

Interface Box IFU 2.1 LAN

Instructions



HPLC

Document No. V6795



Note: For your own safety, read the instructions and observe the warnings and safety information on the device and in the instructions. Keep the instructions for future consultation.

Manuel en français:

Si jamais vous préférez un manuel en français pour ce produit, veuillez vous contacter le support technique (Technical Support) par email ou par fax avec le no. de série. Merci beaucoup.

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Languages: German, English

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For latest version of the instructions, check our website:

www.knauer.net/knowledge



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Product information

Intended use



Note: Only use the device for applications that fall within the range of the intended use. Otherwise, the protective and safety equipment of the device could fail.

The Interface Box IFU 2.1 LAN (further on referred to as „interface box“) has 4 channels for data recording and device control for devices that are not supported by KNAUER software. This includes data recording from detectors via analog inputs, flow rate control for HPLC pumps via analog outputs or switching of valves via digital outputs. The only requirement is that the device supports these tasks. Further information comes included with the instructions of the device.

The interface box is no standalone device, which means that software control is strictly required (e. g. KNAUER ClarityChrom®).



Note: The functions of the interface box that are supported by the software are listed in the respective control software instructions.

Views

Side view

Legend

- ① Power connector
- ② LAN port

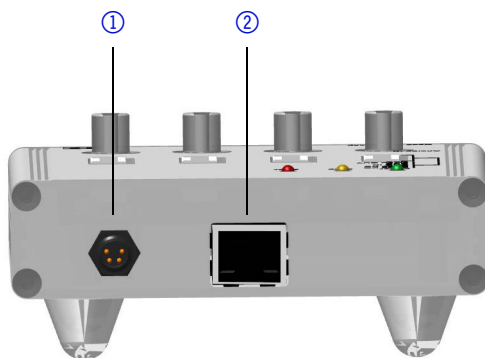


Fig. 1 Side view

Front view

Legend

- ① Digital out (or autozero)
- ② Digital in (Trigger input)
- ③ Analog out (output of analog control signal)
- ④ Analog in (data signal input)
- ⑤ Channel 1 to 4

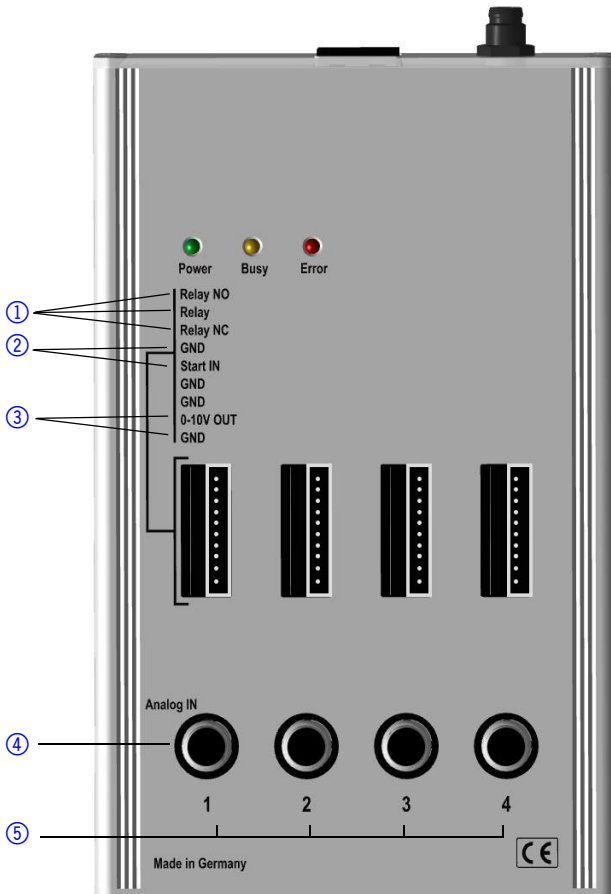


Fig. 2 Front view

Scope of delivery



Note: Only use original parts and accessories made by KNAUER or a company authorized by KNAUER.

- Interface Box IFU 2.1 LAN
- Interface Box IFU 2.1 LAN accessories kit

Content of the accessories kit:

- 2 x 9-pin female connector
- 2 x 10-way ribbon cable
- 2 x connecting cable (CINCH-wire end)
- 1 x operating tool
- 1 x power cable (connecting cable for distribution box)
- 1 x LAN cable

Related documents:

- Instructions (German/English)
- Installation Qualification document (English)
- Declaration of Conformity (English)

General safety instructions

Target group

The instructions address persons who have fundamental knowledge of liquid chromatography.

If you do not belong to this or a comparable professional group, you may not perform the work described in this instructions under any circumstances. In this case, please contact your superior.

Safety equipment

When working with the interface box, no measures according to lab regulations or protective clothing are needed.

What must the user take into account?

- All safety instructions in the instructions
- The environmental, installation, and connection specifications in the instructions
- National and international regulations pertaining to laboratory work
- Original spare parts, tools, and solvents made or recommended by KNAUER
- Good Laboratory Practice (GLP)

- Accident prevention regulations published by the accident insurance companies for laboratory work

More safety-relevant information is listed below:

- power cable: Defective power cables are not to be used to connect the device and the power supply system.
- power strip: If several devices are connected to one power strip, always consider the maximum power consumption of each device.
- power supply: Only connect devices to voltage sources, whose voltage equals the device's voltage.

Where is use of the device prohibited?

Never use the system in potentially explosive atmospheres without appropriate protective equipment. For further information, contact the Technical Support of KNAUER.

Secure decommissioning

At any time, take the device completely out of operation by either switching off the power switch or by pulling the power plug.

Opening the device

The device may be opened by the KNAUER Technical Support or any company authorized by KNAUER only.

Signal words

Possible dangers related to the device are divided into personal and material damage in this instructions.



DANGER indicates a hazardous situation which, if not avoided, will result in death or serious injury.



WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury.



CAUTION indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.



NOTICE is used to address practices not related to physical injury.

Decontamination

Contamination of devices with toxic, infectious or radioactive substances poses a hazard for all persons during operation, repair, sale, and disposal of a device.



Life-threatening injuries

Health danger if getting in contact with toxic, infectious or radio-active substances.

→ Before disposing of the device or sending it away for repair, you are required to decontaminate the device in a technically correct manner.




All contaminated devices must be properly decontaminated by a specialist company or the operating company before they can be recommissioned, repaired, sold, or disposed of. All materials or fluids used for decontamination must be collected separately and disposed of properly.

Decontamination Report

Devices without a completed Decontamination Report will not be repaired. If you would like to return a device to KNAUER, make sure to enclose a completed Decontamination Report with the device: <http://www.knauer.net/en/knowledge/downloads/service.html>

Symbols and signs

The following symbols and signs can be found on the device or in the instructions:

Symbol	Meaning
	A device or system marked with CE fulfills the product specific requirements of European directives. This is confirmed in a Declaration of Conformity.
	Electrostatic discharge hazard, damages to system, device, or components can occur.
	Hints provide useful tips or information worth knowing.

Unpacking and setup

Only if the requirements for ambient conditions of the operating environment are met, can the intended use be ensured. Details on the operating conditions can be found in the Technical Data section.

Preparations

Location requirements

- Position the device on a level and even surface.
- Protect the device against direct exposure to sunlight.
- Set up the device at a location not exposed to air drafts (A/C systems).
- Do not set up the device near other machines that cause floor vibrations.

Unpacking the device

Prerequisite

Check packaging for damage caused during transportation. If necessary, put forward any claim for damages to the carrier.

Tools

Utility knife



Bruising danger

Damage to the device by carrying or lifting it on protruding housing parts. The device may fall and thus cause injuries.

→ Lift the device only centrally on the side of the housing.

Process

1. Set up the package in such a way that you can read the label. Using the utility knife, cut the adhesive tape and open the packaging.
2. Remove the foam insert. Take out the accessory kit and the instructions.
3. Open the accessory kit and check the scope of delivery. In case any parts are missing, contact the Technical Support.
4. Clasp the device from below, lift it out of the packaging and place it on its feet.
5. Check the device for signs of damage that occurred during transport. In case you notice any damage, contact the Technical Support.
6. Place the device in its site of operation.

Next steps

Store packaging and keep the included packing list for repeat orders.

Power supply

For power supply, use the distribution box or its respective main adapter if no additional auxiliary device has to be powered.

Inspect the provided power cable beforehand to ensure that it is approved for your country. Replace defective power cables only with accessories from

KNAUER. Detachable power cables are not allowed to be replaced with other cable types. The maximum power input is 36 VA.

NOTICE

Device defect

No electrical isolation is provided for the interface box. Voltages above 10 V could damage connected devices.

- Take protective measures.
- Use the device according to the specifications.

Connecting the device to computer via LAN



Note: HPLC devices made by KNAUER work only with IP addresses which are assigned via IPv4. IPv6 is not supported.

This section describes how to set up an HPLC system in a local area network (LAN) and how a network administrator can integrate this LAN into your company network. The description applies to the operating system Windows and all conventional routers.

To set up a LAN, we recommend to use a router. That means the following steps are required:

Process

1. On the computer, go to the control panel and check the LAN properties.
2. Hook up the router to the devices and the computer.
3. On the computer, configure the router to set up the network.
4. Install the chromatography software from the data storage device.
5. Switch on the device and run the chromatography software.

Configuring the LAN settings

The LAN uses only one server (which is normally the router) from that the devices automatically receive their IP address.

Prerequisite

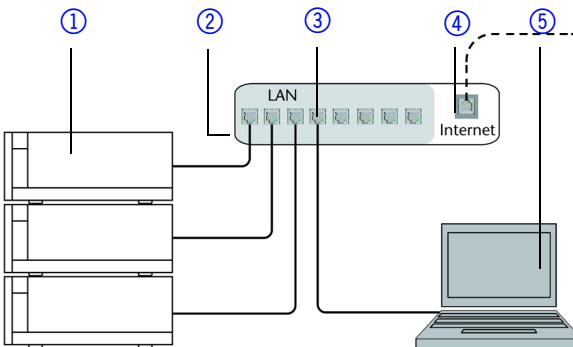
- In Windows, power saving, hibernation, standby, and screen saver must be deactivated.
- In case you use an USB-to-COM box, the option "Allow the computer to turn off this device to save power" in the devicemanager must be deactivated for all USB hosts.
- For all LAN devices: For the network adapter, the following option in the Device Manager must be deactivated: "Allow the computer to turn off this device to save power".

Process

1. In Windows choose Start ⇒ Control Panel ⇒ Network and Sharing Center.
2. Double-click on LAN Connection.
3. Click on the button Properties.
4. Select Internet Protocol version 4 (TCP/IPv4).
5. Click on the button Properties.
6. Check the settings in the tab General. The correct settings for the DHCP client are:
 - a) Obtain IP address automatically
 - b) Obtain DNS server address automatically
7. Click on the button OK.

Connecting the cables

A router ② has several LAN ports ③ and one WAN port ④ that can be used to integrate the LAN into a wide area network (WAN), e.g. a company network or the Internet. In contrast, the LAN ports serve to set up a network from devices ① and a computer ⑤. To avoid interference, we recommend operating the HPLC system separately from the company network.



You will find patch cables for each device and the router in the accessories kit. To connect the router to a WAN, an additional patch cable is required, which is not supplied within the scope of delivery.

Prerequisite

- The computer has been switched off.
- There is a patch cable for each device and the computer.

Process

1. Use the patch cable to connect the router and the computer. Repeat this step to connect all devices.

2. Use the power supply to connect the router to the mains power system.

Configuring the router

The router is preset at the factory. The login information is mentioned on the router case (IP address, user name, and password), which is needed for router configuration.

Process

1. To open the router configuration, start your Internet browser and enter the IP address (not for all routers).
2. Enter user name and password.
3. Configure the router as DHCP server.
4. In the router configuration, check the IP address range and make changes if necessary.

Note: If the IP address range has been changed, it is necessary to note it down.

Result

Once the router has assigned IP addresses to all devices, the chromatography software can be used to remotely control the system.

Integrating the LAN into a company network

A network administrator can integrate the LAN into your company network. In this case you use the WAN port of the router.

Prerequisite

There is a patch cable for the connection.

Process

1. Check that the IP address range of the router and of the company network do not overlap.
2. In case of an overlap, change the IP address range of the router.
3. Use the patch cable to connect the router WAN port to the company network.
4. Restart all devices, including the computer.

Controlling several systems separately in a LAN

Devices connected to a LAN communicate through ports, which are part of the IP address. If more than one HPLC system is connected to the same LAN and you plan on controlling them separately, you can use different ports to avoid interference. Therefore, the port number for each device must be changed and this same number must be entered into the device configuration of the chromatography software. We recommend to use the same port number for all devices in the same system.

Note: The port is set to 10001 at the factory. You must use the same numbers in the device configuration of the chromatography software as in the device, otherwise the connection fails.

Process

1. Find out port number and change it on the device.
2. Enter the port number in the chromatography software.

Result

The connection is established.

Setting a static IP address

If you want to change the LAN settings of the IFU 2.1 LAN from a dynamic IP address (DHCP) to a static IP address, please contact the Technical Support.

Remote control

To control one device through another, you use the multi-pin connector. To use remote control, you have to connect cables to the terminal strip (both included with delivery). The single ports are used to exchange control signals.

Prerequisite

- The device has been turned off.
- The power plug has been pulled.

Tools

Operating tool

NOTICE

Electronic defect

Connecting cables to the multi-pin connector of a switched on device causes a short circuit.

- Turn off the device before connecting cables.
- Pull the power plug.

NOTICE

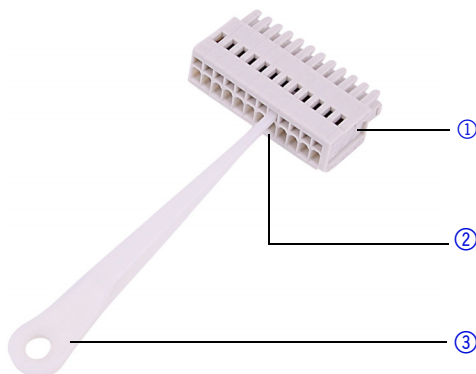
Electronic defect

Electrostatic discharge can destroy the electronics.

- Wear a protective bracelet against electrostatic discharge and ground.

Process

1. Push the operating tool ③ into an upper small opening on the front of the terminal strip ①.
2. Lead the cable into the opening ② below the inserted operating tool.
3. Remove the operating tool.



Next steps

Check if the cables are firmly attached. Push the terminal strip onto the multi-pin connector. Finish the installation. Then put the device into operation.

Analog inputs

If the analog output of a device (e. g. 1 V integrator output of a detector) should be connected to the analog input of the interface box, use a Cinch cable supplied or recommended by KNAUER. Alternatively use a matching cable included with the interface box accessory kit.

NOTICE

Electronic defect

If the allowed maximum voltage is exceeded, the interface box can be damaged.

→ Pay attention to the allowed maximum voltage.

Analog outputs

The analog output have to match the control input of the connected device. The respective information has to be checked in the device instructions. Particular attention has to be paid to the allowed maximum voltage, since the non-compliance of limits can damage the device. KNAUER can not be held reliable in this case. The required components of the remote connector are part of the accessories kit of the interface box.

Digital connections

Digital inputs can be used to forward trigger signals coming from the injection unit. The connector for the trigger signal is the digital input of the channel, which also serves for recording data from the detector.

Digital outputs can be programmed via control software.

The required components of the remote connector are part of the accessories kit of the interface box. If you require a NO connect the contacts 1 and 2 or the contacts 2 and 3 if a NC is required, respectively (front view, Fig. 2).



Note: If the analog input of a channel is used, it is not possible to program the digital output of the same channel. In this case, the digital output sends a sampled signal at the start of run that e. g. can be used as autozero signal for a detector.

Cable plan

The exemplary cable plan shows a possible connection scheme for the connectors. Pay attention to the fact that the digital output and analog input of a channel can not be used at the same time, except the analog input is used for autozero of a detector.

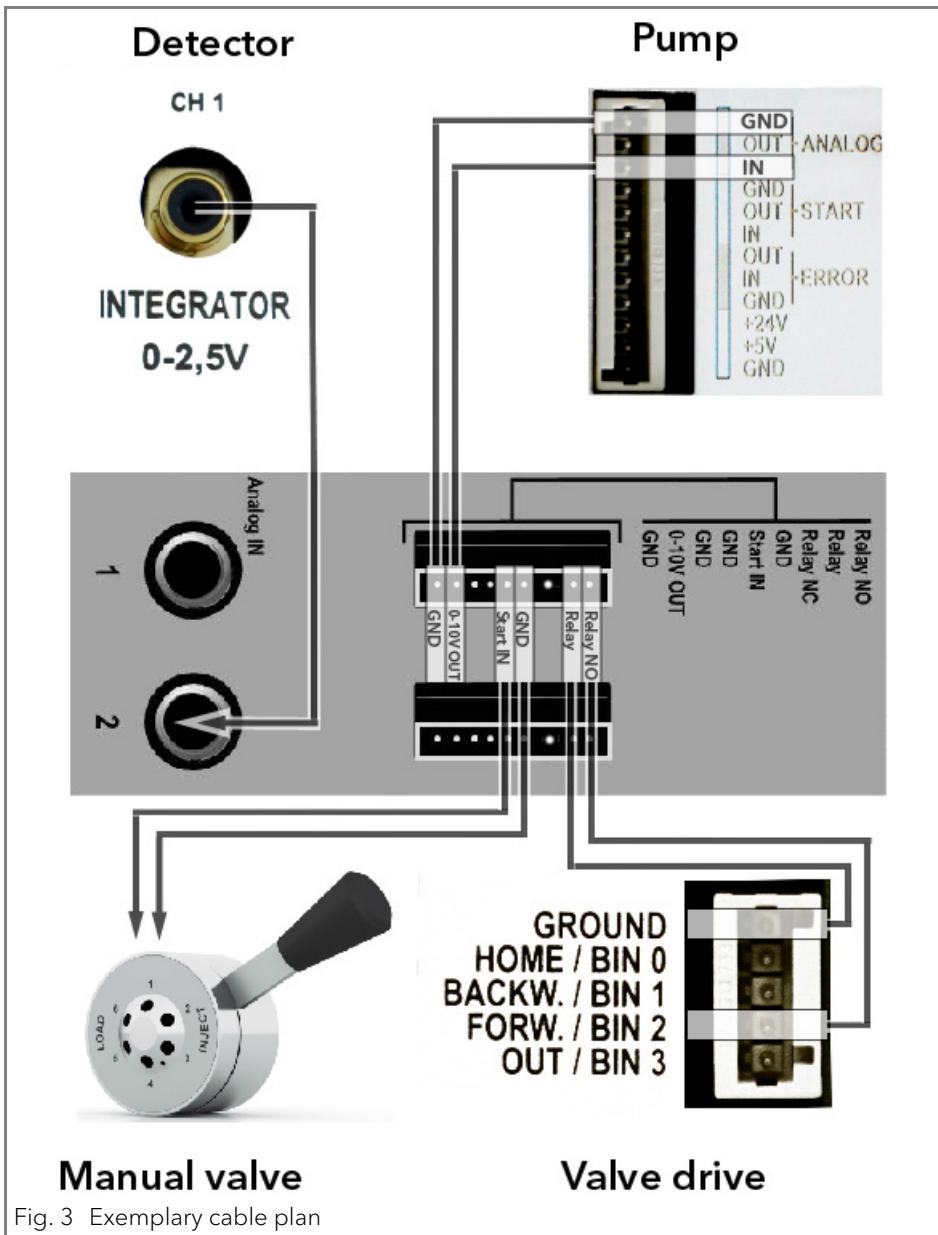


Fig. 3 Exemplary cable plan

Installation Qualification (IQ)

The customer may request the Installation Qualification, which is free of charge. In case of a request, the Technical Support of KNAUER or from a provider authorized by KNAUER performs this functionality test during the installation.

The Installation Qualification is a standardized document that comes as part of the delivery and includes the following:




- confirmation of flawless condition at delivery
- check if the delivery is complete
- certification on the functionality of the device

Operation

Further information about the operation of the interface box is listed in the respective control software instructions.

Device status

The colour of the lighting LED indicates the current status of the interface box.

LED	Status
 Power (green)	Green LED lighting permanently: Connected to power supply.
 Busy (yellow)	Yellow LED lighting shortly: During calibration or after receiving a signal from the control software. Calibration is done when starting a device or a run. Yellow LED lighting permanently: Control software checks on the device's status regularly, e. g. every second.
 Error (red)	Red LED lighting permanently: Error is detected while running the self-test or if the software sends a signal that is not recognized by the device.



Troubleshooting

Further information on troubleshooting of the interface box is listed in the respective control software instructions.

LAN

Go through the following steps, in case no connection between the computer and the devices can be established. Check after each step if the problem is solved. If the problem cannot be located, call the Technical Support.

1. Check the status of the LAN connection in the Windows task bar:

-  Connected
-  Connection not established

If no connection was established, test the following:

- Is the router switched on?
 - Is the patch cable connected correctly to the router and the computer?
2. Check the router settings:
 - Is the router set to DHCP server?
 - Is the IP address range sufficient for all the connected devices?
 3. Check all connections:
 - Are the patch cable connected to the LAN ports and not the WAN port?
 - Are all cable connections between devices and router correct?
 - Are the cables plugged in tightly?
 4. If the router is integrated into a company network, pull out the patch cable from the WAN port.
 - Can the devices communicate with the computer, even though the router is disconnected from the company network?
 5. Turn off all devices, router, and computer. Firstly, switch on the router and wait until its self-test is finished. Secondly, switch on the devices and the computer.
 - Has this been successful?
 6. Replace the patch cable to the device with that no connection could be established.
 - Has this been successful?
 7. Make sure that the IP port of the device matches the port in the chromatography software.

Maintenance and care

Cleaning

Clean the interface box from dust with a dry cloth.

NOTICE

Device defect

Intruding liquids can cause damage to the interface box.

- Keep the interface box away from liquids.
- During cleaning the interface box, do not moisten the cleaning cloth.

Transport

Carefully prepare the device for transport. If you want to return your device to KNAUER for repairs, enclose the Service Request Form which can be downloaded from our website.

For a secure transport, note the weight and dimensions of the device (see chapter "Technical Data").



Bruising danger

Damage to the device by carrying or lifting it on protruding housing parts. The device may fall and thus cause injuries.

→ Lift the device only centrally on the side of the housing.

Repeat orders

This list for repeat orders is valid for the time the document has been published. Deviations afterwards are possible.

For repeat orders of spare parts use the enclosed packing list. Contact the Technical Support in case there are any questions on spare parts or accessories.

Further information

Further information on spare parts and accessories can be found online: www.knauer.net

Name	Order No.
Interface Box IFU 2.1 LAN accessories kit	FZB00XA
Distribution box	AZS80SA

Technical data

General

Power connection	24 V = 1.5 A, external
Dimensions	105 x 26 x 161.5 mm (W × H × D)
Weight	0.35 kg

Connectors

Analog inputs

Serving the purpose of receiving analog signals, up to 4 channels or devices can be connected to the interface box. Channels are independent of each other and can be used simultaneously by one system or various systems.

Voltage range	-2.56 to +2.56 V (bipolar mode)
Absolute max. ratings	-10 V to +10 V
Input impedance	10 M Ω
Max. resolution	24 bit
Min. noise level	7 μ V (1 Hz, time constant 0.1 s)
Max. data rate	up to 10 Hz (each channel)
Gain factor (for all channels)	1, 2, 4, 8, 16

Analog outputs

These outputs send analog voltage signals to control devices, which have the necessary inputs. According to the number of outputs, four of these devices can be controlled with one interface box. The outputs can be programmed independently of each other. This e. g. refers to the control of pumps in a high pressure gradient system.

Voltage range	0 V to +10 V
Min. voltage step (DAC resolution)	2.5 mV (12 bit)
Max. load resistance	2 k Ω

Digital inputs

These inputs are trigger inputs receiving a start signal from the injection system. They work with contact end on ground and are compatible for TTL/CMOS or open collectors. If the channels are used for different systems, it is possible to start each channel individually.

High level input voltage (min. - max.)	+2.5 V to +15 V
Low level input voltage (min. - max.)	-15 V to +1 V
Max. input, current at V (in) = 0,5V	10 mA

Digital outputs

These outputs are electromechanical relays with single pole switch (SPDT) meaning they are to be used as NO (normally open, connectors 1 - 2, see front view) or as NC (normally closed, connectors 2 - 3, see front view). You can program sampled signals or steady rate signals. A sampled signal has a duration of approx. 1 s, the length of the steady rate signal is not predetermined.

Output type	either NO or NC
Max. switching voltage	max. 175 V, DC
Max. switching current	max. 0.25 A

Legal information

Transport damage

The packaging of our devices provides the best possible protection against transport damage. Check the devices for signs of transport damage. In case you notice damages, contact the Technical Support and the forwarder company within three workdays.

Warranty conditions

The factory warranty for the device is stipulated by contract. During the warranty period, any components with material or design-related defects will be replaced or repaired by the manufacturer free of charge. Please connect to our website for further information on terms and conditions.

All warranty claims shall expire in the event that any unauthorized changes are made to the device. This warranty also excludes the following:

- accidental or willful damage
- damage or errors caused by third parties that are not contractually related to the manufacturer at the time the damage occurs
- wear parts, fuses, glass parts, columns, light sources, cuvettes and other optical components
- damage caused by negligence or improper operation of the device and damage caused by clogged capillary
- packaging and transport damage

In the event of device malfunctions, directly contact the manufacturer.

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Warranty seal

A warranty seal is attached on some devices. The warranty seal is color-coded. A blue seal is used by the assembly or technical support of KNAUER for devices to be sold. After repair, service technicians stick an orange seal in identical position. If unauthorized persons interfere with the device or the seal is damaged, the warranty claim becomes void.



Declaration of conformity

The Declaration of Conformity accompanies the product as a separate document.

Disposal

Hand in old devices or disassembled old components at a certified waste facility, where they will be disposed of properly.

AVV Marking in Germany

According to the German "Abfallverzeichnisverordnung" (AVV) (January, 2001), old devices manufactured by KNAUER are marked as waste electrical and electronic equipment: 160214.

WEEE Registration

KNAUER as a company is registered by the WEEE number DE 34642789 in the German "Elektroaltgeräteregister" (EAR). The number belongs to category 8 and 9, which, among others, comprise laboratory equipment.

All distributors and importers are responsible for the disposal of old devices, as defined by the WEEE directive. End-users can send their old devices manufactured by KNAUER back to the distributor, the importer, or the company free of charge, but would be charged for the disposal.

Solvents and Other Operating Materials

All solvents and other operating materials must be collected separately and disposed of properly.

All wetted components of a device, e. g. flow cells of detectors or pump heads and pressure sensors for pumps, have to be flushed first with isopropanol and then with water before being maintained, disassembled or disposed.

Science Together



Latest KNAUER manuals online:
www.knauer.net/knowledge

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