Operating instructions

BSD0104EN

Plug-in display unit SD 1

BSD1EN_D0025710002-02

Englisch

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1 General points

1.1 About the documentation

These operating instructions describe the installation and operation of the plug-in display unit **SD 1**, also referred to below as the device.

The device is manufactured in different versions. Information about the version concerned in the individual case can be found on the device's type plate.

The structure of the type designation can be found in the chapter 3 “Device description”.

If you have any questions about this operating manual, please contact the manufacturer.

1.2 Manufacturer´s address

Kracht GmbH

Gewerbestraße 20

DE 58791 Werdohl

phone: +49 (0) 23 92 / 935-0

fax: +49 (0) 23 92 / 935-209

email: info@kracht.eu

web: www.kracht.eu

1.3 Intended use

The electronic device has been constructed according to the latest technical standard. Only use it:

- in a perfect technical condition,
- intended use,
- conscious of safety and danger, taking the operating instructions into account.

The device may only be used when it is in a proper condition.

The device must not be used in potentially explosive areas, for medical equipment or in areas expressly named according to VDE 0411 Part 100.

Deviations from the above-mentioned data and operating conditions require express approval by the manufacturer and/or are specified on the type plate.

Type plates or other references on the device must not be removed nor made unlegible or unrecognisable.

In cases of noncompliance, all warranty and manufacturer responsibility shall be void.

2 Safety

2.1 Safety instructions and symbols

The safety notices in these operating instructions are marked with caution symbols.
Non-compliance can lead to hazards for people and the device.
In addition, the safety instructions are marked with signal words. They have the meanings as explained below:
Caution: Identification of a low risk hazard, which could lead to minor or medium bodily injury if not avoided.
Warning: Identification of a potential medium risk hazard, which would lead to death or severe bodily injury if not avoided.
Danger: Identification of an immediate hazard, which would result in death or severe bodily injury if not avoided.

Notice: Flagging of notices to prevent property damage.

Flagging of special user tips and other especially useful or important information.

2.2 Personnel qualification and training

The personnel designated to install, operate and maintenace the device must be properly qualified. This can be through training or specific instruction. Personnel must be familiar with the contents of this operating manual.

2.3 General safety instructions

The operational safety of the device delivered is only guaranteed when it is used for the intended purpose (see chapter 1 “General points”).
The limit values given must never be exceeded (see chapter 4 “Technical data”).
National regulations concerning accident preventation and health and safety at work must be observed, as well as internal regulations laid down by the operator, even of these are not specifically mentioned in this manual.
The operator must ensure that this operating manual is accessible to the personnel responsible at all times.

2.4 Hazard statements

DANGER

Danger through failure or incorrect operation!

When using the device to control machines or processes, incorrect operation or device failure can lead to damage and functional problems with the device or to accidents resulting in severe injuries or death.

- Suitable safety precautions must be taken when the device is used.

DANGER

Danger due to electric voltage!

Danger of death due to electric shock.

- Follow the special safety regulations during all work on electrical installations.
- Only allow electricians to work on electrical systems.

DANGER

Danger through changes!

In the case of changes (including operating behaviour) that can impair safety, the device can be damaged or functional problems can lead to accidents with serious injuries or death.

- Switch the device off immediately in the case of any changes.

3 Device description

3.1 General points

The plug-in display SD 1 is a universal display for flexible use for all volume counter systems made by KRACHT that are fitted with a plug connection in accordance with DIN 43650.

The plug-in display is simply inserted between the connector and connector base on the volume counter. The plug-in display can be set to display flow or volume.

Retrofitting volume counters
Volume counters already delivered can also be operated with the plug-in display. For this, the pre-amplifier board is removed from the volume counter's connector (see section 6.5 "Connections" for new pin assignment).

The plug-in display can be freely programmed. All the necessary settings can be made using two keys. The programmed data are stored in an FRAM and are thus not lost even in the event of a power failure.

The plug-in display is optionally available with a current output proportional to flow (0-20 mA, 4-20 mA) with relay contacts or rectangular signals. In the case of current output or relay contacts, there are no rectangular signals.

Special versions are available on request.

3.2 Type key

Ordering example					
SD 1	**-**	**R**	**-**	**24**	**/V**
1.		2.		3.	4

Explanation of type key SD 1		
1.	**Product name**	
2.	**Version**	
	R	Rectangular signal (incremental signal)
	K	Relay contacts
	I	Current output 0-20 mA, 4-20 mA
3.	**Supply**	
	12	12 VDC
	24	24 VDC
4.	**Further program variants**	
	V	Volume measurement possible in connection with all versions

4 Technical data

4.1 General characteristics

General characteristics		
Display		Principle: 7-segment LED, 7,62 mm, red Display : 0.000 ... 9999 with floating point Overflow (>9999): Display 9999
Keypad		Two keys behind the fromt panel
Housing material		Aluminium
Dimensions		Height wihout connection ca. 35 mm, width ca. 60 mm, depth ca. 60 mm
Protection class (DIN 40050)		IP 65
Mass (Weight)		ca. 0,12 Kg
Connections		Connector DIN 43650 (4-pole), protected against recerse polarity
Ambient temperature	Working temperature	0 °C to 60 °C
	Storage temperature	-25 °C to 85 °C

4.2 Electrical data

Electrical data SD 1		
Processor		PIC 17C42
Mains adapter	Supply	12 VDC ± 20% 24 VDC ± 20%
	Maximum current consumption	ca. 120 mA

4.3 Version

Version SD 1	
Analogue output (optional)	Current output 0 - 20 mA, 4 - 20 mA Apparent ohmic resistance <= 250 ohm with 24 VDC supply Apparent ohmic resistance <= 50 ohm with 12 VDC supply Resolution 10 Bit, short.circuit proof
Impulse output	Incremental signal
Impulse amplitude	ca. 0,8 x supply voltage, depending on load
Impulse shape with symmetrical output signal	Rectangular, pulse-duty factor per channel 1:1 ± 15%
Impuls offset between the two channels	90°, ± 30°
Power output per channel	Maximum 0,3 W
Relay contacts	One ech normally open contact, 24 Volt / 1 ohmic load, typ. switching time 6 ms

5 Transport and storage

5.1 Transport damage

Inspect the device for shipping damage as soon as the delivery has been received.

If shipping damage is discovered, inform the shipping company.

If proper operation of the device is impaired by the damage, the device must be replaced or repaired. In that case, contact the manufacturer.

6 Installation

6.1 Connectiong supply voltage

Electrical connection is made through a plug-type connection in accordance with DIN 43650.

The device is operated using direct current 24 VDC or 12 VDC (see the device type plate for information on which version is involved in the individual case).

Connection is made at the terminals:

Terminal 1	+24 VDC to +12 VDC
Terminal 2	GND

The device is available in three expansion stages:

- **SD 1-R** with two rectangular signals offset by 90°,
- **SD 1-I** with analogue output (0-20 mA / 4-20 mA),
- **SD 1-K** with relay contacts.

The contacts vary in the different expansion stages.

6.1.1 Connecting rectangular outputs

Connection is made at the terminals:

Terminal 3	Channel 1
Terminal ⏚	Channel 2

If the device is operated with a volume counter that is equipped with two sensors, we talk about a two-channel version.

If the device is operated with a volume counter that is only equipped with one sensor, we talk about a one-channel version. There is no channel 2 signal.

☞

Setting the volume counter version

- The one-channel or two-channel volume counter version is set at the device.
- This setting is done under menu code "**08**" at the position "**Count input**".
- Entering a "**0**" sets the two-channel version, entering a "**1**" sets the one-channel version (see section 7.3 “Overview of input values”).

6.1.2 Connecting analogue output

Connection is made at the terminals:

Terminal 3	Analogue output **(+)**
Terminal 2	GND

Setting the analogue signal

- 0-20 mA and 4-20 mA can be selected as signals.
- This setting is done under menu code "**08**" at the position "**Analogue signal**".
- Entering a "**0**" sets the device for 0-20 mA, entering a "**1**" sets 4-20 mA (see section 7.3 “Overview of input values”).

Analogue output function

The analogue output function can be freely adjusted, i.e. it can be assigned to the parameter flow or volume.

Operating mode flow measurement / volume measurement

- See section 6.2 “Setting flow measurement” and section 6.3 “Setting volume measurement” on details of how to set the operating mode flow measurement / volume measurement.

A maximum value can be programmed for the analogue output. The maximum value programmed corresponds to an output of 20 mA.

Programming the maximum value

- See section 7.8 “Programming the analogue output connection” under menu code "**01**" on programming the maximum value.

6.1.3 Connecting relay contact

The device has two rely contacts. The relay contacts switch the supply voltage for external subsequent processing.

Connection is made at the terminals:

Terminal 3	Relay 1
Terminal ⏚	Relay 2

The relays are equipped with normally open contacts. The switching voltage is maximum 30 volt, maximum switching current 1 A ohmic load.

Relay function

The relay function can be freely adjusted, i.e. the relays can be assigned to the parameter flow or volume.

If the device is operated in the volume measurement mode, relay 2 is not required.

On switch-on and one switch-off value can be programmed for each relay. The relay switches when the switch-on value has been exceeded. When the

switch-off value is exceeded, the relay drops out again. This means the relays can be programmed as normally open or normally closed contacts or as hysteresis switches.

Programming the switch-on or switch-off value

- See section 7.7 “Programming the relay output connection” on programming the switch-on or switch-off value.

Operating mode flow measurement / volume measurement

- See section 6.2 “Setting flow measurement” and section 6.3 “Setting volume measurement” on details of how to set the operating mode flow measurement / volume measurement.

6.2 Setting flow measurement

Setting the parameter

- The device can either be switched to flow measurement or volume measurement.
- This setting is done under menu code "**07**" at the position "**Parameter**".
- Entering a "**0**" sets the device for flow measurement, entering a "**1**" for volume measurement (see table 7.1).

As soon as a medium flows through the volume counter, a flow display appears. No separate release is required. The flow is displayed as an absolute value, usually in litres per minute.

Adjusting the device to the volume counter

- The device must be adjusted to the respective volume counter connected. See section 7.4 “Programming of volume counter connection” for procedure.

6.3 Setting volume measurement

Setting the parameter

- The device can either be switched to flow measurement or volume measurement.
- This setting is done under menu code "**07**" at the position "**Parameter**".
- Entering a "**0**" sets the device for flow measurement, entering a "**1**" for volume measurement (see table 7.1).

The term volume measurement is used for the sum of the medium that flows through a volume counter. The cumulated quantity is shown as an absolute value, usually in litres.

Cumulation of the medium

- Cumulation only takes place when the cumulation function has been released and the flow has exceeded the adjustable limit frequency.
- The limit frequency is programmed under menu code "**10**".
- The impulse frequency of the volume counter is programmed in Hertz. The limit frequency is usually set to 0.000.

Connection of the release input is to terminal:

Terminal ⏚	Release volume measurement

Voltage at the release input

- If a there is a voltage of 24 volts at the release input, the volume is cumulated. The measured values on the display change.
- If a there is a voltage of 0 volts at the release input, the cumulation of the volume is halted. The measured values on the display do not change.
- When the voltage at the release input changes from 0 to 24 volts, the cumulation is reset to zero. Volume recording starts again.

6.4 Error display

In the case of two-channel volume counters, it is possible for the volume counter channels to be monitored.

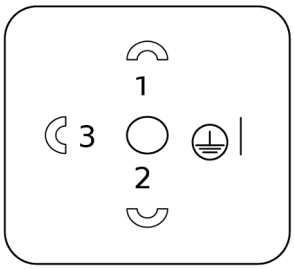
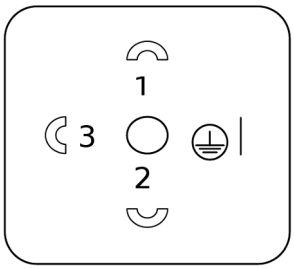
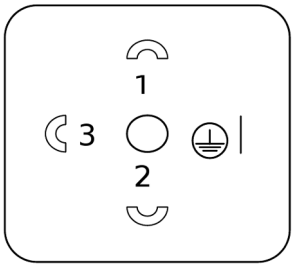
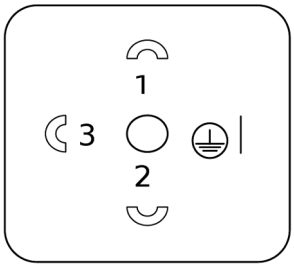
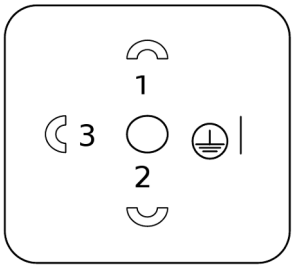
When a channel fails, the characters "**FAUL**" appear.

Switching off the error display

- The error display can also be switched off completely. This is done under menu code "**08**" at position "**Count input**".
- Entering a "**0**" clears the error display, entering a "**1**" blocks the error display (see section 7.3 “Overview of input values”).

6.5 Connections

Electrical connection is made through a plug-type connection in accordance with DIN 43650.

	Connection version **SD1-R-24**	
	PIN 1	= UB+
	PIN 2	= GND
	PIN 3	= Channel 1
	PIN ⏚	= Channel 2
	Connection version **SD1-I-24**	
	PIN 1	= UB+
	PIN 2	= GND
	PIN 3	= Analogue signal 0/4-20 mA
	PIN ⏚	= No function
	Connection version **SD1-I-24/V**	
	PIN 1	= UB+
	PIN 2	= GND
	PIN 3	= Analogue signal 0/4-20 mA
	PIN ⏚	= Release volume count
	Connection version **SD1-K-24**	
	PIN 1	= UB+
	PIN 2	= GND
	PIN 3	= Relay 1
	PIN ⏚	= Relay 2
	Connection version **SD1-K-24/V**	
	PIN 1	= UB+
	PIN 2	= GND
	PIN 3	= Relais 1
	PIN ⏚	= Release volume count

7 Operation start-up

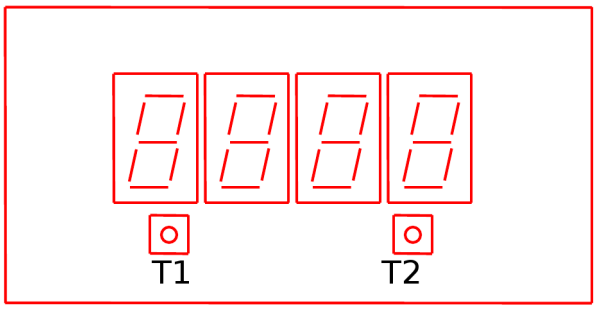
7.1 Programming the device

The device must always be adapted to the volume counter connected before it is put into operation.

7.2 Input technology

The input technology is identical for all input values. Programming is via two keys that are accessible after the front panel has been removed. To do this, a small screwdriver must be used to remove the two small round plastic cover caps to reach the attachment screws for the front panel.

The position of the keys can be seen in the diagram.



7.2.1 Start input mode

To start input mode, keys "**T1**" and "**T2**" have to be kept pressed for about four seconds.

The first two segments are dark, segments three and four indicate the menu code "**00**". "**T1**" and "**T2**" must be released.

7.2.2 Changing the menu code

The menu codes "**00**" to "**10**" can be run through by pressing "**T1**" briefly.

There is an input value stored behind each menu code.

To select the input value, press "**T2**" briefly. A four-digit input value will appear.

7.2.3 Changing the input value

The spot marks the digit that can be changed by pressing "**T2**".

The spot can be moved by pressing "**T1**".

After the numbers have been set correctly, the spot must be set on the correct decimal place.

The device moves back to the menu code level when "**T1**" and "**T2**" are pressed at the same time. Menu code "**00**" is displayed again.

7.2.4 Stop input value

To leave input mode, keys "**T1**" and "**T2**" have to be pressed again for about four seconds.

7.3 Overview of input values

The values to be set always be entered in the "**User input values**" column.

Menu code	Input value User	Standard setting	Function		Unit with standard setting
00		0. 0 4 0	Impulse volume, volume counter		ccm
01*		3. 5 0 0	Maximum value analogue output		l/min
02		0. 4 0 0	Damping of digital filters (permanent period measurement) or Gate time in seconds (gate window measurement)		s
03*		9 9 9 9.	Switch-on relay 1		l/min
04*		9 9 9 9.	Switch-off relay 1		l/min
05*		9 9 9 9.	Switch-on relay 2		l/min
06*		9 9 9 9.	Switch-off relay 2		l/min
07		0 0 0 0.			
		X _ _ _	Measurement	0 = gate window measurement 1 = permanent period measurement	
		_ X _ _	Parameter	0 = Flow 1 = Volume	
		_ _ X _	Alternative time basis	0 = Second 1 = Hour	
		_ _ _ X	Time basis	0 = Minute 1 = Alternative time basis	
08		0 0 0 0.			
		X _ _ _	Analogue signal	0 = 0-20 mA 1 = 4-20 mA	
		_ X _ _	Analogue / Relay	0 = Analogue output 1 = Relay contacts	
		_ _ X _	Display	0 = Normal 1 = 180° rotation	
		_ _ _ X	Count input	0 = Two-channel 1 = One-channel	
09		1. 0 0 0	Desity factor		kg/l
10		0. 0 0 0	Limit frequency		Hz
** Unit depending on the time basis chosen in "Menu code" 07*					

If the input and output values for the relays are set at 9999, the relays are switched off.

7.4 Programming of volume counter connection

The device is adjusted to the respective volume counter connected.

This is carried out unter menu code "**00 - Impulse volume, volume counter**", menu code "**09 - Desity factor**" and unter menu code"**08**" at position "**Count input**".

The impulse volumes for KRACHT volume counters can be found in the table.

Description	Material	Input value menu code "00"		Counter version
		Display in litres in cm^3	Display of millimetres in mm^3	
VC 0.025	Ductil cast iron / Stainless steel	0.025	25.00	Two-channel
VC 0.04		0.040	40.00	
VC 0.2		0.245	245.0	
VC 0.4		0.400	400.0	
VC 1		1.036	1036.	
VC 3		3.000	3000.	
VC 5		5.222	5222.	
VC 10		10.48	not possible	
VCA 0.04 / VCN 0.04	Aluminium / Stainless steel	0.040	40.00	One-channel
VCA 0.2 / VCN 0.2		0.200	200.0	
VC 0.2 AL	Aluminium	0.245	245.0	Two-channel
VCA 2		2.000	2000.	One-channel
VCA 5		5.222	5222.	
VCL 0.1	Stainless steel	0.100	100.0	Two-channel

A VC 0.04 volume counter is connected. The impulse volume is 0.040 cm^3.

The volume counter VC 0.04 has a two-channel version.

- The value 0.040 is entered under menu code "**00**"
- A "**0**" is entered under menu code "**08**" at the position marked "**Count input**".

In addition, a density factor can also be set. This factor allows densities to be converted to masses.

The density of the medium is set under the menu code "**09 - Density factor**". With volumetric measurement, the density factor is set to **1,000**.

The impulse figures for KRACT TM turbines can be seen on their type plates and accompanying papers. The pulse count refers to the flow of 1 litre of the medium used for calibration.

The impulse volume to be programmed is calculated as follows:

1000 ccm : Number of impulses/litre = impulse volume

e.g. 1000 ccm : 9854 Imp/L = 0.1014816...

0.101 would then be entered under menu code "**00**".

The impulse volume is also quoted on the type plate!

7.5 Changing the time basis of the flow display

There is a choice of seconds, minutes and hours as the time basis for the flow display. Users switch betrween these different units unter the menu code "**07**".

Time basis	Input value menu code 07
Minute	XX00
Minute	XX10
Second	XX01
Hour	XX11

The place marked "**X**" in column "**Input value menu code 07**" are not important for setting the time basis.

7.6 Determining flow

The device has two measuring methods available for determining flow.

- Permanent period measurement and
- gate window measurement

☞ **Selection of gate window measurement / permanent period measurement**

- Selection of gate window measurement or permanent period measurement is carried out under menu code "**07**".

7.6.1 Permanent period measurement

☞ **Non-processed input signals**

- Input signals smaller than 1 Hz are not processed.

Permanent period measurement allows very fast measurements. A digital filter makes smoothing possible where there are great fluctuations in flow, thus settling the display.

The digital filter can be activated under menu code "**02**". The larger the value entered, the greater the filter effect.

Programming value 0000: no filter effect

Programming value 9999: maximum filter effect

7.6.2 Gate window measurement

In the case of gate window measurement, the impulses are counted within a programmed gate window and converted to flow using the counter's impulse volume. Gate window measurement provides an even display.

The gate window can be set in seconds under menu code "**02**". The smallest gate window that can be set is 0.1 seconds.

7.7 Programming the relay output connection

The relay functions can only be set when the device has been ordered with the relay contacts option (SD 1-K...).

The relays can be assigned to flow or volume measurement.

7.7.1 Flow measurement

A "**0**" is entered under menu code "**7**". This is done at the place marked "**Parameter**" (see section 7.3 “Overview of input values”).

7.7.2 Volume measurement

A "**1**" is entered under menu code "**7**". This is done at the place marked "**Parameter**" (see section 7.3 “Overview of input values”).

7.7.3 Switching functions

Programming takes place via relay 1 under menu codes "**03**" and "**04**", for relay 2 under menu codes "**05**" and "**06**" (see section 7.3 “Overview of input values”).

The following switching functions can be realised:

Make-contact function

The contact is closed when the switch-on value is reached.

Example:

Switch-on value: 2.500

Switch-off value: 9999.

The relay is switched when the switch-on value has been exceeded. The switch-off value of **9999.** means that only the switch-on value is evaluated.

The relay is not switched off when the switch-off value is reached.

Break-contact function

The contact is opened when the switch-off value is reached.

Example:

Switch-on value: 0.000

Switch-off value: 3.000

The relay contact is switched as long as the switch-off value has not been reached. The switch-on value of **0.000** means that only the switch-off value is evaluated.

The relay is not switched off when the switch-on value is reached.

Window function

Example:

Switch-on value: 2.500

Switch-off value: 3.000

The relay is switched when the switch-on value is reached. The relay opens again when the switch-off value is exceeded.

Hysteresis switch

The contact is made when the switch-on value is reached. The relay only drops out when the value falls below the switch-off value.

Example:

Switch-on value: 4.000

Switch-off value: 3.000

7.8 Programming the analogue output connection

The analogue output can only be used when the device has been ordered with the analogue output option (SD 1-I...).

The analogue output can be assigned to flow or volume measurement.

7.8.1 Flow measurement

A "**0**" is entered under menu code "**7**". This is done at the place marked "**Parameter**" (see section 7.3 “Overview of input values”).

7.8.2 Volume measurement

A "**1**" is entered under menu code "**7**". This is done at the place marked "**Parameter**" (see section 7.3 “Overview of input values”).

7.8.3 Signal selection

Menu code "08"	Analogue output
00XX	0 - 20 mA
10XX	4 - 20 mA

The places marked "**X**" in column menu code "**08**" are not important for setting.

The maximum value which corresponds to an output of 20 mA is entered under menu code "**01 - Maximum value analogue output**".

Example:

Maximum value analogue output: 3.500 [litres/minute]

If the flow is 3,500 litres/minute, 20 mA is shown on the display. If the flow is 0,000 litres/minute, 0 mA or 4 mA are shown on the display.

7.9 Programming examples

7.9.1 Task 01: SD1-I-24

A flow is to be measured inlitres per hour (maximum 100 l/h). In addition, the analogue signal (4-20 mA) is to be transmitted to the higher-order PLC. The volume counter used is a VC 0.2 F6 PS.

Menu code	Relevant setting	Function	Units
00	**0.245**	Impulse volume, volume counter	ccm
01	**100.0**	Maximum value analogue output	l/min
02	0.400	Damping of digital filters or Gate time in seconds	s
03	9999.	Switch-on relay 1	l/min
04	9999.	Switch-off relay 1	l/min
05	9999.	Switch-on relay 2	l/min
06	9999.	Switch-off relay 2	l/min
07	**1011.**	Time basis, Parameter, Measurement	
08	**1000.**	Analogue signal, Analogue/Relay, Display, Count input	
09	**1.000**	Desity factor	kg/l
10	0.000	Limit frequency	Hz

7.9.2 Task 02: SD1-I-24 /V

The quantity of a medium with a density of 1.214 kg/l consumed in a production process is to be recorded (maximum 500 kg). In addition, the PLC is expecting an analogue signal of 0..20 mA for monitoring the production process. There is a VC 1 F1 PS installed in the production machine.

Menu code	Relevant setting	Function	Units
00	**1.036**	Impulse volume, volume counter	ccm
01	**500.0**	Maximum value analogue output	l/min
02	0.400	Damping of digital filtersorGate time in seconds	s
03	9999.	Switch-on relay 1	l/min
04	9999.	Switch-off relay 1	l/min
05	9999.	Switch-on relay 2	l/min
06	9999.	Switch-off relay 2	l/min
07	**0100.**	Time basis, Parameter, Measurement	
08	**0000.**	Analogue signal, Analogue/Relay, Display, Count input	
09	**1.214**	Desity factor	kg/l
10	0.000	Limit frequency	Hz

7.9.3 Task 03: SD1-K-24

The volume flow of the lubricant at a bearing spot is to be monitored using a VC 0.1 F1 PS. The ideal flow range is between 3.5 l/min and 4.5 l/min. A 24 V signal indicates the correct flow to the higher-order control unit. A second signal is designed to cancel the line release if there is not sufficient lubricant oil flow (Q < 3.5 l/min).

Menu code	Relevant setting	Function	Units
00	**0.100**	Impulse volume, volume counter	ccm
01	3.500	Maximum value analogue output	l/min
02	0.400	Damping of digital filtersorGate time in seconds	s
03	**3.500**	Switch-on relay 1	l/min
04	**4.500**	Switch-off relay 1	l/min
05	**3.500**	Switch-on relay 2	l/min
06	**9999.**	Switch-off relay 2	l/min
07	**1000.**	Time basis, Parameter, Measurement	
08	**0100.**	Analogue signal, Analogue/Relay, Display, Count input	
09	**1.000**	Desity factor	kg/l
10	0.000	Limit frequency	Hz

7.9.4 Task 04: SD1-K-24 /V

During a production process, a medium is taken from a tank containing 1000 litres. The supply tank should not be allowed to run dry. A monitoring function is to be set up to inform the operator when 85% of the contents have been removed. The volume counter used is a VCA 0.2 FB R1.

Menu code	Relevant setting	Function	Units
00	**0.200**	Impulse volume, volume counter	ccm
01	3.500	Maximum value analogue output	l/min
02	0.400	Maximum value analogue output	s
03	**850.0**	Switch-on relay 1	l/min
04	**9999.**	Switch-off relay 1	l/min
05	**9999.**	Switch-on relay 2	l/min
06	**9999.**	Switch-off relay 2	l/min
07	**0100.**	Time basis, Parameter, Measurement	
08	**0101.**	Analogue signal, Analogue/Relay, Display, Count input	
09	**1.000**	Desity factor	kg/l
10	0.000	Limit frequency	Hz