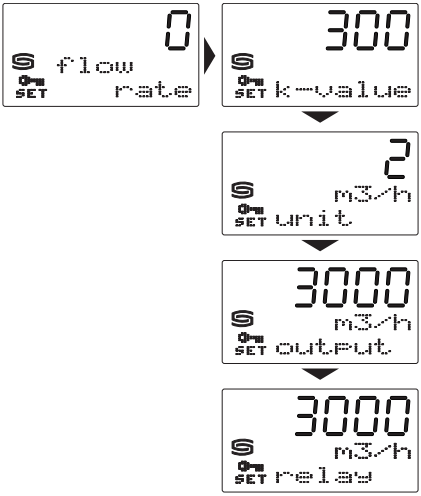
Type 3:
Liquid level

Complete the entry by pressing the **SELECT** pushbutton.

After selecting the measuring function, you are automatically guided through the parameters that must be set (see next page).

Setting the parameters:

Type 0:
Volume flow rate



K factor from 1 to 3000
Depending on the manufacturer, the K factors are calculated differently. Therefore, it is necessary to use the corresponding calculation formula to enter data:

$k_{S+S} = k_{EBM\text{-}PAPST}$
$k_{S+S} = k_{ZIEHL\text{-}ABBEG}$
$k_{S+S} = k_{GEBHARDT} / 0.7746$
$k_{S+S} = k_{ROSENBERG} / 0.7746$
$k_{S+S} = 3600 / k_{FLÄKT}$

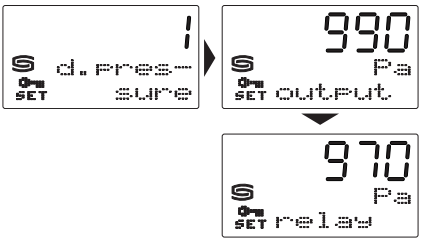
Unit of volume flow rate

0 = m^3/s **3** = liters/s
1 = m^3/min **4** = liters/min
2 = m^3/h **5** = liters/h

Volume flow rate at max. output signal 10 V
Setting (measuring range end value = 10 V)
10 % to 100 % of the max. possible volume flow rate in the selected measurement unit.

Relay switching threshold at volume flow rate
Setting (relay switchpoint)
10 % to measuring range end value in the selected measurement unit.

Type 1:
Differential pressure



Differential pressure for max. output signal 10 V
Setting (measuring range end value = 10 V)
10 % to 100 % of the max. possible differential pressure in Pa.

Relay switching threshold at differential pressure
Setting (relay switchpoint)
10 % to measuring range end value in Pa.

Type 2:
Filter contamination

Switching threshold for filter replacement
Setting switchpoint for filter replacement
(measuring range end value = 10 V)
0 % to 100 % of the max. possible differential pressure in Pa.

Type 3:
Liquid level

Density 700 ... 1300 kg/m^3
Enter density of the liquid

Switching threshold for level height relay
Setting (relay switchpoint)
10 % to measuring range end value in cm.

(GB) General notes

This device can be mounted in any position. The voltage output is short-circuit proof. Applying overvoltage at the voltage output will destroy this device. Pressure ranges are indicated on the device label. Applying measuring pressures beyond that range will cause mismeasurements and increased deviations or may destroy the device.

- Attention! When leading in cables, make sure, they do not go under the board. This might buckle or damage hose connections!
- Pressure inputs are "poled" i.e. the above-atmospheric pressure line must be connected at input P+ and the below-atmospheric pressure line must be connected at input P–.
- At an adjusting element, the output signal can be offset by ± 10 % of the final value of the measuring range. In this way, possible ageing or drift effects can be compensated.
- If this device is operated beyond the specified range, all warranty claims are forfeited.

Our "General Terms and Conditions for Business" together with the "General Conditions for the Supply of Products and Services of the Electrical and Electronics Industry" (ZVEI conditions) including supplementary clause "Extended Retention of Title" apply as the exclusive terms and conditions.

In additionIn addition, the following points are to be observed:

- These instructions must be read before installation and putting in operation and all notes provided therein are to be regarded!
- A suitable weather and sun protection hood must be used when installed outdoors.
- Devices must only be connected to safety extra-low voltage and under dead-voltage condition. To avoid damages and errors the device (e.g. by voltage induction) shielded cables are to be used, laying parallel with current-carrying lines is to be avoided, and EMC directives are to be observed.
- This device shall only be used for its intended purpose. Respective safety regulations issued by the VDE, the states, their control authorities, the TÜV and the local energy supply company must be observed. The purchaser has to adhere to the building and safety regulations and has to prevent perils of any kind.
- No warranties or liabilities will be assumed for defects and damages arising from improper use of this device.
- Consequential damages caused by a fault in this device are excluded from warranty or liability.
- These devices must be installed and commissioned by authorised specialists.
- The technical data and connecting conditions of the mounting and operating instructions delivered together with the device are exclusively valid. Deviations from the catalogue representation are not explicitly mentioned and are possible in terms of technical progress and continuous improvement of our products.
- In case of any modifications made by the user, all warranty claims are forfeited.
- This device must not be installed close to heat sources (e.g. radiators) or be exposed to their heat flow. Direct sun irradiation or heat irradiation by similar sources (powerful lamps, halogen spotlights) must absolutely be avoided.
- Operating this device close to other devices that do not comply with EMC directives may influence functionality.
- This device must not be used for monitoring applications, which serve the purpose of protecting persons against hazards or injury, or as an EMERGENCY STOP switch for systems or machinery, or for any other similar safety-relevant purposes.
- Dimensions of housing or housing accessories may show slight tolerances on the specifications provided in these instructions.
- Modifications of these records are not permitted.
- In case of a complaint, only complete devices returned in original packing will be accepted.

Notes on commissioning:
This device was calibrated, adjusted and tested under standardised conditions. When operating under deviating conditions, we recommend performing an initial manual adjustment on-site during commissioning and subsequently at regular intervals.

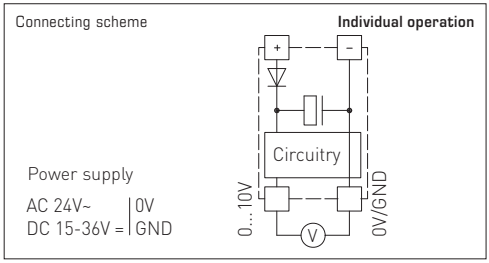
Commissioning is mandatory and may only be performed by qualified personnel!
These instructions must be read before installation and commissioning and all notes provided therein are to be regarded!

SUPPLY VOLTAGE:

For operating voltage reverse polarity protection, a one-way rectifier or reverse polarity protection diode is integrated in this device variant. This internal one-way rectifier also allows operating 0-10 V devices on AC supply voltage.

The output signal is to be tapped by a measuring instrument. Output voltage is measured her against zero potential (0 V) of the input voltage!

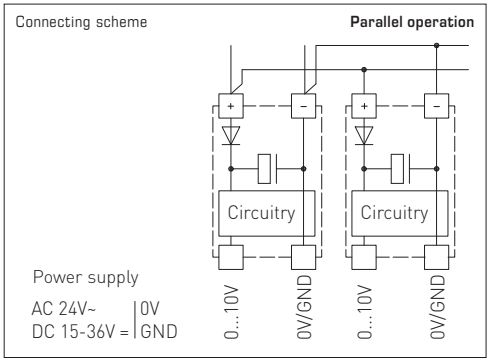
When this device is operated on **DC supply voltage**, the operating voltage input UB+ is to be used for 15...36 V DC supply and UB– or GND for ground wire!



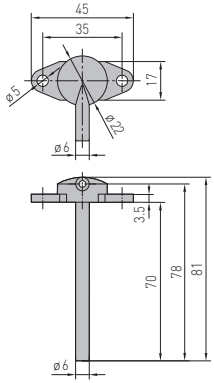
When several devices are supplied by one 24 V **AC voltage supply**, it is to be ensured that all "positive" operating voltage input terminals (+) of the field devices are connected with each other and all "negative" operating voltage input terminals (–) (= reference potential) are connected together (in-phase connection of field devices). All outputs of field devices must be referenced to the same potential!

In case of reversed polarity at one field device, a supply voltage short-circuit would be caused by that device. The consequential short-circuit current flowing through this field device may cause damage to it.

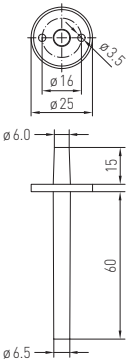
Therefore, pay attention to correct wiring!



Maßzeichnung **ASD-07**
Dimensional drawing
Plan coté
Габаритный чертеж



Maßzeichnung **ASD-06**
Dimensional drawing
Plan coté
Габаритный чертеж

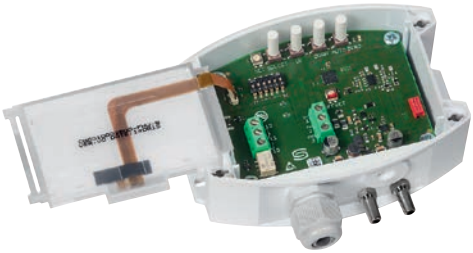


ASD-07
Anschlussnippel
Connection nipple
Embouts de raccordement
Соединительный ниппель

ASD-06
Anschluss-Set
Connection set
Kit de raccordement
Комплект соединительных деталей

PREMASREG® **716x**

PREMASREG® **716x**
LCD



PREMASREG® **716x-Q**
LCD

WS-03

Wetter- und Sonnenschutz
(optional)

Weather and sun protection hood
(optional)

Protection contre
les intempéries et le soleil
(en option)

Приспособление для защиты
от непогоды и солнечных лучей
(опция)