Electronic

SD1, AS 8, ASR 14, ASR 20
## Contents

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>List of contents</td>
<td>3</td>
</tr>
<tr>
<td>Function and characteristics</td>
<td>SD 1</td>
</tr>
<tr>
<td>Technical data</td>
<td>SD 1</td>
</tr>
<tr>
<td>Type key, dimensions and electrical connection</td>
<td>SD 1</td>
</tr>
<tr>
<td>Function and product characteristics</td>
<td>AS 8</td>
</tr>
<tr>
<td>Technical data</td>
<td>AS 8</td>
</tr>
<tr>
<td>Type key</td>
<td>AS 8</td>
</tr>
<tr>
<td>Dimensions</td>
<td>AS 8</td>
</tr>
<tr>
<td>Flow rate / Volumetric measurement</td>
<td>AS 8</td>
</tr>
<tr>
<td>Flow rate controller</td>
<td>AS 8</td>
</tr>
<tr>
<td>Dosing</td>
<td>AS 8</td>
</tr>
<tr>
<td>Cylinder stroke measurement</td>
<td>AS 8</td>
</tr>
<tr>
<td>Flow rate and sum measurement  A2F</td>
<td>AS 8</td>
</tr>
<tr>
<td>Flow rate and difference measurement  D2F</td>
<td>AS 8</td>
</tr>
<tr>
<td>Volume and difference measurement  D2C</td>
<td>AS 8</td>
</tr>
<tr>
<td>Ratio measurement</td>
<td>AS 8</td>
</tr>
<tr>
<td>Flow rate and ratio measurement  V2F</td>
<td>AS 8</td>
</tr>
<tr>
<td>Ratio controller</td>
<td>AS 8</td>
</tr>
<tr>
<td>AS 8 in the desk-top housing</td>
<td>AS 8</td>
</tr>
<tr>
<td>Function and product characteristics</td>
<td>ASR 14</td>
</tr>
<tr>
<td>Technical data</td>
<td>ASR 14</td>
</tr>
<tr>
<td>Dimensions</td>
<td>ASR 14</td>
</tr>
<tr>
<td>Function and product characteristics</td>
<td>ASR 20</td>
</tr>
<tr>
<td>Technical data</td>
<td>ASR 20</td>
</tr>
<tr>
<td>Dimensions</td>
<td>ASR 20</td>
</tr>
<tr>
<td>Product portfolio</td>
<td>28</td>
</tr>
</tbody>
</table>
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.
## Technical Data SD 1

<table>
<thead>
<tr>
<th>Processor</th>
<th>PIC 17 C 42</th>
</tr>
</thead>
</table>

### Power unit
- Supply: 19 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
- **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**: $P_{\text{amax}} = \text{max.} 0.3 \text{ W}$
- **Ambient conditions**: Operating temperature: 0 °C up to + 60 °C, Storage temperature: -25 °C up to + 85 °C

## Technical Data SD 1 - Service

<table>
<thead>
<tr>
<th>Processor</th>
<th>PIC 17 C 42</th>
</tr>
</thead>
</table>

### 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

KRACHT GmbH · Gewerbestr. 20 · 58791 Werdohl, Germany · fon +49(0)23 92/935-0 · fax +49(0)23 92/935 209 · mail info@kracht.eu · web www.kracht.eu
Electronic SD1

Type Key SD1

Ordering example

<table>
<thead>
<tr>
<th>SD1</th>
<th>R</th>
<th>24 / V</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product name</td>
<td>Operating voltage</td>
<td></td>
</tr>
<tr>
<td>Without specification =</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flow rate measurement</td>
<td>Volume measurement</td>
<td></td>
</tr>
</tbody>
</table>

Output signal

- **R**: square wave signal
- **I**: current output 0 – 20 mA, 4 – 20 mA
- **K**: two relay contacts 24 VDC / 1A

Dimensions SD1

Electrical Connection SD1

**Version: K**

- PIN 1 = 12/24 VDC
- PIN 2 = GND
- PIN 3 = Relay 1
- PIN 4 = Relay 2

**Version: I**

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

**Version: R**

- PIN 1 = 12/24 VDC
- PIN 2 = GND
- PIN 3 = Channel 1
- PIN 4 = Channel 2

At version V = Volume measurement on Pin  = “Enable Summation”
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.

**Function**

- 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

**Product Characteristics**
### Technical Data AS 8

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

### 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 impedance | >= 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 impedance | >= 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 x 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 |
Electronic AS 8

Type Key AS 8

**Ordering example**

<table>
<thead>
<tr>
<th>Product name</th>
<th>Power supply voltage</th>
<th>Versions</th>
<th>Keyboard</th>
</tr>
</thead>
<tbody>
<tr>
<td>AS 8</td>
<td></td>
<td>without specification</td>
<td>without specification =</td>
</tr>
<tr>
<td>U</td>
<td>230 V – 50/60 Hz</td>
<td>Standard = Flow rate or volumetric measurement</td>
<td></td>
</tr>
<tr>
<td>230</td>
<td>120 V – 50/60 Hz</td>
<td>RP</td>
<td>Flow rate controller</td>
</tr>
<tr>
<td></td>
<td>24 VDC</td>
<td>DOS</td>
<td>Dosing program</td>
</tr>
<tr>
<td></td>
<td>12 VDC</td>
<td>ZM</td>
<td>Cylinder stroke measurement</td>
</tr>
<tr>
<td></td>
<td></td>
<td>A2F</td>
<td>Flow rate and sum measurement</td>
</tr>
<tr>
<td></td>
<td></td>
<td>D2F</td>
<td>Flow rate and difference measurement</td>
</tr>
<tr>
<td></td>
<td></td>
<td>D2C</td>
<td>Volume and difference measurement</td>
</tr>
<tr>
<td></td>
<td></td>
<td>VA</td>
<td>Ratio measurement</td>
</tr>
<tr>
<td></td>
<td></td>
<td>V2F</td>
<td>Flow rate and ratio measurement</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PUR</td>
<td>Ratio controller</td>
</tr>
<tr>
<td></td>
<td></td>
<td>FM20</td>
<td>Flow rate indication switchable for all KRACHT volume counter</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SIM</td>
<td>Simulator for volumetric meter</td>
</tr>
</tbody>
</table>

**Optional:** Desktop unit 19" plug-in unit
Electronic AS 8

Dimensions AS 8

Panel cutout

Dimensions in mm

Terminals

Dimensions in mm
Flow Rate Measurement AS 8-Standard

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

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

Two relay contacts

Volume counter

Incremental encoder signals

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

Flow rate indication
e.g.: 20 l

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

Two relay contacts

Volume counter

Incremental encoder signals

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

- 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).

Rotational Speed Controller AS 8 - RP

- 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

- 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.
Electronic AS 8

Dosing 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

- 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 microcontroller 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.

### Functional Characteristics AS 8 - ZM

- Reset (Zero position)
- Cylinder position, e.g.: 200 mm
- Two relay contacts
- Volume counter
- Analogue output
  - ± 10 volt, 0–10 volt
  - ± 20 mA, 0–20 mA,
  - 4–20 mA or RS 232
- Electronic AS 8
- Cylinder Stroke Measurement AS 8 - ZM
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
- Flow rate component A = 10 l/m
- Flow rate component B = 5 l/m
- Analogue output: 0 – 10 volt, 0/4 – 20 mA
- Relay

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.
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

Volume component A = 10 l

Key F1

Difference indication

A–B = 5.00 l

Analogue output

0 – 10 volt,
0/4 – 20 mA

Key F3

Component B

e.g.: 5 l

Volume component B = 5 l

Key F2

Analogue output

0 – 10 volt,
0/4 – 20 mA

Relay

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.
电子 AS 8

混合比例测量 AS 8-VA

- 两个可编程继电器，一个模拟输出，或者 RS 232 串行接口，可用于进一步外部处理。
- 程序和设置通过三个键实现，可从前面板拆下。
- 通过前面板上的键（版本 /F）是可选的。

功能特性 AS 8-VA

- 两个可编程继电器，一个模拟输出，或者 RS 232 串行接口，可用于进一步外部处理。
- 程序和设置通过三个键实现，可从前面板拆下。
- 可选通过前面板上的键（版本 /F）。

混合比例指示器
- AS 8 混合比例指示器显示两个组件的混合比例。
- 从每个体积计数器所需的方波信号。输入信号由微控制器进行过滤、转换和处理，以给出混合比例。

旋转速度比测量 AS 8-VA

- 另一个应用示例是旋转速度比测量。
- 通过两个旋转传感器检测到的脉冲 A 和 B 在 AS 8 上作为旋转速度比表示。

旋转速度比指示器
- 另一个应用示例是旋转速度比测量。
- 旋转速度 A
  - 例如：1000 min⁻¹
- 旋转速度 B
  - 例如：500 min⁻¹

- 旋转速度比
  - A / B = 2

- 模拟输出
  - 0-10 伏特，0/4-20 毫安
  - 或 RS 232

- 继电器
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

**Flow rate component A = 10 l/m**

**Flow rate component B = 5 l/m**

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

**Relay**

Key **F3**

**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.
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.
Electronic AS 8

AS 8 in the Desk-top Housing

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

Front view

Rear view with RS 232

Rear view with analogue output

Dimensions in mm
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.
## 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
Dimensions ASR 14

Panel cutout
max. 4.5 mm plate thickness

Dimensions in mm
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.
### 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 condensing)
- **Storage temperature**: -20 to 60°C
- **Humidity at storage**: 5% to 95% (not condensing)

### 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 modules
- **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.0090208207**: Digital input module 10 digital inputs, thereof 4 inputs for volume counters (one channel)
- **L.0090208208**: 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
Electronic ASR 20

Dimensions ASR 20

Panel cutout

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.