Manual DUCT





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This manual contains safety information and user instructions. Both owners and users should read the manual before starting up the DUCT to optimise safety. The manual is an integral part of the delivery of your DUCT system. Only qualified personnel may carry out the installation and service of DUCT. No changes or reinstallations may be made to the DUCT system without first consulting UVtech AB as this may result in safety deficiencies. UVtech AB cannot be held responsible for changes made without UVtech's consent.



Components







Operation of the DUCT

On receipt of the DUCT, the goods must be examined immediately for any visible damage. Any damage must be reported immediately to the carrier on site. During installation, the DUCT must be protected so that construction dust and other dirt cannot settle on the UV tubes.



The DUCT system consists of:

Power Box Touch

Panel

1.1

1.2

1.3

Power Box and Touch Panel are the two components of DUCT Control - the control system controls operating time, alarms, and cleaning.

DUCT plug-in modules

Adapter for installation of DUCT plug-in modules in the ventilation duct











2. Physical location of the constituent components



Placement of the Power Box

The Power Box should be placed in the immediate vicinity of the location where the DUCT plug-in module(s) is located in the ventilation duct and is preferably mounted above the ceiling in a location that makes the Power Box easily accessible.

Location Touch Panel

The Touch Panel is mounted directly adjacent to the location of the DUCT plug-in module(s) in the ventilation duct. The Touch Panel is mounted on the wall, at eye level, in a location where the Touch Panel is not in the way, but where it is clearly visible and accessible and checked daily. See further under "4. Installation of the Touch Panel".

Placement and mounting of plug-in modules

Start locating, on the ventilation drawing, where the DUCT is to be installed and check which type of DUCT plug-in module(s) are to be installed. When unpacking, check that you have received the correct type. The DUCT plug-in module is mounted directly in the ventilation duct using the Adapter. See also under "5. Installation of plug-in module"



3.2

3.4

4.1

3. Installation of the Power Box

The electrical installation must comply with local electrical regulations and be carried out by a qualified electrician. See wiring diagram on page 18.

The location of the DUCT Control system should always be indoors and in ventilated rooms. The Touch Panel shall be placed where it is visually checked daily. The power supply to the Power Box shall always have an external safety switch. If the installation has more than one (1) DUCT plug-in module, a distribution box must be installed between the Power Box and the DUCT plug-in modules. The distribution box is not included in the delivery.

- 3.1 The Power Box should be mounted upright, with the hose pointing straight up. Place the Power Box in the immediate vicinity of the location where the DUCT plug-in module(s) is located in the ventilation duct and preferably above the suspended ceiling in a location that makes the Power Box easily accessible even after the entire project is completed.
 - Drill a 6 mm hole in the main exhaust air duct and insert the supplied nipple with the curved side into the duct. Screw the nipple in place. The hose is then connected to the straight side of the nipple.
 - The other end of the hose should be fitted to the front of the two nipples (labelled "-") on the pressure switch in the Power Box.
 - Incoming electricity should be fed to the terminal: IN in the Power Box.
 - All UV cassettes must be supplied with power from the OUT terminal. If the installation consists of more than 1 cassette, the cable from OUT is fed to a distribution box, from which all the cassettes are then fed. Note the position of the phase and neutral.

4. Installation of the Touch Panel

- The Touch Panel is mounted directly adjacent to the location of the DUCT plug-in module(s) in the ventilation duct and attached to the wall, at eye level, in a location where the Touch Panel is not in the way, but where it is clearly visible and accessible and checked daily.
- 2 Connect the Touch Panel via the supplied data cable to the data port in the Power Box
 - The Touch Panel is supplied with 3 metres of data cable. If necessary, this cable can be replaced with a longer cable the maximum permitted data cable length between the Power Box and the Touch Panel is 50 m.

















5. Installation of DUCT plug-in modules

| 5.1 | Unpack the plug-in module from its packaging and remove the protective plastic. | | | | | | |
|-----|---|--|--|--|--|--|--|
| 5.2 | Unpack the adapter from its packaging and remove the protective plastic. | | | | | | |
| 5.3 | Check the ventilation drawing and find the place where the DUCT should be mounted. | | | | | | |
| 5.4 | The DUCT should be mounted horizontally along the route of the ventilation duct. | | | | | | |
| 5.5 | Identify which Adapter and which DUCT to install in the ventilation duct. Make a hole in the ventilation duct 460 x 110 mm. | | | | | | |
| 5.6 | Fix the adapter to the ventilation duct with the required insulation (not part of the DUCT delivery) between duct and adapter. | | | | | | |
| 5.7 | Insert the plug-in module through the adapter and check that the microswitch clicks into place when the plug-in module is inserted. | | | | | | |
| 5.8 | Attach the plug-in module using the clamps and insert and screw on the power cable. For the wiring diagram, see page 18. | | | | | | |
| | 5.4 | | | | | | |





UV light can cause painful irritation of the cornea ("snow blindness" or "welding glare"), so always avoid looking directly at the blue light from the UV tubes and always wear protective glasses during installation or servicing of the system.







6. First start and calibration of the system

Automatic calibration

6.1

When the Power Box, Touch Panel and all DUCT plug-in modules are connected as above, the system is started by pressing the "START/STOP" button on the Touch Panel. An automatic calibration will then start immediately and the system will automatically calibrate the different alarm levels during the first 60 minutes.

If the system is switched off before the first 60 minutes have elapsed, the system will re-calibrate the next time the system is switched on. The start-up of the DUCT installation is now complete and the display on the Touch Panel shows "Operation".

Performing new automatic calibration

If you want to reset the system and do a new calibration, you do it under "extended menus" on the Touch Panel:

1) Use the arrow key to go to "Extended menus".

2) Press and hold the " + " button for 5 seconds.

3) Use the arrow key to go to "reset". Press the "+" button. A new calibration will now start. After 60 minutes a new calibration has been done.

7. Interconnection with other equipment

This installation is not necessary for the DUCT plant to function. In some cases, you may want to interlock with other equipment in the DUCT system. In the Power Box, the pressure switch is connected at the factory to the terminal "EXT" - external stop. If you also want other sensors/switches/relays to interlock the UV system and be able to switch off the current, these must also be connected to the "EXT" terminal. These interlocks must be connected in series with the pressure switch. See wiring diagram on page 18.





8.1

8.2

8. Forwarding of alarm functions

Switching on the retransmission of alarm functions

The DUCT Power Box can be switched on to forward alarms to the higher-level system. DUCT Control keeps track of and displays five different alarms if each alarm situation occurs. Four of these different alarms can be forwarded to a higher-level system. If you wish to have alarms forwarded to a higher-level system, this is connected via the NC/NO terminal "ALARM" in the power box. The wiring diagram can be found on page 18.

Installation of alarm functions to be transmitted

You can choose to forward one or two different alarms, if you want two alarms forwarded, you connect control to both NC/NO ports (Alarm 1 and Alarm 2). If only one alarm is forwarded, use the NC/NO port that can be programmed to send alarm information you want to forward:

| Port: | 1 | 2 | 3 |
|-----------|-------------|---------------|-------------------|
| "Alarm 1" | Drift error | External stop | Cleaning reminder |
| "Alarm 2" | Pipe faults | External stop | Cleaning reminder |



8.3

Programming when retransmitting one (1) alarm

1) Connect signal cables to either NC/NO terminal "Alarm 1" or "Alarm 2", depending on which alarm is to be forwarded - see overview above to see which alarms can be sent via which port.

- 2) Press the arrow key three (3) times until the display shows "Extended menus".
- **3)** Press and hold the "+" button for five (5) seconds until the display shows "Power on".

4) Press the arrow key until the display shows "Alarm 1 - Malfunction". From the factory, the equipment is programmed to send alarms "Operating error" via the "Alarm 1" port. If you want to send

"Operating error" via "Alarm 1", you do not need to reprogramme the system.

- 5) Press the "+" button to send the "External Stop" alarm via Alarm 1 instead of "Operational Error".
- **6)** Press the "+" button to send the "Cleaning interval" alarm via Alarm 1 instead of "External stop".
- 7) Press the "+" button to return to "Operational Error" being sent via Alarm 1.



Programming in case of retransmission of two (2) alarms

8.4

1) Connect signal cables to both NC/NO terminals "Alarm 1" and "Alarm 2" - see overview above to see which alarms can be sent via which port.

2) Press the arrow key three (3) times until the display shows "Extended menus".

3) Press and hold the "+" button for five (5) seconds until the display shows "Power on".

4) Press the arrow key until the display shows "Alarm 1 - Malfunction". From the factory, the equipment is programmed to send the "Operational error" alarm via the "Alarm 1" port. If you want to send "Operating error" via "Alarm 1", you do not need to reprogramme the system.

5) Press the "+" button to send the "External Stop" alarm via Alarm 1 instead of "Operational Error".

- 6) Press the "+" button to send the "Cleaning interval" alarm via Alarm 1 instead of "External stop".
- 7) Press the "+" button to return to "Operational Error" being sent via Alarm 1.

8) Press the arrow key once (1) until the display shows "Alarm 2 - Pipe fault". From the factory, the equipment is programmed to send "Pipe fault" alarms via the "Alarm 2" port. If you want to send "Pipe fault" via "Alarm 2", you do not need to reprogramme the system.

9) Press the "+" button to send the "External Stop" alarm via Alarm 2 instead of "Pipe Failure".

10) Press the "+" button to send the "Cleaning interval" alarm via Alarm 2 instead of "External stop".

11) Press the "+" button to return to "Pipe fault" being sent via Alarm 2.

8.5 Delay of retransmission of alarm functions

There is a delay from the time the alarm(s) are displayed on the Touch Panel, until they are forwarded to the supervisory system. The factory default time is two (2) hours. It is possible to reprogramme this time to between 6 minutes and 24 hours. To make this change:

1) Use the arrow key and go to "extended menus" on the touch panel.

2) Press and hold the "+" button for 25 seconds. Note: Keep the button pressed as the disc will change picture for the first time after about 5 seconds.

3) Use the arrow key to get to "TIME ALARM ON" and set the desired value using the "+" and "-" keys.

9. Resetting the forwarded alarm function

To reset an alarm that has been forwarded to a higher-level system, the control system must deenergised. This is most easily done by switching the power off and on via the safety switch according to "3. Installation of Power Box". Alternatively, by temporarily disconnecting the fuse to the UV system.



10. Adjustment of calibrated current values

If the automatic calibration failed or the conditions of the system have changed since the last calibration, it may be necessary to adjust the calibrated current values. This can be done either manually or automatically.

10.1

10.2

11.1

Manual adjustment of calibrated current settings

To adjust the calibrated current settings manually:

- 1) Press the arrow key three (3) times until the display shows "Extended menus".
- 2) Press and hold the "+" button for five (5) seconds until the display shows "Power on"

3) When all UV tubes in the system are lit, the two current values in this image on the display should be identical. If the values differ, use the "+" and "-" buttons to change the calibrated value until both values are identical.

Automatic adjustment of calibrated values

To recalibrate the power settings automatically:

- 1) Press the arrow key three (3) times until the display shows "Extended menus".
- **2)** Press and hold the "+" button for five (5) seconds until the display shows "Power on".
- 3) Press the arrow key five (5) times until the display shows "Reset".
- 4) Press the "+" button

The system now starts a new automatic calibration that takes 60 minutes.

11. Adjustment of alarm levels

Adjustment of alarm levels for "Pipe failure"

To adjust the values at which the system alarms for minor functional impairment due to non-functioning UV tubes:

1) Press the arrow key three (3) times until the display shows "Extended menus".

2) Press and hold the "+" button for five (5) seconds until the display shows "Power on".

3) Press the arrow key once (1) until the display shows "Level Pipe Error". Set the desired

% value using the '+' and '-' buttons. The selected value represents the % value of the calibrated current value to which the system should drop before the "Pipe failure" alarm appears in the display.



11. Adjustment of alarm levels (continued)

Adjustment of alarm levels for "Operation error"

To adjust the values at which the system alerts for significant functional impairment due to nonfunctioning UV tubes:

1) Press the arrow key three (3) times until the display shows "Extended menus".

2) Press and hold the "+" button for five (5) seconds until the display shows "Power on".

3) Press the arrow key two (2) times until the display shows "Level Operating Error". Set the desired

% value using the '+' and '-' buttons. The selected value represents the % value of the calibrated current value to which the system should drop before the "Operation error" alarm appears in the display.

12. Choice of language

11.2

The Touch Panel can be set to display six different languages: Swedish, English, German, French, Finnish and Italian. To change the language:

1) Press the arrow key one (1) time until the display shows "Swedish press +".

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

3) The selectable languages are then one after the other, keep pressing the "+" button until you have the language you want.



13. Operation & Maintenance Instruction

Cleaning intervals

The UV tubes should be cleaned at regular intervals to keep the DUCT plant functioning optimally. The frequency of cleaning varies with the type of installation. When the DUCT is fitted in the exhaust air duct from a restaurant, cleaning should be carried out once every two weeks. When the DUCT is installed in the exhaust air duct of a residential building, cleaning once a quarter may be sufficient.

The Touch Panel will remind you when it is time to clean the UV tubes. The factory setting is that the reminder comes every 200 hours. Once the UV tubes have been cleaned, the cleaning interval is reset (see "13.2 Cleaning UV tubes" below).

You can increase or decrease the cleaning intervals if necessary:

1) Press the arrow key four (4) times until the display shows "Cleaning interval increase by +".

2) Set the desired interval with the "+" and "-" buttons. You can only change the cleaning interval once the 60-minute calibration has been completed.

13.2

Cleaning of UV tubes

The UV tubes should be cleaned at regular intervals to keep the DUCT system functioning optimally. To clean the UV tubes:

1) Stop the DUCT plant on DUCT Control by pressing "start/stop" once. The display should now show "Not Operating"

2) Unscrew the power cable on the DUCT plug-in module and disconnect it. Open the buckles on the side the DUCT. Carefully pull the plug-in module out of the adapter and place the plug-in module on a work surface.

3) Gently wipe the UV tubes with a damp cloth.

4) If the pipes do not become crystal clear after step 3, spray on a high pH detergent (pH+10-13) and leave for one (1) minute. Then wipe the pipes again with a damp cloth.

5) Carefully insert the plug-in module into the Adapter again. Check that the microswitch is in the correct position and that it clicks into when you insert the plug-in module. Tighten the buckles on the side of the DUCT. Insert and screw on the power cable.

6) Start the DUCT plant on DUCT Control by pressing once on "start/stop" The display should now show "Operation"

7) Press the arrow key five (5) times to go to "Reset after cleaning". Press the "+" button.

NOTE! Avoid touching the UV tubes with your fingers when cleaning, as fingerprints can cause the UV tubes to become dirty more quickly.

WARNING:

UV light can cause painful irritation of the cornea ("snow dness" or "welding glare"), so always avoid looking directly at the blue light from the UV tubes and always wear protective glasses during installation or servicing of the system.





13.5

Interval for replacement of UV tubes

The Touch panel gives an alarm when the life of the UV tubes is approaching the end. The UV tubes has a lifetime of 12,000 hours or 2 years, whichever comes first. The touch panel keeps track of the time left until replacement and gives two different alarms:

1) "Lamp replacement prepare". From the factory, this alarm is preset to come when there are 1,000 hours of total life remaining - When this alarm comes, it is time to contact the supplier to plan the replacement of UV tubes.

2) "Lamp change". From the factory, this alarm is preset to occur when only 300 hours remain. This alarm is accompanied by an audible signal.

Checking the time remaining before replacing UV tubes

To check how much operating time is left on the UV tubes in the system: Press the arrow key two (2) times until the display shows "Operating time hours left". This shows how many hours of operation are left before the UV tubes need to be replaced.

Replacement of UV tubes

To change the UV tubes:

1) Stop the DUCT plant on DUCT Control by pressing "Start/stop" once. The display should now show "Not Operating".

2) Unscrew the power cable and disconnect it. Open the buckles on the side of the DUCT. Carefully pull the plug-in module out of the adapter and place it on a work surface.

3) To gain access to change the UV tubes, the stainless steel cover of the plug-in module must be unscrewed.

4) Disconnect the electrical connectors at the ends of the tubes, then carefully remove the UV tubes and rubber gaskets from the module. The rubber gaskets may have hardened over time - use great care when removing the UV tubes. Should a tube break during the process, follow the same procedure as when a low energy lamp breaks - i.e. leave the room for thirty (30) minutes before resuming work.

5) Insert new rubber gaskets and new UV tubes. Connect the electrical plugs on the ends of the UV tubes and screw on the stainless steel cover

6) Carefully insert the plug-in module into the Adapter again. Check that the microswitch is in the correct position and that it clicks into when you insert the plug-in module. Tighten the buckles on the side of the DUCT. Insert and screw on the power cable.

7) Start the plant on DUCT Control by pressing "Start/stop" once. The display should now show "Operation".

8) Reset the UV system after pipe replacement: Press the arrow key three (3) times until the display shows "Extended menus". Press and hold the "+" button for five (5) seconds, the display now shows "Power on". Press the arrow key seven (7) times until the display shows "Reset". Press the "+" button. The system is now updated to show that the remaining life is 12,000 hours.

13.6

Recycling of UV tubes

NOTE! The used UV tubes contain mercury and should therefore be recycled at a recycling centre. UV tubes are disposed of in the same place as fluorescent tubes for light fittings.

During transport, pipes should be treated as dangerous goods and thus protected from shocks or other impacts that could cause the pipes to break.



14. Alarms and troubleshooting





Reminder "Cleaning intervals"

This alarm is displayed when the set interval between UV tube cleanings has passed since the last reset after cleaning. The number displayed after "Cleaning interval" indicates number of hours since the cleaning reminder was first displayed.

Alarm "Pipe fault"

If one or more UV tubes are off for any reason. The display reads "Tube fault". For alarm levels, see "11. Adjusting the alarm levels"



14.2

Drift error" alarm

If several UV tubes are switched off for some reason. The display reads "Operating error". For alarm levels, see "11. Adjustment of alarm levels"

Alarm "Stop EXT"

If the pressure switch in the Power Box has tripped and switched off the DUCT system. The display shows "Ext. Stop". This alarm will also be displayed when interlocked equipment connected according to "7. Installation of interlocking with other equipment" has tripped.



Alarm "Replace UV tube"

When the operating time is nearing its end:

At 1000 hours left, the display shows "Prepare lamp change hours left XXX". If there are less

than 300 hours left, the display shows "Replace lamps, contact service".

When the life of the UV tubes has gone below zero (0) hours, the DUCT Control automatically switches off the UV system and the display shows "System stop"

If you have UVtech Inservice, we will contact you and book an appointment automatically.

If no one has contacted you, it is probably because you are not registered with UVtech Inservice. Then contact your dealer or email info@uvtech.se

See further information on the next page in "Troubleshooting scheme DUCT"



DUCT troubleshooting

Warning: Make sure to always protect your eyes from the blue light to avoid painful conjunctivitis. Never work inside the ventilation ducts when the UV lights are switched on to avoid exposure to ozone concentrations above the hygienic limit.

Message on the Touch Panel

| | | | Reason | | Action |
|---|---|----|---|-----|--|
| 1 | "OPERATION" changes to "Cleaning interval" Green diode lights up with a steady glow Red diode flashes slowly | A | It's time to clean the UV tubes | L | Clean the UV tubes. Follow the instructions in section 14.2 of this manual. |
| 2 | "DRIFT" changes to "Stop EXT" Green LED flashes rapidly | A | Exhaust fan not running. | l. | Switch on the fan, let it warm up and see if the alarm goes off |
| | | В | The pressure switch in the power box is not installed correctly | I. | Make sure that the hose is connected to the front nipple of the pressure switch marked "-" (as opposed to the rear one marked "+"). Check that the hose is correctly connected to the exhaust air duct. The nipple should be fitted with the tapered part in the duct. Check that the hose fits tightly against the nipple. |
| | | С | The pressure switch in the Kraft box does not pull | l. | Unscrew the transparent plastic cover of the pressure switch in Kraftbox. Turn the small screw anti-clockwise until the pressure switch clicks into place. |
| | | D | The pressure switch in the power box is defective | l. | If all the above points have been addressed, the pressure switch may be defective and need to be replaced. |
| 3 | "DRIFT" changes to "Pipe fault" Green diode lights up steadily Red diode flashes rapidly | A | One or more UV tubes are defective | l. | Replace the UV tubes. If the UV tubes do not light up after replacement, it means that one or more ballasts inside the cassette are defective. Replace the ballasts |
| 4 | "OPERATION" changes to "Operational error, service" Green diode lights up with a steady light Red diode lights up with a steady light | A | The pressure switch in one or more UV cassettes does not pull. | I. | Check that the pressure switches of the cassettes are connected: The red pressure hose supplied should be connected with one end to the small black nipple next to the electrical connector on the UV cassette. The other end of the hose should be connected using the supplied loose small black plastic nipple. This nipple should be attached to the inner ceiling of the filter housing of the ventilation hood. Drill a 6 mm hole, stick out the tapered part of the nipple and screw the nipple on. Connect the other end the red hose. |
| | | | | II. | With point I. done and the problem persisting, the pressure across the hood grease filter must be checked. The pressure switch in the UV cassette draws at 15-18 Pa. If the pressure is below 20 Pa, the pressure must be increased, this is most easily done by replacing the grease filter with blanking plates. |
| | | В. | Several UV tubes are defective | l. | Replace the UV tubes. If the UV tubes do not light up after replacement, it means that one or more ballasts inside the cassette are defective. Replace the ballasts |
| 5 | "DRIFT" changes to "Replacement UV tube hours left <1000" Green diode lights up with a steady glow Red diode flashing slowly | A | 1000 hours (or less) left until UV tube replacement is necessary | II. | Plan for the replacement of UV tubes. Contact your supplier for ordering and planning. |
| 6 | "DRIFT" changes to "Replacement UV tube hours left <300" Green diode lights up with a steady glow Red LED flashing rapidly | A | 300 hours (or less) left until UV tube replacement is necessary | l. | Replace the UV tubes. Follow the instructions in section 14.5 of this manual |
| 7 | "DRIFT" changes to "System stop" Green LED off Red diode lights up with a steady glow Beep every minute | A. | The UV tubes are worn out and the system has therefore shut down automatically | I. | Replace the UV tubes. Follow the instructions in section 14.5 of this manual |
| 8 | The ControlPanel shows "DRIFT" but the UV lights are off | A. | Due to repeated switching on/off over a short period of time, the inbuilt sticky protection has kicked in | l. | Switch on the system. Wait up to four (4) minutes for the anti-sticking device to switch on again. |



Wiring diagram DUCT Control





Setting up the Touch Panel



