(D) (GB) (F) (RU) 6000-3150-0000-1XX **31500-2020 V107** 03/2020

AERASGARD® KCO_2-W
AERASGARD® KCO_2-SD

S+S REGELTECHNIK

(D) Bedienungs- und Montageanleitung

Kanal-CO_2-Fühler bzw. Messumformer,
incl. Montageflansch, selbstkalibrierend, mit Mehrbereichs umschaltung und aktivem / schaltendem Ausgang

(GB) Operating Instructions, Mounting & Installation

Duct CO_2 sensors and measuring transducers,
including mounting flange, self-calibrating,
with multi-range switching and active / switching output

(F) Notice d'instruction

Sonde (transmetteur) de CO_2 pour montage en gaine,
y compris bride de montage, auto-calibrante,
avec commutation multi-gamme et sortie active / tout ou rien

(RU) Руководство по монтажу и обслуживанию

Датчик / измерительный преобразователь содержания углекислого газа, канальный, вкл. присоединительный фланец, самокалибрующийся, с переключением диапазонов измерения и активным / релейным выходом

KCO_2-SD
(IP 54)

KCO_2-W
(IP 65)

KCO_2-W
(IP 65)

S+S REGELTECHNIK

S+S REGELTECHNIK GMBH
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MADE IN GERMANY

Herzlichen Glückwunsch!
Sie haben ein deutsches Qualitätsprodukt erworben.

Congratulations!
You have bought a German quality product.

Félicitations!
Vous avez fait l'acquisition d'un produit allemand de qualité.

Примите наши поздравления!
Вы приобрели качественный продукт, изготовленный в Германии.

(D) (GB) (F) (RU)

AERASGARD® KCO_2-W
AERASGARD® KCO_2-SD

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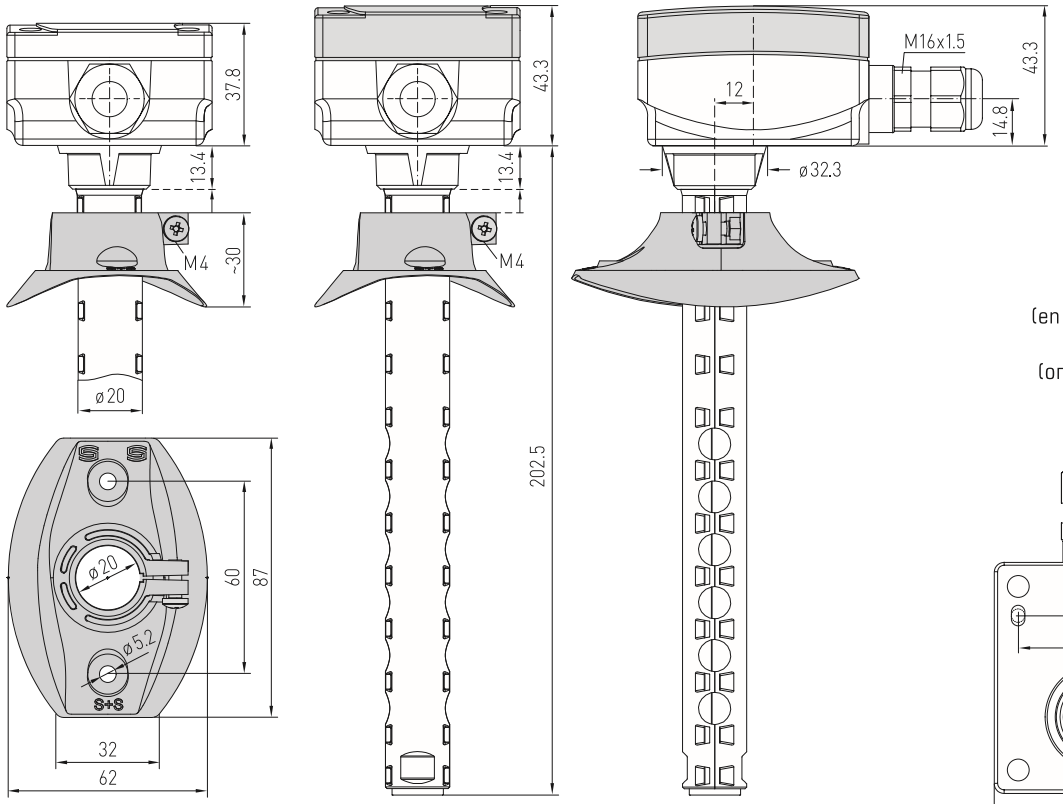
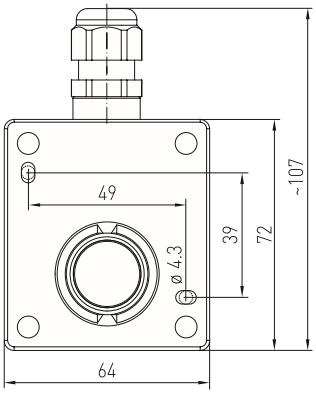
Maßzeichnung
Dimensional drawing
Plan coté
Габаритный чертеж

KCO_2-W
KCO_2-SD

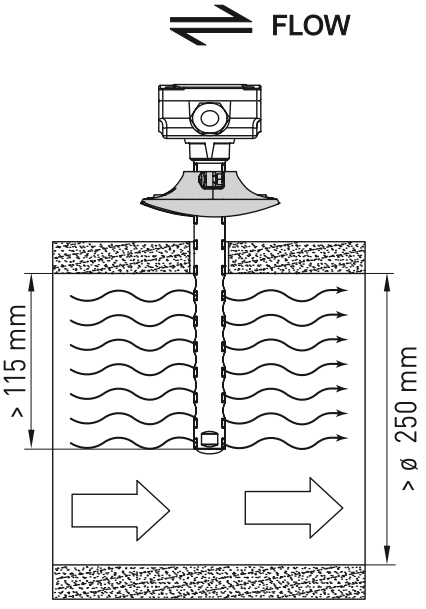


M12-Steckverbinder
(optional auf Anfrage)
M12 connector
(optional on request)
connecteur M12
(en option et sur demande)
разъем M12
(опционально по запросу)



Montageschema
Mounting diagram
Schéma de montage
Схема монтажа

KCO_2-W
KCO_2-SD



MFT-20-K
Montageflansch
aus Kunststoff
Mounting flange, plastic
Bride de montage
en matière plastique
Присоединительный фланец
из пластика

Patented quality product (patent no. DE 10 2014 010 719.1)

Maintenance-free duct sensor **AER**ASGARD® **KCO_2-SD** with active output, automatic calibration (fixed), in a compact plastic enclosure with snap-on lid, for determining the CO_2 content of the air (0…2000 ppm/0…5000 ppm). The measuring transducer converts the measured values into a standard signal of 0-10 V.

Maintenance-free duct sensor **AER**ASGARD® **KCO_2-W** with active/switching output, automatic calibration (can be deactivated), in a compact plastic enclosure with quick-locking screws, optionally with/without display, for determining the CO_2 content of the air (0…2000 ppm/0…5000 ppm). The measuring transducer converts the measured values into a standard signal of 0-10 V or 4...20 mA (switchable).

The sensor is used in offices, hotels, convention centres, apartments, shops, etc. for the purpose of evaluating the indoor climate. This enables energy-saving room ventilation on an as-needed basis, thereby reducing operating costs and improving well-being. The CO_2 measurement is performed using an optical **NDIR sensor** (non-dispersive infra-red technology). The detection range is calibrated for standard applications such as monitoring residential rooms and conference rooms.

TECHNICAL DATA

Power supply:	24 V AC / DC (± 10 %)
Power consumption:	< 1.5 W / 24 V DC typical; < 2.9 VA / 24 V AC typical; Peak current 200 mA
Sensor:	optical NDIR sensor (non-dispersive infra-red technology), with manual calibration (via zero button), **KCO_2-SD** with automatic calibration (fixed) **KCO_2-W** with automatic calibration (can be deactivated via DIP switches)
Measuring range:	**Multi-range switching** (selectable via DIP switches) 0…2000 ppm; 0…5000 ppm
Output:	**KCO_2-SD** 0-10 V (fixed) **KCO_2-W** 0-10 V **or** 4…20 mA, working resistance < 800 Ω (selectable via DIP switches), with offset potentiometer (± 10 % of the measuring range)
Relay output:	**KCO_2-SD** without changeover contact **KCO_2-W** with potential-free **changeover contact** (24 V / 1 A), switchpoint adjustable
Measuring accuracy:	typically ± 30 ppm ± 3 % of measured value
Temperature dependence:	± 5 ppm / °C or ± 0.5 % of measured value / °C (whichever is higher)
Pressure dependence:	± 0.13 % / mm Hg
Long-term stability:	< 2 % in 15 years
Gas exchange:	by diffusion
Warm up time:	approx. 1 hour
Ambient temperature:	–10…+60 °C
Response time:	approx. 1 minute, minimum flow rate 0.3 m/s (air)
Electrical connection:	0.14 - 1.5 mm^2, via screw terminals
Housing:	plastic, UV-stabilised, material polyamide, 30 % glass-globe reinforced, colour traffic white (similar to RAL 9016), housing cover for display is transparent! **KCO_2-SD** **with snap-on lid,** **KCO_2-W** **with quick-locking screws** (slotted / Phillips head combination)
Housing dimensions:	72 x 64 x 37.8 mm (Tyr 1/Tyr 01 without display) 72 x 64 x 43.3 mm (Tyr 1 with display)
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)
Protective tube:	**PLEUROFORM™**, material polyamide (PA6), with torsion protection, Ø 20 mm, NL = 202.5 mm, v_{max} = 30 m/s (air)
Process connection:	via flange made of plastic (included in scope of delivery)
Protection class:	III (according to EN 60730)
Protection type:	**KCO_2-SD** **IP 54** (according to EN 60529)* Housing tested, TÜV SÜD, Report No. 713160960A (Tyr 01) **KCO_2-W** **IP 65** (according to EN 60529)* Housing tested, TÜV SÜD, Report No. 713139052 (Tyr 1) * Housing in the built-in state (permeable PLEUROFORM: IP 30)
Standards:	CE conformity, electromagnetic compatibility according to EN 61 326, EMC Directive 2014 / 30 / EU
Optional:	**Display with illumination,** two line, cutout approx. 36 x 15 mm (W x H), for displaying the **Actual CO_2 content** and for setting the **switchpoint**

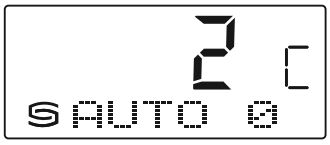
ATTENTION!
The minimum CO_2 concentration of outdoor air amounts to approx. 350 ppm (output voltage = 1.75 V at MR = 0...2000 ppm or 0.7 V at MR = 0...5000 ppm) in leafy, hardly industrialised areas. Gas inter-exchange in the sensor element happens by diffusion. Depending on changes in the concentration and flow velocity of the air surrounding the sensor, the reaction of the device to changes in CO_2 concentration may appear with a delay. It is absolutely necessary to choose the device mounting position to ensure that the air stream "presses" into the duct tube. Otherwise, below-atmospheric pressure will develop in the duct tube that may cause a substantial deceleration of gas exchange of even prevent it.

Automatic calibration of the carbon dioxide measurement – ABC logic (default)
The automatic background logic is a self-calibrating mechanism that is suitable for use in applications in which the CO_2 concentration regularly drops to fresh air level (350 - 400 ppm). This should typically happen attimes during which the rooms are unoccupied. The sensor reaches its normal accuracy after 24 hours of continuous operation in an environment which has been exposed to a fresh air supply of 400 ppm CO_2. The deviation error remains minimal with at least 4 cases of sensor exposure to fresh air within 21 days. The ABC logic requires continuous operating cycles of longer than 24 hours in order to function properly.

Manual calibration of carbon dioxide measurement
Manual calibration can be carried out regardless of the position of the DIP switch (ABC logic).

Before and during the calibration process, sufficient fresh air (CO_2 content = 500 ppm) must be provided.

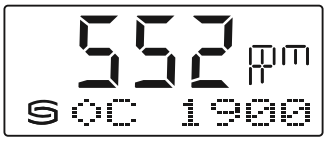
The calibration process is started by pressing the "ZERO" button (approx. 5 seconds).
This is signalled by the flashing LED or the countdown timer on the display (**AUTO 0**).



The calibration follows. During this phase, the LED is constantly active and a 600-second countdown runs on the display **CAL 0**). The LED is deactivated after successful calibration.

Display
The first line shows the **CO_2 measured value** in ppm.

In the second line, the **switching status of the relay** is shown on the left as a circuit
(full ● = relay energised; empty ○ = relay de-energised)
followed by the **indicator** (**C** for CO_2)
and the **switchpoint value** is shown on the right.



Putting in operation
After switching on the device, a self-test and tempering period follows.
This procedure takes 30 - 50 minutes depending on ambient conditions.
Afterwards, it is mandatory to run the manual calibration procedure.
Thereafter the ABC logic may be activated.

Switching point setting
A potential-free changeover contact is available as a switch output.
A switching point between 10 % and 95 % of the measuring range can be selected using the SET potentiometer. The 10 % value is added to the fresh air limit of 400 ppm for CO_2.
(600...1900 ppm with MR = 0...2000 ppm or 900...4700 ppm with MR = 0...5000 ppm).

Offset
Subsequent adjustment of the CO_2 measured value can be carried out using the offset potentiometer. The adjustment range is ± 10 % of the measuring range.

DIP switch	KCO_2 - W
CO_2 content	**DIP 1**
0...2000 ppm (default)	OFF
0...5000 ppm	**ON**
CO_2 automatic zero point	**DIP 3**
deactivated	OFF
activated (default)	**ON**
Output	**DIP 4**
Voltage 0-10 V (default)	OFF
Current 4...20 mA	**ON**
Note: **DIP 2** is not assigned!	

DIP switch	KCO_2 - SD
CO_2 content	**DIP 1**
0...2000 ppm (default)	OFF
0...5000 ppm	**ON**

AERASGARD® **KCO_2 - SD** Duct CO_2 sensors and measuring transducers, *Standard*
AERASGARD® **KCO_2 - W** Duct CO_2 sensors and measuring transducers, *Premium*

Type / WG02	Measuring Range CO_2	Output CO_2	Equipment	Display	Item No.
KCO_2 - SD	(switchable)	(fixed)			**IP 54**
KC02-SD-U	0...2000 ppm / 5000 ppm	0-10 V	–		1501-3160-1001-200
KCO_2 - W	(switchable)	(switchable)			**IP 65**
KC02-W	0...2000 ppm / 5000 ppm	0-10 V / 4...20 mA	changeover contact		1501-3140-7301-200
KC02-W DISPLAY	0...2000 ppm / 5000 ppm	0-10 V / 4...20 mA	changeover contact, display	■	1501-3140-7321-200
Optional:	Cable connection with **M12 connector** according to DIN EN 61076-2-101 (on request)				
Note:	This unit **must not** be used as safety-relevant device!				

(GB) General notes

- This device may only be used in non-precipitating air without above-atmospheric or below-atmospheric pressure at the sensor element.
- The voltage output is short-circuit proof.
- Applying overvoltage will destroy the device.
- In case of pollution, we recommend cleaning and recalibration in the factory.
- The device operating range covers 10...95 % relative humidity respectively 0...+50 °C.
  Outside of that range, mismeasurements or increased deviations will occur.
- The CO_2 sensor is shock-sensitive. Due to the mechanism's design, the measuring result may vary if shaken.
- 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 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!
- Devices must only be connected to safety extra-low voltage and under dead-voltage condition. To avoid damages and errors at 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 enclosures or enclosure 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.

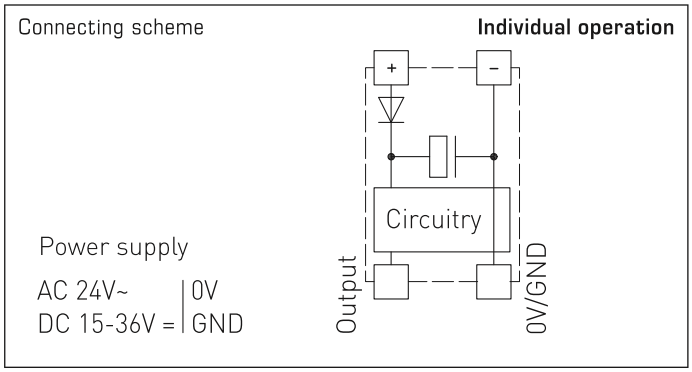
Commissioning is mandatory and may only be performed by qualified personnel!
These instructions must be read before installation and commissioning and all notes provided therein are to be regarded!

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!

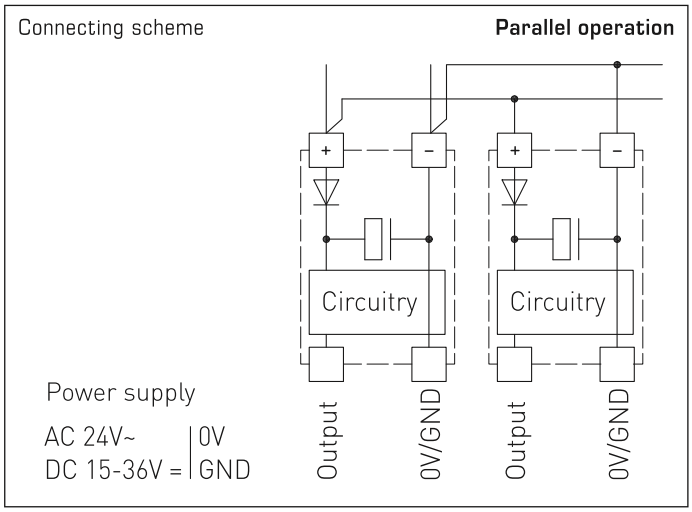
When this device is operated on **DC supply voltage**, the operating voltage input UB+ is to be used for 15...36 V DC supply and UB– or GND for ground wire!



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!



(D) (GB) (F) (RU)

AERASGARD® KCO_2-SD

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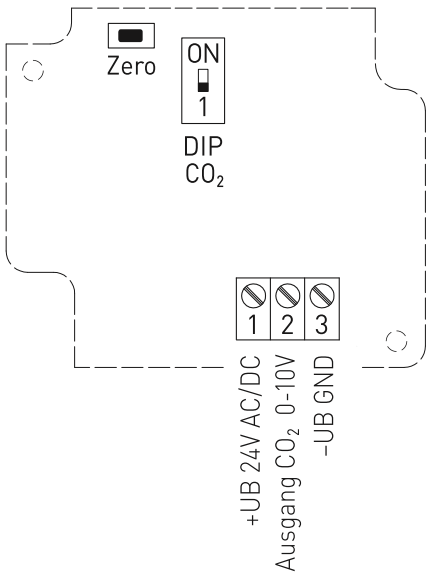
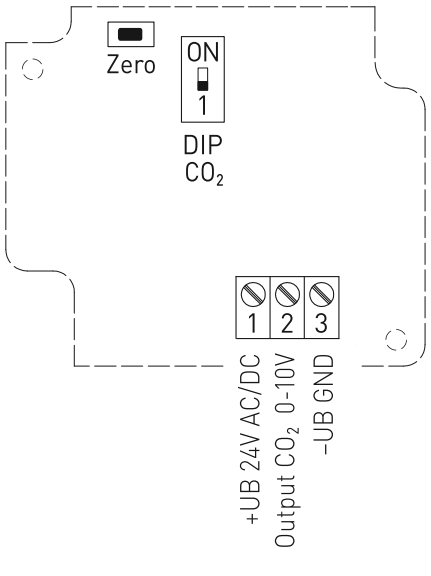
Schaltbild **KCO_2-SD-U**



Connecting diagram **KCO_2-SD-U**
Schéma de raccordement
Схема подключения



Anschlussbild **KCO_2-SD-U**

1 UB+ 24V AC/DC
2 Ausgang CO_2 0-10V in ppm
3 UB– GND

Schematic diagram **KCO_2-SD-U**
Schéma de raccordement
Схема подключения

1 UB+ 24V AC/DC
2 Output CO_2 0-10V in ppm
3 UB– GND

DIP-Schalter	KCO_2-SD
CO_2-Gehalt	**DIP 1**
0...2000 ppm (default)	OFF
0...5000 ppm	**ON**

DIP switch	KCO_2-SD
CO_2 content	**DIP 1**
0...2000 ppm (default)	OFF
0...5000 ppm	**ON**

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AERASGARD® KCO_2-W

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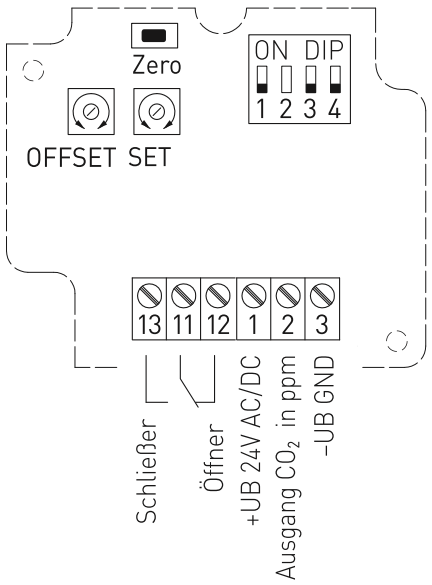
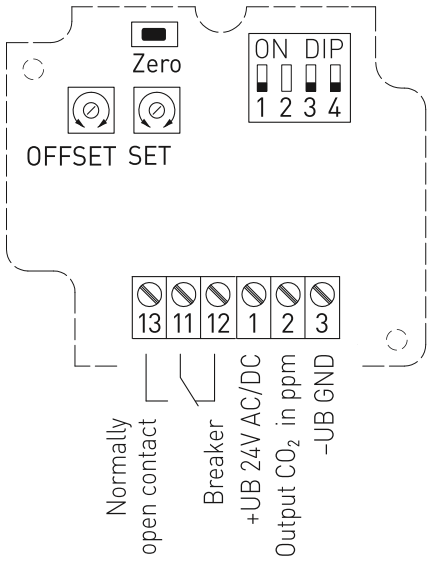
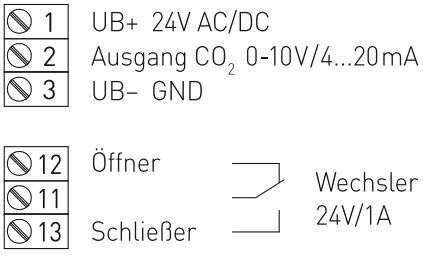
Schaltbild **KCO_2-W**



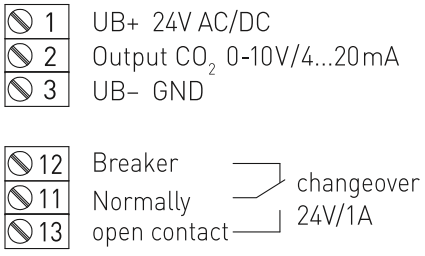
Connecting diagram **KCO_2-W**
Schéma de raccordement
Схема подключения



Anschlussbild **KCO_2-W**



Schematic diagram **KCO_2-W**
Schéma de raccordement
Схема подключения



DIP-Schalter	KCO_2-W
CO_2-Gehalt	**DIP 1**
0...2000 ppm (default)	OFF
0...5000 ppm	**ON**
CO_2-Nullpunktautomatik	**DIP 3**
deaktiviert	OFF
aktiviert (default)	**ON**
Ausgang	**DIP 4**
Spannung 0-10 V (default)	OFF
Strom 4...20 mA	**ON**
Hinweis: **DIP 2** ist nicht belegt!	

DIP switch	KCO_2-W
CO_2 content	**DIP 1**
0...2000 ppm (default)	OFF
0...5000 ppm	**ON**
CO_2 automatic zero point	**DIP 3**
deactivated	OFF
activated (default)	**ON**
Output	**DIP 4**
Voltage 0-10 V (default)	OFF
Current 4...20 mA	**ON**
Note: **DIP 2** is not assigned!	