

OPERATING INSTRUCTIONS

EN

Translation of the Original

37-PIN INPUT/OUTPUT BOARD

Communication interface

Disclaimer of liability

These operating instructions describe all models and variants of your product. Note that your product may not be equipped with all features described in this document. Pfeiffer Vacuum constantly adapts its products to the latest state of the art without prior notice. Please take into account that online operating instructions can deviate from the printed operating instructions supplied with your product.

Furthermore, Pfeiffer Vacuum assumes no responsibility or liability for damage resulting from the use of the product that contradicts its proper use or is explicitly defined as foreseeable misuse.

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We reserve the right to make changes to the technical data and information in this document.

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1 About this manual



IMPORTANT

Read carefully before use.
Keep the manual for future consultation.

1.1 Validity

This operating instructions is a customer document of Pfeiffer Vacuum. The operating instructions describe the functions of the named product and provide the most important information for the safe use of the device. The description is written in accordance with the valid directives. The information in this operating instructions refers to the product's current development status. The document shall remain valid provided that the customer does not make any changes to the product.

1.1.1 Products concerned

This document applies to products with the following part numbers.

ASM 340

Description	Part Number
ASM 340 Wet - 37-pin I/O - USB	JSVA0xA2Mx9x
ASM 340 Wet - 37-pin I/O - USB - Ethernet	JSVA0xA4Mx9x
ASM 340 Dry - 37-pin I/O - USB	KSBA0xA2MM9A
ASM 340 Dry - 37-pin I/O - USB - Ethernet	KSBA0xA4MM9A
ASM 340 Integrable - 37-pin I/O - USB	MSXA0xA2MM9A
ASM 340 Integrable - 37-pin I/O - USB - Ethernet	MSXA0xA4MM9A
Accessory - 37-pin I/O communication interface board	121350S
Accessory - 37-pin I/O communication interface board - USB - Ethernet	121352S

ASM 390/392

Description	Part Number
ASM 390 - 37-pin I/O - USB	CSGB01G2MM9x
ASM 390 - 37-pin I/O - USB - Ethernet	CSGB01G4MM9x
ASM 392 - 37-pin I/O - USB	ESGB02G2MM9X
ASM 392 - 37-pin I/O - USB - Ethernet	ESGB02G4MM9X
Accessory - 37-pin I/O communication interface board	126254
Accessory - 37-pin I/O communication interface board - USB - Ethernet	126255

ASM 306S

Description	Part Number
ASM 306S - 37-pin I/O - USB	RSAS00A2MM9A
ASM 306S - 37-pin I/O - USB - Ethernet	RSAS00A4MM9A
Accessory - 37-pin I/O communication interface board	127258S
Accessory - 37-pin I/O communication interface board - USB - Ethernet	127256S

ASI 35

Description	Part Number
ASI 35 - 37-pin I/O - USB	Sxxx0x02MM9A
ASI 35 - 37-pin I/O - USB - Ethernet	Sxxx0x04MM9A
37-pin I/O communication interface kit - USB	123057S
37-pin I/O communication interface kit - USB - Ethernet	123058S

1.1.2 Applicable documents

Documents relevant for the use of options and/or accessories, and for product maintenance are the following:

Document	Part Number ¹⁾
Operating instructions - ASM 340 leak detector	121762 128863
Operating instructions - ASM 390/392 leak detector	126348
Operating instructions - ASM 306S leak detector	127443
Operating instructions - ASI 35 leak detector	127801
Operating instructions - RS-232 Serial link	122215

1) also available at www.pfeiffer-vacuum.com

1.2 Target group

This user manual is intended for all persons in charge of transport, installation, commissioning/decommissioning, use, maintenance or storage of the product.

The work described in this document must only be carried out by persons with suitable technical training (specialized staff) or persons who have undergone Pfeiffer Vacuum training.

1.3 Conventions

1.3.1 Instructions in the text

Usage instructions in the document follow a general structure that is complete in itself. The required action is indicated by an individual step or multi-part action steps.

Individual action step

A horizontal, solid triangle indicates the only step in an action.

- ▶ This is an individual action step.

Sequence of multi-part action steps

The numerical list indicates an action with multiple necessary steps.

1. Step 1
2. Step 2
3. ...

1.3.2 Abbreviations

I/O Input/Output

[XXXXXX] The control panel menus and parameters are shown in bold between square brackets.

Example: **[Advanced]** **[Input/Output]** to select the Input/Output menu.

The screenshots are given as an example only. They can vary according to the user setting.

2 Safety

2.1 General safety information

The following 4 risk levels and 1 information level are taken into account in this document.

DANGER

Immediately pending danger

Indicates an immediately pending danger that will result in death or serious injury if not observed.

- ▶ Instructions to avoid the danger situation

WARNING

Potential pending danger

Indicates a pending danger that could result in death or serious injury if not observed.

- ▶ Instructions to avoid the danger situation

CAUTION

Potential pending danger

Indicates a pending danger that could result in minor injuries if not observed.

- ▶ Instructions to avoid the danger situation

NOTICE

Danger of damage to property

Is used to highlight actions that are not associated with personal injury.

- ▶ Instructions to avoid damage to property



Notes, tips or examples indicate important information about the product or about this document.

2.1.1 Safety instructions

All safety instructions in this document are based on the results of the risk assessment carried out in accordance with Low-Voltage Directive 2014/35/EU regarding electrical safety. Where applicable, all life cycle phases of the product were taken into account.

WARNING

Risk of electric shock in case of contact with products that are not electrically isolated

When powering off _mains switch to **O**, certain components located between the mains connection and the circuit breaker will still contain an electric charge (live). There is a risk of electric shock in case of contact.

- ▶ Make sure that the mains connection is always visible and accessible so that it can be unplugged at any time.
- ▶ Disconnect the mains cable from the electrical network before working on the product.
- ▶ Wait for the control panel screen to turn off completely before working on the product and/or removing the cover(s).

NOTICE

Risk of electromagnetic disturbance

Voltages and currents can induce a multitude of electromagnetic fields and interference signals. Installations that do not comply with the EMC regulations can interfere with other equipment and the environment in general.

- ▶ Use shielded cables and connections for the interfaces in interference-prone environments.

NOTICE

Safety extra-low voltage circuits

The remote control circuits are equipped with dry contact outputs (30 V - 40 A max). Overvoltages and overcurrents can result in internal electrical damage. Users must observe the following wiring conditions:

- ▶ Connect these outputs in compliance with safety extra-low voltage (SELV) circuit rules and safety standards.
- ▶ The voltage applied to these contacts should be less than 30 V and the current less than 40 A.

2.1.2 Precautions



Duty to provide information on potential dangers

The product holder or user is obliged to make all operating personnel aware of dangers posed by this product.

Every person who is involved in the installation, operation or maintenance of the product must read, understand and adhere to the safety-related parts of this document.



Infringement of conformity due to modifications to the product

The Declaration of Conformity from the manufacturer is no longer valid if the operator changes the original product or installs additional equipment.

- Following the installation into a system, the operator is required to check and re-evaluate the conformity of the overall system in the context of the relevant European Directives, before commissioning that system.

Only qualified personnel trained in safety regulations (EMC, electrical safety, chemical pollution) are authorized to carry out the installation and maintenance described in this manual. Our service centers can provide the necessary training.

- ▶ Follow the safety and accident prevention requirements (see chapter "Safety instructions").
- ▶ Do not turn on the product if the cover is not in place.

2.2 Intended use

The communication interface is intended to be integrated into a leak detector from the manufacturer Pfeiffer Vacuum (see chapter "Products concerned").

The communication interface enables the leak detector to communicate with a PLC (at the customer's expense).

The communication interface must be used in conjunction with the leak detector operating instructions (see chapter "Applicable documents").

2.3 Foreseeable misuse

Misuse of the product will render the warranty and any claims void.

Any use, whether intended or not, that diverges from the uses already mentioned will be treated as non-compliant.

3 Installation

3.1 Receipt of the product



Condition of the delivery

- Check that the product has not been damaged during transport.
- If the product is damaged, take the necessary measures with the carrier **and** notify the manufacturer.

- ▶ Keeping the product in its original packaging so it stays as clean as it was when dispatched by us. Only unpack the product once it has arrived at the location where it will be used.



Keep the packaging (recyclable materials) in case the product needs to be transported or stored.

3.2 ASM 340

To install the "Communication interface board" accessory, it is necessary to remove the communication interface already installed in the leak detector in order to replace it with the accessory instead.

3.2.1 Removal of the communication interface

⚠ WARNING

Electric shock hazard

Voltage and current can cause electric shock.

Only skilled, authorized people may carry out maintenance work.

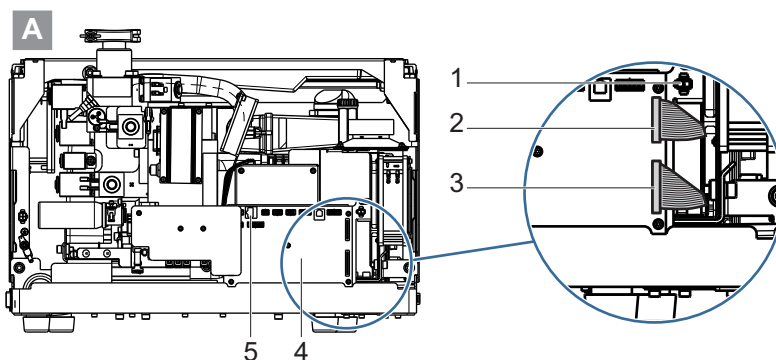
- ▶ Insulate and lock the power supply circuit by positioning the circuit breaker on **O**.
- ▶ Disconnect the power supply cable from all power sources before working on the product and/or removing the covers.

⚠ WARNING

Risk of crushing during product handling

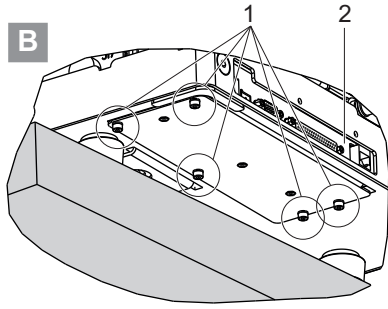
Considering the weight of the leak detector in which the accessory is to be installed, there is a risk of crushing when handling the leak detector. Under no circumstances shall the manufacturer be liable if the following instructions are not followed:

- ▶ Only qualified staff trained in handling heavy objects are authorized to handle the product.
- ▶ The lifting devices **must** be used on the leak detector and follow the procedures (see chapter "Handling" of the leak detector operating instructions).



1 24 VDC supply connector
2 J2 connector
3 J1 connector

4 Supervisor board
5 J9 connector



1 Fixing screws 2 Support plate

1. Switch off the leak detector (see chapter “Shutdown the detector” in the detector operating instructions).
2. Remove the front cover of the detector (see leak detector maintenance manual).
3. Disconnect connectors J1, J2 and J9 from the supervisor board (see [A]).
 - There are no J2 connectors for the 15-pin I/O board
4. Disconnect the 24 VDC supply (see [A]).
5. Move the detector over the edge of the work surface.
6. Remove the 5 fixing screws from the support plate located below the leak detector (see [B]).

3.2.2 Installation of the new communication interface

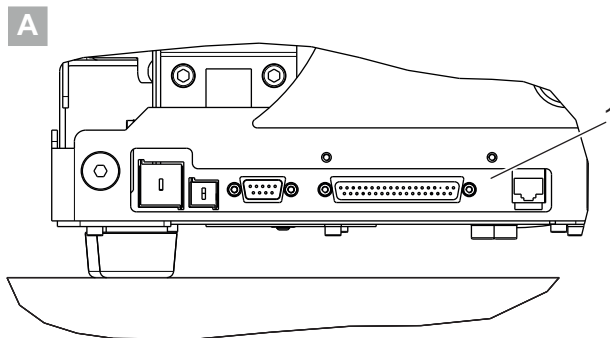
Composition of a 37-pin I/O interface board kit

- 1 support plate equipped with the 37-pin I/O board and a label
- 5 screws and 5 washers to fix the plate on the detector
- 1 37-pin male D-Sub connector to prepare the connection cable (at the customer’s expense)
- 1 operating instructions for the 37-pin I/O communication interface

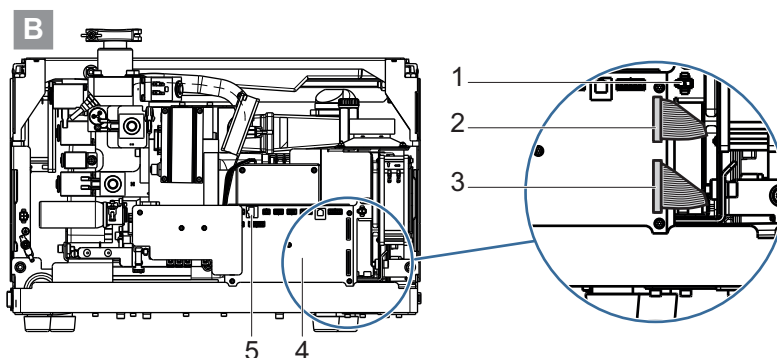
⚠ WARNING

Electric shock hazard
Voltage and current can cause electric shock.
Only skilled, authorized people may carry out maintenance work.

- ▶ Insulate and lock the power supply circuit by positioning the circuit breaker on **O**.
- ▶ Disconnect the power supply cable from all power sources before working on the product and/or removing the covers.



1 Support plate



- | | |
|---------------------------|--------------------|
| 1 24 VDC supply connector | 4 Supervisor board |
| 2 J2 connector | 5 J9 connector |
| 3 J1 connector | |

1. Remove the communication interface (see chapter "Removal of the communication interface").
2. Install in place of the new support plate equipped with the I/O board (see [A]).
3. Place the wiring harnesses under the supervisor board of the new communication interface (see [B]).
4. Replace the 5 screws and washers.
5. Connect the connectors J1, J2 and J9 of the I/O board to the supervisor board (see [B]).
 - There are no J2 and J9 connectors for the 15-pin I/O board
6. Connect the 24 VDC supply (see [B]).
7. Stick the label supplied in the kit on the detector frame if the I/O board is equipped with an Ethernet module.
8. Set the USB port (see chapter "Command via USB").
9. Set the Ethernet module if the I/O board is equipped with the module (see chapter "Command via Ethernet").

3.3 ASM 390-392

To install the "Communication interface board" accessory, it is necessary to remove the communication interface already installed in the leak detector in order to replace it with the accessory instead.

3.3.1 Removal of the communication interface

⚠ WARNING

Electric shock hazard

Voltage and current can cause electric shock.

Only skilled, authorized people may carry out maintenance work.

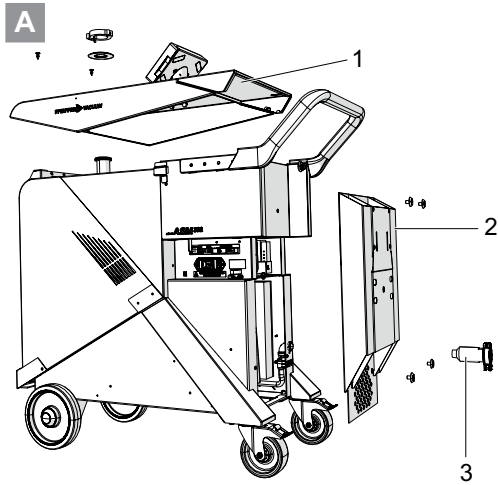
- ▶ Insulate and lock the power supply circuit by positioning the circuit breaker on **O**.
- ▶ Disconnect the power supply cable from all power sources before working on the product and/or removing the covers.

⚠ WARNING

Risk of crushing during product handling

Considering the weight of the leak detector in which the accessory is to be installed, there is a risk of crushing when handling the leak detector. Under no circumstances shall the manufacturer be liable if the following instructions are not followed:

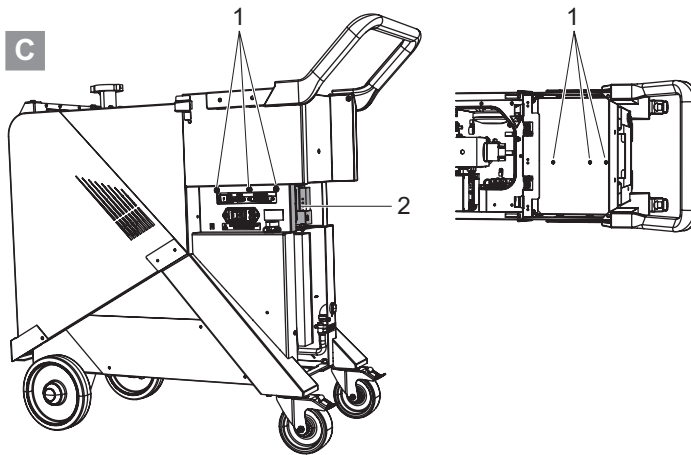
- ▶ Only qualified staff trained in handling heavy objects are authorized to handle the product.
- ▶ The lifting devices **must** be used on the leak detector and follow the procedures (see chapter "Handling" of the leak detector operating instructions).



1 Work surface
2 Rear panel
3 Exhaust



1 J2 connector
2 J1 connector
3 Ground connection



1 Fixing screws
2 Support plate

1. Switch off the leak detector (see chapter “Shutdown the detector” in the detector operating instructions).
2. Remove the work surface and the pump exhaust if installed (see [A]).
3. Remove the rear panel from the detector (see [A]).
4. Empty the storage box and remove the groundsheet.
5. Disconnect connectors J1 and J2 from the supervisor board (see [B]).
 - There are no J2 connectors for the 15-pin I/O board
6. Remove the ground wire connecting the support plate to the detector frame (see [B]).

7. Remove the 6 support plate fixing screws (see [C]).
 - 3 on the detector side,
 - 3 on the bottom of the storage box.
8. Pull the support plate horizontally to remove it (see [C]).

3.3.2 Installation of the new communication interface

Composition of a 37-pin I/O interface board kit

- 1 support plate equipped with the 37-pin I/O board and a label
- 6 screws and 6 washers to fix the plate on the detector
- 1 37-pin male D-Sub connector to prepare the connection cable (at the customer's expense)
- 1 operating instructions for the 37-pin I/O communication interface

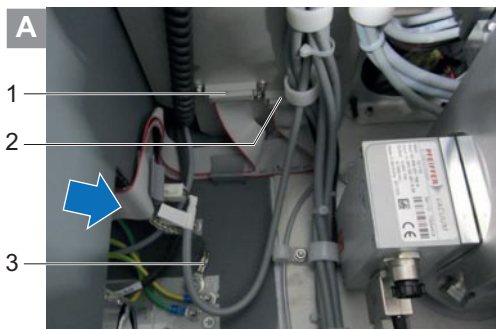
⚠ WARNING

Electric shock hazard

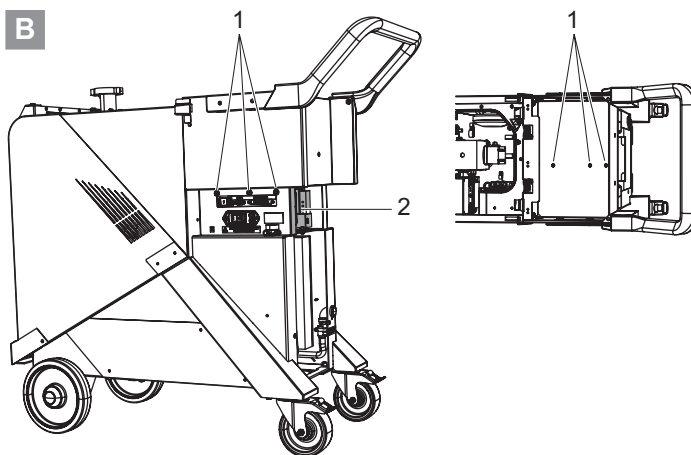
Voltage and current can cause electric shock.

Only skilled, authorized people may carry out maintenance work.

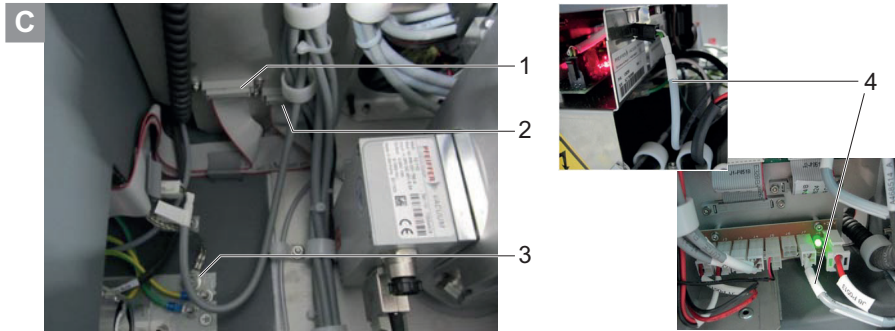
- ▶ Insulate and lock the power supply circuit by positioning the circuit breaker on **O**.
- ▶ Disconnect the power supply cable from all power sources before working on the product and/or removing the covers.



- 1 J2 connector 3 Ground connection
2 J1 connector



- 1 Fixing screws 2 Support plate



1 J2 connector 3 Ground connection
 2 J1 connector 4 Supply cable

1. Remove the communication interface (see chapter “Removal of the communication interface”).
2. Install in place of the new support plate equipped with the I/O board (see [A]).
 - The support plate is introduced horizontally, the wiring harnesses and the ground connection first: the wiring harnesses and the ground connection must come out.
3. Replace the 6 support plate fixing screws (see [B]):
 - 3 on the detector side,
 - 3 on the bottom of the storage box.
4. Connect connectors J1 and J2 from the I/O board to the supervisor board
5. Fasten the ground wire connecting the support plate to the detector frame (see [C]).
6. Connect the power supply cable.
7. Put the work plan, the rear panel and the groundsheet back in the storage box.
8. Stick the label supplied in the kit on the detector frame if the I/O board is equipped with an Ethernet module.
9. Set the USB port (see chapter “Command via USB”).
10. Set the Ethernet module if the I/O board is equipped with the module (see chapter “Command via Ethernet”).

3.4 ASM 306S

To install the “Communication interface board” accessory, it is necessary to remove the communication interface already installed in the leak detector in order to replace it with the accessory instead.

3.4.1 Removal of the communication interface

⚠ WARNING

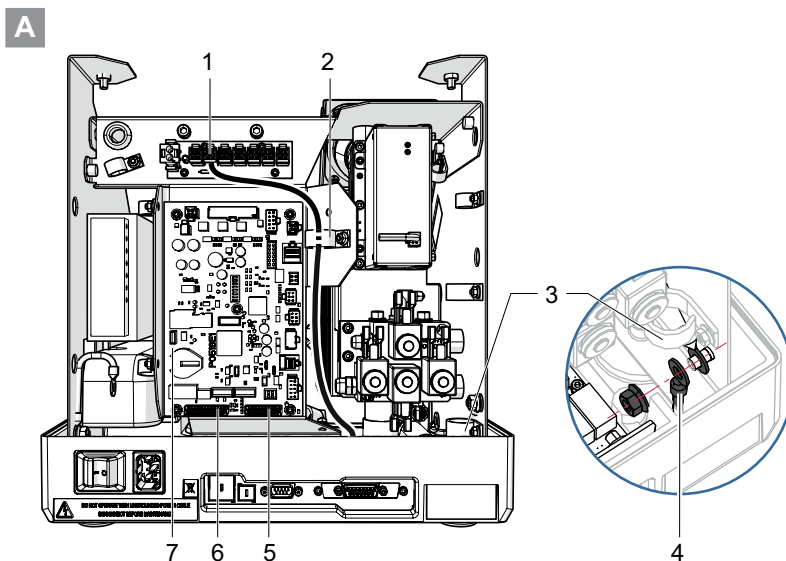
Electric shock hazard
 Voltage and current can cause electric shock.
 Only skilled, authorized people may carry out maintenance work.

- ▶ Insulate and lock the power supply circuit by positioning the circuit breaker on **O**.
- ▶ Disconnect the power supply cable from all power sources before working on the product and/or removing the covers.

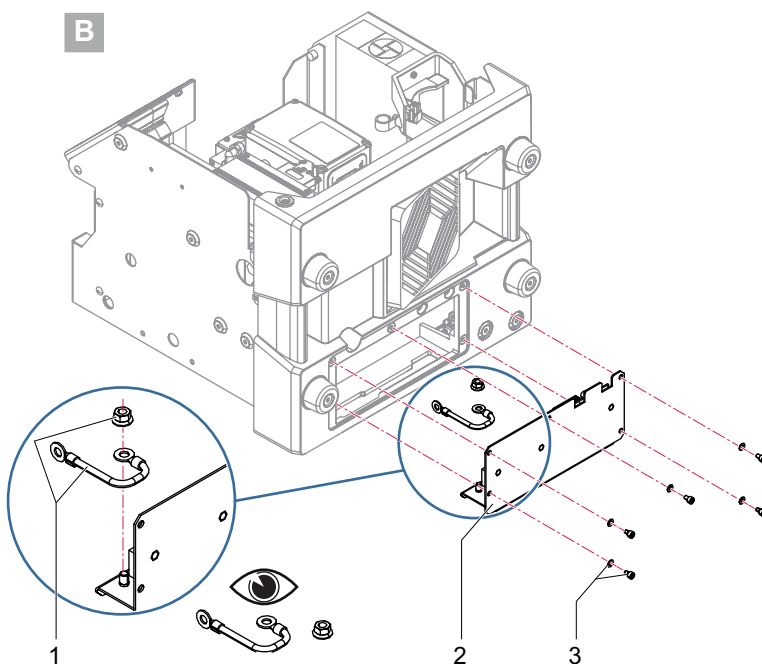
⚠ WARNING


Risk of crushing during product handling
 Considering the weight of the leak detector in which the accessory is to be installed, there is a risk of crushing when handling the leak detector. Under no circumstances shall the manufacturer be liable if the following instructions are not followed:

- ▶ Only qualified staff trained in handling heavy objects are authorized to handle the product.
- ▶ The lifting devices **must** be used on the leak detector and follow the procedures (see chapter “Handling” of the leak detector operating instructions).



- | | |
|------------------------------|--------------------|
| 1 24 VDC J6 supply connector | 5 J2 connector |
| 2 Grommet | 6 J1 connector |
| 3 Grommet | 7 Supervisor board |
| 4 Ground connection | |



 **The ground connection and the nut are not supplied with the kit. They must be removed from the support plate of the old kit to be put back on the support plate of the new kit.**

- | | |
|------------------------------|-----------------------------|
| 1 Ground connection with nut | 3 Fixing screw with washers |
| 2 Support plate | |

1. Switch off the leak detector (see chapter “Shutdown the detector” in the detector operating instructions).
2. Remove the front cover of the detector (see leak detector maintenance manual).
3. On the supervisor board, disconnect the wiring harness(es) from the communication interface (connectors J1 and J2 depending on the configuration and connector J9) (see [A]).
4. Disconnect connectors J1, J2 and J9 from the supervisor board (see [A]).
 - There are no J2 and J9 connectors for the 15-pin I/O board
5. Disconnect the 24 VDC power supply (J6) (see [A]).
6. Remove the ground wire connecting the support plate to the detector frame (see [A]).

7. Tilt the detector onto its rear face on the work surface (the side with the connectors facing the user).
8. Remove the ground connection from the support plate (see [B]).
9. Remove the 5 support plate fixing screws and the washers (see [B]).

3.4.2 Installation of the new communication interface

Composition of a 37-pin I/O interface board kit

- 1 support plate equipped with the 37-pin I/O board and a label
- 5 screws and 5 washers to fix the plate on the detector
- 1 37-pin male D-Sub connector to prepare the connection cable (at the customer's expense)
- 1 operating instructions for the 37-pin I/O communication interface

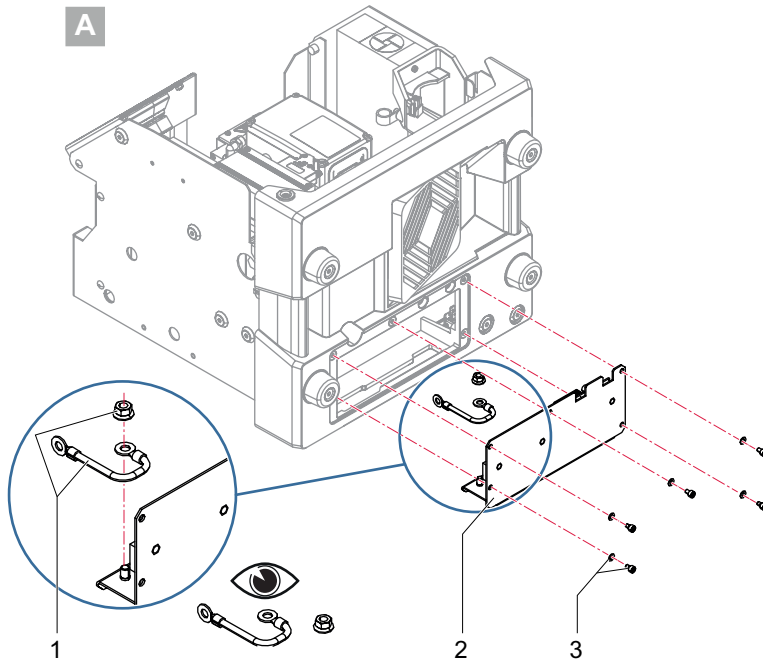
⚠ WARNING

Electric shock hazard

Voltage and current can cause electric shock.

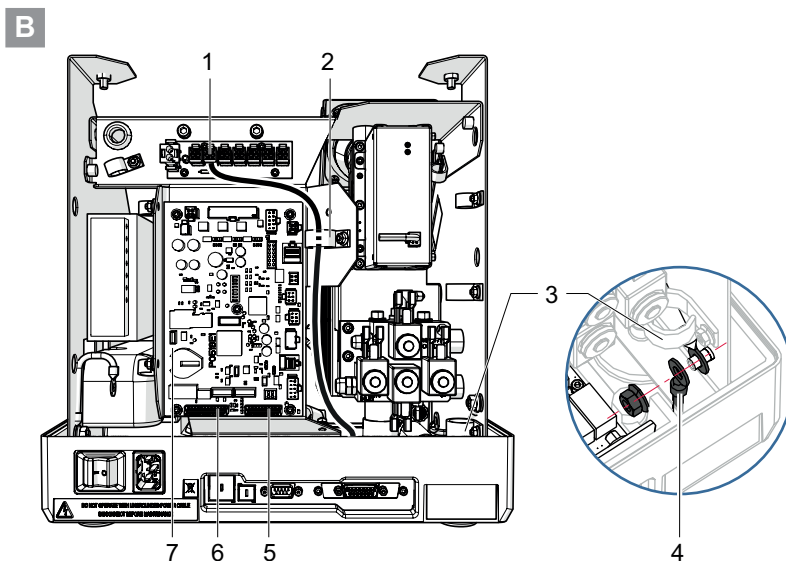
Only skilled, authorized people may carry out maintenance work.

- ▶ Insulate and lock the power supply circuit by positioning the circuit breaker on **O**.
- ▶ Disconnect the power supply cable from all power sources before working on the product and/or removing the covers.



👁 The ground connection and the nut are not supplied with the kit. They must be removed from the support plate of the old kit to be put back on the support plate of the new kit.

- | | |
|------------------------------|-----------------------------|
| 1 Ground connection with nut | 3 Fixing screw with washers |
| 2 Support plate | |



- | | |
|------------------------------|--------------------|
| 1 24 VDC J6 supply connector | 5 J2 connector |
| 2 Grommet | 6 J1 connector |
| 3 Grommet | 7 Supervisor board |
| 4 Ground connection | |

1. Remove the communication interface (see chapter "Removal of the communication interface").
2. Place the ground connection on the new support plate (see **[A]**).
3. Install in place of the new support plate equipped with the I/O board (see **[A]**).
4. Place the wiring harnesses under the supervisor board of the new communication interface.
5. Replace the 5 support plate fixing screws and the washers (see **[A]**).
6. Position the detector, resting its feet on the work surface.
7. Connect the connectors J1, J2 and J9 of the I/O board to the supervisor board (see **[B]**).
 - There are no J2 and J9 connectors for the 15-pin I/O board
8. Connect the 24 VDC supply (see **[B]**).
9. Replace the ground wire connecting the support plate to the detector frame (see **[B]**).
10. Stick the label supplied in the kit on the detector frame if the I/O board is equipped with an Ethernet module.
11. Set the USB port (see chapter "Command via USB").
12. Set the Ethernet module if the I/O board is equipped with the module (see chapter "Command via Ethernet").

4 Connection

4.1 Cable characteristics

NOTICE

Risk of electromagnetic disturbance

Voltages and currents can induce a multitude of electromagnetic fields and interference signals. Installations that do not comply with the EMC regulations can interfere with other equipment and the environment in general.

- ▶ Use shielded cables and connections for the interfaces in interference-prone environments.

NOTICE

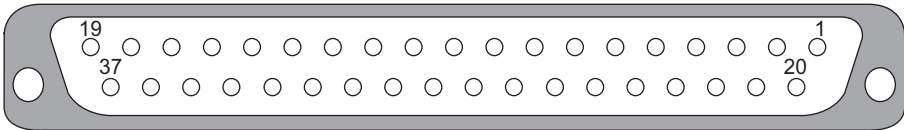
Safety extra-low voltage circuits

The remote control circuits are equipped with dry contact outputs. Overvoltages and overcurrents can result in internal electrical damage. Users must observe the following wiring conditions:

- ▶ Connect these outputs in compliance with safety extra-low voltage (SELV) circuit rules and safety standards.
- ▶ The voltage applied to these contacts should be less than 30 VDC and the current less than 1 A.

37-pin I/O communication interface

- ▶ Use a cable that conforms to I/O cable standards.
 - 37-pin male D-Sub connector and its cover, provided with the leak detector.
 - Cable not provided, at the customer's expense.



Leak detector 37-pin female D-Sub I/O connector

Input	Logic	Pins 11 - 12 - 13 - 30 - 31 - 32
	Accessory	Pins 34 - 35 - 15 - 16: reserved
Output	Logic	Pins 1 to 9 - 20 to 28
	Analog	Pins 19 - 36 - 37 (ground: 17 - 18)
	Other	29-pin: +24 VDC internal or external ¹⁾ 10-pin: internal or external ground ¹⁾ Pins 33 - 14: headphones (8 Ω) ²⁾

1) Depending on SW1 switch configuration.

2) Activation/deactivation for the headphone/audio output (see below)

Activation/deactivation for the headphone/audio output

1. Activation of the loudspeaker: send the command RS-232 '=HPE' to the detector.
2. Deactivation of the loudspeaker: send the command RS-232 '=HPD' to the detector.

USB

- ▶ Use a type A-B USB cable.
 - Cable not provided, at the customer's expense.

RS-232 serial link

- ▶ Use a cable (not supplied) that conforms to RS-232 cable standards.
 - 9-pin female D-Sub connector
- ▶ Refer to the operating instructions for the RS-232 serial link (see chapter "Applicable documents").

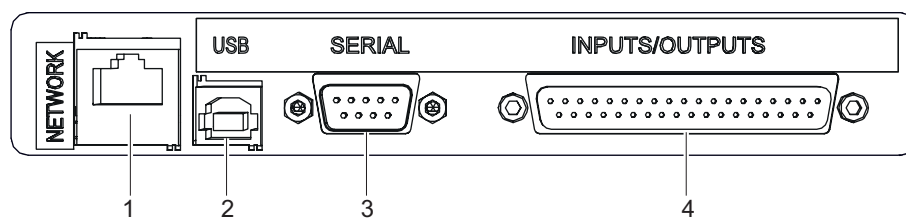
Ethernet

- ▶ Connect a cable between the detector Ethernet port and the computer.
 - Cable not provided, at the customer's expense.
 - As soon as the cable is connected, the USB module is detected.

4.2 Connection interface

Refer to the leak detector operating instructions to locate the connection interface.

Before connecting the cable, switch off the leak detector (see chapter "Powering off" in the leak detector maintenance instructions).



37-pin I/O communication interface

- 1 Ethernet connector (depending on option)
- 2 USB connector
- 3 9-pin male D-Sub RS-232 serial link connector

Refer to the operating instructions for the RS-232 serial link (see chapter "Applicable documents").

- 4 37-pin female D-Sub I/O communication interface connector

5 Command via I/O communications interface

- ▶ From the “Settings” screen, press [Advanced] [Input/Output] [I/O Connector].

5.1 Save

Saving all of the configured I/O is automatically suggested when exiting the menu if a parameter has been modified.

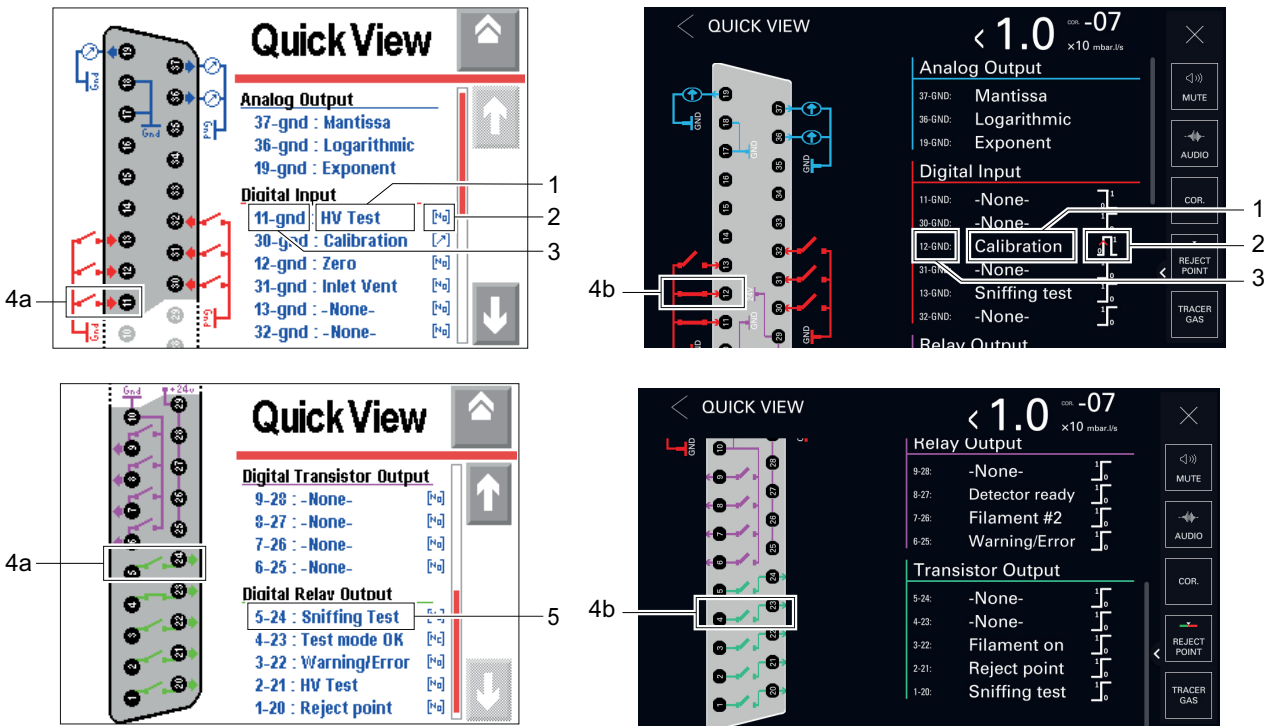
- ▶ Enter the name of the file and validate the save (“.IOP” file).

5.2 Quick View

- ▶ From the “Settings” screen, press [Advanced] [Input/Output] [I/O Connector] [Quick View].

Quick view makes it possible to view, for each I/O:

- connection pins
- allocation (function, setting, order)
- status (allocation and contact)
- activation mode.



Quick View description (example)

- | | |
|-------------------|------------------------------|
| 1 Allocated value | 4a Contact dynamic status |
| 2 Activation mode | 4b Initial status of contact |
| 3 Connection pins | 5 Status |
| | — blue display = inactive |
| | — green display = active |

5.3 Analog Output

Quantity	Pin
3	37-gnd 36-gnd 19-gnd

Leak rate writing

$$\overset{\textcircled{x}}{\quad} = \overset{\textcircled{a}}{\quad} \cdot 10^{\overset{\textcircled{b}}{\quad}}$$

1 2 3

- 1 Leak Rate
- 2 Mantissa
- 3 Exponent

Setting

Pin	Action
37-gnd	<ol style="list-style-type: none"> 1. Select the value to be allocated. ¹⁾ 2. Depending on the value, set the low decade. ²⁾
36-gnd	<ol style="list-style-type: none"> 1. Select the value to be allocated. ¹⁾ 2. Depending on the value, set the low decade. ²⁾
19-gnd	Output always allocated to the "Exponent" value. <ol style="list-style-type: none"> 1. Set the exponent.

1) See table below

2) The low decade is the decade corresponding to 0 V.

Value	Function
Mantissa	1–10 V ¹⁾
Exponent	1–10 V ¹⁾
Logarithmic	1–10 V ¹⁾
Inlet pressure	See details below
He compound	0–10 V (compound exponent, mantissa) ¹⁾
Ext. pressure	External pressure gauge 0-10 V Formula: see the connected gauge operating instructions

1) See chapter "Formulas"

'Inlet pressure' analogic output detail

Connected gauge(s)	Detector	Control of the detector
None	ASM 306S	No gauge for control of the detector Inlet pressure = 1000 hPa = 8.5 V
Internal gauge	ASM 340 ¹⁾ ASM 390 ¹⁾ ASM 392 ¹⁾ ASI 35 ²⁾	Control of the detector with the detector internal gauge <ul style="list-style-type: none"> • Range: 2.5–8.5 V (10⁻³ – 10⁺³ hPa) • Formula ⁴⁾ Setting: see below depending on the detector ASM 340/390/392 No Setting ASI 35 From the "Settings" screen, press [Advanced] [Leak Detection] [Detector pressure gauge] . <ul style="list-style-type: none"> • Pirani gauge connected <ul style="list-style-type: none"> – Gauge = "TPR/PCR" • Linear gauge connected <ul style="list-style-type: none"> – Gauge = 'Linear' – Max scale: to be set

1) Internal gauge PI1/PI3

2) Gauge at the customer's expense: see chapter "Leak detection: Detector pressure gauge" of the leak detector operating instructions

3) Gauge at the customer's expense: see chapter "Leak detection: External gauge" for the leak detector operating instructions

4) See chapter "Formulas"

Connected gauge(s)	Detector	Control of the detector
Internal gauge + External gauge	ASM 340 ^{1) 3)} ASM 390 ^{1) 3)} ASM 392 ^{1) 3)} ASI 35 ^{2) 3)}	Control of the detector with the detector internal gauge <ul style="list-style-type: none"> • Range: 2.5–8.5 V (10^{-3} – 10^{+3} hPa) • Formula ⁴⁾ Setting: From the “Settings” screen, press [Advanced] [Leak Detection] [External gauge] . <ul style="list-style-type: none"> • Pump inlet source pressure = ‘Internal’
		Control of the detector with an external gauge (at the customer’s expense) <ul style="list-style-type: none"> • Range: 0–10 V • Formula: see the connected gauge operating instructions Setting: From the “Settings” screen, press [Advanced] [Leak Detection] [External gauge] . <ul style="list-style-type: none"> • Pirani gauge connected <ul style="list-style-type: none"> – Gauge = “TPR/PCR” – Pump inlet source pressure = ‘External’ • Linear gauge connected <ul style="list-style-type: none"> – Gauge = ‘Linear’ – Pump inlet source pressure = ‘External’ – Max scale: to be set
External gauge	ASI 35 ³⁾	Control of the detector with an external gauge (at the customer’s expense) <ul style="list-style-type: none"> • Range: 0–10 V • Formula: see the connected gauge operating instructions Setting: From the “Settings” screen, press [Advanced] [Leak Detection] [External gauge] . <ul style="list-style-type: none"> • Pirani gauge connected <ul style="list-style-type: none"> – Gauge = “TPR/PCR” – Pump inlet source pressure = ‘External’ • Linear gauge connected <ul style="list-style-type: none"> – Gauge = ‘Linear’ – Pump inlet source pressure = ‘External’ – Max scale: to be set

1) Internal gauge PI1/PI3

2) Gauge at the customer’s expense: see chapter "Leak detection: Detector pressure gauge" of the leak detector operating instructions

3) Gauge at the customer’s expense: see chapter "Leak detection: External gauge" for the leak detector operating instructions

4) See chapter “Formulas”

5.4 Formulas

Mantissa (1–10 V)	
The “Mantissa” output corresponds to the leak rate mantissa.	
Formula	Mantissa = U U = Voltage measured (V) on analog output
Examples	<ul style="list-style-type: none"> • U = 3.5 V -> Mantissa = 3.5 • U = 6.9 V -> Mantissa = 6.9

Exponent (0–10 V)

The “Exponent” output corresponds with the leak rate exponent.

- The exponent changes by 1 V per decade.
- The starting decade corresponds with 0 V.

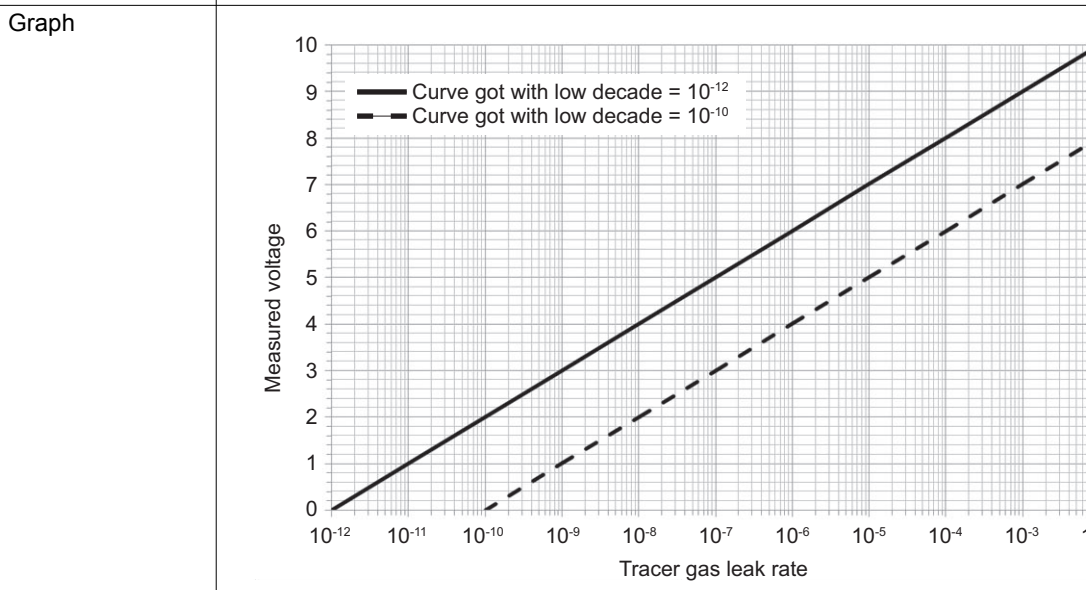
Formula	<p>Exponent = 10 - U + D₀ U = Voltage measured (V) on analog output D₀ = Low decade for 0 V</p>
Examples	<ul style="list-style-type: none"> • Example 1 Low decade at 10⁻¹² (10 V = -12) -> D₀ = -12 – U = 7 V -> Exponent = 10 - 7 - 12 -> Exponent = -9 – U = 2 V -> Exponent = 10 - 2 - 12 -> Exponent = -4 • Example 2 Low decade at 10⁻¹⁰ (10 V = -10) -> D₀ = -10 – U = 7 V -> Exponent = 10 - 7 - 10 -> Exponent = -7 – U = 2 V -> Exponent = 10 - 2 - 10 -> Exponent = -2

Logarithmic (0–10 V)

The “Logarithmic” output corresponds to the leak rate value.

- The leak rate changes by 1 V per decade.
- The starting decade corresponds with 0 V.

Formula	<p>Mantissa = 10^{(U - Integer value (U))} Exponent = Integer value (U) + D₀ Leak rate = Mantissa x 10^{Exponent} U = Voltage measured (V) on analog output D₀ = Low decade for 0 V</p>
Examples	<ul style="list-style-type: none"> • Example 1 Low decade at 10⁻¹² (0 V = 1 · 10⁻¹²) -> D₀ = -12 – U = 3.91 V -> Leak rate = 10^{(3.91 - 3)}} x 10^{(3 - 12)}} = 8.13 · 10⁻⁹ – U = 8.25 V -> Leak rate = 10^{(8.25 - 8)}} x 10^{(8 - 12)}} = 1.78 · 10⁻⁴ • Example 2 Low decade at 10⁻¹⁰ (0 V = 1 · 10⁻¹⁰) -> D₀ = -10 – U = 3.91 V -> Leak rate = 10^{(3.91 - 3)}} x 10^{(3 - 10)}} = 8.13 · 10⁻⁷ – U = 8.25 V -> Leak rate = 10^{(8.25 - 8)}} x 10^{(8 - 10)}} = 1.78 · 10⁻²



Inlet pressure

The "Inlet Pressure" output corresponds to the value of the inlet pressure.

Source of inlet pressure measurement:

- ASM 340/390/392: internal leak detector gauge
- ASM 306S: no gauge
- ASI 35: external gauge (at the customer's expense)

Formula	<p>ASM 340/390/392 (2.5–8.5 V) Inlet pressure = $10^{(U-5.5)}$ hPa U = Voltage measured (V) on analog output</p> <p>ASI 35 (0–10 V) See the connected gauge operating instructions</p>
Graph	<p>ASM 340/390/392 (2.5–8.5 V)</p> <p>ASI 35 (0–10 V) See the connected gauge operating instructions</p>

He Compound (0–10 V)

The "He Compound" output is a combination of the mantissa and the exponent.

- The integer part represents the exponent.
- The decimal part represents the mantissa.

Formula	<p>Mantissa = $10 \times (U - \text{Integer value (U)})$ Exponent = Integer value (U) - 12 He Compound = Mantissa $\times 10^{\text{Exponent}}$ U = Voltage measured (V) on analog output</p>
Examples	<ul style="list-style-type: none"> • U = 3.91 V -> He Compound = $10 \times (3.91 - 3) \times 10^{(3 - 12)} = 9.10 \cdot 10^{-9}$ • U = 8.25 V -> He Compound = $10 \times (8.25 - 8) \times 10^{(8 - 12)} = 2.50 \cdot 10^{-4}$

5.5 Digital input

Type	Quantity	Pins
Optocoupled	6	11-gnd 30-gnd 12-gnd 31-gnd 13-gnd 32-gnd

Setting

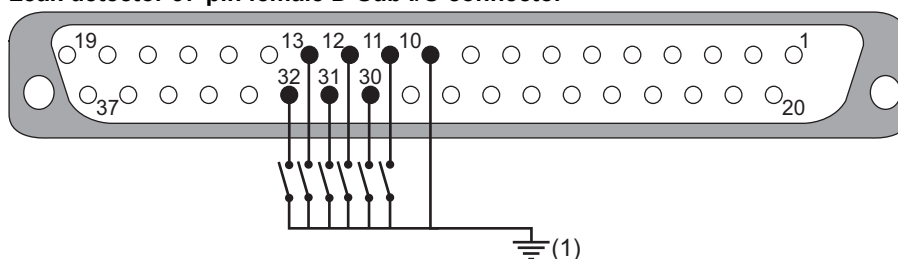
Pins	Description
xx-gnd	1. Select the value to be allocated. ¹⁾ 2. Select the activation mode. ¹⁾

1) See table below

Value ¹⁾	Function
None	-
HV test	Start/Stop a hard vacuum test
Calibration	Start an automatic calibration
Zero	Activate/Deactivate Zero function
He memo	Activate/Deactivate Memo function
Dynamic cal.	Start a dynamic calibration
Sniffing test	Start/Stop a sniffing test
Filament	Force filament on/off
GL mode	Force detector in Gross Leak test mode
NR mode	Force detector in Normal test mode
HS mode	Force detector in High Sensitivity test mode
Inlet vent	Open/Close the inlet vent valve
Rec. Graph	Start/Stop data recording
Save Graph	Save recorded data to an SD card
Bypass option	Activate/Deactivate Bypass (accessory)
HLT Calib	Calibrate for HLT 5xx/HLT 2xx compatibility
Check Cal	Start a calibration check
Internal Cal	Start an internal calibration
External Cal	Start an external calibration
Machine Cal	Start a machine calibration
Clear	Reset warning and error messages
Sniff./Vac.	Select test method
Start/Stop	Start/Stop a test (hard vacuum or sniffing)

1) Depending on the leak detector model, some values are not available.

Leak detector 37-pin female D-Sub I/O connector



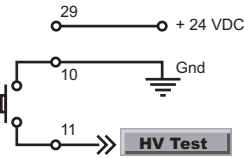

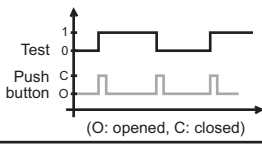


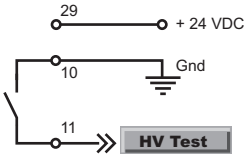

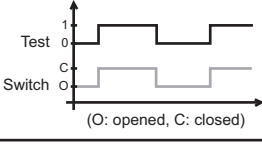

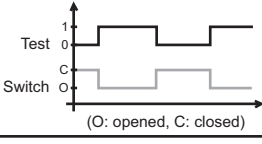


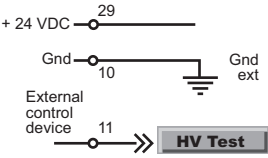

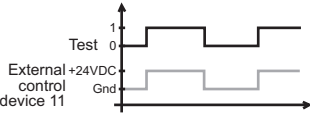

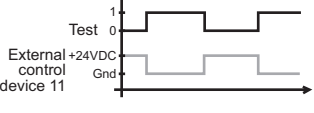


1 Internal ground and +24 VDC: switch SW1 = ON
External ground and +24 VDC: switch SW1 = OFF

Examples

The examples given below illustrate 3 standard uses of digital inputs for which we recommend setting the 24 VDC and the activation mode described in the example.

The 24 VDC and the activation modes can be set by the user.

Type	24 VDC	Diagram	Mode	Logical status
Push button 	Internal 			
Switch 	Internal 			
				
External control device 	External 			
				

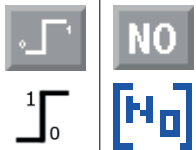

5.6 Digital Output

Type	Quantity	Pins	
MOSFET transistor	4	6-25 7-26 8-27 9-28	
Relay	DS-P relay	2	1-20 2-21
	TX relay	3	3-22 4-23 5-24

Setting

Pin	Description
x-xx	1. Select the value to be allocated. ¹⁾ 2. Select the activation mode. ¹⁾

1) See table below

Activation mode	Pictogram	Description
0 > 1 / NO		<ul style="list-style-type: none"> • Normally open (unswitched output idle) • Activation on rising edge (closing) • Deactivation on falling edge (opening) • This activation mode is generally applicable.
1 > 0 / NC		<ul style="list-style-type: none"> • Normally closed (unswitched output idle) • Activation on falling edge (opening) • Deactivation on rising edge (closing) • This activation mode is recommended for a function that should be activated in fail safe mode.

Value ⁴⁾	Function	Setting	
		0 > 1 / NO Active mode	1 > 0 / NC Active mode
None	Not allocated	-	-
Stand-by	Detector in 'Stand-by' mode	C	O
HLT Stand-by	Detector in 'Standby' mode while awaiting an acknowledgment of the calibration for HLT compatibility	C	O
Test	Detector in test	C	O
Temp limit	Detector near max. use temperature	C	O
Reject point	Detector reject set point ¹⁾	C	O
Set point #2	Leak rate #2 set point ¹⁾	C	O
Set point #3	Leak rate #3 set point ¹⁾	C	O
Set point #4	Leak rate #4 set point ¹⁾	C	O
Set point #5	Leak rate #5 set point ¹⁾	C	O
Warning/Error	Warning/error message	C	O
HV test	Detector in hard vacuum test	C	O
Sniffing test	Detector in sniffing test	C	O
Detector ready	Detector ready to perform a test	C	O
Calibration fail	Calibration failure	C	O
Detector busy	Detector in start-up, test or calibration mode	C	O
Filament #2 on	Filament # 2 selected	C	O
TMP synchro	Hard vacuum pump synchronized	C	O
Filament on	Selected filament ON	C	O
Snif. Clogged	Sniffer probe clogged	C	O
Press s. pt #1	Pressure #1 set point ^{2) 3)}	O	C
Press s. pt #2	Pressure #2 set point ^{2) 3)}	O	C
Press s. pt #3	Pressure #3 set point ^{2) 3)}	O	C
HV Cor	Corrected hard vacuum leak rate	C	O
Maint. Required	Maintenance required	C	O
Sniffing valve	Sniffing valve management	C	O
GL test	Detector in Gross Leak test mode	C	O
N test	Detector in Normal test mode	C	O
HS test	Detector in High Sensitivity test mode	C	O
General failure	Critical failure on the detector	C	O

O = Open - C = Closed

1) Leak rate measured > rejection set point / leak value set.

2) Measured pressure ≤ pressure set point set.

3) ASI 35 not concerned unless a pressure gauge is installed on the customer's installation.

4) Depending on the leak detector model, some values will not be available.

Value ⁴⁾	Function	Setting	
		0 > 1 / NO Active mode	1 > 0 / NC Active mode
Test mode ok	Target test mode reached	C	O
Zero	Zero function activated	C	O
Bypass	Bypass valve opening command	C	O
Calib. ack.	Validation request of a calibration step	C	O
Roughing valve	Roughing mode crossover	O	C

O = Open - C = Closed

1) Leak rate measured > rejection set point / leak value set.

2) Measured pressure ≤ pressure set point set.

3) ASI 35 not concerned unless a pressure gauge is installed on the customer's installation.

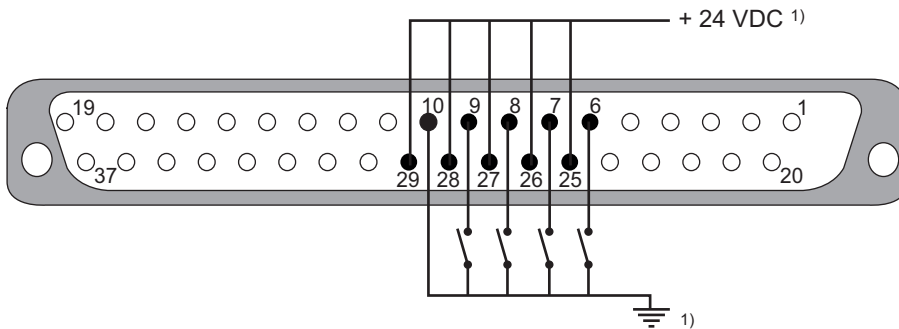
4) Depending on the leak detector model, some values will not be available.

Digital Transistor Output

Characteristics

- Direct current digital outputs: MOFSET transistor
- Quantity: 4 (pins 6-25; 7-26; 8-27; 9-28)
- Functions: according to user setting
- Open collector type
- Direct current: 30 VDC - 1 A max - 30 W

Leak detector 37-pin female D-Sub I/O connector



1 Internal ground and +24 VDC: switch SW1 = ON
External ground and +24 VDC: switch SW1 = OFF





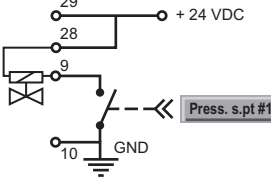
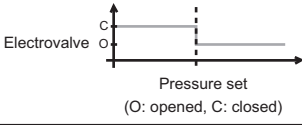
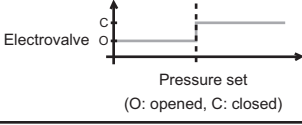

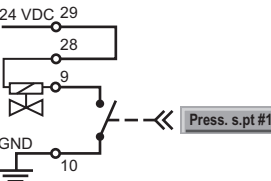
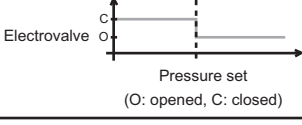
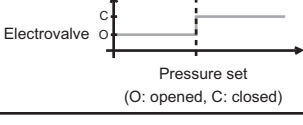
- External 24 VDC (± 10%) power supply is essential to benefit from the optocoupled gate (atmosphere with interferences) and/or to supply 4 Transistor digital outputs. In this case, the SW1 switch on the supervisor board must be in OFF position to avoid any detector deterioration.
- It is possible to occasionally use the leak detector internal 24 VDC if global power on outputs 25 to 28 is less than 2 A.



These outputs can be used to supply an electromagnetic valve (24 VDC – 24 W max).

Example

The example below illustrates standard use of digital outputs.

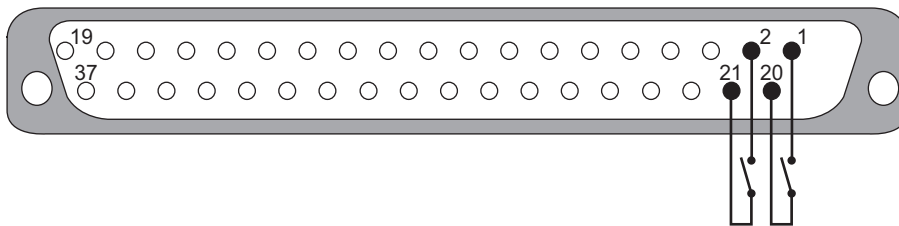
Type	24 VDC	Diagram	Mode	Logical status
Electrovalve 	Internal ON 		NO	
			NC	
	External OFF 		NO	
			NC	

Relay digital outputs: DS-P relay

Characteristics

- Direct/alternating current digital outputs: DS-P relay
- Quantity: 2 (pins 1-20; 2-21)
- Functions: according to user setting
- Dry contact type
- Direct current: 60 VDC - 2.5 A max - 30 VDC - 5 A max
- Alternating current: 60 VAC - 5 A max.

Leak detector 37-pin female D-Sub I/O connector

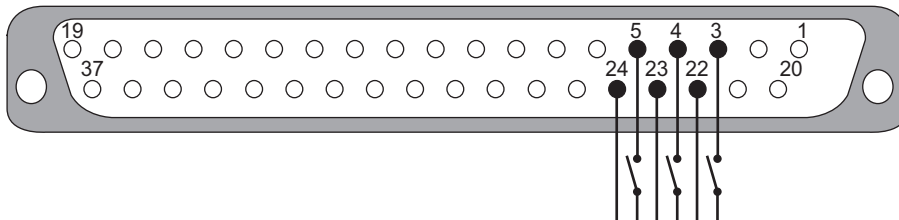


Relay digital outputs: TX relay

Characteristics


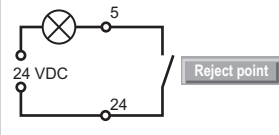
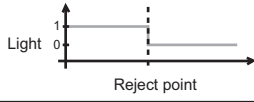
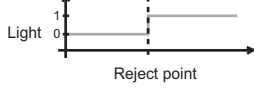
- Direct current digital outputs: TX relay
- Quantity: 3 (pins 3-22; 4-23; 5-24)
- Functions: according to user setting
- Dry contact type
- Direct current: 60 VDC - 1 A max - 30 VDC - 2 A max

Leak detector 37-pin female D-Sub I/O connector



Example

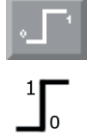

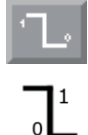



The example below illustrates standard use of digital outputs.

Type	24 V	Diagram	Mode	Logical status
Light 	Internal Or External		NO	
			NC	

5.7 Selection of default configuration (Select Default Config.)

- From the “Settings” screen, press **[Advanced] [Input/Output] [I/O Connector] [Select Default Configuration]**.

This is the default configuration of the I/O upon delivery of the detector. It is specific to one leak detector model.

Activation mode	Pictogram	Description
0 > 1 / NO	 	<ul style="list-style-type: none"> • Normally open (unswitched output idle) • Activation on rising edge (closing) • Deactivation on falling edge (opening) • This activation mode is generally applicable.
1 > 0 / NC	 	<ul style="list-style-type: none"> • Normally closed (unswitched output idle) • Activation on falling edge (opening) • Deactivation on rising edge (closing) • This activation mode is recommended for a function that should be activated in fail safe mode.
Impulsion	 	<ul style="list-style-type: none"> • Activation/Deactivation by impulsion • This activation mode is recommended for the start/stop of a test by a user, an external pushbutton, or a test pedal.

ASM 340 detector								
Analog Out-put	37-gnd	Mantissa	-	Digital Transistor Output	9-28	Bypass	0 > 1 / NO	
	36-gnd	Logarithmic	-		8-27	Detector ready	0 > 1 / NO	
	19-gnd	Exponent	-		7-26	Filament #2	0 > 1 / NO	
Digital Input	11-gnd	Inlet Vent	0 > 1 / NO		Digital Relay Output	6-25	Warning/Error	0 > 1 / NO
	30-gnd	Zero	0 > 1 / NO			5-24	GL test	0 > 1 / NO
	12-gnd	Calibration	Impulsion	4-23		N test	0 > 1 / NO	
	31-gnd	Filament	0 > 1 / NO	3-22		Filament on	0 > 1 / NO	
	13-gnd	HV Test	0 > 1 / NO	2-21		Reject point	0 > 1 / NO	
32-gnd	Bypass option	0 > 1 / NO	1-20	HV Test		0 > 1 / NO		

ASM 390/392 detector							
Analog Output	37-gnd	Mantissa	-	Digital Transistor Output	9-28	Filament on	0 > 1 / NO
	36-gnd	Logarithmic	-		8-27	Warning/Error	0 > 1 / NO
	19-gnd	Exponent	-		7-26	Detector ready	0 > 1 / NO
Digital Input	11-gnd	Calibration	Impulsion	Digital Relay Output	6-25	Filament #2	0 > 1 / NO
	30-gnd	Sniffing test	0 > 1 / NO		5-24	Sniffing Test	0 > 1 / NO
	12-gnd	Filament	0 > 1 / NO		4-23	GL Test	0 > 1 / NO
	31-gnd	GL mode	0 > 1 / NO		3-22	HS Test	0 > 1 / NO
	13-gnd	HV Test	Impulsion		2-21	HV Test	0 > 1 / NO
	32-gnd	Inlet Vent	0 > 1 / NO		1-20	Reject point	0 > 1 / NO

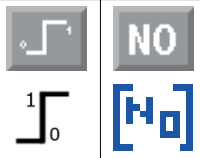
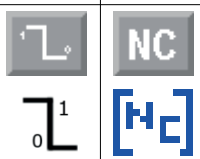

ASM 306S detector							
Analog Output	37-gnd	Mantissa	-	Digital Transistor Output	9-28	-None-	0 > 1 / NO
	36-gnd	Exponent	-		8-27	-None-	0 > 1 / NO
	19-gnd	-	-		7-26	-None-	0 > 1 / NO
Digital Input	11-gnd	Sniffing test	0 > 1 / NO	Digital Relay Output	6-25	-None-	0 > 1 / NO
	30-gnd	Calibration	Impulsion		5-24	Sniffing method	0 > 1 / NO
	12-gnd	Zero	0 > 1 / NO		4-23	Sniffing test	0 > 1 / NO
	31-gnd	-None-	0 > 1 / NO		3-22	Warning/Error	0 > 1 / NO
	13-gnd	-None-	0 > 1 / NO		2-21	Calibration	0 > 1 / NO
	32-gnd	-None-	0 > 1 / NO		1-20	Reject point	0 > 1 / NO

ASM 35 detector							
Analog Output	37-gnd	Mantissa	-	Digital Transistor Output	9-28	Detector Ready	0 > 1 / NO
	36-gnd	Logarithmic	-		8-27	Reject point	1 > 0 / NC
	19-gnd	Exponent	-		7-26	Calibration fail	0 > 1 / NO
Digital Input	11-gnd	Memo	0 > 1 / NO	Digital Relay Output	6-25	Detector Busy	0 > 1 / NO
	30-gnd	Calibration	Impulsion		5-24	Press s. pt #1	0 > 1 / NO
	12-gnd	Dynamic Cal.	0 > 1 / NO		4-23	Set point #4	1 > 0 / NC
	31-gnd	Sniffing Test	0 > 1 / NO		3-22	Set point #3	1 > 0 / NC
	13-gnd	Zero	0 > 1 / NO		2-21	Set point #5	1 > 0 / NC
	32-gnd	HV Test	0 > 1 / NO		1-20	General Failure	1 > 0 / NC

5.8 Other Configurations

1. From the "Settings" screen, press **[Advanced] [Input/Output] [I/O Connector] [Other configurations] [xxx configuration]**.
2. Select the predefined configuration to be used.

Each I/O can be configured according to requirements. 3 predefined configurations are available.

Activation mode	Pictogram	Description
0 > 1 / NO		<ul style="list-style-type: none"> • Normally open (unswitched output idle) • Activation on rising edge (closing) • Deactivation on falling edge (opening) • This activation mode is generally applicable.
1 > 0 / NC		<ul style="list-style-type: none"> • Normally closed (unswitched output idle) • Activation on falling edge (opening) • Deactivation on rising edge (closing) • This activation mode is recommended for a function that should be activated in fail safe mode.
Impulsion		<ul style="list-style-type: none"> • Activation/Deactivation by impulsion • This activation mode is recommended for the start/stop of a test by a user, an external pushbutton, or a test pedal.

3 predefined configurations - ASM 340 detector

- Configuration ASM 142

Requires the use of an ASM 142 I/O cable (see chapter “Spare parts - ASM 340”)

Analog output	37-gnd	Mantissa	-	Digital Transistor Output	9-28	-None-	0 > 1 / NO
	36-gnd	Logarithmic	-		8-27	-None-	0 > 1 / NO
	19-gnd	Exponent	-		7-26	-None-	0 > 1 / NO
Digital input	11-gnd	HV Test	0 > 1 / NO	Digital Relay Output	6-25	-None-	0 > 1 / NO
	30-gnd	Calibration	Impulsion		5-24	Sniffing Test	0 > 1 / NO
	12-gnd	Zero	0 > 1 / NO		4-23	Test mode OK	1 > 0 / NC
	31-gnd	Inlet Vent	0 > 1 / NO		3-22	Warning/Error	0 > 1 / NO
	13-gnd	-None-	0 > 1 / NO		2-21	HV Test	0 > 1 / NO
	32-gnd	-None-	0 > 1 / NO	1-20	Reject point	0 > 1 / NO	

- Configuration ASM 182

Requires the use of an ASM 182 I/O cable (see chapter “Spare parts - ASM 340”)

Analog output	37-gnd	Mantissa	-	Digital Transistor Output	9-28	Filament on	0 > 1 / NO
	36-gnd	Logarithmic	-		8-27	-None-	0 > 1 / NO
	19-gnd	Exponent	-		7-26	-None-	0 > 1 / NO
Digital input	11-gnd	Calibration	Impulsion	Digital Relay Output	6-25	-None-	0 > 1 / NO
	30-gnd	HV Test	Impulsion		5-24	Sniffing Test	0 > 1 / NO
	12-gnd	Filament	0 > 1 / NO		4-23	GL Test	0 > 1 / NO
	31-gnd	GL Mode	0 > 1 / NO		3-22	HS Test	0 > 1 / NO
	13-gnd	Sniffing test	0 > 1 / NO		2-21	HV Test	0 > 1 / NO
	32-gnd	Inlet Vent	0 > 1 / NO	1-20	Reject point	0 > 1 / NO	

- HLT 5xx configuration (compatible with HLT 2xx)

Requires the use of an HLT I/O cable (see chapter “Spare parts - ASM 340”)

Analog output	37-gnd	Mantissa	-	Digital Transistor Output	9-28	HLT Stand-by	0 > 1 / NO
	36-gnd	Exponent	-		8-27	Test	0 > 1 / NO
	19-gnd	-None-	-		7-26	Reject point	0 > 1 / NO
Digital input	11-gnd	HV Test	Impulsion	Digital Relay Output	6-25	Warning/Error	0 > 1 / NO
	30-gnd	Inlet Vent	Impulsion		5-24	Calib. Ack.	0 > 1 / NO
	12-gnd	Zero	Impulsion		4-23	Bypass	0 > 1 / NO
	31-gnd	HLT Calib	Impulsion		3-22	Reject point	1 > 0 / NC
	13-gnd	-None-	0 > 1 / NO		2-21	-None-	0 > 1 / NO
	32-gnd	Bypass option	0 > 1 / NO		1-20	-None-	0 > 1 / NO

3 predefined configurations - ASM 390/392 detector

- Configuration ASM 142

Requires the use of an ASM 142 I/O cable (see chapter "Spare parts - ASM 390/392")

Analog output	37-gnd	Mantissa	-	Digital Transistor Output	9-28	-None-	0 > 1 / NO
	36-gnd	Logarithmic	-		8-27	-None-	0 > 1 / NO
	19-gnd	Exponent	-		7-26	-None-	0 > 1 / NO
Digital input	11-gnd	HV Test	0 > 1 / NO	Digital Relay Output	6-25	-None-	0 > 1 / NO
	30-gnd	Calibration	Impulsion		5-24	Sniffing Test	0 > 1 / NO
	12-gnd	Zero	0 > 1 / NO		4-23	Test mode OK	1 > 0 / NC
	31-gnd	Inlet Vent	0 > 1 / NO		3-22	Warning/Error	0 > 1 / NO
	13-gnd	-None-	0 > 1 / NO		2-21	HV Test	0 > 1 / NO
	32-gnd	-None-	0 > 1 / NO		1-20	Reject point	0 > 1 / NO

- Configuration ASM 182

Requires the use of an ASM 182 I/O cable (see chapter "Spare parts - ASM 390/392")

Analog output	37-gnd	Mantissa	-	Digital Transistor Output	9-28	Filament on	0 > 1 / NO
	36-gnd	Logarithmic	-		8-27	-None-	0 > 1 / NO
	19-gnd	Exponent	-		7-26	-None-	0 > 1 / NO
Digital input	11-gnd	Calibration	Impulsion	Digital Relay Output	6-25	-None-	0 > 1 / NO
	30-gnd	HV Test	Impulsion		5-24	Sniffing Test	0 > 1 / NO
	12-gnd	Filament	0 > 1 / NO		4-23	GL Test	0 > 1 / NO
	31-gnd	GL Mode	0 > 1 / NO		3-22	HS Test	0 > 1 / NO
	13-gnd	Sniffing test	0 > 1 / NO		2-21	HV Test	0 > 1 / NO
	32-gnd	Inlet Vent	0 > 1 / NO		1-20	Reject point	0 > 1 / NO

- HLT 5xx configuration (compatible with HLT 2xx)

Requires the use of an HLT I/O cable (see chapter "Spare parts - ASM 390/392")

Analog out-put	37-gnd	Mantissa	-	Digital Transistor Output	9-28	HLT Stand-by	0 > 1 / NO
	36-gnd	Exponent	-		8-27	Test	0 > 1 / NO
	19-gnd	-None-	-		7-26	Set point	0 > 1 / NO
Digital input	11-gnd	HV Test	Impulsion	Digital Relay Output	6-25	Warning/Error	0 > 1 / NO
	30-gnd	Inlet Vent	Impulsion		5-24	Calib. Ack.	0 > 1 / NO
	12-gnd	Zero	Impulsion		4-23	Bypass	0 > 1 / NO
	31-gnd	HLT Calib	Impulsion		3-22	Reject point	1 > 0 / NC
	13-gnd	-None-	0 > 1 / NO		2-21	-None-	0 > 1 / NO
	32-gnd	Bypass option	0 > 1 / NO		1-20	-None-	0 > 1 / NO

3 predefined configurations - ASM 306S detector

- Configuration ASM 142S
Requires the use of an ASM 142 I/O cable (see chapter “Spare parts - ASM 306S”)

Analog out-put	37-gnd	Mantissa	-	Digital Transistor Output	9-28	-None-	0 > 1 / NO
	36-gnd	Logarithmic	-		8-27	-None-	0 > 1 / NO
	19-gnd	Exponent	-		7-26	-None-	0 > 1 / NO
Digital input	11-gnd	Sniffing test	0 > 1 / NO	Digital Relay Output	6-25	-None-	0 > 1 / NO
	30-gnd	Calibration	Impulsion		5-24	Sniffing method	0 > 1 / NO
	12-gnd	Zero	0 > 1 / NO		4-23	Sniffing test	0 > 1 / NO
	31-gnd	-None-	0 > 1 / NO		3-22	Warning/Error	0 > 1 / NO
	13-gnd	-None-	0 > 1 / NO		2-21	Calibration	0 > 1 / NO
	32-gnd	-None-	0 > 1 / NO		1-20	Reject point	0 > 1 / NO

- Configuration ASM 340

Analog out-put	37-gnd	Mantissa	-	Digital Transistor Output	9-28	-None-	0 > 1 / NO
	36-gnd	Logarithmic	-		8-27	Detector ready	0 > 1 / NO
	19-gnd	Exponent	-		7-26	Filament #2	0 > 1 / NO
Digital input	11-gnd	-None-	0 > 1 / NO	Digital Relay Output	6-25	Warning/Error	0 > 1 / NO
	30-gnd	Zero	0 > 1 / NO		5-24	-None-	0 > 1 / NO
	12-gnd	Calibration	Impulsion		4-23	-None-	0 > 1 / NO
	31-gnd	Filament	0 > 1 / NO		3-22	Filament on	0 > 1 / NO
	13-gnd	-None-	0 > 1 / NO		2-21	Reject point	0 > 1 / NO
	32-gnd	-None-	0 > 1 / NO		1-20	-None-	0 > 1 / NO

- Configuration ASM 142
Requires the use of an ASM 142 I/O cable (see chapter “Spare parts - ASM 306S”)

Analog out-put	37-gnd	Mantissa	-	Digital Transistor Output	9-28	-None-	0 > 1 / NO
	36-gnd	Exponent	-		8-27	-None-	0 > 1 / NO
	19-gnd	-None-	-		7-26	-None-	0 > 1 / NO
Digital input	11-gnd	-None-	0 > 1 / NO	Digital Relay Output	6-25	-None-	0 > 1 / NO
	30-gnd	Calibration	Impulsion		5-24	Sniffing test	0 > 1 / NO
	12-gnd	Zero	0 > 1 / NO		4-23	Test mode ok	1 > 0 / NC
	31-gnd	-None-	0 > 1 / NO		3-22	Warning/Error	0 > 1 / NO
	13-gnd	-None-	0 > 1 / NO		2-21	-None-	0 > 1 / NO
	32-gnd	-None-	0 > 1 / NO	1-20	Reject point	0 > 1 / NO	

3 predefined configurations - ASI 35 detector

- Configuration ASI 20MD

Requires the use of an ASI 20 MD I/O module (see chapter "Spare parts - ASI 35")

Analog out-put	37-gnd	Mantissa	-	Digital Transistor Output	9-28	Detector Ready	0 > 1 / NO
	36-gnd	Logarithmic	-		8-27	Reject point	1 > 0 / NC
	19-gnd	Exponent	-		7-26	Calibration fail	0 > 1 / NO
Digital input	11-gnd	Memo	0 > 1 / NO	Digital Relay Output	6-25	Detector Busy	0 > 1 / NO
	30-gnd	Calibration	Impulsion		5-24	Press s. pt #1	0 > 1 / NO
	12-gnd	Dynamic Cal.	0 > 1 / NO		4-23	Set point #4	1 > 0 / NC
	31-gnd	Sniffing test	0 > 1 / NO		3-22	Set point #3	1 > 0 / NC
	13-gnd	Zero	0 > 1 / NO		2-21	Set point #5	1 > 0 / NC
	32-gnd	HV Test	0 > 1 / NO		1-20	General Failure	1 > 0 / NC

- Configuration 2xx

Requires the use of a type 2xxx I/O module (see chapter "Spare parts - ASI 35")

Analog out-put	37-gnd	Mantissa	-	Digital input	9-gnd	Clear	0 > 1 / NO	
	36-gnd	Expo. 0.5 V/dec	-		Digital Transistor Output	8-27	Set point	1 > 0 / NC
	19-gnd	-None-	-			7-26	Set point #2	1 > 0 / NC
Digital input	11-gnd	-None-	0 > 1 / NO	6-25		Set point #3	1 > 0 / NC	
	30-gnd	Sniff./Vac.	0 > 1 / NO	Digital Relay Output	5-24	Set point #4	1 > 0 / NC	
	12-gnd	Start/Stop	1 > 0 / NC		4-23	Detector Ready	0 > 1 / NO	
	31-gnd	Zero	0 > 1 / NO		3-22	Warning/Error	1 > 0 / NC	
	13-gnd	External Cal	0 > 1 / NO		2-21	Calib. Ack.	1 > 0 / NC	
	32-gnd	Internal Cal	0 > 1 / NO		1-20	-None-	0 > 1 / NO	

- Configuration 3xx

Requires the use of a type 3xxx I/O module (see chapter "Spare parts - ASI 35")

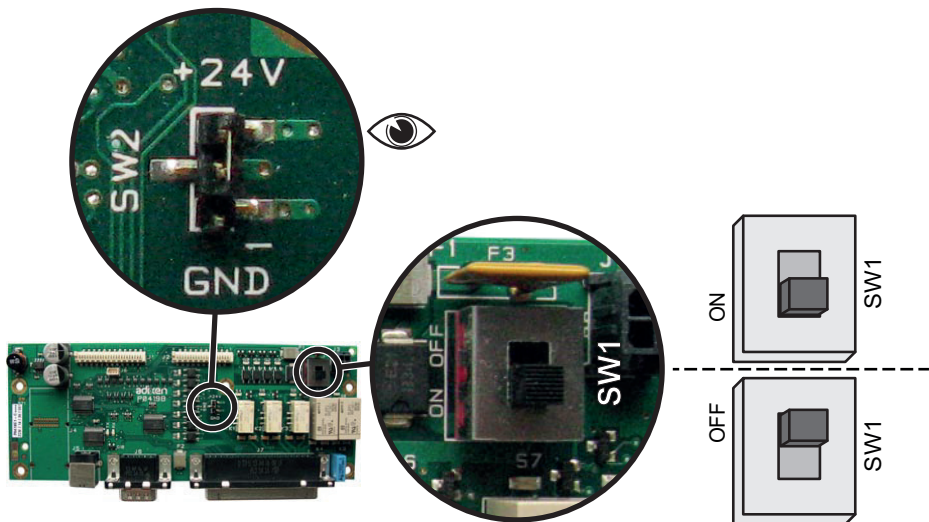
Analog out-put	37-gnd	Mantissa	-	Digital input	9-gnd	Clear	0 > 1 / NO
	36-gnd	Expo. 0.5 V/dec	-	Digital Transistor Output	8-27	Set point	1 > 0 / NC
	19-gnd	-None-	-		7-26	Set point #2	1 > 0 / NC
Digital input	11-gnd	-None-	0 > 1 / NO	Digital Relay Output	6-25	Set point #3	1 > 0 / NC
	30-gnd	Sniff./Vac.	0 > 1 / NO		5-24	Set point #4	1 > 0 / NC
	12-gnd	Start/Stop	1 > 0 / NC		4-23	Detector ready	0 > 1 / NO
	31-gnd	Zero	0 > 1 / NO		3-22	Warning/Error	1 > 0 / NC
	13-gnd	External Cal	0 > 1 / NO		2-21	Calib. Ack.	1 > 0 / NC
	32-gnd	Internal Cal	0 > 1 / NO		1-20	-None-	0 > 1 / NO

5.9 Loading a configuration (Load Config from SD Card)

During loading, the user loads a file for an I/O configuration (values + activation modes) that has previously been saved on the SD card.

- ▶ From the “Settings” screen, press on **[Advanced] [Input/Output] [I/O Connector] [Load Config. from SD card]**.

5.10 Internal 24 VDC or external 24 VDC power supply

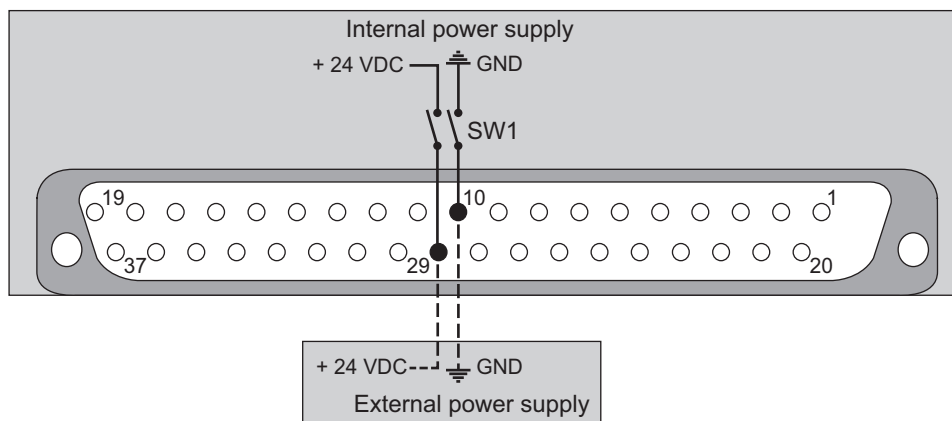


Localization of SW1 and SW2 switches on the I/O board (P0419)

The SW2 switch should always be set to 24 VDC.

- ▶ Configure the SW1 switch according to power supply type.

ON	Internal power supply Internal 24 VDC ± 10 % + internal ground
OFF	External power supply External 24 VDC ±10 % + external ground Configuration by default from factory



5.11 Additional equipment

5.11.1 ASM 142 type I/O cable

Available for the ASM 340, ASM 390/392 and ASM 306S leak detector only (see chapter "Spare parts").

This accessory is used to communicate with the customer's automated system to replace an ASM 142 detector (25-pin D-Sub) with an ASM 340 (37-pin D-Sub) detector. The D-sub connectors of the two products are configured identically.

1. From the "Settings" screen, press **[Advanced] [Input/Output] [I/O Connector] [Other configurations] [ASM142]** (see chapter "Other configurations").
2. Connect the adapter cable between the detector 37-pin D-Sub I/O connector and the automation system 25-pin D-Sub I/O connector.

5.11.2 ASM 182 type I/O cable

Available for the ASM 340 and ASM 390/392 leak detector only (see chapter "Spare parts").

This accessory is used to communicate with the customer automated system to replace an ASM 182 detector (25-pin D-Sub) with an ASM 340 (37-pin D-Sub) detector. The D-sub connectors of the two products are configured identically.

1. From the "Settings" screen, press **[Advanced] [Input/Output] [I/O Connector] [Other configurations] [ASM182]** (see chapter "Other configurations").
2. Connect the adapter cable between the detector 37-pin D-Sub I/O connector and the automation system 25-pin D-Sub I/O connector.

5.11.3 Type HLT I/O module

Available for the ASM 340 and ASM 390/392 leak detector only (see chapter "Spare parts").

This accessory is used to communicate with the customer's automated system to replace an HLT5xx detector with an ASM 340 detector: see the operating instructions for the HLT I/O compatibility module (see chapter "Applicable documents").

5.11.4 Type ASI 20 MD I/O module

Available for the ASI 35 leak detector only (see chapter "Spare parts").

This accessory is used to communicate with the customer's automated system to replace a 2xxx or 3xxx detector with an ASI 20 detector: see the operating instructions for the type ASI 20 MD I/O module (see chapter "Applicable documents").

5.11.5 Type 2xxx or 3xxx I/O module

Available for the ASI 35 leak detector only (see chapter "Spare parts").

This accessory is used to communicate with the customer's automated system to replace a 2xxx or 3xxx detector with an ASI 35 detector: see the operating instructions for the type 2xxx/3xxx I/O module (see chapter "Applicable documents").

6 Configuration (USB - Ethernet)

6.1 Allocation of Serial Link 1 and Serial Link 2

From the "Settings" screen, press [Advanced] [Input/Output], then [Serial Link 1] or [Serial Link 2].

Type	To be set ¹⁾
Parameters	To be set ¹⁾

1) See details below

Type

The user must allocate the 2 serial links (1 and 2) according to their use.

Use	Possible allocation		Type to select
	Serial Link 1	Serial Link 2	
USB ¹⁾	yes	yes	USB
Ethernet ²⁾	no	yes	Network

1) Available with all I/O boards

2) Available with I/O boards equipped with Ethernet module

Parameters

- ▶ From the "Settings" screen, press [Advanced] [Input/Output], then [Serial Link 1] or [Serial Link 2], and then [Parameters].

Mode ¹⁾	Description	Use	
		USB	Ethernet
Basic	Continuous acquisition of data based on defined sampling At any time, a command can be sent to the detector 5 VDC power supply available	x	x
Spreadsheet	Variation of the Basic mode Continuous data acquisition, formatted in a spreadsheet such as Excel Microsoft® Office or other similar software 5 VDC power supply available	x	x
Advanced	Full control of the detector by a supervisor The detector sends information at the supervisor request 5 VDC power supply available Recommended mode for automatic systems	x	x
Export Data	Export, via computer, of "tickets" issued by the detector after: <ul style="list-style-type: none"> • calibration with an internal/external calibrated leak • calibration check with an internal calibrated leak • a test 5 VDC power supply available Serial links 1 and 2 must not be in 'Export Data' mode at the same time.	x	x
RC 500 WL	Use of a wireless remote control 5 VDC power supply available	-	-
RC 500	Use of a wired remote control 24 VDC power supply available	-	-
HLT 5xx	Protocol for compatibility with the HLT 5xx detector protocol Available only for ASM 340/ASI 35 5 VDC power supply available	x	x

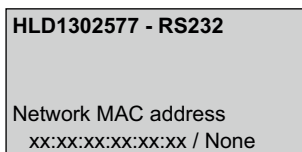
1) Depending on the leak detector model, some modes will not be available.

Mode ¹⁾	Description	Use	
		USB	Ethernet
HLT 2xx	Protocol for compatibility with the HLT 2xx.detector protocol Available only for ASM 340/ASI 35 5 VDC power supply available	x	x
Ext. module	Full control of the detector by a supervisor The detector sends information at the supervisor request 24 VDC power supply available A 24 VDC power supply is required for using an external module	-	-

1) Depending on the leak detector model, some modes will not be available.

6.2 MAC address

The MAC address, which is required for the installation of the Ethernet module drivers, is available on the label attached to the detector or on the accessory.



Example MAC address label

7 Command via USB



When the RS-232 serial link is already in use, USB can be used to control the detector with RS commands by emulating a serial port, as if the RS-232 serial link was being used.

7.1 Configuration

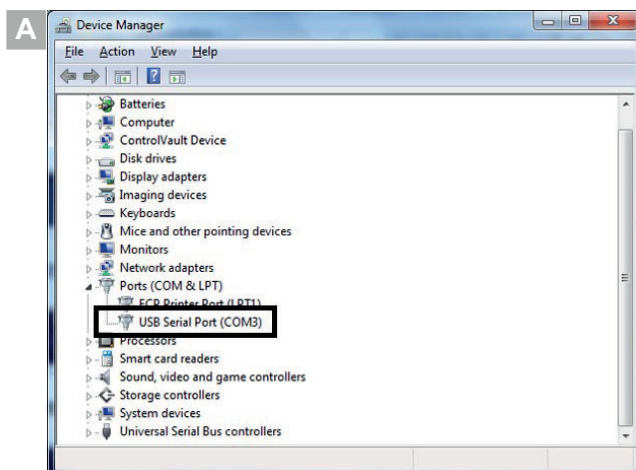
- ▶ Allocate the 'USB' type to serial link 1 or 2 (see chapter "Allocation for Serial Link 1 and Serial Link 2").

7.2 Driver installation

Screens are given as examples (Windows 7). They can vary depending on the computer system.

Do not connect the USB cable before driver installation.

1. Insert the USB stick supplied with the leak detector operating instructions into your player.
2. Install the 'Driver_FTDI_VPC' saved in the "Driver" folder on the USB stick.
3. Press **[Extract]** to launch driver installation.
 - Windows 8: Run program in compatibility mode for Windows 7.
4. Validate the different steps.
5. Press **[Finish]**.
6. Press **[Next]** to extract the driver.
7. Validate the different steps.
8. Press **[Finish]**.
9. Connect a cable between the detector USB port and your computer. As soon as the cable is connected, the USB module is detected.
10. To know which USB port is allocated, consult your computer device manager: Device Manager > Ports (COM & LPT).
 - In example **[A]**, the USB port is on COM 3. Use this COM port as an RS-232 serial link.



8 Command via Ethernet

Available on any detector equipped with the 37-pin Ethernet board.

After driver is loaded and set, user has a virtual RS-232 serial link allowing the leak detector to be controlled from a computer.

The detector can be controlled by using RS-232 serial link commands (see the RS-232 serial link operating instructions (see chapter “Applicable documents”)).

8.1 Configuration

- ▶ Allocate the “Network” type to serial link 2 (see chapter “Allocation for Serial Link 1 and Serial Link 2”).

8.2 Program and driver installation

Installation takes place in 4 steps:

- Step 1: program installation
- Step 2: change in the IP address of the Ethernet module
- Step 3: allocation of a serial port to the Ethernet module
- Step 4: visualization of the port created for the Ethernet module

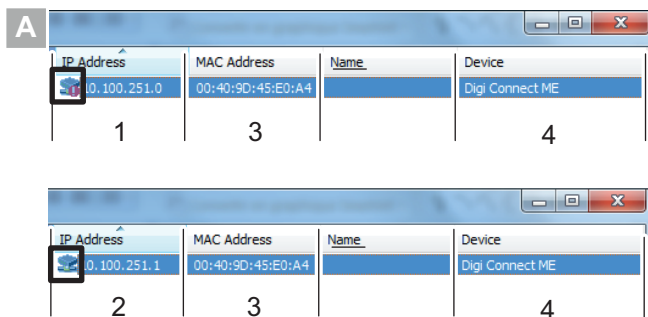
Screens are given as examples (Windows). They can vary depending on the computer system.

Step 1: program installation

1. Insert the USB stick supplied with the leak detector operating instructions into your player.
2. Install the “Device Discovery” program saved in the “Driver” folder on the USB stick.
3. Press **[Next]** to launch the program installation.
 - Windows 8: Run program in compatibility mode for Windows 7.
4. Validate the different steps.
5. Press **[Finish]**

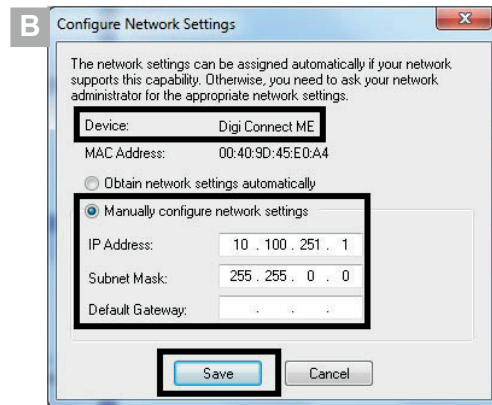
Step 2: change in the IP address of the Ethernet module

1. Launch the “Digi Discovery” program: the Ethernet module is automatically detected.
 - The module is not automatically detected if the sub-network is not correctly configured.
 - The default address of the sub-network is 192.168.x.x.
 - Contact your network administrator for the IP addresses to be configured.
 - Display of the detected and non-detected Ethernet module: see example **[A]**.
2. If the Ethernet module is not automatically detected: press **[Refresh view]** to relaunch detection.
 - Display of the detected and non-detected Ethernet module: see example **[A]**.
3. Change the module IP address to be in the same sub-network as your computer.
4. Change and save the addresses: see example **[B]**.
 - Contact your network administrator for the IP addresses to be configured.
5. Press **[OK]** to relaunch the connection to the module and to finalize the IP address update.



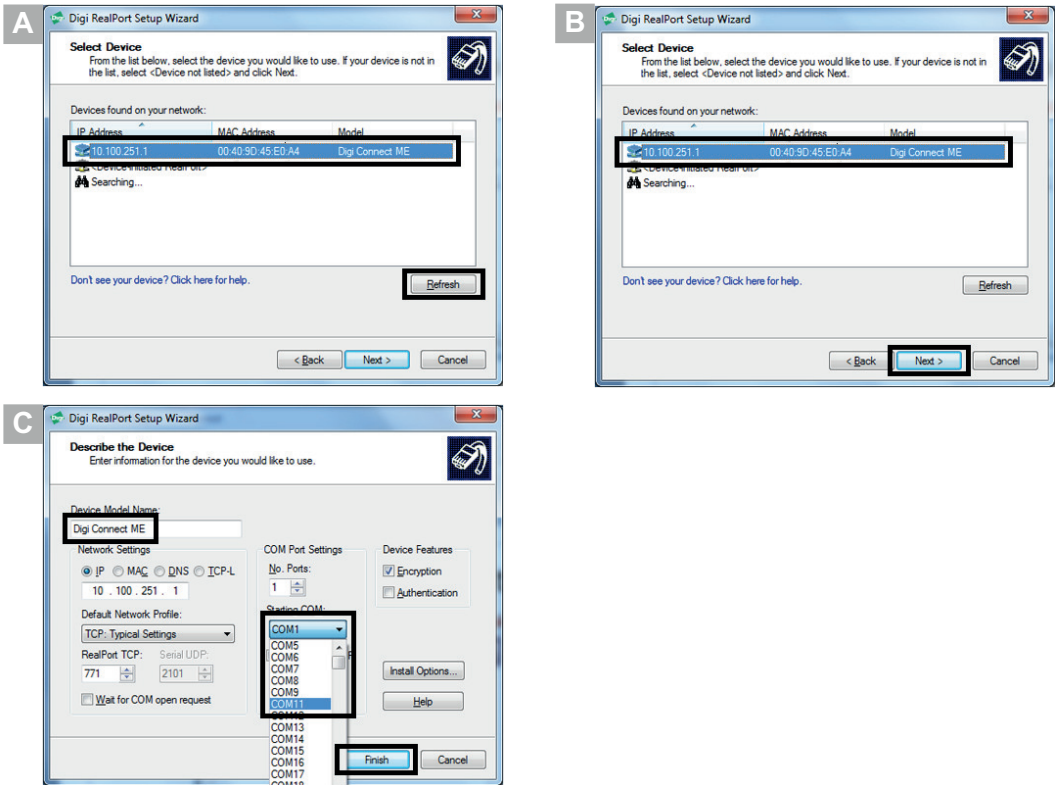
- 1 “Not properly configured” message displayed in the details.
- 2 Module detected: IP address correct (icon OK)

- 3 Module identification MAC address. The MAC address is unique and specific to each Ethernet module.
It is indicated on the module and the identification label stuck to the detector frame.
To select a detector from several detected, select the MAC address of the desired detector.
- 4 Type of module: "Digi Connect ME"



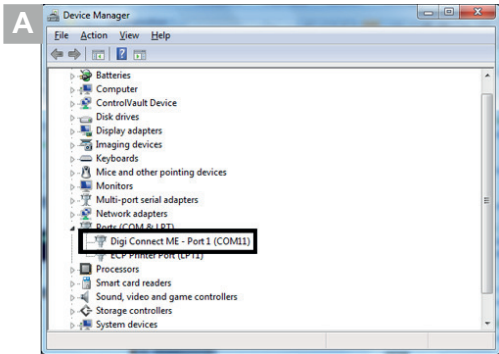
Step 3: allocation of a serial port to the Ethernet module

1. Install the "Digi Real Port" driver supplied in the "Driver" folder of the USB stick supplied with your leak detector operating instructions.
2. Validate the different steps.
3. Press **[Finish]**.
4. Launch the "Digi Real Port" driver: the Ethernet module is automatically detected.
5. If the Ethernet module is not automatically detected: press **[Refresh]** to relaunch detection (see **[A]**).
6. Select the Ethernet module to be allocated to a PC serial port: see example **[B]**.
7. Press **[Next]**.
8. Select the Ethernet module.
9. Select a serial port number from the list.
 - In example **[C]**, the Ethernet port is allocated to COM 11.
10. Press **[Finish]**.
 - The virtual port is created.



Step 4: visualization of the port created for the Ethernet module

- ▶ View the new port created in your device manager: Manager -> Ports (COM and LPT) (see example [A]).
- ▶ Use this COM port as an RS-232 serial link.



8.3 Uninstall

- ▶ Select the Ethernet module allocated to a PC serial port to be uninstalled.
- ▶ Press [Uninstall].

9 Malfunctions

In case of difficulties when using these communication interfaces, please refer to the “Malfunctions” chapter of the leak detector maintenance instructions.

10 Decommissioning

10.1 Disposal



Environmental protection

The product and its components **must be disposed of in accordance with the applicable regulations relating to environmental protection and human health**, with a view to reducing natural resource wastage and preventing pollution.

Our products contain various materials which must be recycled (see chapter "Disposal" in the leak detector maintenance instructions).

10.2 Electrical and Electronic Equipment (EEE)

Electrical and Electronic Equipment (EEE) contain polluting material (electronic boards, batteries, screens, capacitors, mercury, etc.)

Depollution and subsequent recycling of this equipment are necessary to preserve our natural resources and particularly strategic raw materials.

The manufacturer shall only be required to take back EEE marked adixen or Pfeiffer Vacuum sold by Pfeiffer Vacuum:

- EEE subject to applicable regulations for recycling end-of-life products;
- Complete, non modified EEE using original Pfeiffer Vacuum spare parts and including all of their assemblies and sub-assemblies, excluding batteries.

Product on sale on French soil



In the absence of any specific contract and pursuant to current applicable legislation (and Articles R543-172 et seq. of the Environment Code in particular), all EEEs sold by Pfeiffer Vacuum on French soil are covered by the organization and financing of removal and treatment of waste from EEEs provided by Pfeiffer Vacuum.

In order to fulfill its obligations, Pfeiffer Vacuum finances the collection and recycling of waste from EEE by subscribing to **ecosystem**. This voluntary arrangement enables owners of EEEs on French soil to benefit from easy, free solutions to ensure that EEEs subject to the regulations are recycled.

To find out more about the collection solutions, contact **ecosystem** who will inform you of the best collection solution for your needs: www.ecosystem.eco

For further details, consult the General Conditions of Sale available in French on the Pfeiffer Vacuum website.

Product on sale outside of France



In the absence of any specific contract and pursuant to Directive 2012/19/EC on the treatment of waste from EEE, for all EEE sold by Pfeiffer Vacuum outside of France (European Union and third countries), the owner shall be exclusively responsible for organizing and financing the collection and treatment of waste from EEE sold by Pfeiffer Vacuum.

The owner is exclusively responsible, in particular, for its collection (gathering, sorting and storage of waste for its transportation to the treatment site), recycling, recovery and/or disposal, unless otherwise required by legal provisions applicable in the country where the owner is located, which must be reported to Pfeiffer Vacuum by the owner.

11 Spare parts

11.1 ASM 340

Designation	Part Number
37-pin male D-Sub connector (without cover)	118733
37-pin D-Sub connector cover	118732
ASM 142 type I/O cable	A333758
ASM 182 type I/O cable	A335068
Type HLT I/O module	122742
Accessory - 37-pin I/O communication interface board	121350S
Accessory - 37-pin I/O communication interface board - USB - Ethernet	121352S

11.2 ASM 390/392

Designation	Part Number
37-pin male D-Sub connector (without cover)	118733
37-pin D-Sub connector cover	118732
ASM 142 type I/O cable	A333758
ASM 182 type I/O cable	A335068
Type HLT I/O module	122742
Accessory - 37-pin I/O communication interface board	126254
Accessory - 37-pin I/O communication interface board - USB - Ethernet	126255

11.3 ASM 306S

Designation	Part Number
37-pin male D-Sub connector (without cover)	118733
37-pin D-Sub connector cover	118732
ASM 142 type I/O cable	A333758
Accessory - 37-pin I/O communication interface board	127258S
Accessory - 37-pin I/O communication interface board - USB - Ethernet	127256S

11.4 ASI 35

Designation	Part Number
37-pin male D-Sub connector (without cover)	118733
37-pin D-Sub connector cover	118732
37-pin I/O communication interface kit - USB	123057S
37-pin I/O communication interface kit - USB - Ethernet	123058S
Type ASI 20 MD I/O module	123352
Type 2xxx I/O module	123353
Type 3xxx I/O module	123354

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