Manual INDU

UVTECH INSIDE

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INDEX

This manual contains both safety information and user instructions and must be read carefully by both owners and operators of INDU, especially before first-time operation. The following is applicable: Installation and service of INDU must be carried out by qualified personnel only. To avoid safety risks, you must consult UVtech AB before any change to or re-installation of the INDU system. UVtech AB does not warrant INDU for changes made by others, unless approved by UVtech AB.

INDU system, overview

The INDU system consists of:

1.1 INDU Reaction box

1.2 UV-cassettes

1.3 Power Box

1.4 Touch Panel

1.5 Service hatch

2   Placement of the INDU

Cover the INDU cassettes during installation to protect the UV-tubes from dust and dirt.

2.1   Replaces part of the ventilation duct

INDU is installed so that it replaces part of the duct-system. INDU is mounted in the duct system with spigots on both sides of the INDU reaction box, to join up with the ventilation ducts. Please note: These spigots are not part of the delivery of INDU.

2.2   Install horisontally

INDU is to be mounted horizontally. If INDU is placed vertically or at an angle away from the horizontal line, there is a risk that the integrated ozone protection system will not work optimally.

2.3   Accessibility for service and maintenance

INDU must be placed so that the service hatch can be opened fully and swung backwards on its hinges. The hatch must be fully free to open, to enable the operator to slide the UV-cassettes in and out of the reaction box.

**WARNING:**
UV-light can cause a painful irritation of the eyes (photokeratitis or"snow blindness"). Avoid direct eye contact with the blue light issued by the UV-tubes and use protective goggles during installation and maintenance of the UV-system.

3 Electrical installation

The electrical installation must adhere to local legislation and must be carried out by a certified electrician. You can find the wiring diagram on page 18.

3.1 The mains supply should be connected on a separate fuse. Ampere-data for respective model is available in table 1 on page 17. UVtech recommends that the mains supply of the Power Box be equipped with an external safety switch between the INDU and the fuse.

3.2 Mains supply should be connected to the IN-plinth in the power box.

3.3 All UV-cassettes in the reaction box are powered via the OUT-plinth in the power box. This installation is already done from plant.

3.4 Cables that are exposed to UV-light must be of UVC-resistant material. All cables delivered via UVtech are UVC-resistant.
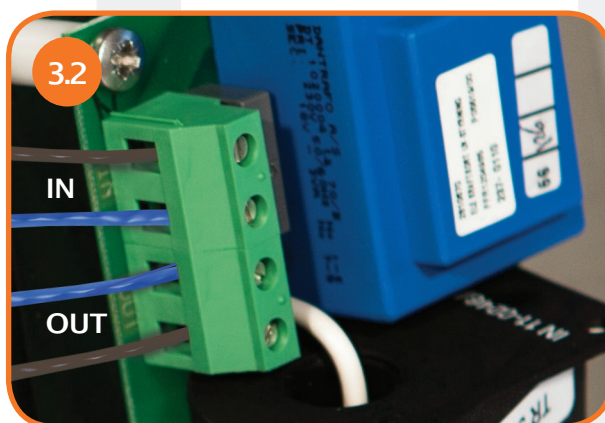
4   Initial start-up and calibration

4.1   Automatic calibration

After installing INDU according to the guidelines above, you start the system by pressing the "Start/Stop" button on the Touch Panel. This will automatically initiate a self-calibration process of about 60 minutes during which the different error message functions are calibrated. If the system is switched off during the self-calibration process, it will start again the next time you switch on the system. After the self-calibration, the INDU start-up is complete and the display on the Touch Panel will say "Duty".

4.2   Initiate a new self-calibration

You can reset the system and run a new calibration process if necessary.
1) Press the arrow button three (3) times until the display says "More menues".
2) Press *and hold* the " +" button for five (5) seconds until the display says "Current set".
3) Press the arrow button seven (7) times until the display says "Reset".
4) Press the "+" button to initiate a new self-calibration process that will last for up to 60 minutes.

5   Installation of optional interlocks

The INDU system does not require interlocks other than the built-in pressure switch to function properly, but can be connected to further optional interlocks, e.g. a filter monitor, if necessary. The external pressure switch is connected to the EXT-plinth in the Power Box. Any further interlock must be connected to the EXT-plinth in series with the pressure switch. See the wiring diagram on page 18.
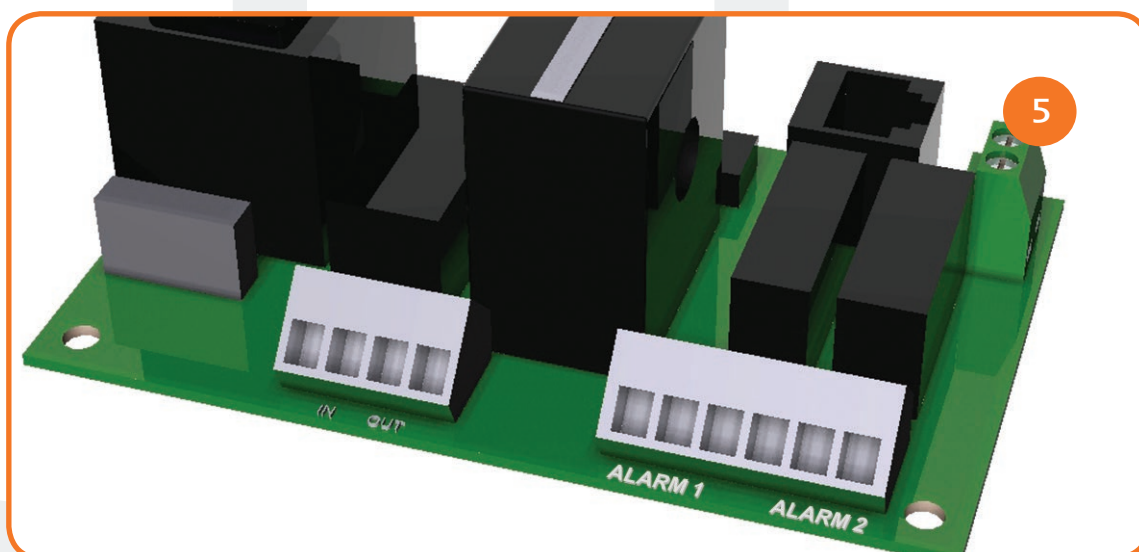
6 Forwarding of error messages via NC/NO contact

The control system INDU Control monitors and indicates five different error messages. Four of those can be forwarded to a superordinate monitoring system if necessary. Connect the super-ordinate system to the NC/NO contacts (ALARM 1 and ALARM 2) in the Power Box.
See the wiring diagram on page 18.

6.1 Choice of error messages to be forwarded

INDU can be programmed to forward either one single or two different error messages to a supe-rordinate system. If you want to forward two error messages, connect that system to both NC/NO contacts (ALARM 1 and ALARM 2). If you want to forward one error message to the superordinate system choose the eligible NC/NO contact (see table below).

Contact	1	2	3
ALARM 1	Dutyerror	Cleaning	Stop ext
ALARM 2	Lamperror	Cleaning	Stop ext

6.2 Programming of one error message to be forwarded

1) Connect the cable to an NC/NO contact. Use the table above to check which error messages are eligible for the contacts ALARM 1 and ALARM 2, respectively.
2) Press the arrow button three (3) times until the display says "More menues".
3) Press *and hold* the "+" button for five (5) seconds until the display says "Current set".
4) Press the arrow button five (5) times until the display says "Function alarm 1 - Dutyerror". The initial programming is for the error message "Dutyerror" to be sent via ALARM 1. There is no need for re-programming if "Dutyerror" is forwarded via ALARM 1.
5) Press the "+" button once to forward the error message "Cleaning" via ALARM 1.
6) Press the "+" button again to forward the error message "System Stop" via ALARM 1.
7) Press the "+" button again to return to forwarding the error message "Dutyerror" via ALARM 1.
8) Press the arrow button three (3) times until the display says "Duty".
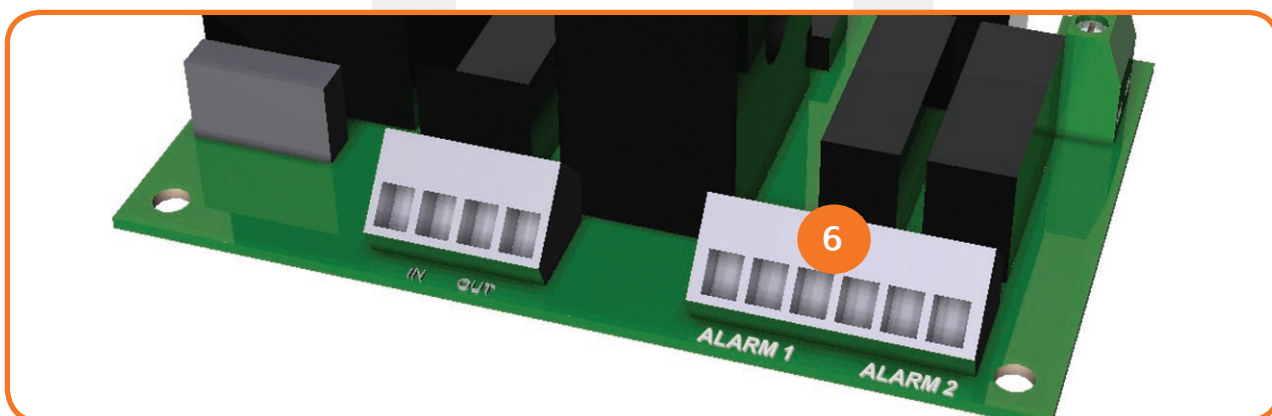
Forwarding of error messages via NC/NO contact (cont.)

6.3 **Programming of two error messages to be forwarded**

1) Connect the cables to both NC/NO contacts.

2) Press the arrow button three (3) times until the display says "More menues".

3) Press and hold the "+" button for five (5) seconds until the display says "Current set".

4) Press the arrow button five (5) times until the display says "Function alarm 1 - Dutyerror". The initial programming is for the error message "Dutyerror" to be sent via ALARM 1. There is no need for re-programming if "Dutyerror" is forwarded via ALARM 1.

5) Press the "+" button once to forward the error message "Cleaning" via ALARM 1.

6) Press the "+" button again to forward the error message "Stop ext" via ALARM 1.

7) Press the "+" button again to return to forwarding the error message "Dutyerror" via ALARM 1.

8) Press the arrow button once until the display says "Function alarm 2 - lamperror". The initial programming is for the error message "Lamperror" to be sent via ALARM 2. There is no need for re-programming if "Lamperror" is forwarded via ALARM 2.

9) Press the "+" button once to forward the error message "Cleaning" via ALARM 2.

10) Press the "+" button again to forward the error message "Stop ext" via ALARM 2.

11) Press the "+" button again to to return to forwarding the error message "Lamperror" via ALARM 2.

12) Press the arrow button twice until the display says "Duty".

6.4 **Delay in the forwarding of error messages**

There is a delay between the display of an error message on the Touch Panel and the forwarding of that message to a superordinate monitoring system. On delivery, the delay time is set at 2 hours but can be re-programmed to any time between 6 minutes and 24 hours. To adjust the delay time:

1) Press the arrow button three (3) times until the display says "More menues".

2) Press *and hold* the "+" button for 25 seconds. **Please, note**: Continue to hold the button when the display changes for the first time after about 5 seconds! After 25 seconds, the display says "Time alarm on x,x h".

3) Change the delay time using the buttons "+" and "-".

4) Press the arrow button four (4) times until the display says "Duty".

7 Deletion of forwarded error messages

After the error message "Dutyerror" was forwarded to a superordinate system you delete it there by cutting the mains supply of INDU Control. The other error messages are automatically erased in the superordinate system when they have been deleted on the Touch Panel.

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8 Adjustment of the calibrated current values

If the automatic self-calibration has failed or the circumstances for the INDU system have changed since the last self-calibration process the calibrated current value must be adjusted. This can be done manually or automatically.

8.1 Manual adjustment of the calibrated current values

1) Press the arrow button three (3) times until the display says "More menues".
2) Press and hold the "+" button for (5) seconds until the display says "Current set x,x A y,y A".
3) When all the UV-tubes in the INDU system are lit, the two current values on the display must be identical. If the values differ from one another, use the "+" och "-" buttons to adjust the calibrated value (on the right) until both values are identical.
4) Press the arrow button eight (8) times until the display says "Duty".

8.2 Automatic adjustment of the calibrated current value

1) Press the arrow button three (3) times until the display says "More menues".
2) Press *and hold* the "+" button for (5) seconds until the display says "Current set x,x A y,y A".
3) Press the arrow button seven (7) times until the display says "Reset push plus".
4) Press the "+" button. The system will now initiate an automatic self-calibration process that can last up to 60 minutes.

9   Adjustment of error levels

9.1   Adjustment of the lamp error level

The error message "Lamperror" is displayed when one or more UV-tubes have gone out and the operating current level has sunk below 95 % of the calibrated value. The error level can be changed to another percentage than 95 %:

1) Press the arrow button three (3) times until the display says "More menues".

2) Press and hold the "+" button for (5) seconds until the display says "Current set x,x A y,y A".

3) Press the arrow button once until the display says "Level tube error". Use the "+" or "-" buttons to change the % value.

4) Press the arrow button seven (7) times until the display says "Duty".

9.2   Adjustment of the duty error level

The error message "Lamperror" is displayed when one or more UV-tubes have gone out and the operating current level has sunk below 90 % of the calibrated value. The error level can be changed to another percentage than 90 %:

1) Press the arrow button three (3) times until the display says "More menues".

2) Press and hold the "+" button for (5) seconds until the display says "Current set".

3) Press the arrow button twice until the display says "Level duty error". Use the "+" och "-" buttons to change the % value.

4) Press the arrow button six (6) times until the display says "Duty".

10   Chose language

The Touch Panel operates in six different languages: Swedish, English, German, French, Finnish and Italian. If you want to change to a different language but Swedish:

1) Press the arrow button once until the display says "Svenska tryck +".

2) Press the "+" button to choose English.

3) If you want another language than English, continue to press the "+" button until you have reached your language of choice.

4) Press the arrow button five (5) or six (6) times until the display says "Duty". (The arrow button must be pressed six (6) times if the error message "Clean interval xx h" has been activated and, not yet, reset (as in 14.2 Cleaning of UV-tubes, 7) and 8)). Otherwise, press the arrow button only five (5) times.)

11 Operation and maintenance instructions

> **WARNING:**
> UV-light can cause a painful irritation of the eyes
> (photokeratitis or "snow blindness"). Avoid direct eye contact with
> the blue light issued by the UV-tubes and use protective goggles
> during installation and maintenance of the UV-system.

11.1 Cleaning interval

The UV-tubes need cleaning regularly in order to optimize the efficiency of the INDU system. In a commercial kitchen, the tubes should be cleaned once a fortnight. In a domestic ventilation system, the interval can be as long as every three months. The Touch Panel indicates the need for UV-tube cleaning. The factory setting for the cleaning interval is 200 service hours, which is generally equivalent with a fortnight in a restaurant setting. After cleaning the UV-tubes, you need to reset the cleaning interval: See "11.2 Cleaning of UV-tubes" below.

You can increase or reduce the cleaning interval, according to your needs:
1) Press the arrow button four (4) times until the display says "Clean interval + to incr.".
2) Use the "+" and "-" buttons to adjust the cleaning interval.
3) Press the arrow button once or twice until the display says "Duty". (The arrow button must be pressed twice if the error message "Clean interval xx h" is activated and, not yet, reset. Otherwise, press the arrow button only once.)
The 60-minute self-calibration is a prerequisite for the adjustment of the cleaning interval.

11.2 Cleaning of UV-tubes

1) Press the "Start/Stop" button on the Touch Panel to stop the INDU system. The display should say "No duty" now.
2) Open the service hatch and slide the UV-cassettes halfway out on their slots.
3) Disconnect the electrical cord and then carefully slide the UV-cassette all the way out of their slots.
4) Wipe the UV-tubes clean carefully with a moist cloth. **Please, note**: Avoid touching the UV-tubes with your bare fingers. Finger prints can cause the UV-tubes to become dirty again more quickly.
5) If the UV-tubes do not become entirely clean, spray them with a detergent with a high pH value (pH 10-13) and let them soak for about a minute. Remove all of the detergent with a moist cloth.
6) Slide the cassettes halfway back in their slots and connect the electrical cord
7) Slide the cassettes all the way in
8) Close the service hatch
9) Press the "Start/Stop" button to restart the INDU system. The display says "Duty" again.
10) Press the arrow button five (5) times until the display says "Reset after clean press +".
11) Press the "+" button.

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11 # Operation and maintenance instructions (cont.)

11.3 ## Exchange interval for UV-tubes

The UV-tubes have a service life of 12.000 hours or 2 years, depending on which time period elapses first. You can check on the Touch Panel how many hours of service life remain until the UV-tubes need changing. The Touch Panels indicates two alarm/error messages:

- "Change lamp xxh": The factory setting for this message to appear on the display for the first time is a remaining total of 1000 hours of service life. When you see the message, contact your supplier to arrange for an exchange of UV-tubes.

- "Change lamp hours left xx h": The factory setting for this message to appear on the display for the first time is a remaining total of 300 hours of service life. The error message will be followed by a sound signal. Exchange the UV-tubes.

11.4 ## Checking the remaining service life hours

1) Press the arrow button twice until the display says "Dutytime hours left xx h". The number indicates the remaining service life hours.

2) Press the arrow button four (4) our five (5) times until the display says "Duty". (The arrow button must be pressed five (5) times if the error message "Clean interval xx h" is activated and, not yet, reset. Otherwise, press the arrow button only four (4) times.)

11.5 ## Exchange of UV-tubes

1) Press the "Start/Stop" button on the Touch Panel to stop the INDU system. The display should say "No duty" now.

2) Open the service hatch and slide the UV-cassettes halfway out on their slots.

3) Disconnect the electrical cord and then carefully slide the UV-cassette all the way out of their slots.

4) Remove the UV-tubes from the INDU the cassette by pressing the tube to the right side of the cassette. The contact on the right side is equipped with a spring that, when fully compressed, releases the UV-tube from its contact on the opposite (left) side.

5) Exchange all the rubber gaskets.

6) Place new rubber gaskets and new UV-tubes in the INDU cassette. Please, note: Avoid touching the UV-tubes with your bare fingers. Finger prints can cause the UV-tubes to become dirty again more quickly.

7) Slide the cassettes halfway back in their slots and connect the electrical cord

8) Slide the cassettes all the way in

9) Close the service hatch

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11   **Operation and maintenance instructions (cont.)**

11.5   **Exchange of UV-tubes** (cont.)

10) Press the "Start/Stop" button to restart the INDU system. The display says "Duty" again.

11) Now the INDU system needs to be reset: Press the arrow button three (3) times until the display says "More menues".

12) Press and hold the "+" button for five (5) seconds until the display says "Current set".

13) Press the arrow button seven (7) times until the display says "Reset push plus".

14) Press the "+" button.

The INDU system is reset to a remaining total of 12.000 hours of service life.

11.6   **Recycling of UV-tubes**

Attention! UV-tubes contain mercury and are classified as hazardous waste. They must be disposed of at a licensed waste disposal service. This is valid for pieces of broken UV-tubes as well. During transportation, the UV-tubes need to be treated as dangerous goods.

12 Error messages

The INDU Control Touch Panel indicates the following five (5) alarm and error messages. For more detailed information and suggested solutions, see the "INDU Error Message Chart" on page 16.

12.1 Alarm message "Clean interval"

The UV-tubes need cleaning.

12.2 Error message "Lamperror"

One or several UV-tubes are not functioning properly for some reason.

12.3 Error message "Dutyerror contact service"

Several UV-tubes are not functioning properly for some reason.

12.4 Error message "Stop ext"

The pressure switch in the Power Box has made contact and switched of the INDU system. Alternatively, an optional interlock connected to the INDU system has been tripped.

12.5 Error message "Change lamp xx h"

The service life of the UV-tubes is coming to an end:
When 1000 hours of service life remain, the display says "Change lamp xx h".
When less than 300 hours of service life remain, the display says "Change lamp hours left xx h".
When the service life has run out, the control system INDU Control automatically switches of the UV-system, and the display says "System stop contact service".

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INDU Error Message Chart

Warning: Use protective goggles against UV-light in order to avoid photokeratitis or "snow blindness". Switch of the INDU system before maintenance inside the ventilation duct in order to avoid hazardous ozone levels.

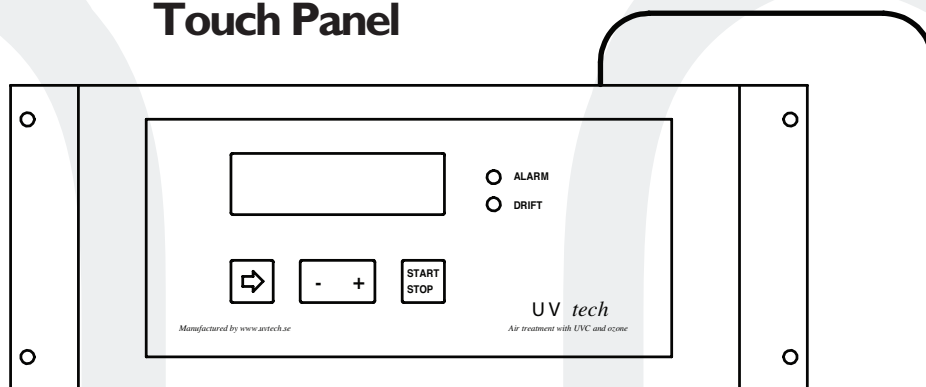|	Touch Panel display message		Cause		Solution
1	"Duty" changes to "Clean interval". Green diode is lit. Red diode blinks slowly.	A	It is time to clean the UV-tubes.	I.	Clean the UV-tubes. Follow the instructions under 11.2 on p.12.
2	"Duty" changes to "Stop ext". Green diode blinks fast.	A	The exhaust fan is not on.	I.	Switch on the fan, let it gain momentum and check if the error message disappears.
		B	The pressure switch in the Power Box is not installed properly.	I.	Make sure that the plastic hose is connected to the front nipple marked "-", not the nipple marked "+". Check that the hose is properly connected to exhaust duct: the cone-shaped side of the nipple must be on the inside of the duct, and the fit between nipple and hose must be air-tight.
		C	The pressure switch in the Power Box does not function properly.	I.	Detach the transparent plastic cover of the pressure switch in the Power Box. Turn the little screw anti-clockwise until the pressure switch clicks.
		D	The pressure switch in the Power Box is defective.	I.	If the measures above have not rectified the problem, the pressure switch might be defective and needs to be exchanged.
3	"Duty" changes to "Lamperror". Green diode is lit. Red diode blinks fast.	A	One or more UV-tubes are defective.	I.	Change the UV-tubes. If the UV-tubes are not lit after the exchange, one or more ballast(s) in the cassette(s) is/are defective and need(s) to be exchanged.
4	"Duty" changes to "Dutyerror, contact service". Green diode is lit. Red diode is lit	A	Several UV-tubes are defective	I.	Change the UV-tubes. If the UV-tubes are not lit after the exchange, one or more of the ballast(s) in the cassette(s) is/are defective and need(s) to be exchanged
5	"Duty" changes to "Change lamp xx h". Green diode is lit. Red diode blinks slowly.	A	1000 hours (or less) of service life are left and the UV-tubes need to be exchanged soon.	I.	Arrange for an exchange of the UV-tubes with your supplier.
6	"Duty" skiftar till "Change lamp hours left xx h". Green diode is lit. Red diode blinks fast.	A	300 hours (or less) of service life are left and the UV-tubes need to be exchanged.	I.	Change the UV-tubes. Follow the instructions under 11.5 on page 14.
7	"Duty" changes to "System stop". Green diode is off. Red diode is lit. Sound signal every minute.	A.	The UV-tubes have reached the end of their service life, and the system has shut down automatically.	I.	Change the UV-tubes. Follow the instructions under 11.5 on page 14.
8	The Touch Panel says "Duty" but the UV-tubes are not lit.	A.	Because of several on/off in a short period of time, the safety shutdown was activated.	I.	Start the system and wait for up to 4 minutes until the safety shutdown is de-activated and the mains feed is released again.

Table 1 INDU

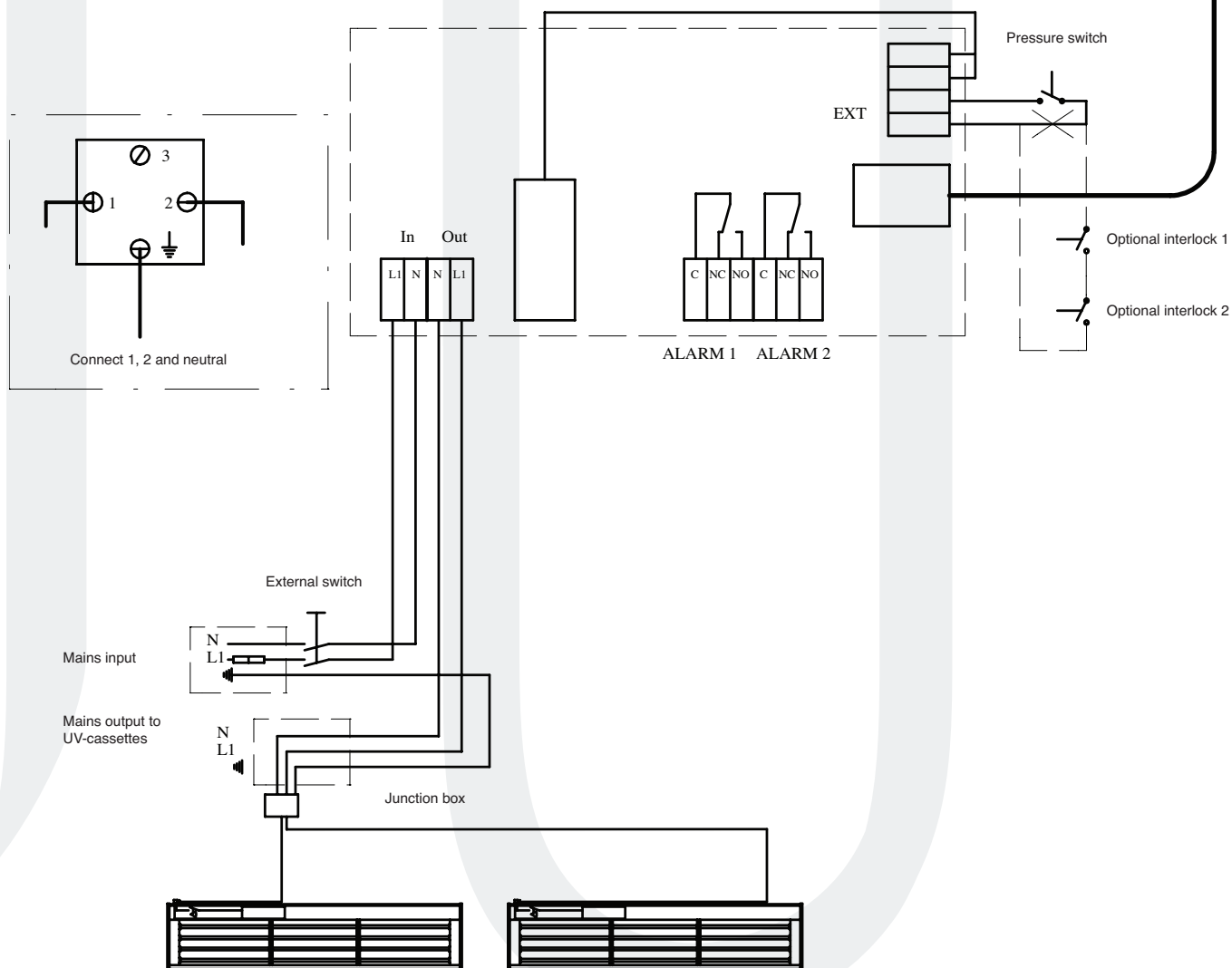| Productname	Module configuration		Maximum air flow		Dimensions (mm)			Electrical data			Number of cassettes	
	Levels	Slots/ level	(l/s)	(m³/h)	B (Width)	H (Height)	L (Length)	W	A	V	4 tube cassettes	6 tube cassettes
INDU 1304	1	3	400	1440	1000	400	800	160	10	230	1	-
INDU 1306	1	3	600	2160	1000	400	800	240	10	230	-	1
INDU 1308	1	3	800	2880	1000	400	800	320	10	230	2	-
INDU 1312	1	3	1200	4320	1000	400	800	480	10	230	-	2
INDU 2416	2	4	1600	5760	1000	800	1000	640	10	230	4	-
INDU 2424	2	4	2400	8640	1000	800	1000	960	10	230	-	4
INDU 2432	2	4	3200	11520	1000	800	1000	1280	10	230	2	4
INDU 2436	2	4	3600	12960	1000	800	1000	1440	10	230	-	6
INDU 2440	2	4	4000	14400	1000	800	1000	1600	10	230	4	4
INDU 2444	2	4	4400	15840	1000	800	1000	1760	10	230	2	6
INDU 3456	3	4	5600	20160	1000	1253	1000	2240	10	230	2	8
INDU 3468	3	4	6800	24480	1000	1253	1000	2720	13	230	2	10
INDU 3472	3	4	7200	25920	1000	1253	1000	2920	13	230	-	12

INDU Control Wiring Diagram

Touch Panel

Power Box (Electronic Box)

Touch Panel Navigation

Duty — **Stopp** → **No duty** ← **Start**

➡️

Svenska tryck plus ⊞/⊟ **English push plus** ⊞/⊟ **German Plustaste drücken** ⊞/⊟ **Franchais Appuyer sur +**

⊟/⊞ **Soumi Paina +**

⊟/⊞ **Italiano Premere +**

➡️

Dutytime Hours left

➡️

Press and hold the "+" button for 5 sec.

More menues ⊞ → **Current set x,x A   y,y A**

➡️ **Level lamperror 95% x,x A**

➡️ **Level dutyerror 90% x,x A**

➡️ **Change lamp Prepare xx h**

➡️ **Change lamp   xx h**

➡️ **Function Alarm 1 1 Dutyerror (+) 2 Cleaning (+/-) 3 Stop ext. (+/-)**

➡️ **Function Alarm 2 1 Lamperror (+) 2 Cleaning (+/-) 3 Stop ext. (+/-)**

➡️ **Reset Push plus** ➡️

Clean interval + to incr.

➡️

Reset after clean press +

➡️

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