KRACHT

Electronic

SD 1, AS 8, ASR 14, ASR 20

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Plug-in Display Unit SD 1

Function

- The plug-in display unit SD 1 may be used with any KRACHT volume counter which uses a plug-in connection according to DIN 43650.

- The display unit is simply inserted between the plug and the plug socket on the volume counter. The displayed value will be the actual flow rate or the volume. The square wave signal remains available for external processing.

- Volume counters already supplied can be equipped with the plug-in display unit. To achieve this the amplifier card must be removed from the plug.

- The plug-in display unit is freely programmable. All necessary settings can be achieved with 2 keys. The programmed data is stored on an FRAM and therefore saved in case of power failure.

- As an option the SD 1 is available with an analogue output (0 – 20 mA or 4 – 20 mA) proportional to flow rate or volume or with two programmable relay contacts. In both cases, the square wave signals are no longer available.

Function + Product Characteristics SD 1-Service

- The SD 1 Service is a plug-in display unit which may be used with any KRACHT volume counter with plug-in connection according to DIN 43650.

- The display unit is simply put on the plug socket of the flow meter.

- The batterypack supplies the SD 1 and the sensors with power.

- No separate power supply is necessary.

- If the battery drains flat the SD 1 Service can be operated and charged with the enclosed charger.

- The impulse volume is freely programmable.

- All necessary settings can be achieved with 2 keys.

- The programmed data is stored on a FRAM and therefore saved in case of flat batteries.

- With the batterypack an operating time of 30 hours is possible without recharging.

Electronic SD 1

KRACHT

Technical Data SD 1

Processor	PIC 17 C 42

Power unit

Supply	18 VDC – 28 VDC optional 10 – 19 VDC
Current consumption max.	ca. 120 mA

General data

Display	principle	7 segment LED, 7,62 mm, red
	display	0.000 ... 9999 with floating decimal point
	overflow	(> 9999): display 9999
Keyboard	2 keys behind the front panel	
Housing material	aluminium	
Dimensions	height without plug approx. 35 mm, width approx. 60 mm, depth approx. 60 mm	
Protection (DIN 40050)	IP 65	
Weight	approx. 0.12 kg	
Connections	angled connector DIN 43650 (4-pins) polarized	

Analogue output (optional)

current output
0 – 20 mA, 4 – 20 mA
load < = 250 Ohm,
at 18 – 28 VDC supply
load < = 50 Ohm,
at 10 VDC supply
10 bit resolution,
short-circuit-proof

Pulse output

	incremental signal
Pulse amplitude	approx. 0.8 x supply voltage, load depending
Pulse shape with symmetr. output signal	square wave, pulse duty factor/channel 1 : 1, ± 15 %
Pulse offset between two channels	90°, ± 30°
Output power / channel	$P_{a\,max}$ = max. 0.3 W short-circuit-proof

Ambient conditions

Operating temperature	0 °C up to + 60 °C
Storage temperature	– 25 °C up to + 85 °C

Technical Data SD 1 - Service

Processor	PIC 17 C 42

Current supply

Accumulator	6 VDC
Working time	approx. 30 hours

Battery charger

	controlled by micro-controller
Input voltage	230 VAC
Charging current	max. 700 mA
Charging timer	approx. 4 hours

General characteristics

Display	principle	7 segment LED, 7,62 mm, red
	display	0.000 ... 9999 with floating point
	overflow	(>9999): display 9999
Keyboard	2 keys on the front side	
Housing material	aluminium	
Protection (DIN 40050)	IP 65	
Weight	approx. 0.46 kg	
Connections	angled connector DIN 43650 (4-pins) polarized	

Ambient conditions

Operating temperature	0 °C up to + 60 °C
Storage temperature	– 10 °C up to + 85 °C

Type Key SD 1

Ordering example | **SD 1** | **R** | **24 / V**

Product name

Operating voltage

24 24 VDC
12 12 VDC

Without specification =

Flow rate measurement
V Volume measurement

Output signal

R square wave signal (incremental signal)

I current output 0 – 20 mA, 4 – 20 mA

K two relay contacts 24 VDC / 1A
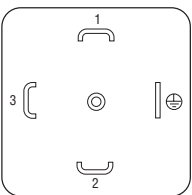
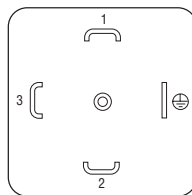## Dimensions SD 1

KRACHT **SD 1**

35

60
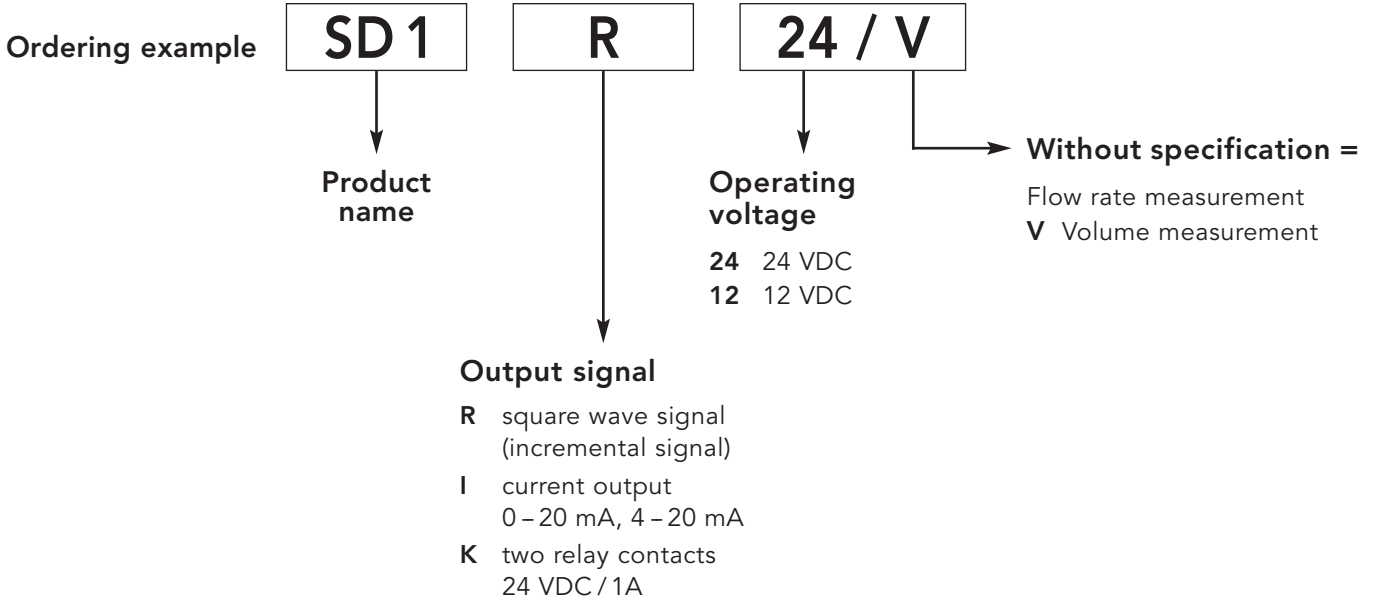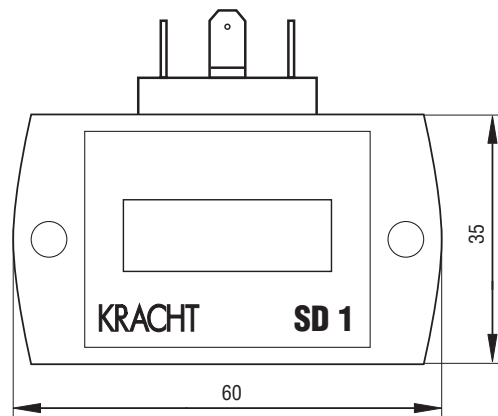
Electrical Connection SD 1
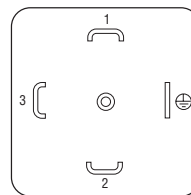
Version: K

PIN 1 = 12/24 VDC
PIN 2 = GND
PIN 3 = Relay 1
PIN = Relay 2

Version: I

PIN 1 = 12/24 VDC
PIN 2 = GND
PIN 3 = 0/4-20 mA
PIN = —

Version: R

PIN 1 = 12/24 VDC
PIN 2 = GND
PIN 3 = Channel 1
PIN = Channel 2

At version V = Volume measurement on Pin = "Enable Summation"

Function and Product Characteristics AS 8

Function

- The microcontroller AS 8 processes incremental input signals from KRACHT volume counters and other sensors.

- The input signals are filtered in the unit, interpreted and converted into the values of flow rate and volume.

- The user may choose to have either flow rate or volume displayed.

- Two relays, one analogue output or one serial interface are available for further, external processing.

- As an option, the AS 8 is also available with three keys on the front panel.

Product Characteristics

- EMC construction (electromagnetic compatibility)

- Programmable micro-processor

- Used for KRACHT volume counters and other sensors with 24 volt incremental signals

- Power supply voltage 230 / 120 V - 50 / 60 Hz, 24 VDC, 12 VDC

- Integrated sensor power supply 24 VDC – 50 mA

- Flow rate or volume measurement

- Smoothing function by means of a digital filter

- 2 programmable relays

- User-selected analogue output
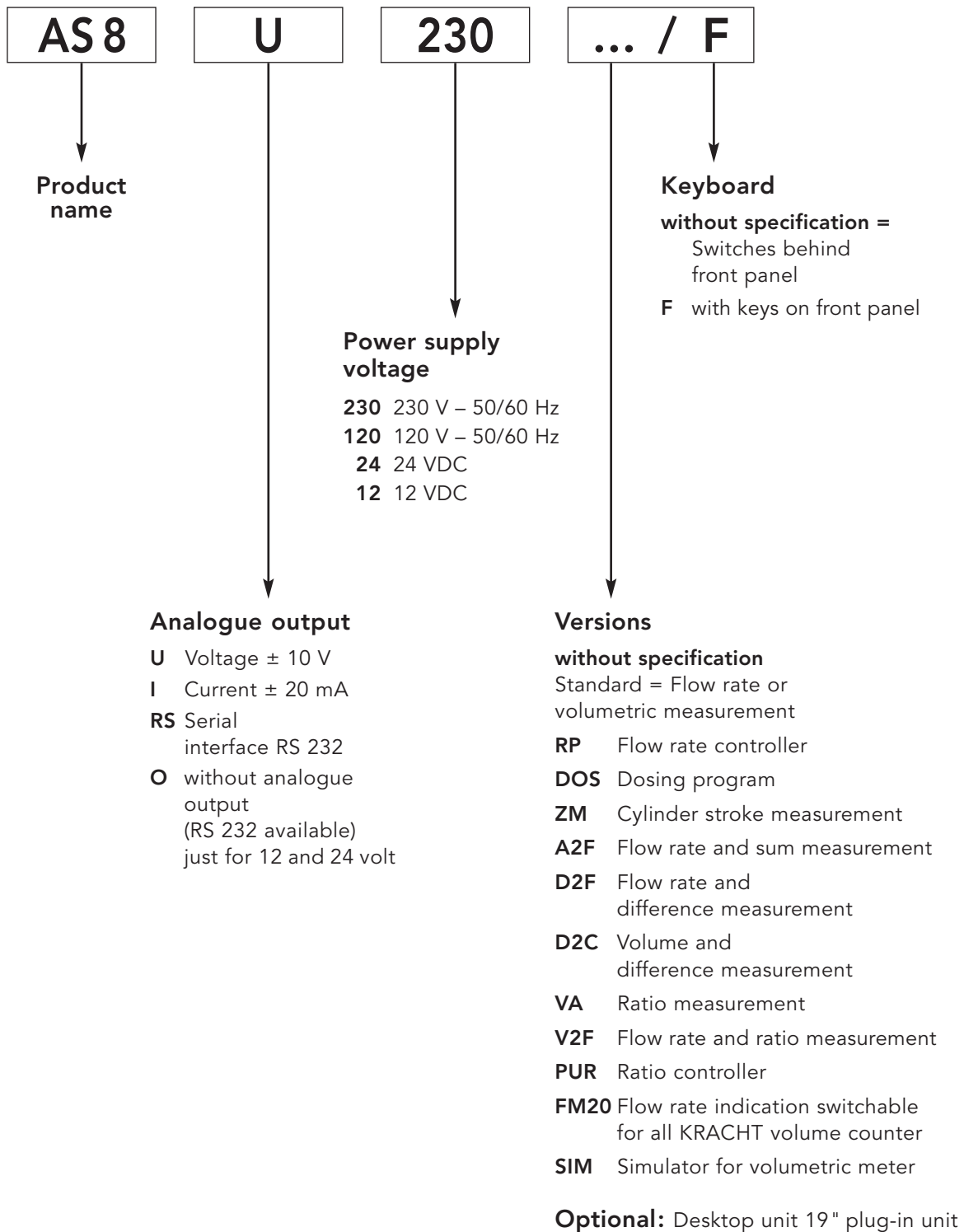 Current   ± 20 mA,
            0…20 mA,
            4…20 mA
  Voltage   ± 10 V
            0…10 V

- Serial interface RS 232

- Selectable time basis (sec, min, hrs)

- Selectable units for display

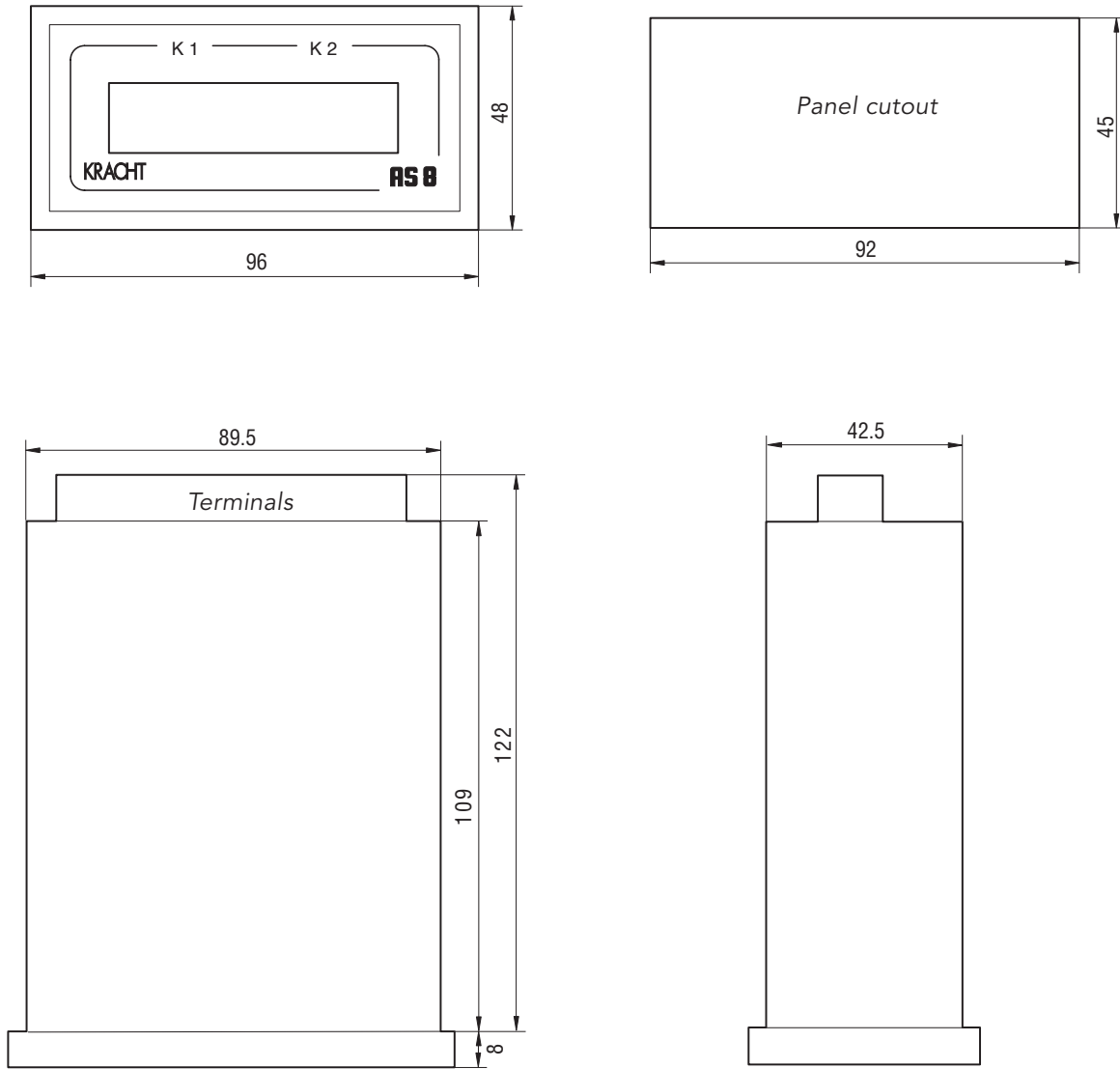- Enclosure with dimensions according to DIN

Technical Data AS 8

Processor	PIC 17C42
Supply	230 VAC, + 6 % ... – 10 % / 50 – 60 Hz, optional 120 VAC, 24 VDC, 12 VDC
Power input (power consumption)	approx. 3.5 W
Sensor supply	24 VDC ± 20 %, 50 mA

General data

Display	principle: 7 segment LED, 13.2 mm, red
	display: 0.000 ... 9999 with floating decimal point
	overflow (> 9999): display 9999
	overflow (< – 9999): display – 9999
	status indicator: LEDs K1 and K2 for relays 1 and 2
Keyboard	three keys behind the front panel, optional keys on front panel
Housing	for switch panel plug-in unit made of plastic
Panel frame	96 x 48 mm, DIN 43700
Insertion depth	ca. 122 mm with plug board
Panel cutout	92 x 45 mm, tolerance + 0.8 x + 0.6 mm
Protection (DIN 40050)	IP 54 in appropriate switch panel mounting
Weight	approx. 0.4 kg
Connections	15 pins terminal connecting block

2 relay contacts	one normally-open-contact switching-time each

2 digital inputs

Input impendance	> = 7500 Ohm
Input amplitude	low <= 9 volt, high >= 12 volt
Switching time	typ. 1 ms

1 analogue output

	current or voltage output adjustable by means of jumper
Voltage output	± 10 volt, 0 – 10 volt, 2 – 10 volt / load >= 1 kOhm,
or	10 bit resolution, short-circuit-proof
Current output	± 20 mA, 0 – 20 mA, 4 – 20 mA / load <= 250 Ohm,
	10 bit resolution, short-circuit-proof

1 volume counter input

Input impendance	> = 7500 Ohm
Input amplitude	low <= 9 volt, high >= 12 volt
Rate-of-flow principle of measurement	period length measurement (rising tooth flank)
Maximum input frequency	1Hz ... 2500 Hz
Measurement range totalizer	2×10^9 pulses

Serial interface

RS 232	cable length < = 15 m
Input voltage	max. ± 30 V
Input current	typ. ± 3 mA at ± 9 V input voltage
Output current	typ. ± 3 mA
Adjustment (selection)	9600 baud, 8 bit, no parity, 1 stop bit
Cable	shielded data cables recommended

Ambient conditions

Operating temperature	0 °C up to + 60 °C
Storage temperature	– 25 °C up to + 85 °C

Type Key AS 8

Ordering example

AS 8	U	230	... / F

Product name

Keyboard

without specification =
Switches behind front panel

F with keys on front panel

Power supply voltage

230 230 V – 50/60 Hz
120 120 V – 50/60 Hz
24 24 VDC
12 12 VDC

Analogue output

U Voltage ± 10 V

I Current ± 20 mA

RS Serial interface RS 232

O without analogue output (RS 232 available) just for 12 and 24 volt

Versions

without specification
Standard = Flow rate or volumetric measurement

RP Flow rate controller

DOS Dosing program

ZM Cylinder stroke measurement

A2F Flow rate and sum measurement

D2F Flow rate and difference measurement

D2C Volume and difference measurement

VA Ratio measurement

V2F Flow rate and ratio measurement

PUR Ratio controller

FM20 Flow rate indication switchable for all KRACHT volume counter

SIM Simulator for volumetric meter

Optional: Desktop unit 19 " plug-in unit

Dimensions AS 8

K 1 ——— K 2

KRACHT

AS 8

48

96

Panel cutout

45

92

89.5

Terminals

122

109

8

42.5

Dimensions in mm

Flow Rate Measurement AS 8 - Standard

Volume counter

*Flow rate indication
e.g.: 20 l/min*

K 1 ———— K 2

20.00

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Incremental encoder signals

*Analogue output
± 10 volt, 0 – 10 volt
± 20 mA, 0 – 20 mA,
4 – 20 mA or RS 232*

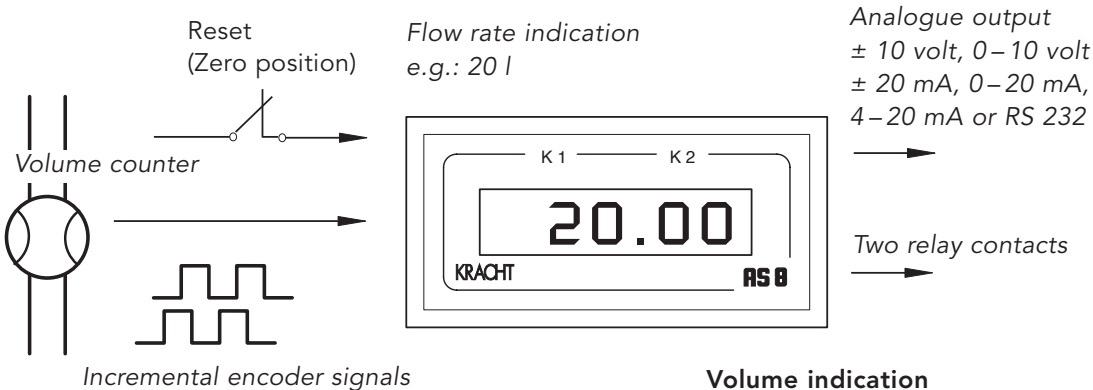*Two relay contacts*
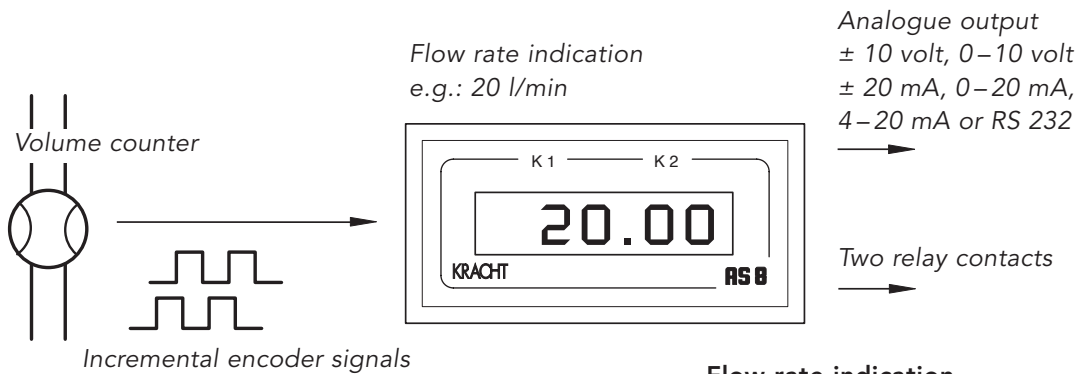
Flow rate indication

- The incremental input signals are filtered, converted and processed by the microcontroller to give the corresponding flow rate.
- Any of the following physical units can be set for the indicator reading:
  l/h, l/min, l/s, or US gal/hr, US gal/min, US gal/s.

Volumetric Measurement AS 8 - Standard

Reset
(Zero position)

*Flow rate indication
e.g.: 20 l*

Volume counter

K 1 ———— K 2

20.00

KRACHT   AS 8

Incremental encoder signals

*Analogue output
± 10 volt, 0 – 10 volt
± 20 mA, 0 – 20 mA,
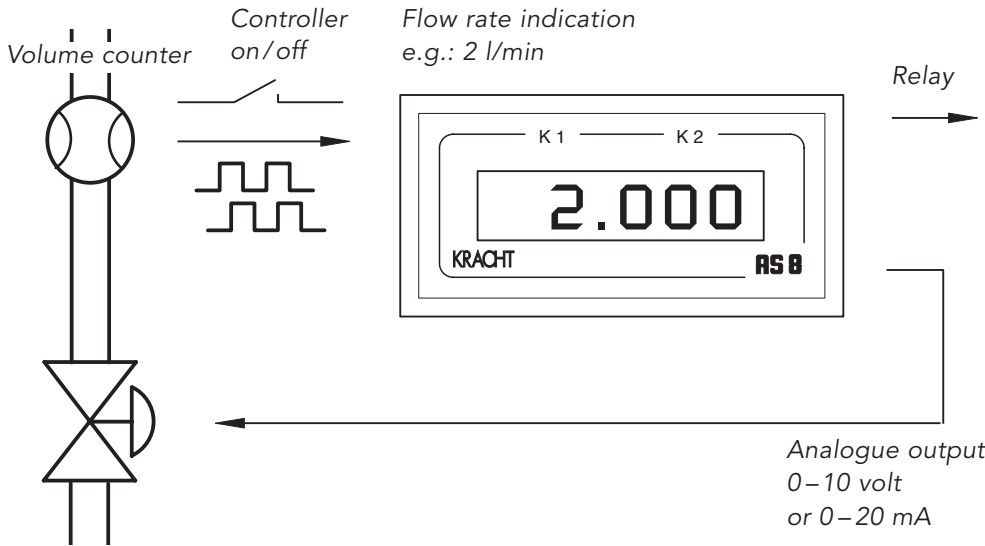4 – 20 mA or RS 232*

Two relay contacts

Volume indication

- The incremental input signals are summarized and converted to the dimensions of volume by the microcontroller, using a programmable factor.
- The physical units l and US gal can be set for display.
- A 24 volt digital input enables the summation to be resetted to zero.

Functional Characteristics AS 8 - Standard

- The standard version AS 8 is an indication and control device for dynamic flow rate and volume measurement. The setting is made by means of three keys, which are accessible behind the front cover. Optional via keys on front panel (version /F).
- The switch-over between the display units is made by means of DIP switches, located behind the front cover.

- Two programmable relays, an analogue output, or an RS 232 serial interface, are available for further external processing.
- The integrated 24 VDC transducer supply enables the volume counter to be directly connected.
- The type AS 8 series measuring devices are available as built-in control panel units, as bench units or as 19 " rack-mounted units.
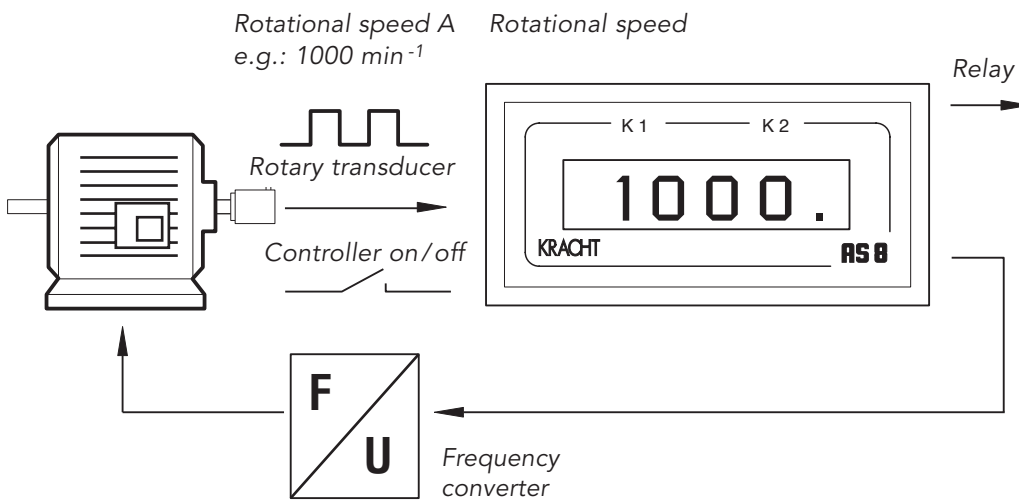
Flow Rate Controller AS 8 - RP

Volume counter

Controller on/off

Flow rate indication
e.g.: 2 l/min

Relay

K 1   K 2

2.000

KRACHT   AS 8

Analogue output
0 – 10 volt
or 0 – 20 mA

Flow rate controller

- The AS 8-RP Flow rate controller version controls the flow rate of a component. The required flow rate is set on the AS 8. The flow rate is detected by the volume counter and fed to the AS 8 as a square-wave signal.

- The controller output is connected to a continuously variable valve via a position amplifier, or is used to control the speed of a dosing pump.

Rotational Speed Controller AS 8 - RP

Rotational speed A
e.g.: 1000 min^{-1}

Rotational speed

Relay

Rotary transducer

K 1   K 2

1 0 0 0 .

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Controller on/off
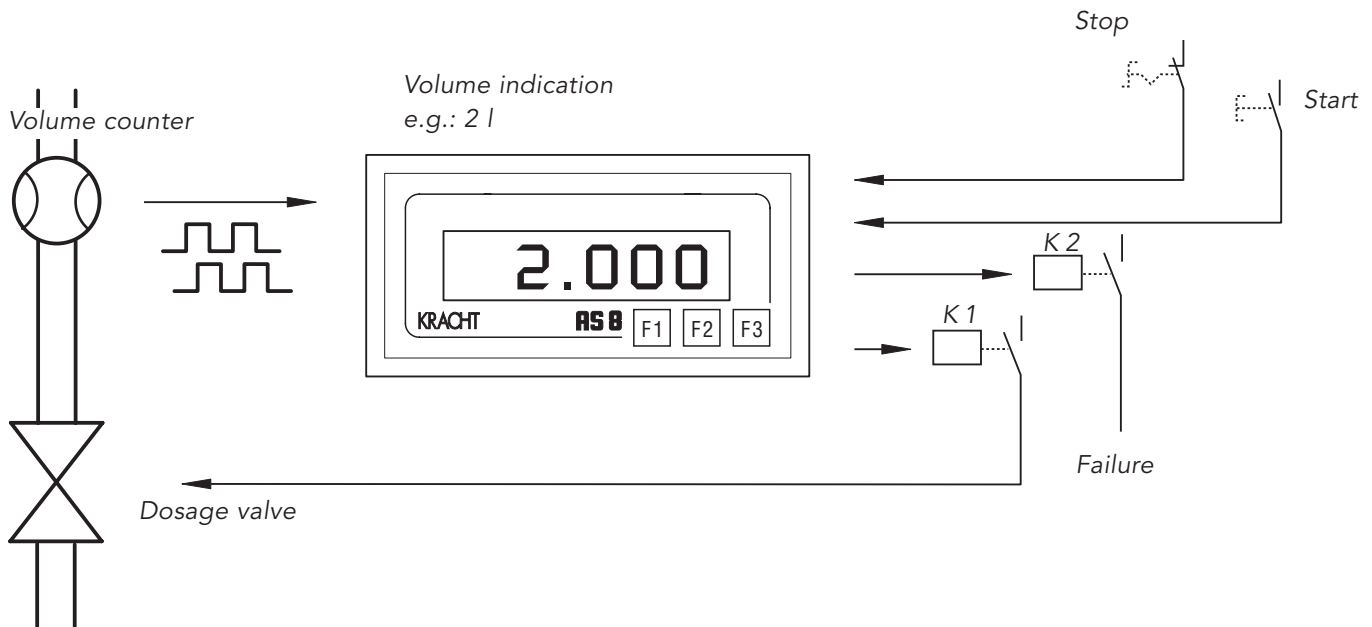
F / U

Frequency converter

Rotational speed controller

- A further application example is that of rotational speed regulation. The required speed is set on the AS 8. The actual rotational speed is detected by the rotary transducer and fed to the AS 8 as a square-wave signal.

- The controller output is connected to the motor via a frequency converter and used to control the rotational speed

Functional Characteristics AS 8 - RP

- Two relay contacts enable the overshoot of permissible error bandwidths to be signalled.

- Programming and setting is carried out by means of three keys which are accessible on removal of the front cover. Optional via keys on front panel (version /F).

- The integrated 24 VDC transducer supply enables the direct connection of the volume counter.

- The type AS 8 series measuring devices are available as built-in control panel units, as bench units, or as 19" rack-mounted units.
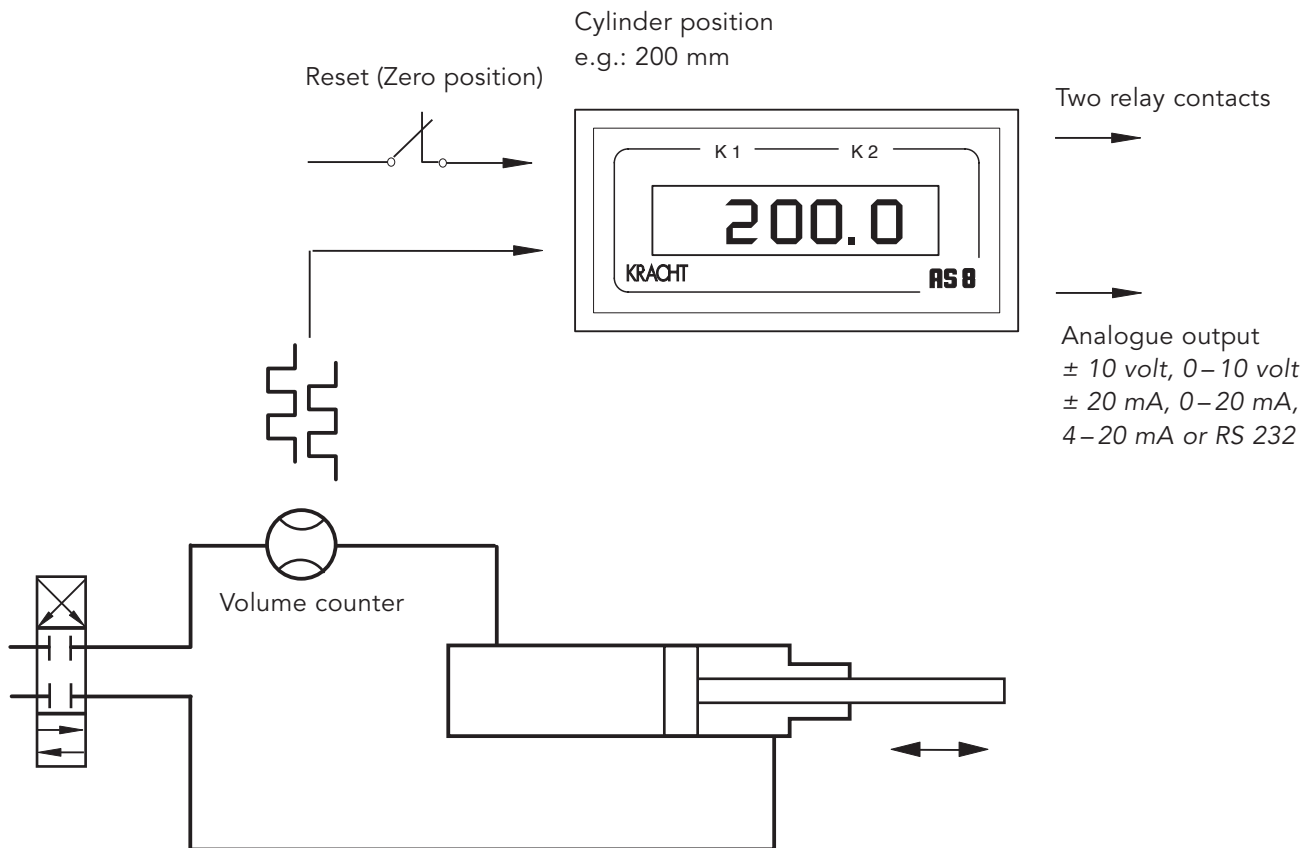
Dosing AS 8 - DOS

Volume counter

*Volume indication
e.g.: 2 l*

2.000

KRACHT **AS 8** F1 F2 F3

Stop

Start

K 2

K 1

Failure

Dosage valve

Functional Characteristics AS 8 - DOS

- The AS 8 dosing version is especially designed for employment in dosing lines. It allows one volume counter to be connected.

- 6 dosages (programmes) can be stored in the AS 8. Specific dosages are called up via the three keys on the front panel. The input values are arranged in menus.

- The filling process is started by the digital input. The AS 8 resets the last dosage quantity and switches the dosage valve. The volume counter measures the flow and delivers square wave signals to the AS 8.

- The AS 8 sums the input signals. When the quantity is reached the dosage valve will be switched.

- The second relay contact enables the indication of faulty dosages.

- The settings are made by using the three keys on the front panel. The input values are arranged in menus.

- The integrated 24 VDC sensor supply enables direct connection to the volume counter.

- The type AS 8 measuring devices are available as built-in control panel units, as desk-top units, or as 19" rack-mounted units
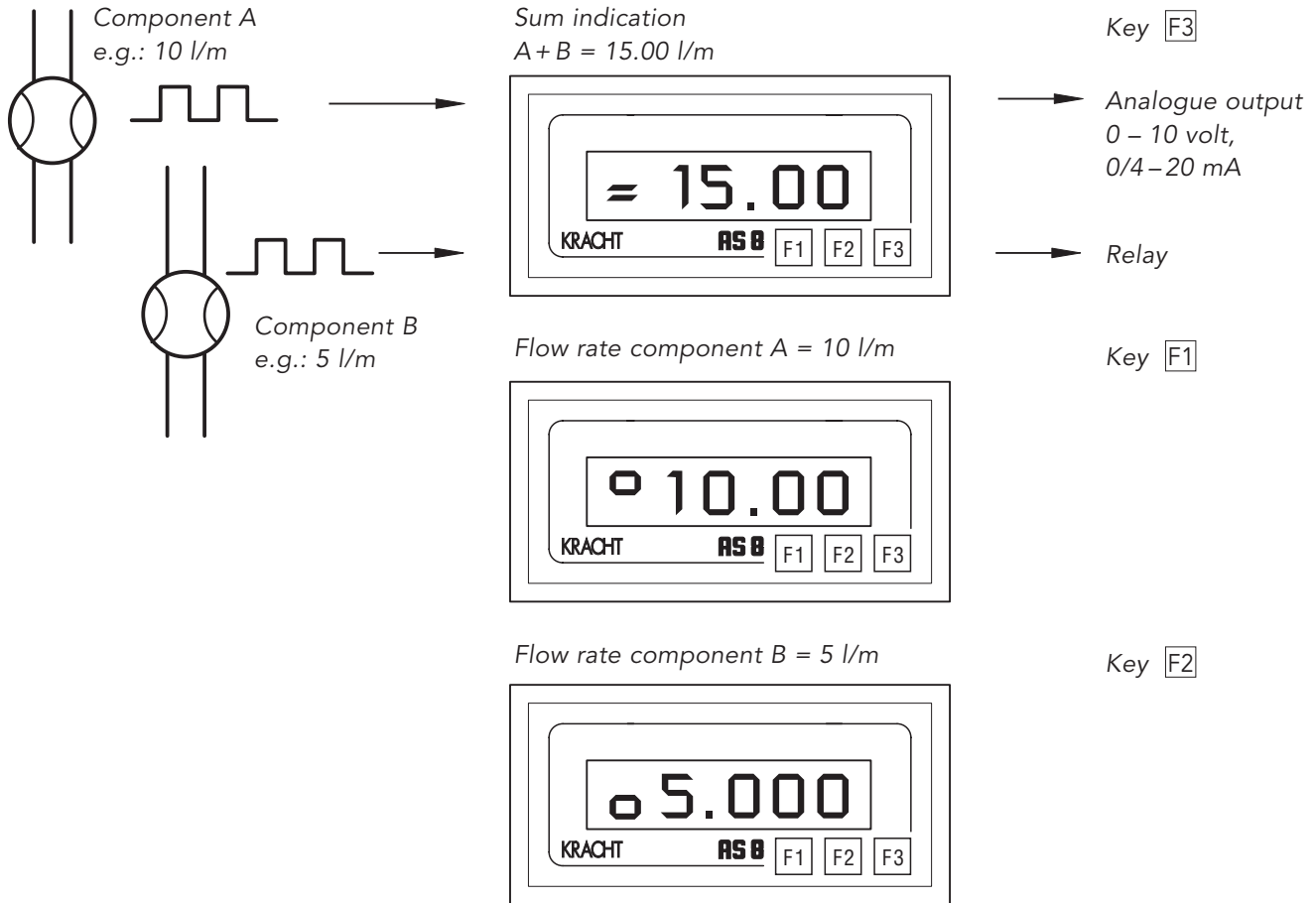
Cylinder Stroke Measurement AS 8 - ZM

Reset (Zero position)

Cylinder position
e.g.: 200 mm

Two relay contacts

K 1   K 2

200.0

KRACHT   AS 8

Analogue output
± 10 volt, 0 – 10 volt
± 20 mA, 0 – 20 mA,
4 – 20 mA or RS 232

Volume counter

Functional Characteristics AS 8 - ZM

- The cylinder stroke measurement version of the AS 8 enables an indirect measurement to be made of hydraulic drive movements, in combination with a volume counter.

- In this system, the volume counter is installed in an operating line, to generate pulses which are proportional to the flow rate and to indicate the direction of flow.

- The electrical pulses are converted by the micro-controller into the physical dimensions of flow rate and volume, or stroke and velocity.

- Erroneous measurements, due to leakage at the end positions, can be prevented by means of a programmable blocking frequency.
  The signals are only processed when the flow rate exceeds the blocking frequency.

- Two relays, an analogue output or an RS 232 interface, are available for additional external processing.

- Programming and setting is carried out by means of three keys, which are accessible behind the front cover.

- The integrated 24 VDC transducer supply enables the direct connection of the volume counter.

- The type AS 8 series measuring devices are available as built-in control panel units, as bench units, or as 19" rack-mounted units
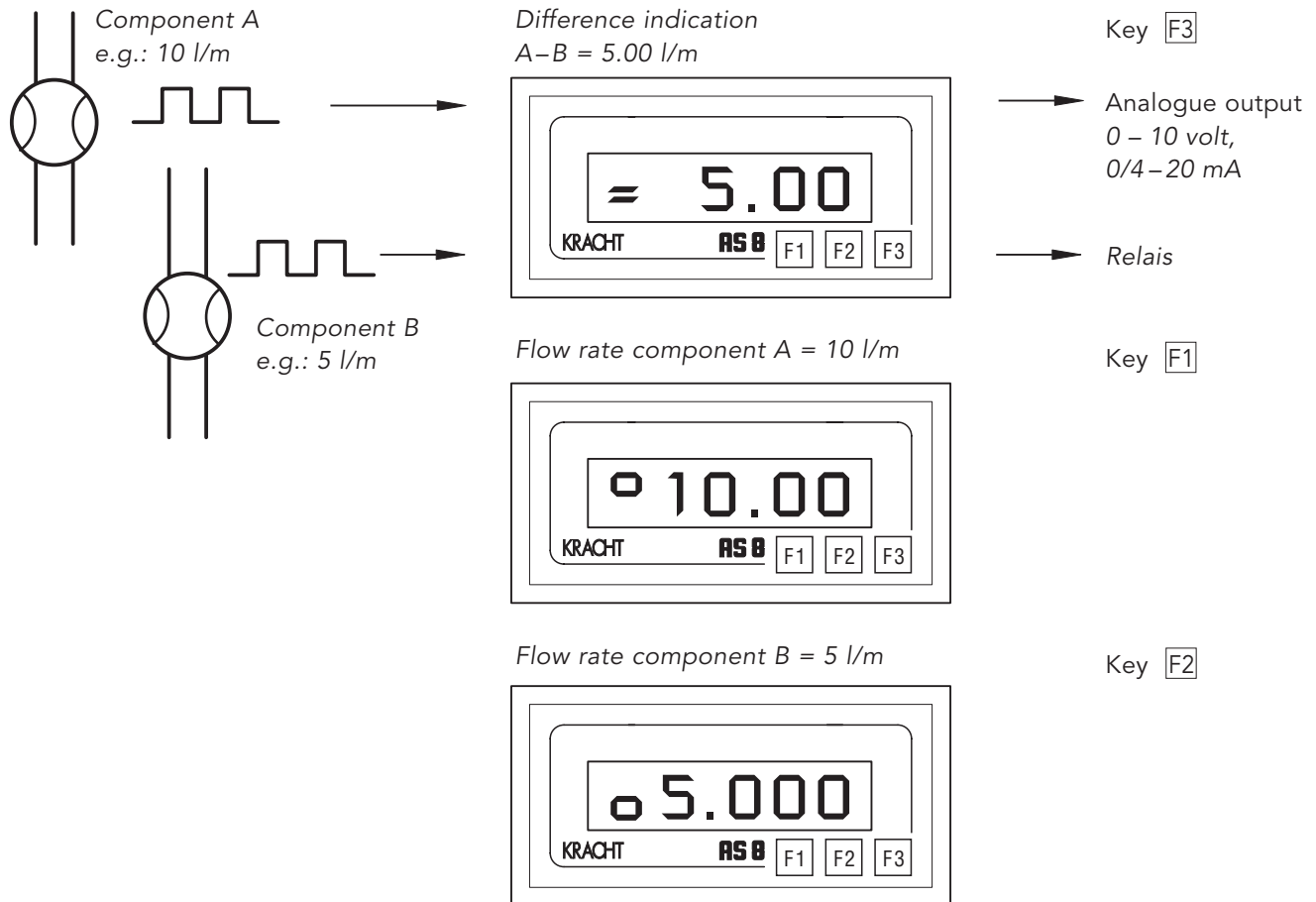
Flow Rate and Sum Measurement AS 8 - A2F

Component A
e.g.: 10 l/m

Component B
e.g.: 5 l/m

Sum indication
A + B = 15.00 l/m

≈ **15.00**

KRACHT **AS 8** F1 F2 F3

Flow rate component A = 10 l/m

▫ **10.00**

KRACHT **AS 8** F1 F2 F3

Flow rate component B = 5 l/m

▫ **5.000**

KRACHT **AS 8** F1 F2 F3

Key F3

Analogue output
0 – 10 volt,
0/4 – 20 mA

Relay

Key F1

Key F2

Functional Characteristics AS 8 - A2F

- Two volume counters could be connected to the AS 8-A2F. The AS 8 shows the flow rate of component A and B and the sum A + B.

- The different indications are switched by the keys F1 , F2 and F3 .

- For each volume counter a density factor can be put in.

- One square-wave signal is required of each volume counter. The input signals are filtered, converted and processed by the microcontroller to give a sum.

- The settings are made using the three keys on the front panel. The input values are arranged in menus.

- Two relay contacts, an analogue output or an RS 232 interface are available for additional external processing.

- The integrated 24 VDC transducer supply enables the direct connection of the volume counter.

- The type AS 8 series measuring devices are available as built-in control panel units, as bench units, or as 19" rackmounted units.
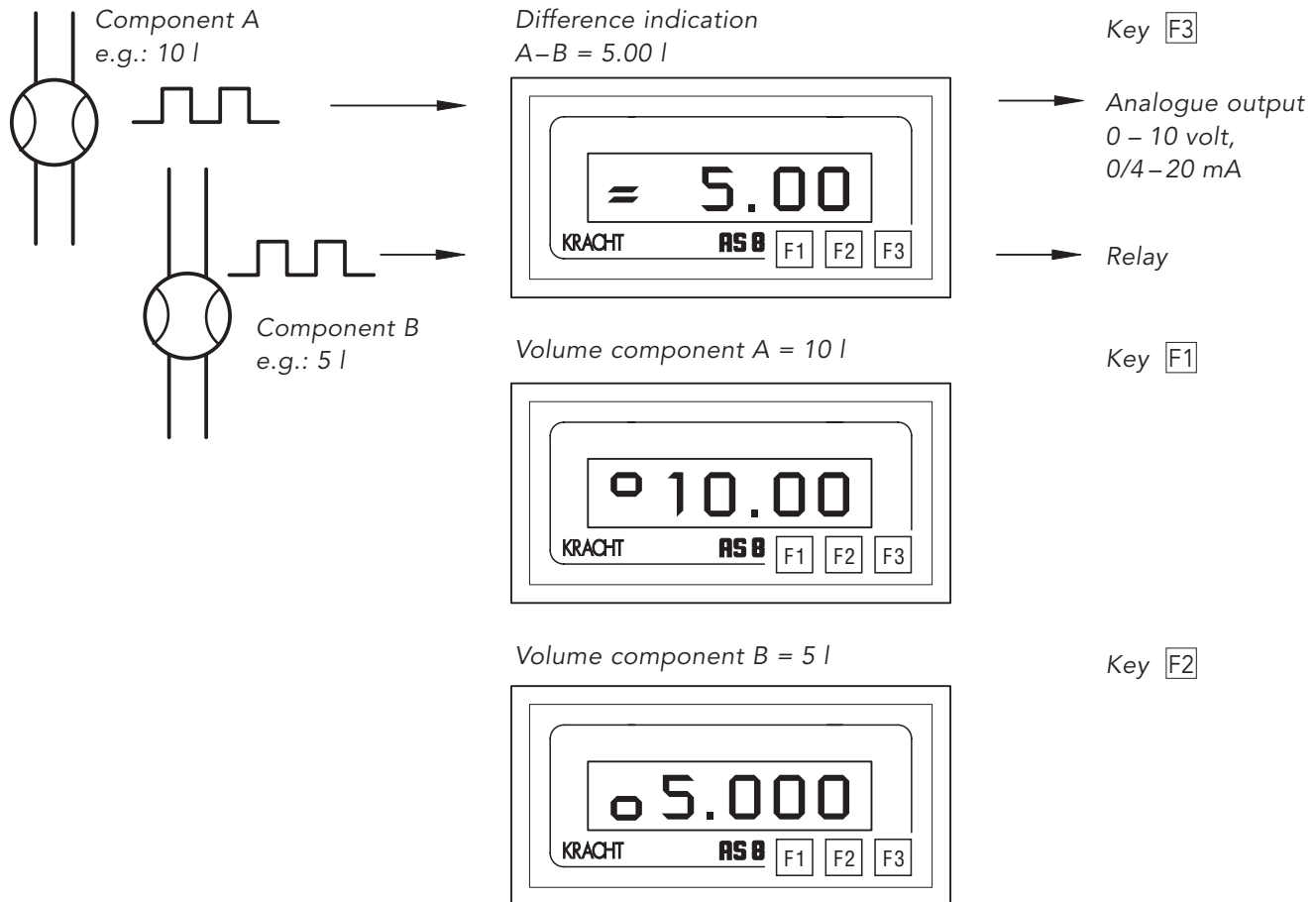
Flow Rate and Difference Measurement AS 8 - D 2 F

Component A
e.g.: 10 l/m

Component B
e.g.: 5 l/m

Difference indication
A – B = 5.00 l/m

≒ **5.00**

KRACHT **AS 8** F1 F2 F3

Flow rate component A = 10 l/m

⊙ **10.00**

KRACHT **AS 8** F1 F2 F3

Flow rate component B = 5 l/m

⊙ **5.000**

KRACHT **AS 8** F1 F2 F3

Key F3

Analogue output
0 – 10 volt,
0/4 – 20 mA

Relais

Key F1

Key F2

Functional Characteristics AS 8 - D2F

- Two volume counters could be connected to the AS 8-D2F. The AS 8 shows the flow rate of component A and B and the difference A–B.

- The different indications are switched by the keys F1, F2 and F3.

- For each volume counter a density factor can be input.

- One square-wave signal is required of each volume counter. The input signals are filtered, converted and processed by the microcontroller to display the difference.

- The settings are made using the three keys on the front panel. The input values are arranged in menus.

- Two relay contacts, an analogue output or an RS 232 interface are available for additional external processing.

- The integrated 24 VDC transducer supply enables the direct connection of the volume counter.

- The type AS 8 series measuring devices are available as built-in control panel units, as bench units, or as 19 " rackmounted units.
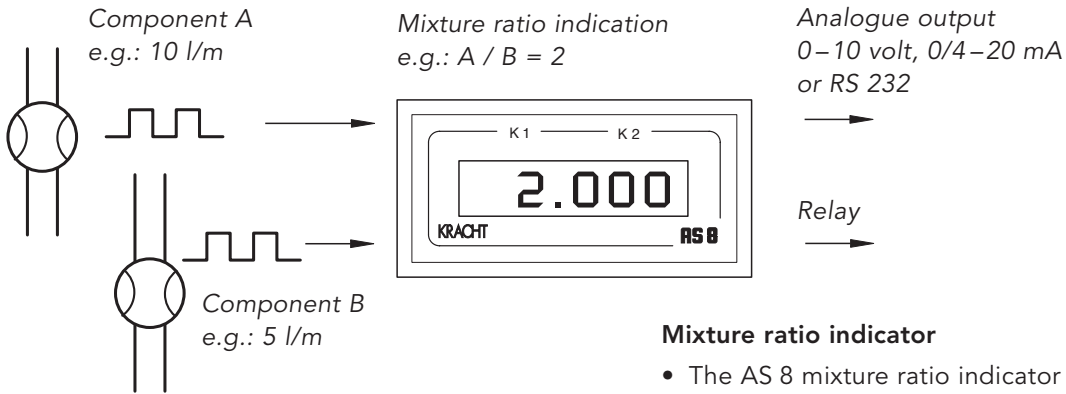
Volume and Difference Measurement AS 8 - D2C

Component A
e.g.: 10 l

Component B
e.g.: 5 l

Difference indication
A – B = 5.00 l

Key F3

Analogue output
0 – 10 volt,
0/4 – 20 mA

Relay

Volume component A = 10 l

Key F1

Volume component B = 5 l

Key F2

Functional Characteristics AS 8 - D2C

- Two volume counters could be connected to the AS 8-D2C. The AS 8 shows the volume of component A and B and the difference A – B.

- The different indications are switched by the keys F1, F2 and F3.

- For each volume counter a density factor can be input.

- One square-wave signal is required of each volume counter. The input signals are filtered, converted and processed by the microcontroller to display the difference.

- The settings are made using the three keys on the front panel. The input values are arranged in menus.

- Two relay contacts, an analogue output or an RS 232 interface are available for additional external processing.

- The integrated 24 VDC transducer supply enables the direct connection of the volume counter.

- The type AS 8 series measuring devices are available as built-in control panel units, as bench units, or as 19 " rackmounted units.
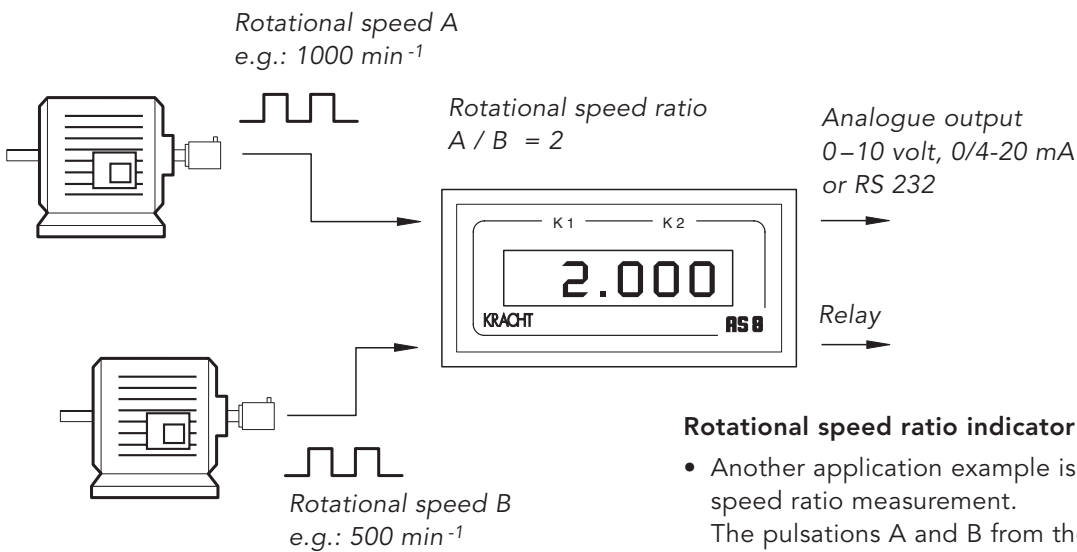
Mixture ratio measurement AS 8 - VA

Component A
e.g.: 10 l/m

Mixture ratio indication
e.g.: A / B = 2

Analogue output
0 – 10 volt, 0/4 – 20 mA
or RS 232

Relay

K 1   K 2

2.000

KRACHT   AS 8

Component B
e.g.: 5 l/m

Mixture ratio indicator

- The AS 8 mixture ratio indicator displays the mixture ratio of two components.
- A square-wave signal is required from each volume counter. The input signals are filtered, converted and processed by the micro-controller to give a mixture ratio.

Rotational Speed Ratio Measurement AS 8 - VA

Rotational speed A
e.g.: 1000 min $^{-1}$

Rotational speed ratio
A / B = 2

Analogue output
0 – 10 volt, 0/4-20 mA
or RS 232

K 1   K 2

2.000

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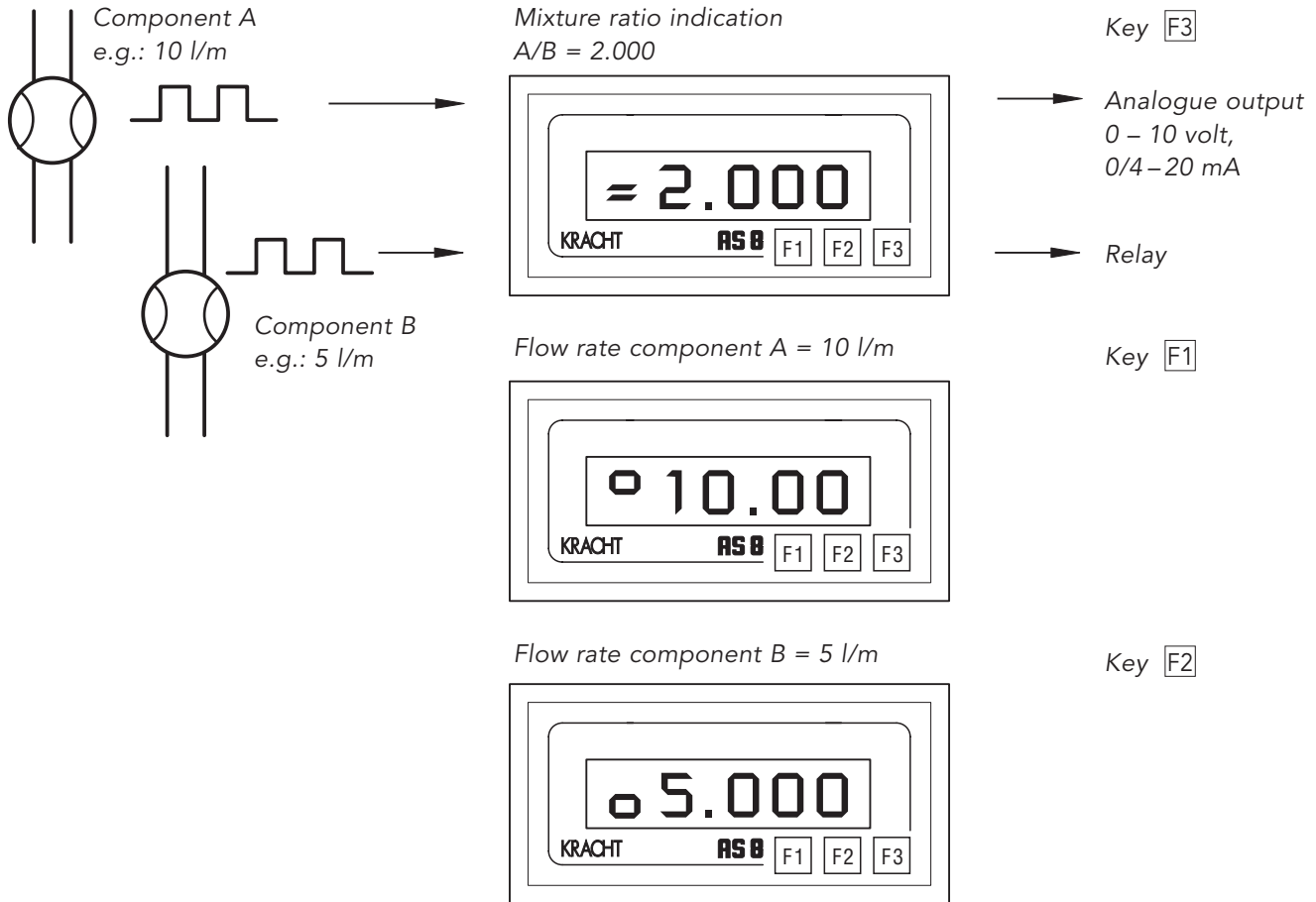
Relay

Rotational speed B
e.g.: 500 min $^{-1}$

Rotational speed ratio indicator

- Another application example is that of rotational speed ratio measurement.
  The pulsations A and B from the rotary transducers are detected and indicated on the AS 8 as a rotational speed ratio.

Functional Characteristics AS 8 - VA

- Two programmable relays, an analogue output, or an RS 232 serial interface, are available for further external processing.
- The programming and settings are achieved via three keys, accessible on removal of the front cover. Optional via keys on front panel (version /F).

- The integrated 24 VDC transducer supply enables the direct connection of the volume counter.
- The type AS 8 series measuring devices are available as built-in control panel units, as bench units, or as 19" rack-mounted units.
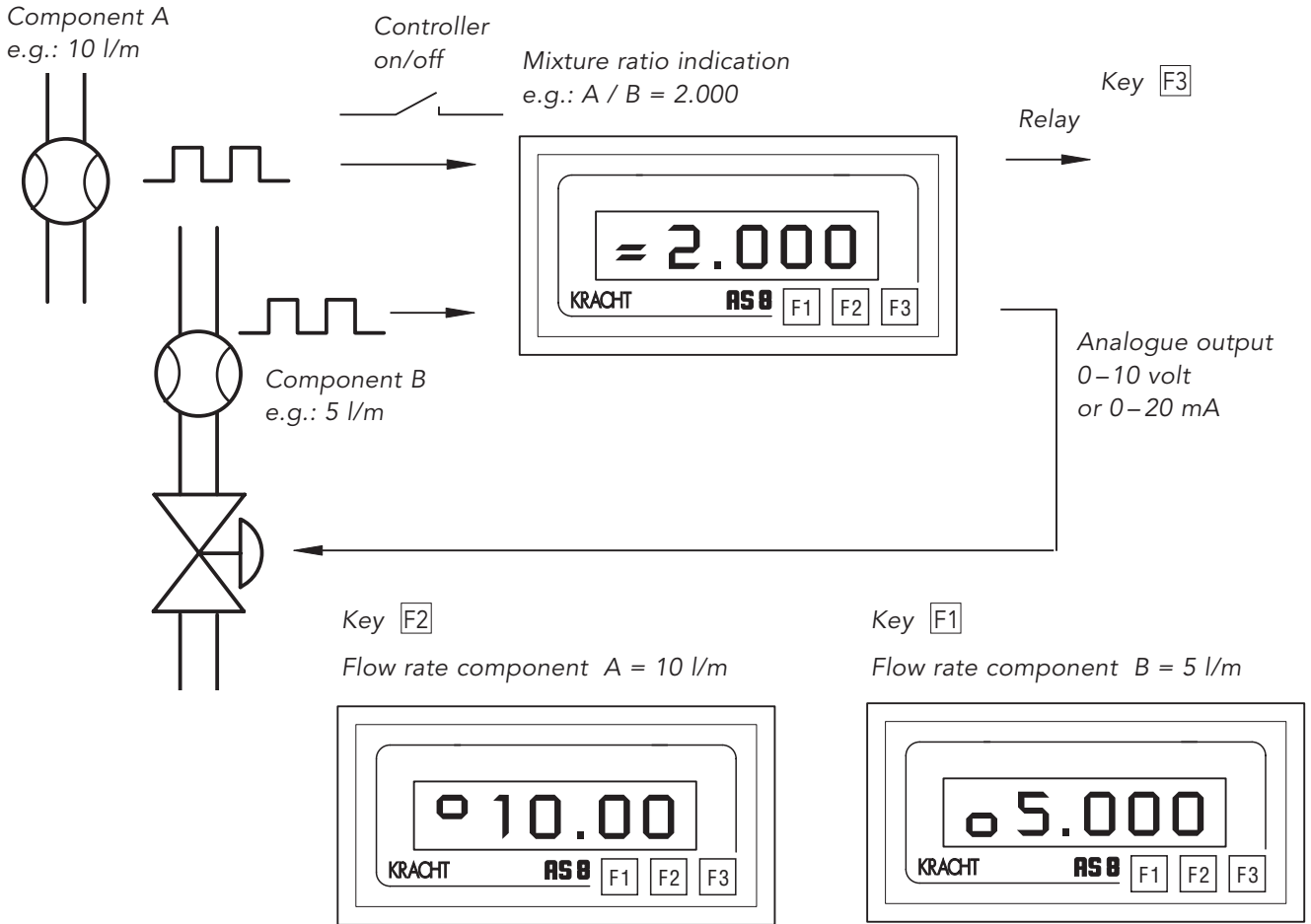
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Flow Rate and Ratio Measurement AS 8 - V2F

Component A
e.g.: 10 l/m

Component B
e.g.: 5 l/m

Mixture ratio indication
A/B = 2.000

≂ 2.000

KRACHT   AS 8   F1 F2 F3

Flow rate component A = 10 l/m

◘ 10.00

KRACHT   AS 8   F1 F2 F3

Flow rate component B = 5 l/m

◦ 5.000

KRACHT   AS 8   F1 F2 F3

Key F3

Analogue output
0 – 10 volt,
0/4 – 20 mA

Relay

Key F1

Key F2

Functional Characteristics AS 8 - V2F

- Two volume counters could be connected to the AS 8-V2F. The AS 8 shows the flow rate of component A and B and the mixture ratio A/B.

- The different indications are switched by the keys F1, F2 and F3.

- For each volume counter a density factor can be input.

- One square-wave signal is required of each volume counter. The input signals are filtered, converted and processed by the microcontroller to give a mixture ratio.

- The settings are made using the three keys on the front panel. The input values are arranged in menus.

- Two relay contacts, an analogue output or an RS 232 interface are available for additional external processing.

- The integrated 24 VDC transducer supply enables the direct connection of the volume counter.

- The type AS 8 series measuring devices are available as built-in control panel units, as bench units, or as 19" rackmounted units.

Ratio Controller AS 8 - PUR

Component A
e.g.: 10 l/m

Controller
on/off

Mixture ratio indication
e.g.: A / B = 2.000

Key F3

Relay

$\approx$ 2.000

KRACHT   AS 8 F1 F2 F3

Analogue output
0 – 10 volt
or 0 – 20 mA

Component B
e.g.: 5 l/m

Key F2

Flow rate component A = 10 l/m

Key F1

Flow rate component B = 5 l/m

10.00

KRACHT   AS 8 F1 F2 F3

5.000

KRACHT   AS 8 F1 F2 F3

Functional Characteristics AS 8 - PUR

- The ratio controller version of the AS 8 controls the mixture ratio of two components and shows the flow rate of the components A and B as well as the mixture ratio A/B.

- The different indications are switched by the keys F1, F2 and F3.

- The volumetric flows are detected by the volume counter and fed to the AS 8 as square-wave signals. The input signals are filtered, converted and processed by the microcontroller, to give a mixture ratio. The controller output is either directly connected, or connected via a position amplifier, to a continuously controllable valve, or used to control the speed of a dosing pump.

- Two relay contacts enable the overshoot of permissible error bandwidths to be signalled.

- All settings are made using three keys, which are accessible behind the front cover. Optional via keys on front panel (version /F). The input values are arranged in menus.

- The integrated 24 VDC transducer supply enables the direct connection of the volume counter.

- The type AS 8 series measuring devices are available as built-in control panel units, as bench units, or as 19" rackmounted units.
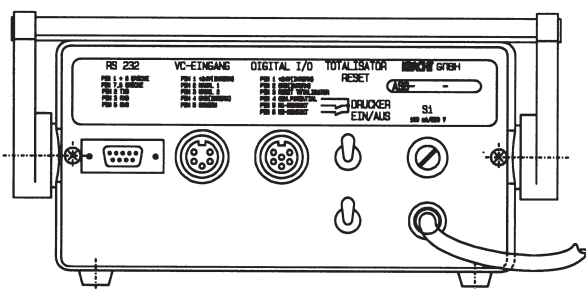
KRACHT

AS 8 in the Desk-top Housing

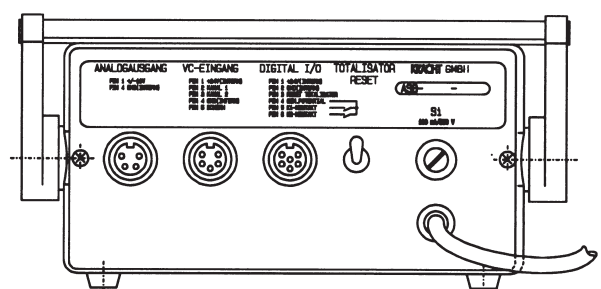The desk-top housing is available with analogue output or serial interface.

Front view
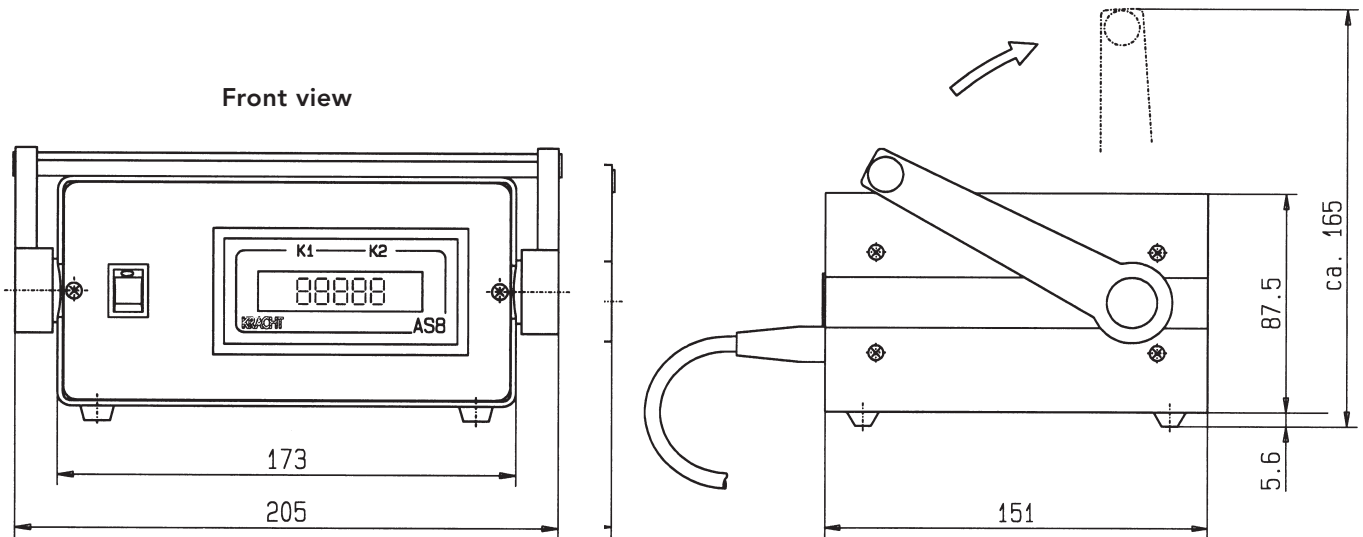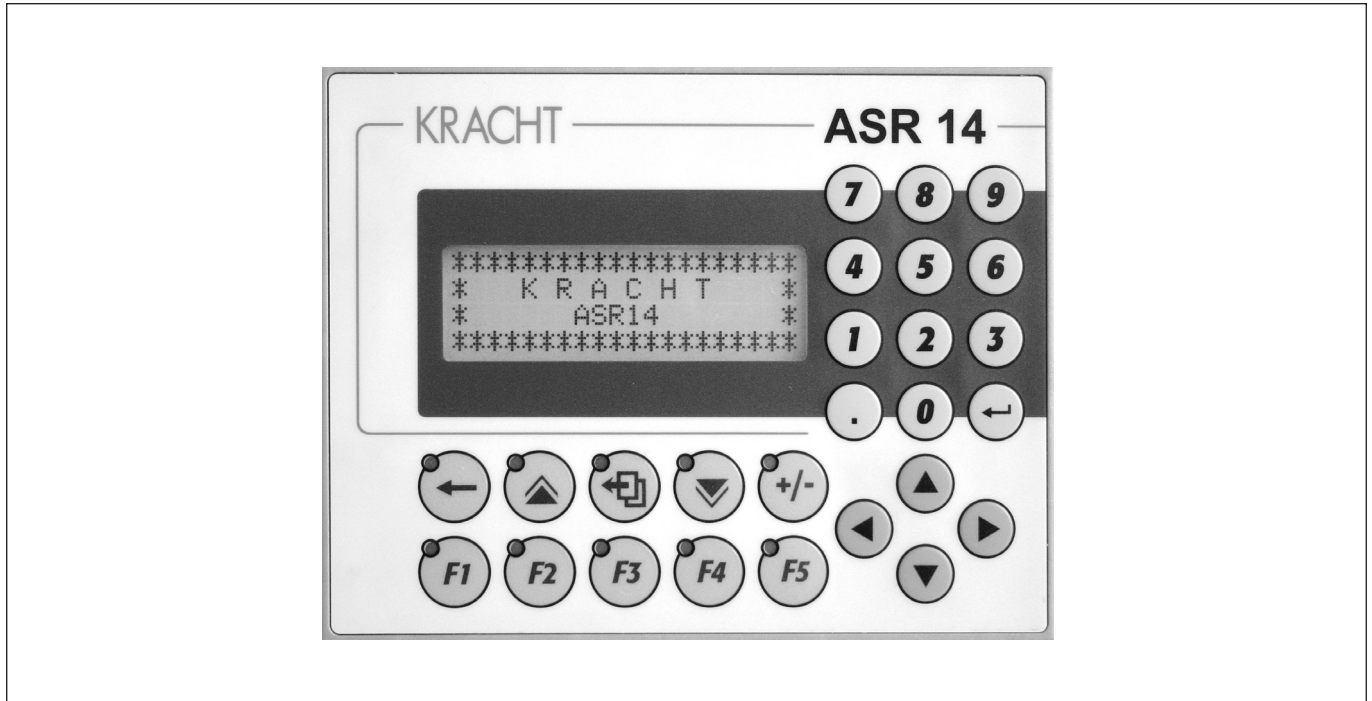
Dimensions in mm

Rear view with RS 232

Rear view with analogue output

Function and Product Characteristics ASR 14

Function ASR 14

- The ASR 14 integrates controlling, operating and visualizing.

- The ASR 14 processes incremental signals.

- A CAN-Bus Interface allows the connection of further In-/Output channels.

- The programming of the ASR 14 can be adapted optimally for the specific applications.

- Optimal for the controlling of batching applications (e.g. metering of gear box oil).).

Product Characteristics ASR 14

- LC-Display with illuminated background with 4 x 20 characters.

- Used for KRACHT flow meters and other sensors with 24 V incremental signals.

- Power supplies 24 V DC.

- 16 digital inputs, 2 of these are counter inputs with one channel or 1 counter input two channels.

- 16 digital outputs.

- For flow rate measurement and totalizing.

- With RS232 interface.

- With CAN-Bus-interface.

KRACHT

Technical Data ASR 14

Power unit

Power supply	24 V DC
Power consumption	max. 6 W

General characteristics

Display	LC-Display, black / white, 4 x 20 characters, illuminated background
Keyboard	26 function keys (10 with LED)
Housing	housing for switch panel plug-in
Panel frame	153 x 120 x 46.1 mm (w x h x d)
Insertion depth	41.6 mm
Panel cutout	141 x 108 mm
Protection	IP 65 (front side)
Weight	0.5 kg

Operating conditions

|	
Ambient temperature	0 °C to 50 °C
Humidity when operating	10 % to 90 % (not condensating)
Storage temperature	– 20 °C to 60 °C
Humidity at storage	5 % to 95 % (not condensating)

Inputs and outputs

Digital Inputs	16; 2 of these are counter inputs (one channel)
Input voltage	24 V DC
Input current 24 V	ca. 10 mA
Digital outputs	16
Switching voltage	24 V DC
Output current	0.5 A

Interfaces

Type 1	RS232
Execution	9pins DSUB-connector
Potential separation	no
Max. baud rate	115.2 kBits/s
Type 2	CAN-bus
Execution	9pins DSUB-connector
Potential separation	yes

KRACHT
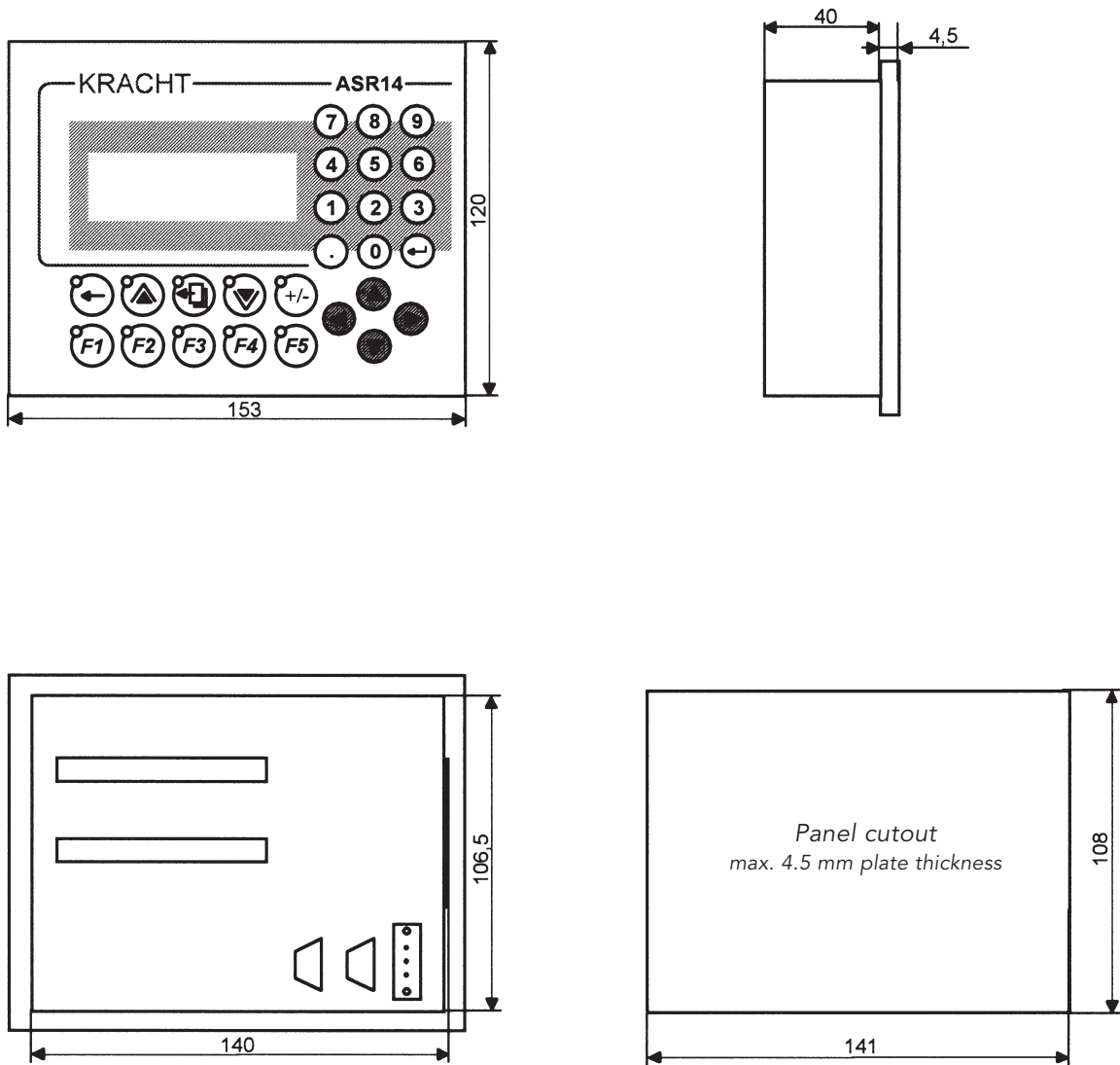
Dimensions ASR 14

Dimensions in mm

Function and Product Characteristics ASR 20
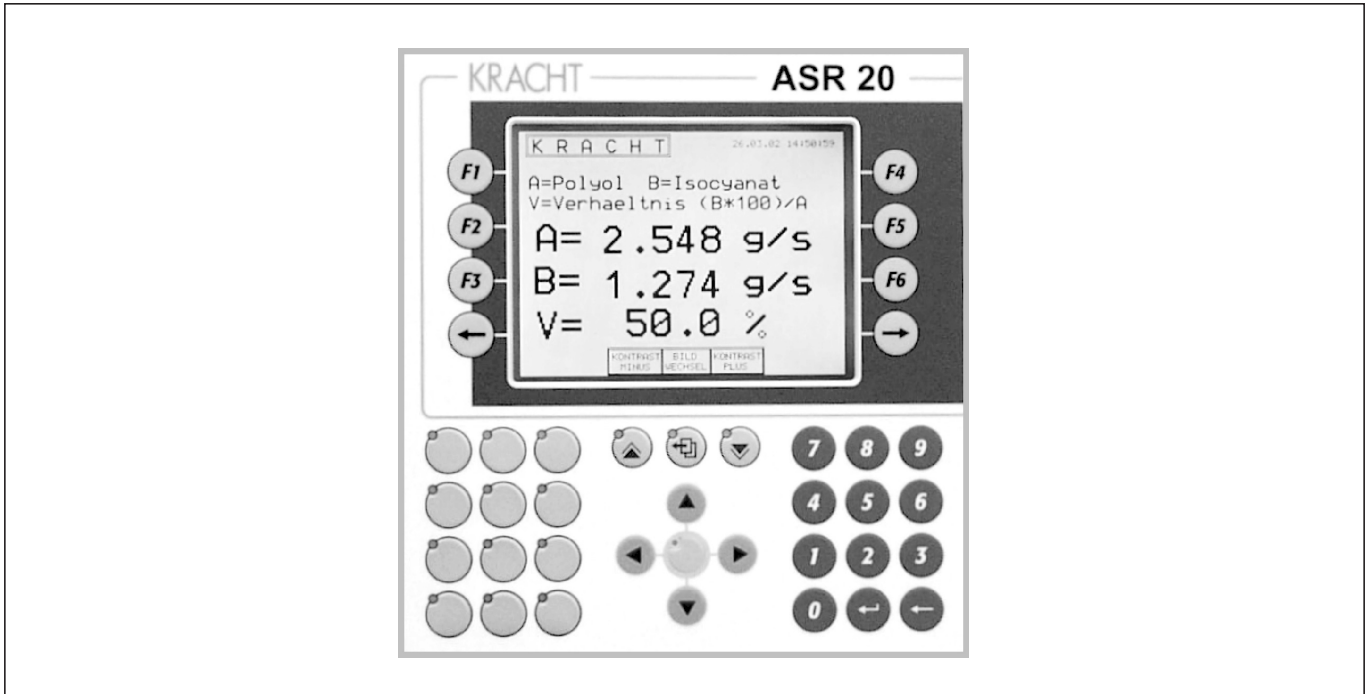
Function ASR 20

- The ASR 20 is a combination of operator panel and controller in one device.
  Many flow specific applications may be controlled.

- The ASR 20 processes incremental signals.

- Standardized programs are available for a wide variety of applications.

- The number of inputs and outputs can be adjusted to the specific application.

- Relay contacts, analogue outputs and serial interfaces are available for further external processing.

- The measured values are indicated on a LC-display.

Product Characteristics ASR 20

- Used for KRACHT volume counters and other sensors with 24 V incremental signals.

- Up to 6 additional modules can be used.

- Analogue inputs allow the connection of pressure transducers, temperature sensors and the like.

- The input signals are filtered in the unit, interpreted and converted into the physical sizes of flow rate and volume.

KRACHT

Technical Data ASR 20

Power unit
Supply	24 VDC ± 25 %
Power consumption	max. 20 W

General data
Display	5.7 " QVGA (320 x 240 characters) black/white LC-display, illuminated background
Keyboard	8 softkeys and 32 function keys
Housing	housing for switch panel plug-in
Panel frame	205 x 220 mm (w x h)
Insertion depth	136 mm with plug board
Panel cutout	191 x 202 mm
Protection	IP 65 (front side)
Weight	approx. 1.95 kg

Operating conditions
|	
Mounting position	horizontal ± 45°
Ambient temperature	0 to 50°C (depending on mounting)
Humidity when operating	10 % to 90 % (not condensating)
Storage temperature	– 20 to 60°C
Humidity at storage	5 % to 95 % (not condensating)

Inputs and outputs of the basic device
Digital inputs	10; 4 of these are counter inputs (one channel)
Input voltage	24 V ± 25 %
Input current at 24 V	approx. 4 mA
Digital outputs	9; 1 of these is a relay contact
Switching voltage	24 V ± 25 %
Output current	max. 0.4 A

Additional moduls
L.0090208203	Analogue input module	1 x ± 10 V or 0 – 20 mA (± 20 mA possible) potentiometer operating, 12 bit resolution
L.0090208204	Analogue input module	4 x ± 10 V, 12 bit resolution
L.0090209210	Analogue input module	4 x 0 – 20 mA
L.0090208205	Analogue output module	2 x ± 10 V or 0 – 20 mA (4 – 20 mA possible) 12 bit resolution
L.0090208206	Digital input module	10 digital inputs 24 VDC
L.0090208208	Digital input module	10 digital inputs, thereof 4 inputs for volume counters (one channel)
L.0090208207	Digital output module	8 digital outputs 24 VDC / 0.5 A
L.0090208217	Temp.-input module	2 x PT 100 3-line from – 200 °C to + 850 °C
L.0090208213	RS 232-module	interface RS 232
L.0090208228	RS 485-module	interface RS 485

Dimensions ASR 20
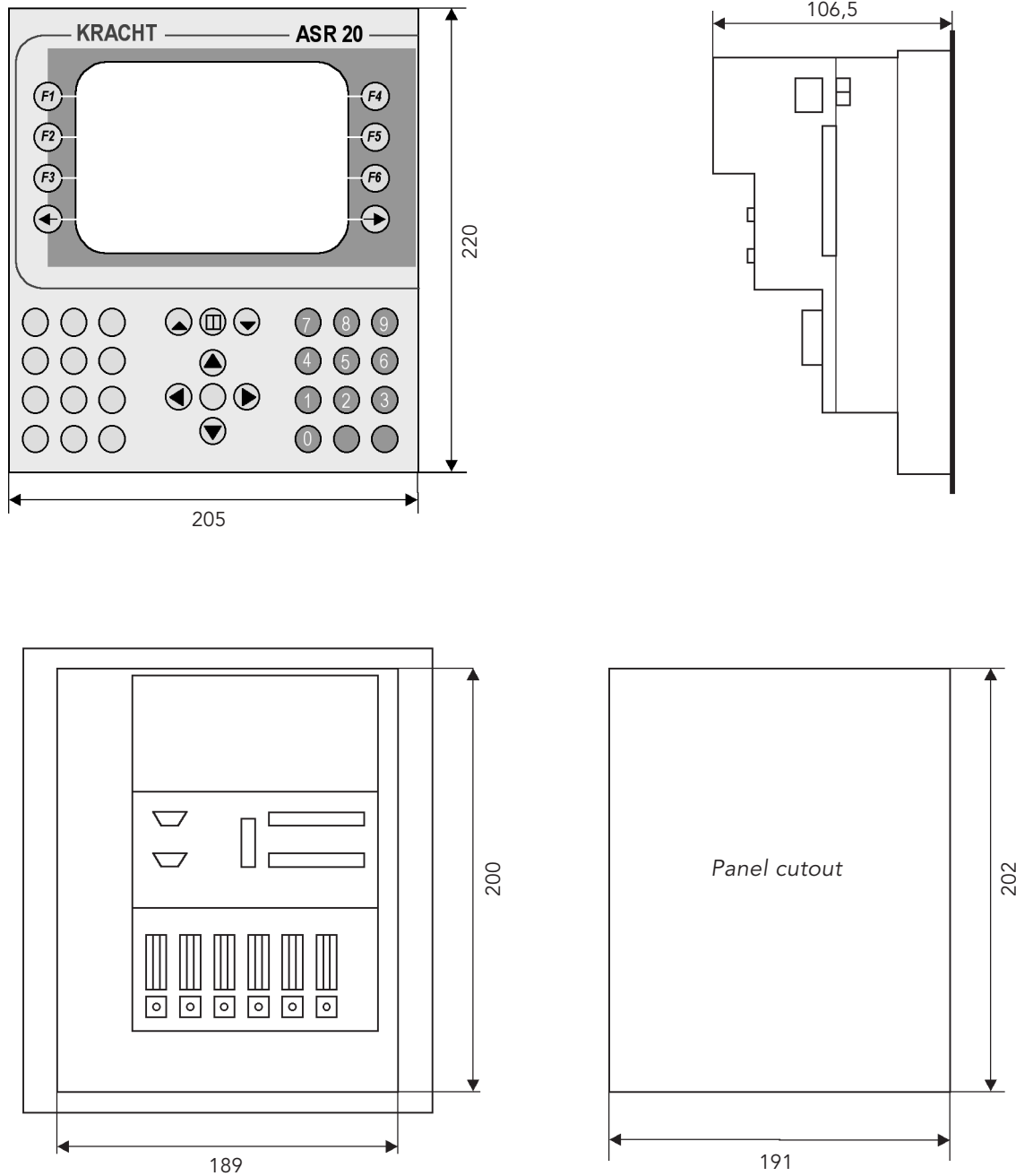
Dimensions in mm

Product Portfolio

Transfer Pumps

Transfer pumps for lubricating oil supply equipment, low pressure filling and feed systems, dosing and mixing systems.

Mobile Hydraulics

Single and multistage high pressure gear pumps, hydraulic motors and valves for construction machinery, vehicle-mounted machines.

Flow Measurement

Gear and turbine flow meters and electronics for volume and flow metering technology in hydraulics, processing and laquering technology.

Industrial Hydraulics / Test Bench Construction

Cetop directional control and proportional valves, hydraulic cylinders, pressure, quantity and stop valves for pipe and slab construction, hydraulic accessories for industrial hydraulics (mobile and stationary use).

Technology Test benches / Fluid Test benches.

Electonic / GB / 04.09

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