CU1000

Control unit

ıINFICON

Content

1 About this manual

1.1 Target groups

This operating manual is intended for the operator and for technically qualified personnel with experience in leak detection technology and integration of leak detection devices in leak detection systems. In addition, the installation and use of the unit require knowledge of electronic interfaces.

1.2 Other applicable documents

Installation manual for mass spectrometer module	jiqa54
Bus module installation manual	jiqb10
I/O module installation manual	jiqc10
Interface protocols	jira54

1.3 Presentation of information

1.3.1 Warnings

⚠ DANGER
Imminent threat of danger resulting in death or severe injuries

⚠ WARNING
Dangerous situation potentially resulting in death or severe injuries

⚠ CAUTION
Dangerous situation resulting in minor injuries

NOTICE
Dangerous situation resulting in damage to property or the environment

1.3.2 Text markings

Marking	Meaning
✓	Requirement for execution of an action
✖	Tool or aid for an action
►	Instruction
1, **2**, **3**, ...	Several instructions in a fixed order
⇒	Result of an action
SMALL CAPS	Designation of the unit or command/term from the menu
Information	Useful tips and information

2 Safety

2.1 Intended use

The unit is intended for querying and configuring the data of the mass spectrometer module LDS3000.

► Install, operate and service the unit only in compliance with this manual.

► Comply with the limits of application (see).

2.2 User requirements

Safety conscious operation

► Operate and install the unit only if it is in perfect working order and as intended, in a safety-conscious manner and fully aware of dangers, in compliance with this manual.

► Fulfill and ensure compliance with the following regulations:

– Intended use

– Generally applicable safety and accident prevention regulations

– International, national and local standards and guidelines

– Additional provisions and regulations that are specific to the unit

► Use only original parts or parts approved by the manufacturer.

► Keep this manual available at the operating site.

Personnel qualifications

► All work must be performed only by technical specialists who have been trained on the unit.

► Allow personnel in training to work with the unit only under the supervision of technical specialists.

► Make sure that the authorized personnel have read and understood this manual and all other applicable documents (see), especially the information on safety, maintenance and repairs, before starting work.

► Define responsibilities, authorizations and supervision of personnel.

2.3 User requirements

► Read, observe and follow the information in this manual and the working instructions created by the owner, especially the safety instructions and warnings.

► Perform all work based on the complete manual.

3 Shipment check, transport, storage

3.1 Checking shipment

Scope of delivery

Article	Quantity
Control unit	1
Touch pin	1
Operating manual	1

► Check shipment to make sure it is complete.

3.2 Transport

NOTICE

Damage due to unsuitable packaging material

Transport in unsuitable packaging material can damage the unit.

► Transport the unit only in the original packaging material.

► Keep original packaging material.

3.3 Storage

► Always store the unit in compliance with the technical data, see Chapter 4.3, page 10.

4 Description

4.1 Construction of the unit
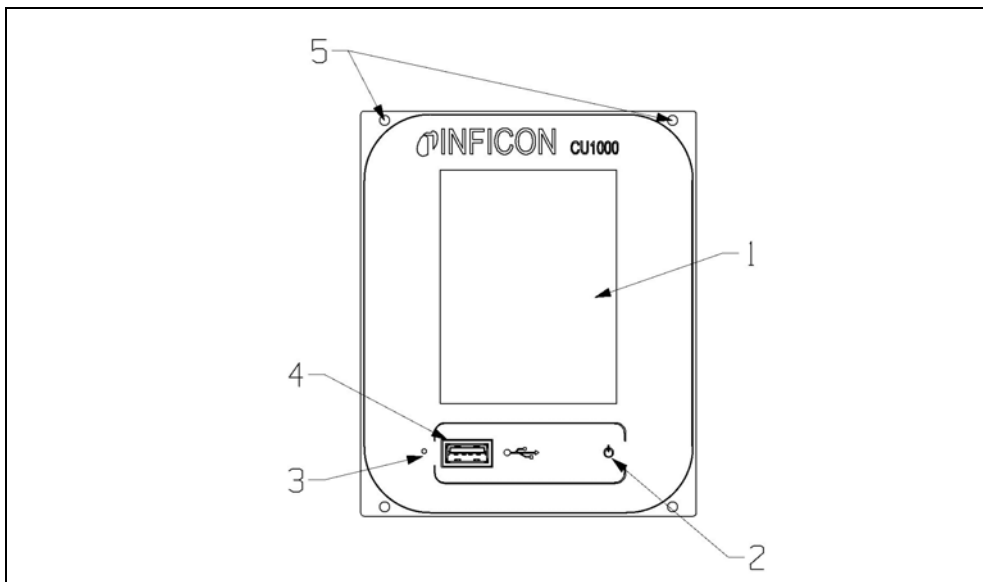
Fig: 1   Front view

1 - Touch display

Display that lets you read and enter data

2 - Status LED

The Status LED indicates the status of the control unit.

Status LED illuminated	Control unit operates normally
Status LED flashing	Display is set to power saving mode

3 - Reset key

Key to rest the control unit (can be operated with touch pin)

Information   The MS module is not reset.

4 - USB connection

Connection for USB stick (FAT formatted)

Information   The connection is suitable only for USB sticks.

5 - Mounting holes

Holes for mounting the control unit
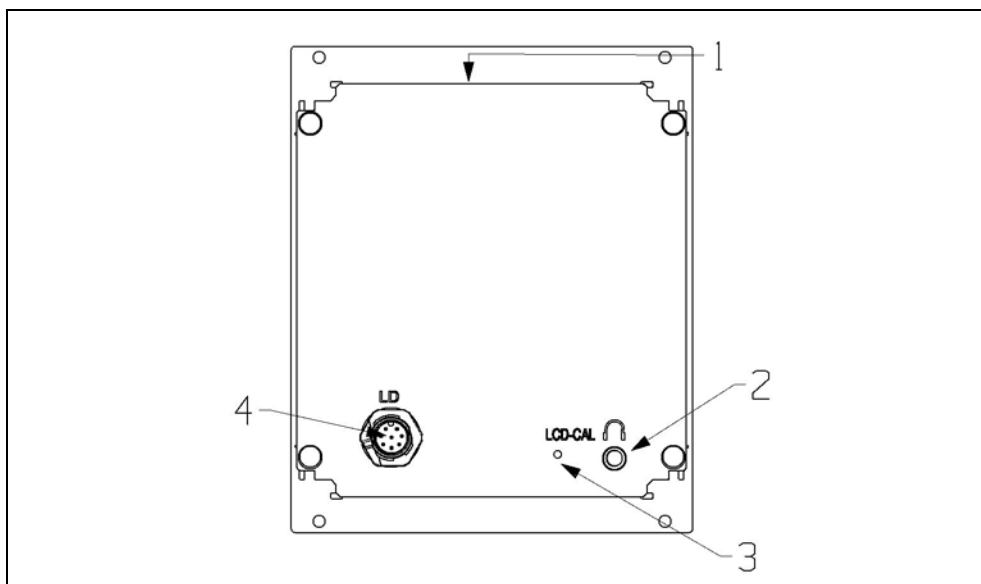
Fig: 2   Rear view

1 - Rating plate

Rating plate of the control unit

2 - ∩

Connection for headphones (impedance >= 8 Ω) or active speaker

3 - LCD-CAL

Calibration key for calibrating the touch display (can be operated with touch pin)

4 - LD

Connection for the data cable to the mass spectrometer module

4.2   Function

You can use the control unit to configure the mass spectrometer module LDS3000. It also lets you output the data stored in the MSB box.

4.3   Technical data

4.3.1   Mechanical data

Dimensions (W x H x D)	106.2 mm x 128.4 mm x 49.2 mm
Weight	500 g

4.3.2   Electrical data

Supply voltage	24 V DC
Memory capacity for measured data	16 MB

4.3.3 Ambient conditions

Permissible ambient temperature (during operation)		10 °C ... 45 °C
Permissible storage temperature		-20 °C ... 60 °C
Max. relative humidity	< +31 °C	80%
	+31 °C to +40 °C	decreasing linearly from 80% ... 50%
	> +40 °C	50%
Type of protection		IP 20
Pollution degree		II
Max. altitude above sea level		2000 m

4.3.4 Factory settings

The parameters of the control unit are stored in the control unit.

You can use the control unit to rest the parameters of the mass spectrometer module and the parameters of the control unit to the factory settings, independent of each other (see Chapter 6.2.3, page 19).

The factory settings of the mass spectrometer module are listed in the installation manual of the mass spectrometer module.

Parameter	Factory setting
Displ. upper limit exponent	-1
Displ. lower limit exponent	-12
Display off after	1h (= 1 hour)
Display brightness	100%
Measurement view mode	Diagram
Audio alarm mode	Proportional
Automatic scaling	On
Data recording	Off
Decades	3
Pressure unit	mbar
Favorite 1	Volume level
Favorite 2	Measurement view mode
Favorite 3	CAL
Error info Operator	No. and text
Error info Supervisor	No., text and info
Error info Viewer	Number only
Used trigger	1
Volume level	8
Leak rate unit SNIFF	mbar*l/s
Leak rate unit VAC	mbar*l/s

Parameter	Factory setting
Linear or logarithmic	Log.
Time axis scale	30 s
Record interval	500 ms
Memory location	USB
Language	English
Show warnings	On
Show value	On

5 Installation

5.1 Connecting the control unit

  ✗ Data cable

  ✓ Mass spectrometer module installed.

  1 Connect data cable to CONTROL UNIT of the MSB box.

  2 Connect data cable to LD.

  Information   The data cable to the control unit can also be connected or
  disconnected during operation.

⚠ **DANGER**
Hearing damage from loud volume setting
Loud volume setting can damage hearing.
► Do no set volume of headphones too loud.

  3 If needed, connect headphones or speakers to ⌒ .
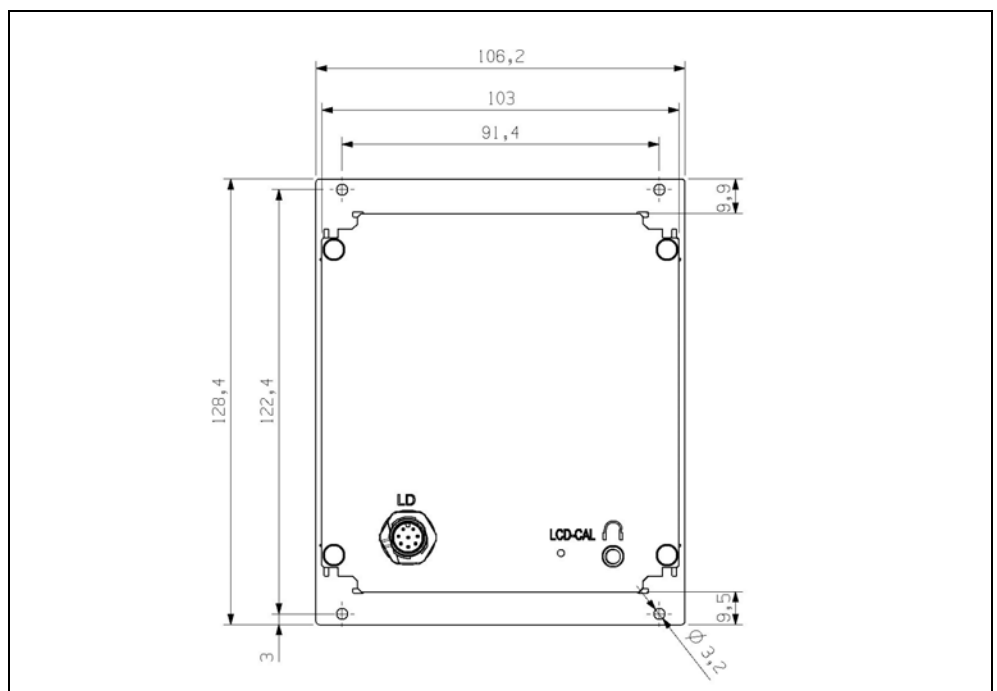
5.2 Installing the control unit

Fig: 3   Dimensions - control unit

  ✓ Recess for the control unit integrated in the test system.

  ► Push the control unit into the recess and screw it tight.

  ► Remove protective foil from display.

6 Operation

NOTICE

Damage to touch display as a result of incorrect operation

The touch display can be damaged by a hard or pointed object.

► Operate the unit only with the fingers.

6.1 Elements on the monitor

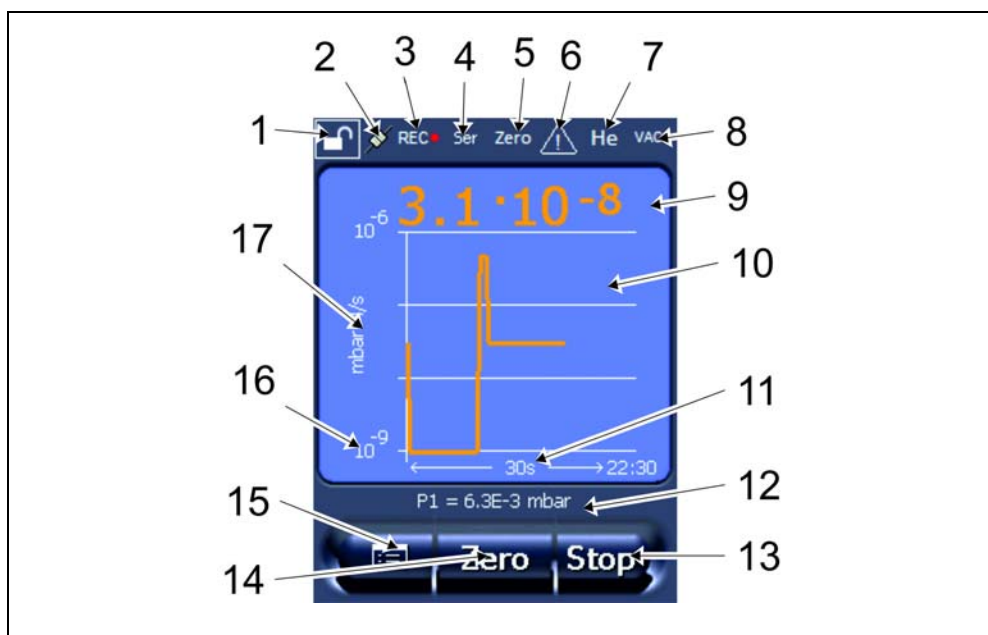### 6.1.1 Measurement display

Fig: 4   Measurement display

1 - Keyboard lock

Press and hold to lock or unlock the control unit.

2 - Communication status

: The unit communicates with the MS module.

: The unit does not communicate with the MS module.

Establish communication:

1 Reset control unit.
2 Check status of MS module.
3 Check cable joint.

3 - REC●

The measurement is recorded.

4 - Ser

The logged-in user is identified by an abbreviation.

Display	User
Ope	Operator
Sup	Supervisor
Int	Integrator
Ser	Service

For more information, see see .

5 - Zero

Background suppression is activated.

6 - ⚠

Active warnings are stored in the unit.

The active warnings can be displayed via the menu "INFO > HISTORY > WARNINGS".

7 - Test gas

Configured test gas.

Display	Test gas
He	Helium (^{4}He)
H2	Hydrogen
M3	e.g. H-D, ^{3}He or H_3

8 - Operation mode

Configured operation mode.

Display	Operation mode
VAC	Vacuum
SNIF	Sniffer

9 - Leak rate

Current measurement for the leakage rate.

10 - Graph

Graphic display of the leakage rate Q(t).

11 - Time axis

Time axis of the leakage rate Q(t).

12 - Backing pump

Backing pressure p1.

13 - Key FAVORITE 2

You can assign preferred parameters to this key (see Chapter 6.2.2, page 18).

In Fig: 4 the key FAVORITE 2 is assigned the function START/STOP for example.

14 - Key FAVORITE 1

You can assign preferred parameters to this key (see Chapter 6.2.2, page 18).

In Fig: 4 the key FAVORITE 1 is assigned the function ZERO for example.

15 - Menu 🔲

All functions and parameters of the control unit can be accessed using the MENU 🔲 key.

Refer to the supplemental sheet "LDS3000 Menu" for an overview of the menu.

16 - Value axis

Value axis of the leakage rate Q(t).

17 - Unit of measurement

Unit of measurement of the value axis.

6.2 Querying and setting parameters

The following chapter describes the parameters and functions of the CU1000 control unit. You will find the parameters and functions of the mass spectrometer module you can set using the control unit in the installation manual of the mass spectrometer module.

The menu tree shows the access level needed for changing the parameters (factory settings).

The parameters explained in this chapter are displayed as follows:

Path (based on Measuring view > Menu key > Main menu)

Parameter	Description	
	Settings	Explanation of the settings (as needed)

6.2.1 Display settings

DISPLAY > Q(T) AXIS

Linear or logarithmic	Linear or logarithmic Q(t) axis
	Lin., Log.
Decades	Number of decades of the Q(t) axis (for logarithmic view)
	1, 2, 3, 4
Automatic scaling	Automatic scaling of the Q(t) axis
	Off, On

DISPLAY > TIME AXIS

Time axis scale	Scaling of the time axis
	15 s, 30 s, 60 s, 120 s, 240 s, 480 s, 960 s

DISPLAY > DISPLAY LIMITS

Displ. upper limit exponent	Maximum value of the exponent of the Q(t) axis
	-12 … -1
Displ. lower limit exponent	Minimum value of the exponent of the Q(t) axis
	-12 … -1

DISPLAY > UNITS (DISPLAY)

Leak rate unit VAC	Unit of the leakage rate in vacuum mode
	mbar·l/s, Pa·m³/s, atm·cc/s, Torr·l/s
Leak rate unit SNIFF	Unit of the leakage rate in sniff mode
	mbar·l/s, Pa·m³/s, atm·cc/s, Torr·l/s, ppm, g/a
Pressure unit	Unit of pressure
	mbar, Pa, atm, Torr

DISPLAY > MEAS. VIEW

Measurement view mode	Type of graphic display
	Diagram, bar graph
Show value	Numeric representation of the measurements
	Off, On

DISPLAY > BRIGHTNESS

Display brightness	Brightness of the display
	20 ... 100%

6.2.2 Settings

SETTINGS > TRIGGER > TRIGGER SEL.

Used trigger	Leakage rate limit shown in the display
	1 ... 4

SETTINGS > FAVORITES

Favorite 1	To execute a frequently used function more quickly, you can assign the function to the key FAVORITE 1. The key FAVORITE 1 is the middle key on the measurement display (see Fig: 4, page 14, No. 14).
	CAL, Zero, Measurement view, Start/Stop, Display settings, Volume, --- (= no function)
Favorite 2	To execute a frequently used function more quickly, you can assign the function to the key FAVORITE 2. The key FAVORITE 2 is the right key on the measuring display (see Fig: 4, page 14, No. 13).
	CAL, Zero, Measurement view, Start/Stop, Display settings, Volume, --- (= no function)
Favorite 3	To execute a frequently used function more quickly, you can assign the function to the key FAVORITE 3. The key FAVORITE 3 is the key at the bottom right of the main menu.
	CAL, Zero, Measurement view, Start/Stop, Display settings, Volume, --- (= no function)

Users with the access level OPERATOR, SUPERVISOR or INTEGRATOR can access the favorites.

SETTINGS > SET UP > CONTROL UNIT > LANGUAGE

Language	Language of the display
	German, English

SETTINGS > SET UP > CONTROL UNIT > MESSAGES

Show warnings	Activation of warnings on the display
	Off, On

Volume level	Volume of the headphones or active speaker	
	0 ... 15	
Audio alarm mode	Type of audio alarm	
	No function	-
	Proportional	The frequency of the audible signal is proportional to the bar graph display or diagram height. The frequency range is 300 Hz to 3300 Hz.
	Setpoint	The pitch is proportional to the leakage rate. A signal sounds if the leakage rate exceeds the selected trigger value.
	Pinpoint	The sound of the acoustic signal changes its frequency within a specific range of leakage rates. Range: A decade below the selected trigger threshold up to one decade above. The sound keeps at a constant low and a constant high frequency below and above this range, respectively.
	Trigger	If the selected trigger threshold is exceeded, a two-pitch signal sounds.

SETTINGS > SET UP > CONTROL UNIT > ENERGY

Display off after	Time after which the display switches off to save energy
	30 s, 1 min, 2 min, 5 min, 10 min, 30 min, 1 h, ∞ (= never)

Information   If the display shows a warning or an error, then a two-pitch signal sounds simultaneously.

6.2.3   Functions

FUNCTIONS > DATA > PARAMETERS > RESET

Control unit settings	Resetting the control unit parameters to the factory settings
	-
MSB settings	Resetting the mass spectrometer module parameters to the factory settings
	-
Parameter access level	Resetting the parameter access levels to the factory settings
	-

FUNCTIONS > DATA > RECORDER > SETTINGS

Data recording	Activation or deactivation of data recording	
	Off, On	
Record interval	Time interval between the recording of data sets	
	100 ms, 200 ms, 500 ms, 1 s, 2 s, 5 s	
Memory location	Memory location of the measured data that is recorded (USB stick, control unit)	
	USB	The data are stored on a USB stick as a TXT file. Each TXT file contains the following information: - Creation date - Software versions - Serial number - Start time - Time stamp (measurement indicates offset in seconds in relation to start time) - File name - Time stamp (offset in seconds in relation to start time) - Leakage rate (in used unit) - Pressure P1 (in used unit) - Device status
	internal	The memory in the control unit is limited (sufficient for recording data for a maximum of 24 hours). Recommendation: Record directly to USB stick.

FUNCTIONS > DATA > PARAMETERS

List	List of parameters that can be changed (sorted alphabetically)
	-

6.2.4   Access Ctrl

ACCESS CTRL > OPERATOR/SUPERVISOR/INTEGRATOR > ERROR INFO

Error info Viewer/ Operator/Supervisor	Depth of error information
	Error number, Short text, Extended information

ACCESS CTRL > OPERATOR/SUPERVISOR/INTEGRATOR

Para. access	List of parameter access levels
	-

ACCESS CTRL > OPERATOR/SUPERVISOR/INTEGRATOR > PIN ASSIGN

Operator/Supervisor/ Integrator	PIN for the access levels
	0000 ... 9999

Information A key switch can be used instead of the PIN. The key switch is connected to the I/O module via three digital inputs.

Access Ctrl		Login with PIN	Parameter	
Level	Designation		query	set
1	Viewer (VIE)	No	Yes	No
2	Operator (OPE)	Yes	Yes	Yes
3	Supervisor (SUP)	Yes	Yes	Yes
4	Integrator (INT)	Yes	Yes	Yes

6.2.5 Info

INFO > MEASUREMENT/TEMPERATURE/ENERGY/HISTORY/CONTROL UNIT/MS MODULE/INTERFACES

Diverse parameters	Information on diverse parameters, e. g. on the pre-amplifier or the ion source
	-

6.3 Loading or saving parameters

You can use a USB stick to backup and restore the control unit and mass spectrometer module parameters.

► Load parameters as needed:
FUNCTIONS > DATA > PARAMETER > LOAD > LOAD PARAMETER

► Save parameters as needed:
FUNCTIONS > DATA > PARAMETER > SAVE > SAVE PARAMETER

6.4 Copying or deleting measured data

► Copy measured data from the control unit's internal memory to a USB stick as needed:
FUNCTIONS > DATA > RECORDER > COPY > COPY FILES

► Delete measured data from the control unit's internal memory as needed:
FUNCTIONS > DATA > RECORDER > DELETE > DELETE FILES

6.5 Lock all access levels

► Lock all access levels as needed:
ACCESS CTRL > VIEWER

6.6 Software update

6.6.1 Updating the software of the control unit

1 Copy these files to the main directory of a USB stick:

– Handset_IFC_Vx.x.xx.exe

– Handset_IFC_Vx.x.xx.key

2 Plug the USB stick into the USB port on the control unit.

3 Select on measurement screen:
FUNCTIONS > DATA > UPDATE > CONTROL UNIT

4 Press OK to confirm message.

5 Press START to begin.

6.6.2 Updating the software of the MS module

1 Copy these files to the main directory of a USB stick:

– Flash_LDS3000_MSB_Vxx.xx.xxx.bin

2 Plug the USB stick into the USB port on the control unit.

3 Select on measurement screen:
FUNCTIONS > DATA > UPDATE > MSB

4 Press OK to confirm message.

5 Press START to begin.

6.6.3 Updating the software of the I/O module

Information   The software of the I/O module can be updated from the control unit if the mass spectrometer module has the software version "MS-Modul 1.02" or higher.

1 Copy these files to the main directory of a USB stick:

– Flash_LDS3000_IO_Vxx.xx.xxx.bin

2 Switch DIP switch S2-3 of the I/O module from OFF to ON (rising flank).

3 Plug the USB stick into the USB port on the control unit.

4 Select on measurement screen:
FUNCTIONS > DATA > UPDATE > I/O MODULE

5 Press OK to confirm message.

6 Press START to begin.

7 Switch DIP switch S2-3 of the I/O module to OFF.

7 Taking out of service

7.1 Disposing of the control unit

The unit can be disposed of by the user or sent to INFICON.

Information   The unit is made of materials that can be reused. By recycling these
materials you reduce waste and environmental impact.

► For disposal, always comply with local and regional environmental and safety
regulations.

7.2 Returning the control unit

⚠ **WARNING**

Danger to health

Contaminated units can damage the health of INFICON's service staff.

► Use the Declaration of Contamination.

The Declaration of Conformity is essential to ensure compliance with statutory
requirements and the protection of our employees. Units submitted without an
enclosed Declaration of Conformity will be returned to the sender by INFICON.

► Attach the form to the unit or enclose it in the unit's packaging.

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