5 Air quality and flow sensors **AER**ASGARD® & **RHE**ASGARD® Flow monitors and controllers **RHE**ASREG®

AERASGARD®

PORTFOLIO

- ➔ Duct and room air quality sensors
- ➔ With VOC sensor (metal oxide) and/or optical CO_2 sensor (NDIR)
- ➔ With chemical ozone sensor, microprocessor-controlled
- ➔ Self-calibrating versions (VOC, NDIR)

FEATURES

- ➔ With active or switching output
- ➔ Measuring ranges 0% to 100% self-calibrating air quality respectively 0 to 2.000 ppm CO_2 or 0 to 1 ppm O_3
- ➔ Ambient temperature ranges –10°C to +50°C
- ➔ Protection type from IP20 to IP65
- ➔ Indoor room versions for on-wall or in-wall flush box installation

RHEASGARD® & **RHE**ASREG®

PORTFOLIO

- ➔ Electronic airflow monitors, one- and two-step
- ➔ Mechanical flow monitors and vane switches with paddle

FEATURES

- ➔ Enclosures made of glass-globe or glass-fibre-reinforced plastic
- ➔ Stainless steel paddles for vertical mounting in horizontal media lines
- ➔ Protection type IP54 respectively IP65

FIELDS OF APPLICATION

- ➔ Room air and air conditioning technology
- ➔ Flow monitoring at ventilators, dampers, heating registers, and humidifiers
- ➔ Energy management
- ➔ Living spaces, working and conference rooms
- ➔ Institutes and laboratories
- ➔ Cinemas and sales rooms

KLQ including mounting flange

Duct air quality sensor/-controller (VOC), self-calibrating, with active/switching output

APPLICATION:

The self-calibrating microprocessor-controlled duct air quality sensor is used to determine the air quality on basis of a mixed gas sensor/VOC sensor (VOC = volatile organic compounds).

It is used:

- To measure the air quality in offices, hotels, meeting rooms and convention centres, apartments, stores, and restaurants, etc.
- For quantitative evaluation of room air pollution with contaminating gases (cigarette smoke, body perspiration, exhaled breathing air, solvent vapours, emissions from building members and cleaning agents)
- For adjustable sensitivity regarding the maximum air contamination to be expected
- For room ventilation on an as-needed basis, conserving energy by air changes only taking place when air is polluted.

Room air quality is understood as subjective air quality, felt by human beings with their olfactory organs. As perception varies from person to person and therefore, air quality is assessed differently, a general definition of criteria for room air quality is not possible.

Due to linearising and high operating temperatures, the air quality sensor achieves marginal drift and good stability. The sensor is automatically self-calibrating.

The air quality sensor does not trace concentrations of individual gases, but assesses the mixed gas as such, i.e. gas concentrations are not measured selectively. Therefore, it is not possible to specify gas concentrations by the unit ppm.

Detectable gases: mixed gas, vapours of alcanoles, cigarette smoke, automobile exhaust gases, exhaled breathing air, combustion smoke (from wood, paper, plastics). In addition, compounds of alkanes, alkenes, aromats, terpenes, halogenated hydrocarbons, esters, aldehydes and ketones as well as native VOCs such as terpenes and isoprene rank among volatile organic compounds VOC. VOCs also evaporate from chemicals products used in construction such as coating compounds, adhesives, or sealing compounds, furnishings, cleaning and care products, office chemicals and floor carpeting.

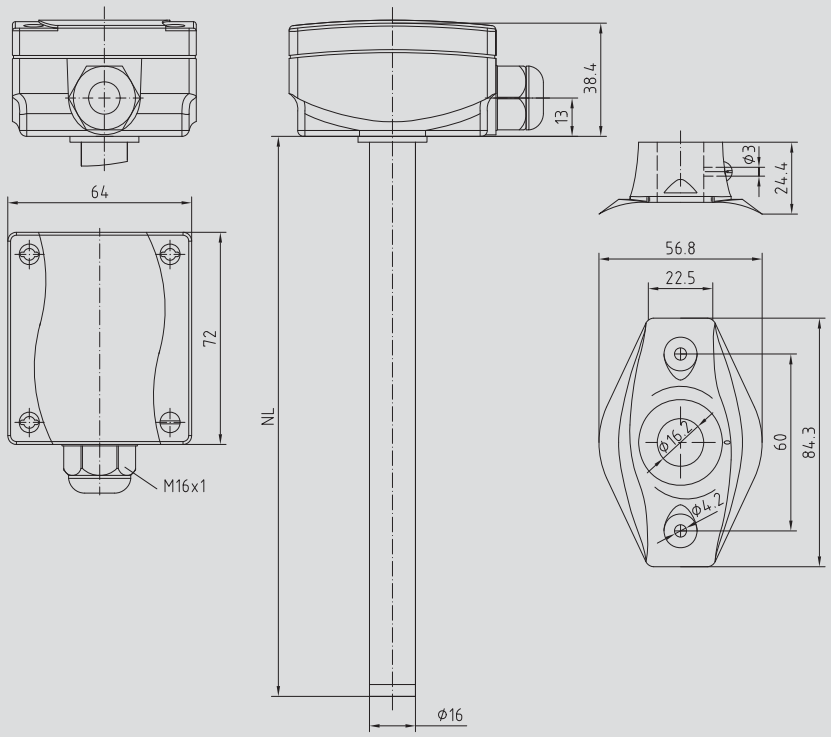
The sensor's lifetime depends on the type of burden and gas concentration.

KLQ

TECHNICAL DATA:

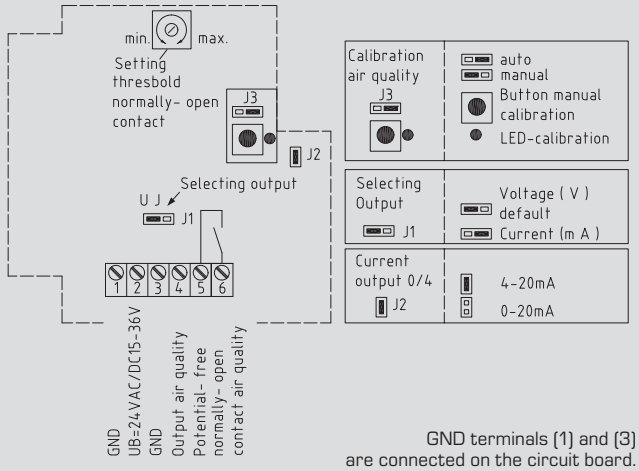
Power supply:	24 V AC/DC, current consumption ca. 70 mA at 24 V
Sensor:	VOC sensor (metal oxide)
Sensor protection:	sinter filter, exchangeable, screwed, easy to clean
Measuring range:	0...100 % air quality; referred to calibrating gas
Output signal:	0 - 10 V (0V=clean air, 10V=polluted air) or 4...20 mA (selectable via jumper) or with potential-free switching output 230 V AC 0.5 A, switchpoint adjustable from 0...100 % of output signal
Measuring accuracy:	±20 % of final value (referred to calibrating gas)
Ambient temperature:	0...+50 °C
Detection of gases:	not selective
Electrical connection:	0.14 - 1.5 mm² via terminals on circuit board
Long-term stability:	<10 %/per year
Warm-up period:	1 hour
Response time:	<60 s
Enclosure:	plastic, material polyamide, 30 % glass-globe-reinforced, with quick-locking screws, colour pure white (similar RAL 9010)
Dimensions:	72 x 64 x 39.4 mm
Process connection:	by mounting flange, plastic, (included in the scope of delivery), galvanised steel optional
Protection class:	III (according to EN 60 730)
Protection type:	IP 65 (according to IEC 529)
Standards:	CE conformity, electromagnetic compatibility according to EN 61 326 + A1 + A2, EMC directive 89/336/EWG low-voltage directive 73/23/EWG
Optional:	8-digit display, cutout 36 x 14 mm (W x H), for displaying actual air quality

Dimensional drawing **KLQ**



KLQ
with display

Circuit diagram **KLQ**



GND terminals (1) and (3)
are connected on the circuit board.

Connecting diagram **KLQ**

1	UB-GND
2	UB+ supply voltage 24V AC / DC
3	GND
4	Output air quality 0-10V / 4-20mA

Connecting diagram **KLQ-S**

1	UB-GND
2	UB+ supply voltage 24V AC / DC
3	GND
4	Output air quality 0-10V / 4-20mA
5	Potential- free
6	Normally -open contact air quality

Duct air quality sensor/-controller KLQ, <u>including mounting flange:</u>

Type/WG1	Range Air quality	Output	Features
KLQ	0...100%	0-10V / 4...20mA	
KLQ-S	0...100%	0-10V / 4...20mA	Normally-open contact
KLQ-xx-Display			
Note:	This air quality sensor must not be used as safety-relevant device!		

RLQ

Room air quality sensor/-controller (VOC), self-calibrating, with active/switching output, series Odin I

RLQ

APPLICATION:

The self-calibrating microprocessor-controlled duct air quality sensor is used to determine the air quality on basis of a mixed gas sensor/VOC sensor (VOC = volatile organic compounds).

It is used:

- To measure the air quality in offices, hotels, meeting rooms and convention centres, apartments, stores, and restaurants, etc.
- For quantitative evaluation of room air pollution with contaminating gases (cigarette smoke, body perspiration, exhaled breathing air, solvent vapours, emissions from building members and cleaning agents)
- For adjustable sensitivity regarding the maximum air contamination to be expected
- For room ventilation on an as-needed basis, conserving energy by air changes only taking place when air is polluted.

Room air quality is understood as subjective air quality, felt by human beings with their olfactory organs. As perception varies from person to person and therefore, air quality is assessed differently, a general definition of criteria for room air quality is not possible.

Due to linearising and high operating temperatures, the air quality sensor achieves marginal drift and good stability. The sensor is automatically self-calibrating.

The air quality sensor does not trace concentrations of individual gases, but assesses the mixed gas as such, i.e. gas concentrations are not measured selectively. Therefore, it is not possible to specify gas concentrations by the unit ppm.

Detectable gases: mixed gas, vapours of alcanoles, cigarette smoke, automobile exhaust gases, exhaled breathing air, combustion smoke (from wood, paper, plastics). In addition, compounds of alkanes, alkenes, aromats, terpenes, halogenated hydrocarbons, esters, aldehydes and ketones as well as native VOCs such as terpenes and isoprene rank among volatile organic compounds VOC. VOCs also evaporate from chemicals products used in construction such as coating compounds, adhesives, or sealing compounds, furnishings, cleaning and care products, office chemicals and floor carpeting.

The sensor's lifetime depends on the type of burden and gas concentration.

TECHNICAL DATA:

Power supply:	24 V AC/DC, current consumption ca. 70 mA at 24 V
Sensor:	VOC sensor (metal oxide)
Measuring range:	0...100 % air quality; referred to calibrating gas
Output signal:	0 - 10 V (0 V = clean air, 10 V = polluted air) or 4 ... 20 mA (selectable via jumper) or with potential-free switching output 230 V AC 0.5 A, switchpoint adjustable from 0...100 % of output signal
Measuring accuracy:	± 20 % of final value (referred to calibrating gas)
Ambient temperature:	0...+50 °C
Detection of gases:	not selective
Electrical connection:	0.14 - 1.5 mm² via terminals on circuit board
Long-term stability:	<10 %/per year
Warm-up period:	1 hour
Response time:	<60s
Enclosure:	plastic, material ABS, colour pure white (similar RAL 9010), stainless steel enclosure optional
Dimensions:	79 x 81 x 26 mm
Installation:	on-wall or on in-wall flush box Ø 55mm, base with 4 holes for mounting on vertically or horizontally installed flush boxes, with predetermined breaking point for on-wall cable entry
Protection class:	III (according to EN 60 730)
Protection type:	IP 30 (according to IEC 529)
Standards:	CE conformity, electromagnetic compatibility according to EN 61 326 + A1 + A2, EMC directive 89/336/EWG low-voltage directive 73/23/EWG
Optional:	8-digit display, cutout 36 x 14 mm (W x H), for displaying actual air quality

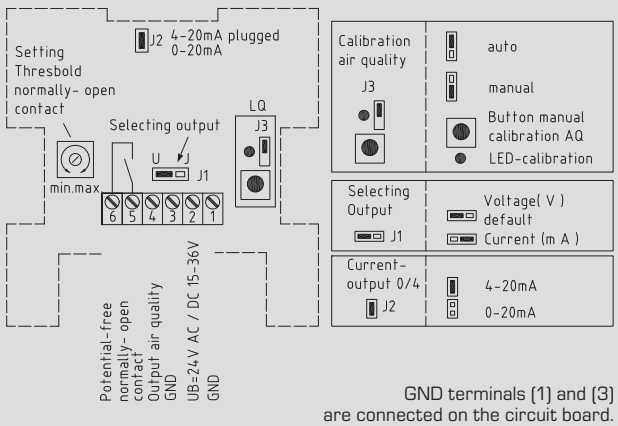
Connecting diagram **RLQ/RLQ-A**

1	UB-GND
2	UB+supply voltage 24 V AC / DC
3	GND
4	Output air quality 0-10 V / 4-20 mA

Connecting diagram **RLQ-S/RLQ-AS**

1	UB-GND
2	UB+ supply voltage 24 V AC / DC
3	GND
4	Output air quality 0-10 V / 4-20 mA
5	Potential- free
6	Normally- open contact air quality

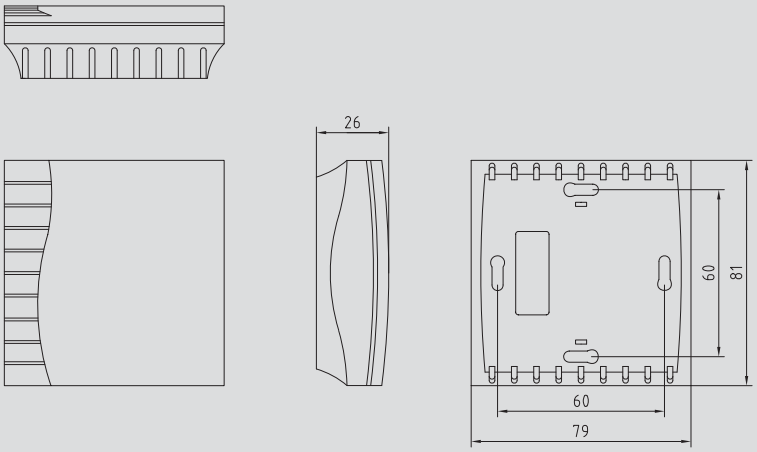
Circuit diagram **RLQ**



GND terminals (1) and (3) are connected on the circuit board.

Dimensional drawing

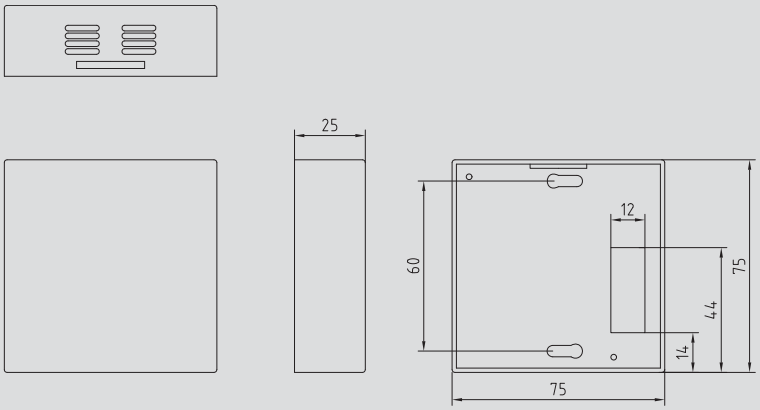
Enclosure **Odin I RLQ**



RLQ with display

Dimensional drawing

Enclosure **stainless steel RLQ**



RLQ with stainless steel enclosure

Room air quality sensor/controller RLQ:

Type/WG1	Range Air quality	Output	Features
RLQ	0...100%	0-10V / 4...20mA	
RLQ-S	0...100%	0-10V / 4...20mA	Normally-open contact
RLQ-A	0...100%	0-10V / 4...20mA	LED indicator
RLQ-AS	0...100%	0-10V / 4...20mA	Normally-open contact, LED indicator
RLQ-Display	0...100%	0-10V / 4...20mA	Normally-open contact, LED indicator
RLQ-stainless steel enclosure			
Note:	This air quality sensor must **not** be used as safety-relevant device!		

RLQ-UP

Room air quality sensor (VOC),
with active output,
in-wall, panel switch programme

APPLICATION:

The room air quality sensor is used to determine the air quality through qualitative evaluation of room air pollution by diverse gas fractions (e.g. cigarette smoke, exhaled breathing air, solvent vapours, etc.). Energy conservation is achieved by ventilation of rooms on an as-needed basis. This in-wall version was developed for users with highest design requirements. These sensors are available in line with all current panel switch programmes, e.g. Busch-Jaeger, Berker, Feller, Gira, Legrand, Merten, Niko and Jung. The sensor's lifetime depends on the type of burden and gas concentration.

RLQ-UP

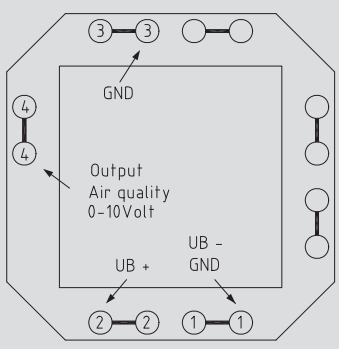
TECHNICAL DATA:

Power supply:	24V AC/DC current consumption ca. 70 mA at 24V
Sensor:	VOC sensor (metal oxide) detection of gases not selective
Measuring range:	0...100% air quality (mixed gas pollution referred to calibrating gas)
Output signal:	0-10V (0V = clean air, 10V = polluted air) (slight to increased room air contamination) or with potential-free switching output 230V AC/2A, Switch point adjustable from 0...100% of output signal
Warm-up period:	1 hour
Measuring accuracy:	±20% of final value (referred to calibrating gas)
Ambient temperature:	0...+50°C
Enclosure:	plastic
Electrical connection:	0.14 - 2.5 mm² via plug terminals on circuit board
Installation:	in in-wall flush box Ø55mm
Protection class:	III (according to EN 60730)
Protection type:	IP 20 (according to IEC 529)
Standards:	CE conformity, electromagnetic compatibility according to EN 61326 + A1 + A2, EMC directive 89/336/EWG low-voltage directive 73/23/EWG

SWITCH PROGRAMME:

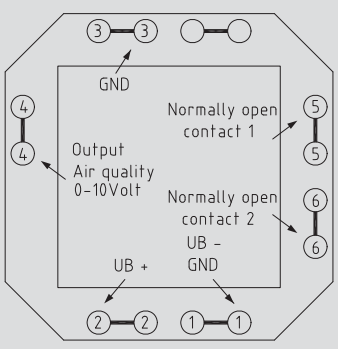
Manufacturer:	Busch-Jaeger Reflex Si (other switch programmes, manufacturers, colours and prices upon request)
Enclosure:	plastic, standard colour alpine white (similar RAL9010) (other colours are possible upon request with colour variants depending on the respective light switch programme)

Circuit diagram **RLQ-UP**



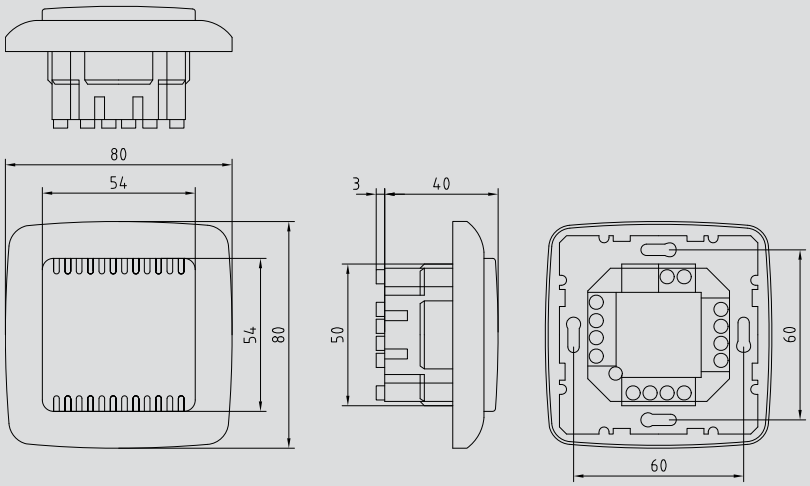
GND terminals (1) and (3)
are connected on the circuit board.

Circuit diagram **RLQ-UP-S**

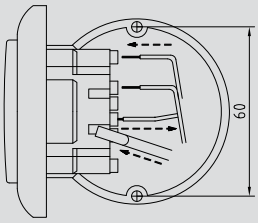


GND terminals (1) and (3)
are connected on the circuit board.

Dimensional drawing **RLQ-UP**



Installation scheme **RLQ-UP**



Room air quality sensor RLQ-UP:

Type/WG1	Output
RLQ-UP	0-10V
RLQ-UP-S	0-10V / Normally open contact
Note:	This air quality sensor must **not** be used as safety-relevant device!

RLQ-/RTM-/RFF-/RFTF-CO_2 and RCO_2

Room air quality/temperature/humidity
and CO_2 sensor respectively measuring transducer (VOC),
self-calibrating, with active output, series Odin II

REGELTECHNIK

APPLICATION:

xx CO_2

The self-calibrating microprocessor-controlled CO_2 and mixed gas measuring device is used for the detection of air quality and/or CO_2 content in air within a range of 0 ppm to 2000 ppm CO_2. Measuring signals are converted into standard signals of 0-10V. Optional, this device can be supplied with switching output, or with a combination of various output variants such as temperature and humidity.

The CO_2 content of air is determined by a NDIR sensor. Self-calibration of the CO_2 measurement takes place in cycles of ca. 7 days. In order to ensure this function, it is necessary to provide the device with fresh air (CO_2 content 300...400 ppm) at least once every 7 days.

The air quality detection range is calibrated for standard applications such as monitoring in residential and conference rooms. The lifetime of the mixed gas sensor used for this purpose is limited. It depends on type and concentration of pollutant gases. When device-specific parameters are observed, the expected lifetime is at least 36 months.

TECHNICAL DATA:

Power supply: ..... 24 V AC/DC

CARBON DIOXIDE:

Sensor, CO_2: ..... optical sensor (NDIR)

Measuring range, CO_2: ..... 0...2.000 ppm CO_2

Output, CO_2: ..... 0-10 V

Measuring accuracy, CO_2: ..... ± 30 ppm, ± 5 % of final value

Pressure dependence: ..... ± 1.6 %/kPa (referred to normal pressure)

Long-term stability: ..... ± 1 % of final value per year

Gas exchange: ..... by diffusion

AIR QUALITY:

Air quality sensor: ..... VOC sensor (metal oxide)

Measuring range, air quality: ..... 0...100 % (mixed gas pollution referred to calibrating gas)

Output air quality: ..... 0-10 V (0 V = clean air, 10 V = polluted air)

Measuring accuracy, air quality: ± 20 % of final value (referred to calibrating gas)

TEMPERATURE:

Measuring range, temperature: 0...+50 °C

Output, humidity: ..... 0-10 V

HUMIDITY:

Measuring range, humidity: ..... 0...100 % r.H.

Output, humidity: ..... 0-10 V

Deviation, humidity: ..... ± 3 % r.H. (40...60 %); at +20 °C, otherwise ± 5 % r.H.

Warm-up period: ..... ca. 1 hour

Ambient temperature: ..... 0...+50 °C

Electrical connection: ..... 0.14 - 1.5 mm² via screw terminals on circuit board

Enclosure: ..... plastic, material ABS,
colour pure white (similar RAL 9010),
stainless steel enclosure optional

Dimensions: ..... 95 x 97 x 30 mm

Installation: ..... on-wall or on in-wall flush box Ø 55 mm,
base with 4 holes for mounting on vertically or
horizontally installed flush boxes,
with predetermined breaking point
for on-wall cable entry

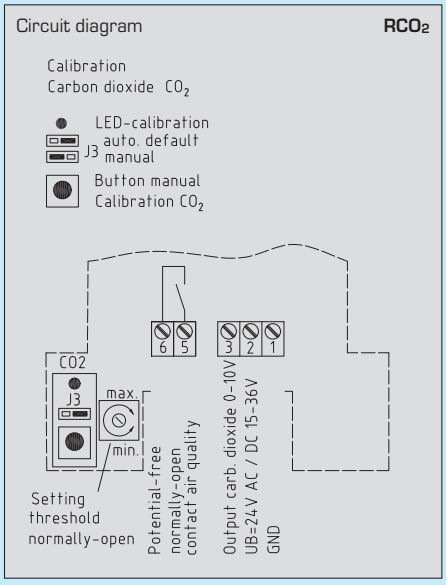
Protection class: ..... III (according to EN 60 730)

Protection type: ..... IP 30 (according to IEC 529)

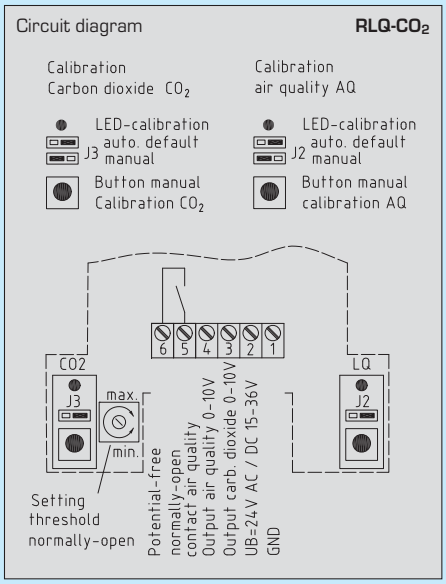
Standards: ..... CE conformity, electromagnetic compatibility
according to EN 61 326 + A1 + A2,
EMC directive 89/336/EWG
low-voltage directive 73/23/EWG

Optional: ..... 8-digit display, cutout 36 x 14 mm (W x H),
for displaying actual CO_2 content, actual air quality,
actual temperature, and actual humidity

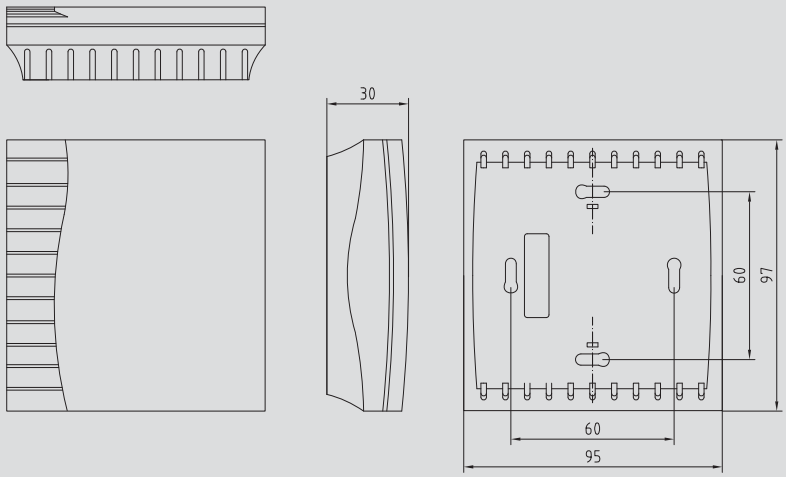
Circuit diagram **RCO_2**



Circuit diagram **RLQ-CO_2**



Dimensional drawing — Enclosure **Odin II xxCO_2**



xxCO_2 with display

Connecting diagram (circuit board inside top) — **RCO_2**

1	UB- GND
2	UB+ supply voltage 24V AC / DC
3	Output 0-10V CO2 content 0-2000ppm

Connecting diagram (circuit board inside base) — **RTM-CO_2**

1	UB- GND
2	UB+ supply voltage 24V AC / DC
6	Output temperature 0-10V

Connecting diagram (circuit board inside base) — **RFTF-CO_2**

1	UB-GND
2	UB+supply voltage 24V DC
4	Output humidity in r. H. 0-10V
6	Output temperature 0-10V

Connecting diagram (circuit board inside base) — **RLQ-CO_2**

1	UB-GND
2	UB+supply voltage 24V AC / DC
3	Output 0-10V CO2 content 0-2000ppm
4	Output 0-10V AQ air quality

Connecting diagram (circuit board inside base) — **RFF-CO_2**

1	UB-GND
2	UB+supply voltage 24V AC / DC
4	Output humidity in r. H. 0-10V

Room CO_2 measuring transducer RCO_2,
Room CO_2 + mixed gas measuring transducer RLQ-CO_2:

Type/WG1	Measuring range CO_2	Measuring range Air quality	Output CO_2	Output Air quality
RCO_2	0 ... 2.000 ppm	-	0-10V	-
RLQ-CO_2	0 ... 2.000 ppm	0 ... 100 %	0-10V	0-10V
xx-Display				
Note:	This CO_2+mixed gas measuring transducer must not be used as safety-relevant device!			

Raum-CO_2 + temperature measuring transducer RTM-CO_2,
Raum-CO_2 + humidity measuring transducer RFF-CO_2,
Raum-CO_2 + temperature + humidity measuring transducer RFTF-CO_2:

Type/WG1	Measuring range CO_2	Measuring range Temperature	Measuring range Humidity	Output CO_2	Output Temperature	Output Humidity
RTM-CO_2	0 ... 2.000 ppm	0 ... + 50 °C	-	0-10V	0-10V	-
RFF-CO_2	0 ... 2.000 ppm	-	0 ... 100 % r.H.	0-10V	-	0-10V
RFTF-CO_2	0 ... 2.000 ppm	0 ... + 50 °C	0 ... 100 % r.H.	0-10V	0-10V	0-10V
xx-Display						
Note:	The CO_2 circuit board is always accommodated inside the top cover and the circuit board for combined measurands is always inside the base.					

KLQ-CO_2 and KCO_2 including mounting flange

Duct air quality and
CO_2 sensor respectively measuring transducer (VOC),
self-calibrating, with active output

APPLICATION:

The self-calibrating microprocessor-controlled CO_2 and mixed gas measuring device is used for the detection of air quality and/or CO_2 content in air within a range of 0 ppm to 2000 ppm CO_2. Measuring signals are converted into standard signals of 0-10V. Optional, this device can be supplied with switching output, or with a combination of various output variants such as temperature and humidity.

The CO_2 content of air is determined by a NDIR sensor. Self-calibration of the CO_2 measurement takes place in cycles of ca. 7 days. In order to ensure this function, it is necessary to provide the device with fresh air (CO_2 content 300 ... 400 ppm) at least once every 7 days.

The air quality detection range is calibrated for standard applications such as monitoring in residential and conference rooms. The lifetime of the mixed gas sensor used for this purpose is limited. It depends on type and concentration of pollutant gases. When device-specific parameters are observed, the expected lifetime is at least 36 months.

TECHNICAL DATA:

Power supply: ..... 24 V AC/DC

CARBON DIOXIDE:

Sensor, CO_2: ..... optical sensor (NDIR)

Measuring range, CO_2: ..... 0 ... 2.000 ppm CO_2

Output, CO_2: ..... 0-10 V

Measuring accuracy, CO_2: ..... ± 30 ppm, ± 5 % of final value

Pressure dependence: ..... ± 1.6 %/kPa (referred to normal pressure)

Long-term stability: ..... ± 1 % of final value per year

Gas exchange: ..... by diffusion

AIR QUALITY:

Air quality sensor: ..... VOC sensor (metal oxide)

Measuring range, air quality: ..... 0 ... 100 % (mixed gas pollution referred to calibrating gas)

Output air quality: ..... 0 -10 V (0 V = clean air, 10 V = polluted air)

Measuring accuracy, air quality: . ± 20 % of final value (referred to calibrating gas)

Warm-up period: ..... 1 hour

Ambient temperature: ..... 0 ... +50 °C

Electrical connection: ..... 0.14 - 1.5 mm^2 via screw terminals on circuit board

Enclosure: ..... plastic, material polyamide, 30% glass-globe-reinforced, with quick-locking screws, colour pure white (similar RAL 9010)

Dimensions: ..... 108 x 72.5 x 70 mm

Cable union: ..... M16, including strain relief

Protective tube: ..... metal, Ø 20 mm, rated length NL = 185 mm

Process connection: ..... by mounting flange, plastic, (included in the scope of delivery), galvanised steel optional

Protection class: ..... III (according to EN 60 730)

Protection type: ..... IP 65 (according to IEC 529)

Standards: ..... CE conformity, electromagnetic compatibility according to EN 61 326 + A1 + A2, EMC directive 89/336/EWG low-voltage directive 73/23/EWG

Optional: ..... 8-digit display, cutout 36 x 14 mm (W x H), for displaying actual CO_2 content, actual air quality, actual temperature, and actual humidity

KLQ-CO_2/KCO_2

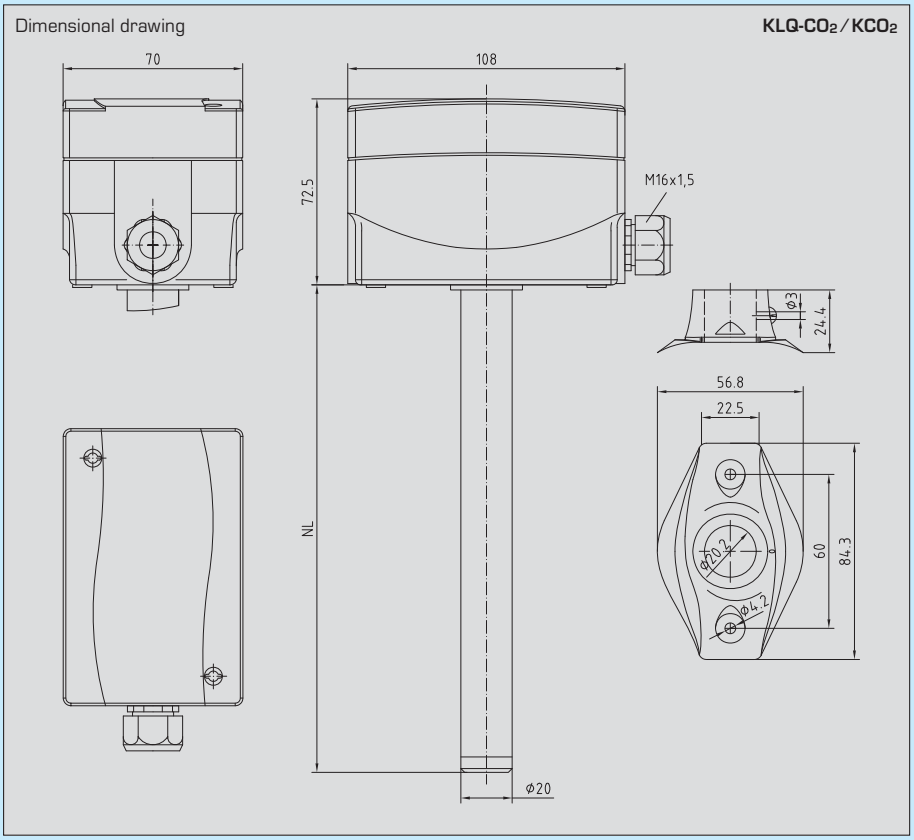
Connecting diagram **KCO_2**

1	UB- GND
2	UB+ supply voltage 24 V AC / DC
3	Output 0-10V CO2 content 0-2000ppm

Connecting diagram **KLQ-CO_2**

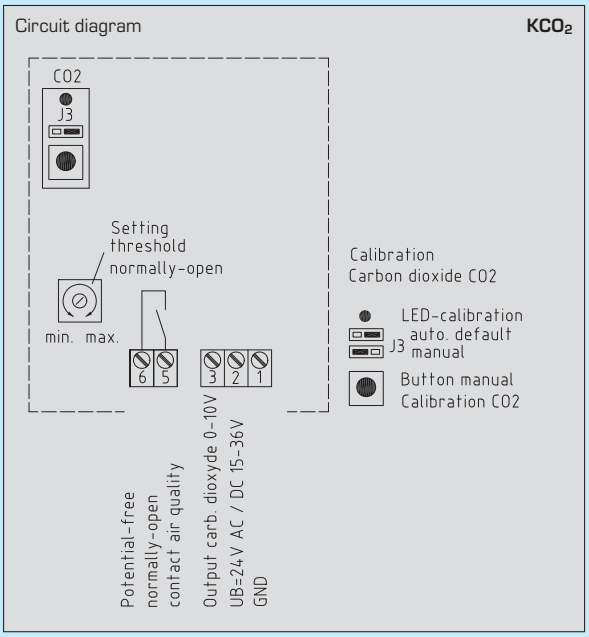
1	UB-GND
2	UB+supply voltage 24 V AC / DC
3	Output 0-10V CO2 content 0-2000ppm
4	Output 0-10V AQ air quality

Dimensional drawing **KLQ-CO_2 / KCO_2**

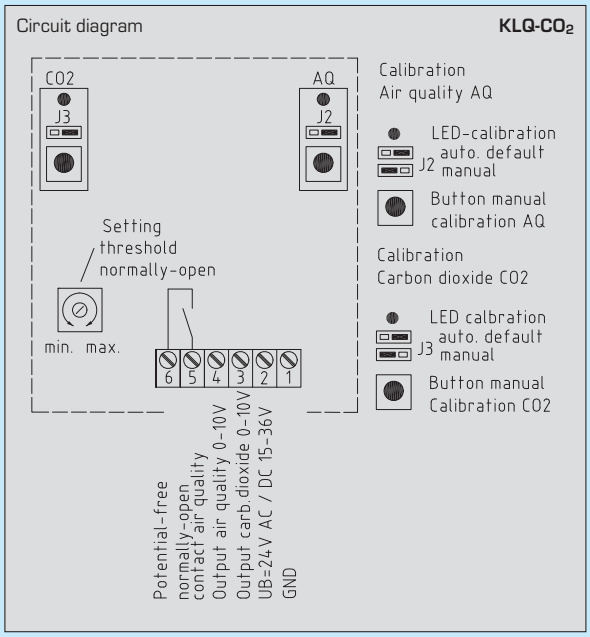


KLQ-CO_2 / KCO_2 with display

Circuit diagram **KCO_2**



Circuit diagram **KLQ-CO_2**



Duct CO_2 measuring transducer KCO_2, including mounting flange,
Duct CO_2 + mixed gas measuring transducer KLQ-CO_2, including mounting flange:

Type/WG1	Measuring range CO_2	Measuring range Air quality	Output CO_2	Output Air quality
KCO_2	0 ... 2.000 ppm	-	0-10V	-
KLQ-CO_2	0 ... 2.000 ppm	0 ... 100 %	0-10V	0-10V
xx-Display				
Note:	This CO_2+mixed gas measuring transducer must **not** be used as safety-relevant device!			

KO_3 including mounting flange
RO_3

Duct respectively room ozone sensor
with active/switching output

S+S REGELTECHNIK

APPLICATION:

This microprocessor-controlled O_3 sensor operates with a chemical sensor. It is used for the detection of air contamination with ozone in residential and working rooms, offices, labs, stores, meeting locations and convention centres and in the industrial sector. The sensor detects the ozone concentration (it measures the O_3 content of room air or air inside ventilation and air conditioning ducts). The sensor's lifetime depends on the type of burden and gas concentration.

TECHNICAL DATA:

Power supply: ..... 24V AC/DC
Sensor: ..... chemical O_3 sensor
Measuring range: ..... 0...1000 ppb respectively 0...1 ppm
Output: 0-10V
Measuring accuracy: ..... ±15% of final value
Warm-up period: ..... 1 hour
Ambient temperature: ..... -10...+50 °C
Reaction time: ..... <60s
Electrical connection: ..... 0.14-1.5 mm² via terminal screws on circuit board
Sensor protection: ..... filter system UM-TE-16
Flow velocity: ..... 0.01 m/s < s < 1 m/s
Long-term stability: ..... ± 5% of final value per year
(at an average burden < 50 ppb)

KO_3:

Enclosure: ..... plastic, material polyamide, 30% glass-globe-reinforced, with quick-locking screws, colour pure white (similar RAL 9010)
Dimensions: ..... 108 x 72.5 x 70 mm
Protective tube: ..... metal, Ø 20 mm, rated length NL = 185 mm
Cable union: ..... M16, including strain relief
Process connection: ..... by mounting flange, (included in the scope of delivery)

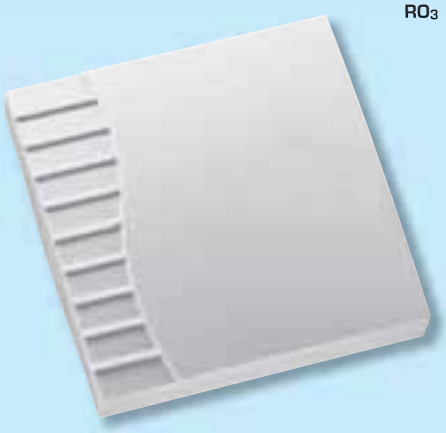
RO_3:

Enclosure: ..... plastic, material ABS, colour pure white (similar RAL 9010)
Dimensions: ..... 95 x 97 x 30 mm
Installation: ..... on-wall or on in-wall flush box Ø55 mm, base with 4 holes for mounting on vertically or horizontally installed flush boxes, with predetermined breaking point for on-wall cable entry

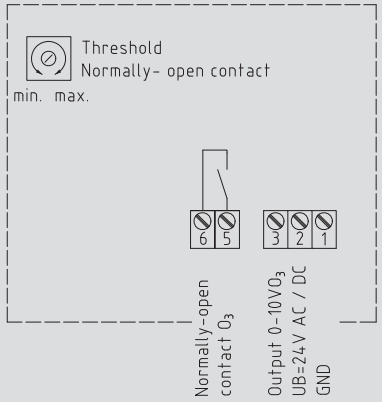
Protection class: ..... III (according to EN 60730)
Protection type: ..... IP 65 (according to IEC 529)
Standards: ..... CE conformity, electromagnetic compatibility according to EN 61326 + A1 + A2, EMC directive 89/336/EWG low-voltage directive 73/23/EWG

KO_3

RO_3



Circuit diagram **KO_3 / RO_3**



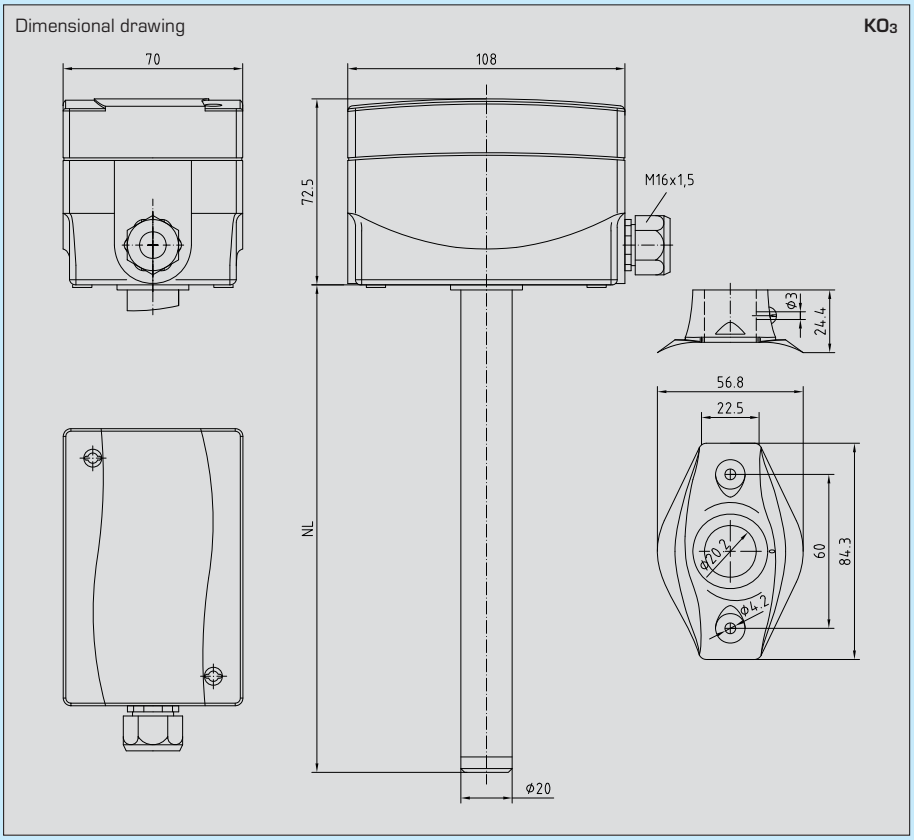
Connecting diagram **KO_3-U** **RO_3-U**

1 GND
2 UB+supply voltage 24V AC / DC
3 Output 0-10V for 0-1ppm O_3

Connecting diagram **KO_3-US** **RO_3-US**

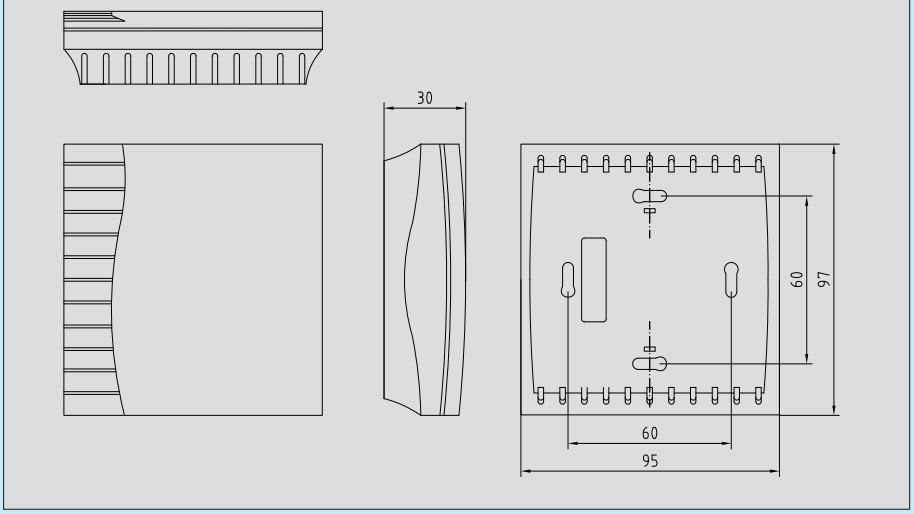
1 UB-GND
2 UB+supply voltage 24V AC / DC
3 Output 0-10V for 0-1ppm O_3
5 potential- free
6 Normally- open contact O_3

Dimensional drawing **KO_3**



Dimensional drawing

Enclosure **Odin II**
RO_3



Duct O_3 measuring transducer KO_3, <u>including mounting flange</u>:

Type / WG1	Measuring range O_3	Output O_3	Features
KO_3-U	0 ... 1 ppm	0 - 10 V	-
KO_3-US	0 ... 1 ppm	0 - 10 V	Normally-open contact

Room O_3-measuring transducer RO_3:

Type / WG1	Measuring range O_3	Output O_3	Features
RO_3-U	0 ... 1 ppm	0 - 10 V	-
RO_3-US	0 ... 1 ppm	0 - 10 V	Normally-open contact

KLSW
KLGF

Duct airflow monitors, electronic
1- and 2-step

APPLICATION:
For monitoring airflows in ducts, at ventilators and dampers, for flow-dependent monitoring of humidifiers and electric heating registers according to DIN 57100, part 420, or for use in connection with DDC systems.

TECHNICAL DATA:

Power supply: ..... 24V AC/DC or
230 V AC +5/-13%, 50...60 Hz

Output: ..... 1 or 2 potential-free relays (changeover contacts)
10 A, max. 2 kW or 0-10 V (relative, non-linear)

Power consumption: ..... ca. 3VA

One-step:

Operating range: ..... 0.1...30 m/s (adjustable)

Sensitivity: ..... 0.1...30 m/s

Two-step (KLSW-5/6):

Operating range: ..... 0.1...15 m/s (adjustable)

Sensitivity: ..... 0.1...5m/s

Switching hysteresis: ..... ca. 1...10% (adjustable)

Start bridging: ..... ca. 15...120s (adjustable)

Switch-off delay: ..... ca. 2...20s (adjustable)

Max. sensor cable length: ..... 50m; avoid laying parallel with mains voltage-carrying lines or use shielded cables

Ambient temperature: ..... 0°C...+60°C at the device
0°C...+80°C medium

Sensor: ..... sensor breakage protection, temperature-compensated

Connecting head: ..... plastic, material polyamide,
30% glass-globe-reinforced,
colour pure white (similar RAL 9010)

Dimensions: ..... 108 x 72.5 x 70mm (KLGF-2 and KLSW)
72 x 64 x 39.4mm (KLGF-1)

Cable union: ..... M 16, including strain relief

Protective tube: ..... metal, Ø 10mm, rated length NL=140mm

Process connection: ..... by mounting flange (included in the scope of delivery)

Electrical connection: ..... 0.14-1.5mm² via screw terminals on circuit board

Protection class: ..... I (according to EN 60730) with UB=230V
III (according to EN 60730) with UB=24V

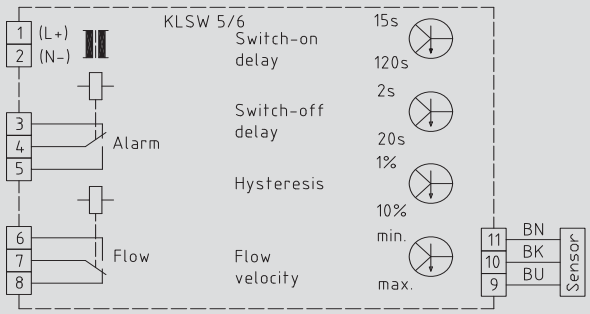
Protection type: ..... IP 65 (according to IEC 529)

Standards: ..... CE conformity,
EMC directive 89/336/EWG
low-voltage directive 73/23/EWG

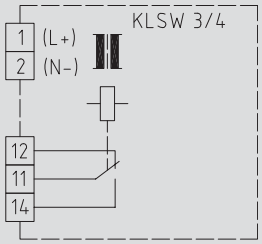
KLGF-2

KLGF-1

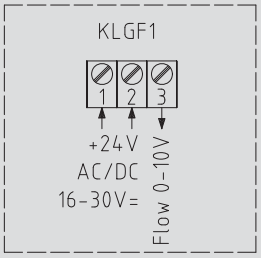
Circuit diagram **KLSW-5/6**



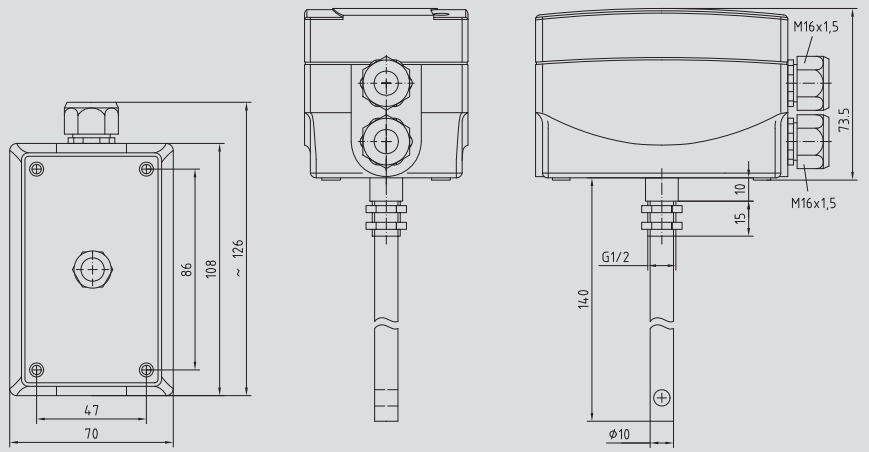
Circuit diagram **KLSW-3/4**



Connecting diagram **KLGF-1/2**

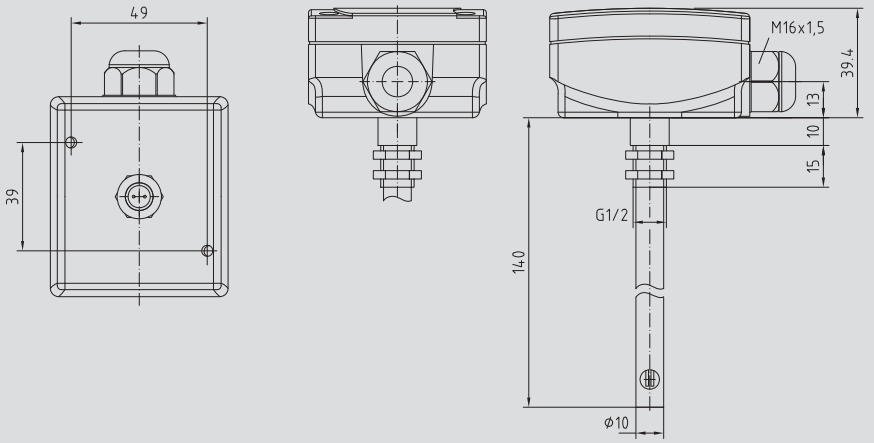


Dimensional drawing **KLGF-2**

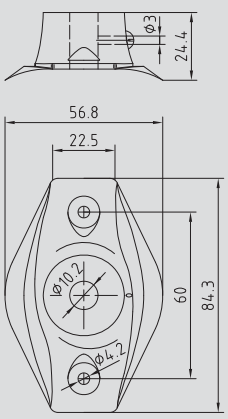


KLGF-2 with display

Dimensional drawing **KLGF-1**



Dimensional drawing **MF-10-K**



Airflow monitor KLSW, KLGF, including mounting flange:

Type/WG1	Relay (steps)	Type	Power supply	Output
KLSW-3	1	1 (compact)	230 V AC	1 x changeover contact (1-step)
KLSW-4	1	1 (compact)	24 V AC/DC	1 x changeover contact (1-step)
KLSW-5	2	2	230 V AC	2 x changeover contact (2-step)
KLSW-6	2	2	24 V AC/DC	2 x changeover contact (2-step)
KLGF-1	-	1 (compact)	24 V AC/DC	0-10 V (relative)
KLGF-2	-	1 (compact)	230 V AC	0-10 V (relative)

SW

Flow monitor, mechanical, with paddle

APPLICATION: **SW**

Used for flow monitoring in liquid or gaseous media in pipes and in hydraulic systems of ½" to 8" in diameter, as flow control instrument or as water deficiency protector, e.g. for pumps in oil circulation and cooling systems, in evaporators, compressors, and heat exchangers.

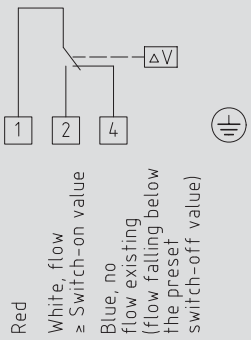
TECHNICAL DATA:

Switching capacity::	15 (8) A; 24...250 V AC
Contact:	dustproof micro switch as potential-free single-pole changeover contact
Enclosure:	plastic, material polyamide, 30% glass-globe-reinforced, colour pure white (similar RAL 9010)
Dimensions:	108 x 72.5 x 76 mm
Base:	galvanised steel
Screw-in plug:	brass or stainless steel (see table)
Paddle:	stainless steel, 1.4401, VA
Cable union:	M 20, including strain relief
Enclosure temperature:	-40 °C...+85 °C
Max. temperature of medium:	+120 °C
Electrical connection:	0.14 - 1.5 mm² via terminal screws
Protection class:	I (according to EN 60730)
Protection type:	IP 65 (according to IEC 529)
Standards:	CE conformity, EMC directive 89/336/EWG low-voltage directive 73/23/EWG
Tests:	TÜV type-tested (see table)

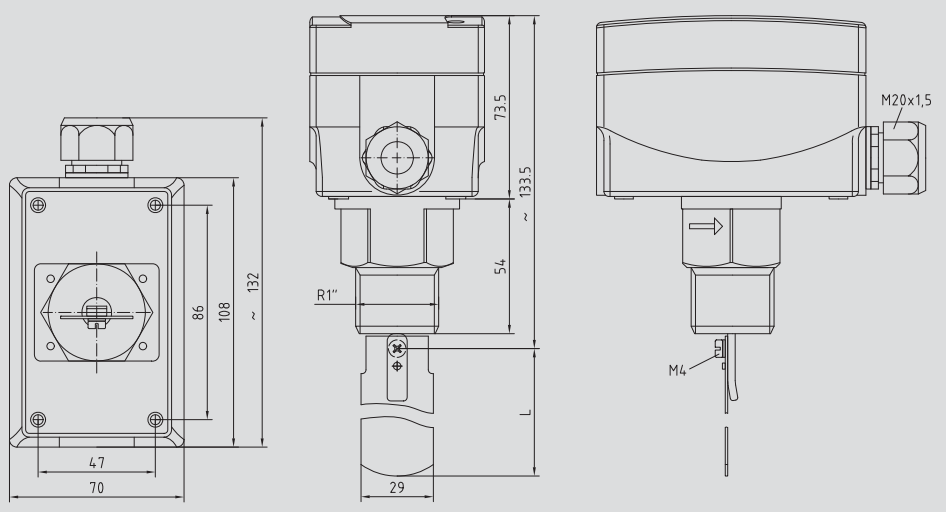
FUNCTION:

Monitor:	Contact 1-2 (red-white) breaks when flow rate drops to the preset value. Simultaneously, contact 1-4 (red-blue) closes and can be used as signal contact. Device is factory-set to the minimum switch-off value, which can be increased by turning the range adjusting screw clockwise.
Installation:	vertical in horizontal pipes, tee Rx" according to DIN 2950, min. smoothing distance = 5 x pipe diameter upstream and downstream of paddle

Connecting diagram **SW**



Dimensional drawing **SW**



Dimensional drawing **PSW-09**

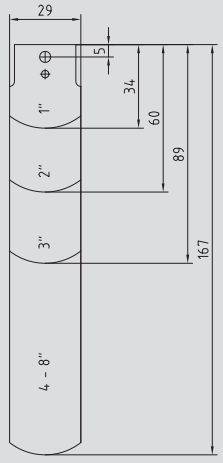


Table of switching values SW-1EPL/SW-2EPL

Pipe Ø DN	Factory setting OFF/ON (m^3/h)	Max. setting OFF/ON (m^3/h)
1"	0.6/1.0	2.0/2.1
1 1/4"	0.8/1.3	2.8/3.0
1 1/2"	1.1/1.7	3.7/4.0
2"	2.2/3.1	5.7/6.1
2 1/2"	2.7/4.0	6.5/7.0
3"	4.3/6.2	10.7/11.4
4"	11.4/14.7	27.7/29.0
4" Z	6.1/8.0	17.3/18.4
5"	22.9/28.4	53.3/55.6
5" Z	9.3/12.9	25.2/26.8
6"	35.9/43.1	81.7/85.1
6" Z	12.3/16.8	30.6/32.7
8"	72.6/85.1	165.7/172.5
8" Z	38.6/46.5	90.8/94.2

Table of switching values SW-1REPL/SW-2REPL

Pipe Ø DN	Factory setting OFF/ON (m^3/h)	Max. setting OFF/ON (m^3/h)
1"	0.2/0.6	1.0/1.1
1 1/4"	0.25/0.9	1.4/1.6
1 1/2"	0.5/1.2	1.6/2.2
2"	0.9/2.3	3.6/4.1
2 1/2"	1.2/3.1	4.9/5.5
3"	2.1/4.9	7.4/8.2
4"	4.9/11.3	17.1/19.1
4" Z	3.3/7.7	11.6/13.0
5"	9.7/22.4	34.0/37.9
5" Z	5.0/11.5	17.5/19.6
6"	13.6/31.5	47.6/53.2
6" Z	6.1/14.1	21.4/23.9
8"	25.7/59.6	90.1/100.7
8" Z	–	–

Table of switching values SW-3EPL/SW-4EPL/SW-5EPL

Pipe Ø DN	Factory setting OFF/ON (m^3/h)	Max. setting OFF/ON (m^3/h)
1/2"	0.174/0.48	0.846/0.948
3/4"	0.138/0.408	0.768/0.858
1"	0.2/0.6	1.0/1.1
1 1/4"	0.25/0.9	1.4/1.6
1 1/2"	0.5/1.2	1.6/2.2
2"	0.9/2.3	3.6/4.1
3"	2.1/4.9	7.4/8.2

Pipe diameters with paddle combinations

Pipe Ø DN in inches	Pipe Ø DN in mm	Paddle combination PSW-09
3/8"	10 mm	**1**
1/2"	15 mm	**1**
3/4"	20 mm	**1**
1"	25 mm	**1**
1 1/4"	32 mm	**1**
1 1/2"	40 mm	**1**
2"	50 mm	**1, 2**
2 1/2"	65 mm	**1, 2**
3"	80 mm	**1, 2, 3**
4" Z	100 mm	**1, 2, 3** plus **4** (shorten to 92 mm)
5" Z	125 mm	**1, 2, 3** plus **4** (shorten to 117 mm)
6" Z	150 mm	**1, 2, 3** plus **4** (shorten to 143 mm)
7-8" Z	200 mm	**1, 2, 3** plus **4** (not shortened)

Flow monitor SW:

Type/WG2	Pipe Ø DN	max. operating pressure PN max	Medium	(contacting parts made of)	Incl. mounted tee according to DIN 2950	TÜV-tested
SW-1 EPL	1"-8"	**11 bar**	**normal**	(brass)		•
SW-1 REPL	1"-8"	**11 bar**	**normal**	(brass)		
SW-2 EPL	1"-8"	**30 bar**	**aggressiv**	(stainless steel, V4A)		•
SW-2 REPL	1"-8"	**30 bar**	**aggressiv**	(stainless steel, V4A)		
SW-3 EPL	1/2"'	**11 bar**	**normal**	(brass)	•	
SW-4 EPL	3/4"	**11 bar**	**normal**	(brass)	•	
SW-5 EPL	3/8"	**11 bar**	**normal**	(brass)	•	
Accessories:	**PSW-09** spare paddle					
Features:	**G** = with gold contacts					
Note:	**R** = Device suitable for smaller flow rates, (has softer spring)					
	Z = Fourth paddle included in the scope of delivery to be used in addition to the three paddles already factory-mounted (**1, 2, 3** plus **4**)!					

WFS

Vane switch, mechanical, with paddle

APPLICATION:
Used for flow monitoring of gaseous media in air ducts, in air intake or exhaust devices, at ventilators or electric heating registers (also for contaminated, oily air), or as flow control instrument.

WFS

TECHNICAL DATA:

Switching capacity: ..... 15 (8) A; 24...250 V AC
(Contact load)

Contact: ..... dustproof micro switch as potential-free single-pole changeover contact

Enclosure: ..... plastic, material polyamide, 30% glass-globe-reinforced, colour pure white (similar RAL 9010)

Dimensions: ..... 108 x 72.5 x 70 mm

Base: ..... galvanised steel

Moving arm: ..... brass

Vane: ..... stainless steel, V2A, 1.4301

Cable union: ..... M 20, including strain relief

Enclosure temperature: ..... -40 °C ...+85 °C

Operating difference: ..... ≥ 1 m/s

Electrical connection: ..... 0.14 - 1.5 mm² via terminal screws

Protection class: ..... I (according to EN 60730)

Protection type: ..... IP 65 (according to IEC 529)

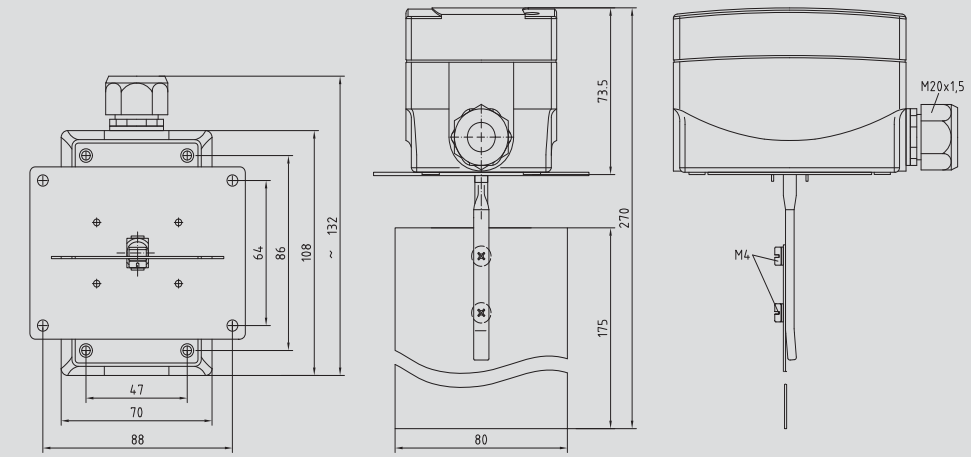
Standards: ..... CE conformity,
EMC directive 89/336/EWG,
low-voltage directive 73/23/EWG

FUNCTION:

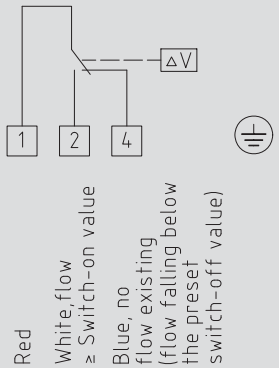
Monitor: ..... Contact 1-2 (red-white) breaks when flow rate drops to the preset value.
Simultaneously, contact 1-4 (red-blue) closes and can be used as signal contact.
Device is factory-set to the minimum switch-off value, which can be increased by turning the range adjusting screw clockwise.

Installation: ..... vertical in horizontal air ducts.
Min. smoothing distance = 5 x duct diameter upstream and downstream of vane. For airspeeds > 5 m/s vane is to be trimmed at the marked spots.
Thereby, the minimum switch-off value rises to ca. 2.5 m/s and the minimum switch-on value to ca. 4 m/s.

Dimensional drawing **WFS**



Connecting diagram **WFS**



Vane switch WFS:

Type/WG2	Min. Switch-on	Min. Switch-off	Max. Switch-on	Max. Switch-off
WFS-1EPL	2.5 m/s	1 m/s	9.2 m/s	8 m/s
Accessories:	**PWFS-08** Spare paddle			