

DA 4 / DA 4 M

EN

OPERATING MANUAL
DISCHARGE CONTROL UNIT



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01. GENERAL DESCRIPTION

The DA 4 / DA 4 M MultiQube Discharge Control Unit is a device for commercial use in order to rectify water damage in interspace and insulation layers. It is a mobile, noise-reduced and electronically operated device for controlling suction air flows.

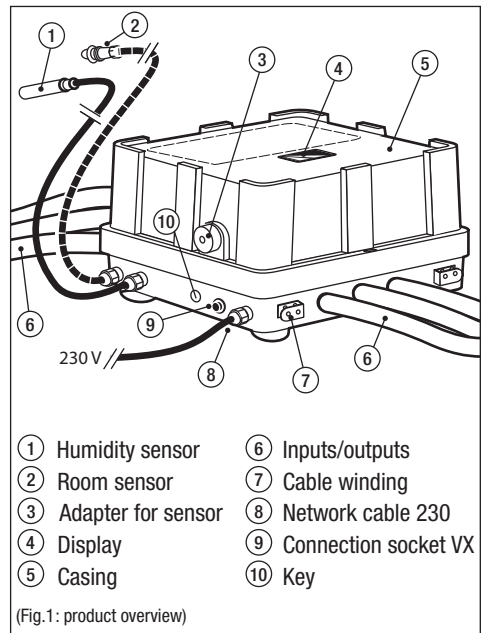
In practice, new water damage is characterised by a non-homogeneous distribution of humidity.

The Discharge Control Unit has been designed for vacuum drying and, by means of the active control of three drying zones, makes it possible to optimize and shorten the drying phase.

The Discharge Control Unit has two sensors - one air sensor for measuring the room air humidity and temperature and one humidity sensor for recording the humidity values of the insulation layers affected.

The automatic controls of the DA 4 record in sequence the humidity values of three different ducts by means of the humidity sensor and then concentrate the entire compressor performance to the duct with the highest humidity value. After a 10-minute drying phase, the humidity values of the individual ducts are measured again and the most humid duct is selected again.

In this way, the total drying time can be significantly accelerated - between 30 and 70 %, depending on the construction concept.



The Discharge Control Unit is installed between the water extractor and the drying zones.

The ambient air sensor of the Discharge Control Unit records the room humidity and temperature. If the room humidity exceeds values which no longer enable a drying process, the display shows the warning "room humidity".

The DA 4 and DA 4 M Discharge Control Unit saves the measurements on an integrated USB flash drive. Previous drying processes are thus documented. The DA 4 M Discharge Control Unit additionally sends in intervals the sensor measurements to a WEB centre and thus offers online remote monitoring of the drying process.

02. READ BEFORE COMMISSIONING

The DA 4 / DA 4 M Discharge Control Unit is to be used as a control unit for drying insulation layers in the suction process of floor screed or flat roofs exclusively. The unit consists of a casing in which the valves, the control unit and the connection nozzles are installed, as well as the humidity sensor with adapter, which is plugged into the respective holding fixture for transportation purposes. During operation, the sensor is installed at a four-fold distributor at the compressor by means of the adapter.

△ *The humidity sensor must not have direct contact with water!*

△ *Never place items on the device or step on it.*

The Discharge Control Unit can be used with all conventional compressors in suction processes for the drying of insulation layers. Furthermore, the device is specifically aligned to the Trotec Multi-Qube modules.

The task of the Discharge Control Unit is to efficiently distribute the suction flow to the existing core drill holes; it is positioned between the water extractor and the core drill holes. Water, particulate matter, fine dust or other small particles are not filtered through the device. Foreign bodies of this kind do not impair the function of the device.

△ *Foreign bodies with a diameter of more than 15mm may lead to a clogging of the valves. For this reason, the core drill hole is to be cleaned thoroughly before drying. An industrial vacuum cleaner is suitable for cleaning.*

The Discharge Control Unit does not have any defined inputs and outputs. It is irrelevant from which side the hoses are connected.

△ *All three inputs and all three outputs must be connected and used.*

Ensure a proper connection of the inputs and outputs. Insufficient connections with the aluminium nozzle of the Discharge Control Unit may result in leakages. This will lead to reduced drying performance. In a worst case scenario, water leaks from the connection and causes water damage. Use hoses with smooth and elastic internal surfaces or spiral hoses with a corresponding special clamp. With the Discharge Control Unit, you can directly control three core drilling holes. By means of T/Y pieces or other distributors, the number of the controllable core drilling holes can be expanded. Here, ensure that the core drilling holes which are controlled via one duct are grouped closely together.

Generally, before using the MultiQube elements, water in the core drilling holes must be removed via suction before starting the drying process. This shortens the drying time for rectifying the water damage.

All three ducts of the Discharge Control Unit must be connected as otherwise correct functioning cannot be guaranteed and the connected compressor turbine will be damaged.

The use of a Discharge Control Unit in explosion-risk rooms and atmospheres is inadmissible.

The Discharge Control Unit may only be operated by specialist staff and experts who have been instructed regarding the operation of the devices and are trained in the area of insulation layer drying technologies. The operating manual must be followed. Instructed persons are persons who have been informed and, if required, trained regarding the tasks transferred to them and the possible hazards occurring in the event of inappropriate behaviour.

Repair and maintenance work on electrical parts may only be executed by a specialist electrician. On construction sites, the DA 4 may only be connected via an electrical 1~230V, 50Hz; 16A energy supply with a corresponding upstream FI residual current operated protective device (RCD) 30 mA, in accordance with with DIN VDE 100.

In order to avoid faults, the device is to be cleaned at regular intervals during or after each use, depending on individual loads.

When using extension cables or cable drums, the cable must always be rolled off completely.

03. COMMISSIONING

- Ensure that the inlets and outlets are free. Remove any plugs or foreign bodies from the nozzles and lines.
- Install the required elements for the insulation layer vacuum drying (water extractor, filter, compressor and exhaust mufflers).
- Connect the hoses coming from the core drilling holes to one side of the DA 4.
- Connect the hoses coming from the DA 4 with the water extractor for the insulation layer drying.
- Plug the black humidity sensor by means of the screw-in adapter into an inlet of the 4-fold distributor at the compressor (figure 2). Or use the Quad Distributor Pro VE/VX (6.100.000.142) with the additional sensor socket.

- Place the grey room air sensor near the condensation dryer.
- Connect the device to the power supply.
- The device is now ready for operation.
- Carry out a reset: Hold down the key (10). After 4 seconds, a countdown appears on the display. Once the countdown has finished, please release the key.

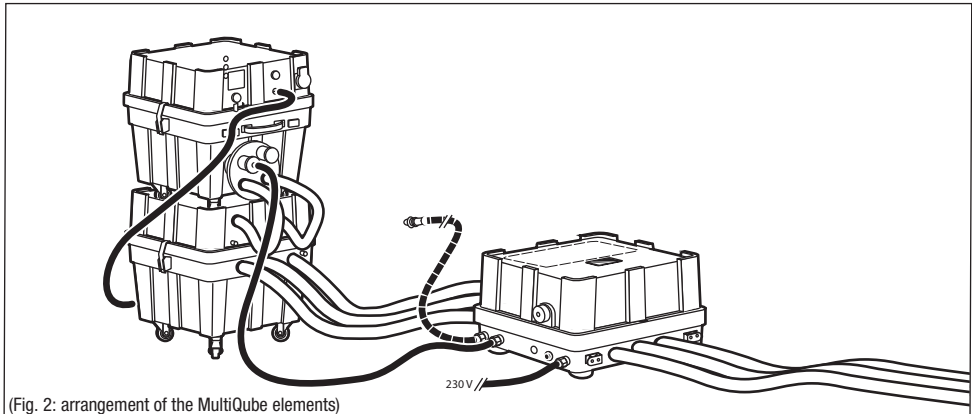
⚠ You have to RESET with each new use.

- Follow the instructions on the display and press the reset push-button when prompted.

If a different text is visible on the display, press the key for 6 seconds in order to reset the programme.

The device will start.

⚠ The DA 4 may only be commissioned and operated by professional users.



(Fig. 2: arrangement of the MultiQube elements)

04. OPERATION

Drying process

The DA 4 separates the drying process into several drying cycles and/or drying intervals

1. Active drying

- In the first switching cycle, the humidity is measured in all three ducts.
- In the following cycle, the two ducts with low measured humidity are closed and active drying is implemented in the only open and moist duct.
- Subsequently, the humidity is re-measured in all three ducts.
- Thereafter, active drying starts again in the most humid duct, while the two less humid ducts are closed again.

2. Subsequent drying 1

- These cycles are repeated until the following conditions are met:
 1. The humidity of the process air is below 70 % RH
 2. Drying runs for at least 4 days
 3. The mixing ratio in all three channels is less than 10 g water / kg air
 4. The process air can be max. 20% wetter than the ambient air.
- If the conditions listed above are met, the device goes into the “Subsequent drying 1”. Drying performance will be controlled now every 4 hours. This phase lasts for 48 hours
- If moisture is detected again in this phase, the unit returns into “active drying”.

3. Subsequent drying 2

- After “Subsequent drying 1” the final interval “Subsequent drying 2” begins. All channels are open and the moisture gets checked continuously.
- Drying and moisture measurement runs with the open channels to further degradation.

The interval times can be changed using the file “DA.cfg”. See chapter “Timer configuration”.

Room air humidity

For the drying process, the difference between the room air humidity and the soil moisture content must amount to a minimum of 20 %.

For this reason, the DA 4 Discharge Control Unit also records the room humidity and temperature by means of the room air sensor. If the room air sensor measures an excessive room humidity which makes drying impossible, the DA 4 starts to emit flashing warning signals.

Remote monitoring of warnings and measuring data

The DA 4 / DA 4 M Discharge Control Unit saves the measurements on an integrated USB flash drive. In this way, all drying processes are documented and secured against data losses.

The DA 4 M Discharge Control Unit additionally sends the measurements of both sensors to a WEB centre which enables a continuous online remote monitoring of the room air humidity and the drying process.

If the sending signal is too weak directly at the installation location of the DA 4 M Discharge Control Unit, the antenna with the approx. 5-m cable may be installed (e.g. next to the window) in order to obtain a sufficient sending signal. Even if the data can not be sent (for example, due to a weak telecommunication network), the data is always stored on the USB stick.

The registration on the website www.mqdatamonitor.com is separately described there. With an e-mail address and a self-selected password you can register at www.mqdatamonitor.com.

On your DA 4 M you will find a white sticker with the device-name and an associated password. You need this information to register the device at www.mqdatamonitor.com.

Remove the sticker from the appliance lid and archive it in a secure place.

Operating range

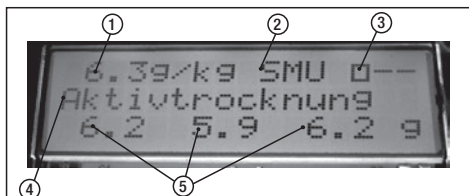
The Discharge Control Unit has an air flow of up to 350 m³/h and may work with vacuums of up to 250 mbar. This makes it suitable for work with the majority of compressors and other components for renovation of water damage.

Please note that the Trotec Compressor VX5 is designed for a use up to 70 m² and the VE 4 for use up to 40 m². Install the unit separately in a suitable location next to the core drilling holes (fig. 2).

Display

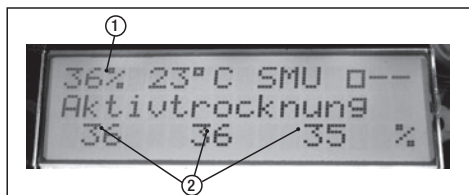
The display of the Discharge Control Unit DA 4 informs you about

- past and present humidity and room measurements,
- the active selection and drying ducts,
- about the connection of the DA 4 with the USB flash drive or mobile or web central.



- ① Mixing ratio of the ambient air
- ② Status indicator: S – send readiness (network found), M – modem recognized, U – USB stick recognized
- ③ Channel indicator
- ④ Current function or warning alert
- ⑤ Measurement results of channels / mixing ratios

(Illustration 3.1: Display screen)



- ① Relative humidity and temperature of the ambient air.
- ② Measurement results of channels / relative humidity

(Illustration 3.1: Display screen)

MultiMeasure Studio

We recommend using our “MultiMeasure Studio” software. The scope of delivery of the Discharge Control Unit includes the standard version of MultiMeasure Studio, which includes all our basic functions and is available for download on our website. By means of this software, you can easily record, analyse and evaluate the generated USB data. You can comfortably create protocols of measurement data or use the data as basis for creating offers and invoices.



Find out how to install MM Studio or expand the basic version to include interesting functions under <https://de.trotec.com/en/services/overview-of-services/downloads/>

05. TIMER CONFIGURATION

The interval times (moisture measurement 90 sec., active drying 10 min, and subsequent drying 4 hours) as well as the difference in the mixing ratio between the ambient air and the process air, can be configured via usb stick.

On the USB stick must be a text file with the name DA4.CFG and must be saved to the following content:

- T1: 90
- T2: 600
- T3: 48
- T4: 96
- HT: 70
- HD: 20
- TD: 14400
- MR: 100

The parameter and values have the following meaning:

	Description	Minimal value	Maximum value	Preset value
T1	„Moisture measurement“ - Time in seconds	20	65535	90
T2	„Active drying“ interval between 2 measurements of moisture - Time in seconds	60	65535	600
T3	„Subsequent drying“ - Time in hours	4	240	48
T4	„Active drying“ - Time in hours	4	240	96
HT	Relative humidity in % which must be exceeded in order for the subsequent drying to begin.	50	80	70
HD	Maximum allowable difference in % between space and process air in g water / kg air	1	40	20
TD	Sending interval - Time in seconds	300	65535	14400
MR	Threshold value mixing ratio multiplied with 10 in g water / kg air	10	800	100

When a value has been misspelled or the value entered is outside the range values, the default value is used automatically.

Comments:

- On each abbreviation must be a ‘:’ and then the selected value
- A line must have only one parameter, and separated by a ‘:’, the corresponding value
- The order of the parameters is arbitrary
- A value of 100 for the parameter MR means 10 g water / kg air

Method:

- Connect the USB stick with the USB interface of the DA 4
- Now the file is loaded from the usb stick and the configuration gets stored on the device-board
- The file is not deleted from USB stick, but the configuration contained therein is read each time again for a restart

- When the USB stick which is connected to the device contains no DA4.CFG file, the default values are used during the drying.

06. DECOMMISSIONING

The display shows the subsequent drying (E). The subsequent drying has been completed. The moisture values are recorded in intervals only. However, not every channel is measured individually, but a common value from all three channels. This serves to concluding observation of the floor structure. Should the moisture value measured increase three times during this phase, the drying starts again.

- Remove the humidity sensor from the compressor, and store it in the holding bracket of the Discharge Control Unit .
- Store the air sensor at the Discharge Control Unit .
- Store the antenna with the antenna cable at the DA 4 M Discharge Control Unit again.
- Remove the hose connections.

⚠ Pay attention to possible residual water in the hoses.

- Disconnect the power plug.

⚠ Before maintenance, service or repair work, always disconnect the electrical power plug and the connection hoses and ensure that the device is de-energised.

07. CARE AND MAINTENANCE

⚠ The DA 4 may only be serviced, opened and maintained by professional users.

Upon completion of the work, the device should be cleaned.

- Disconnect the power plug.
- Remove the hose connections.
- The hose passageways of the DA 4 may be cleaned with water and suitable brush or, if applicable, with compressed air.

⚠ High-pressure cleaners are not allowed.

- The casing can be wiped clean with a moist cloth. Here, splashing water is to be avoided. The casing of the MultiQube series is made of ABS plastic. For this reason, avoid the use of chemical or solvent-containing cleaning agents. Test the cleaning agent at a covered spot if required.
- Regularly check cables and plugs of the connection line and sensors. Damaged cables and plugs are to be removed.
- The valves of the Discharge Control Unit are only admissible for a flow of air, water and foreign bodies up to 15 mm. Clean the core drilling holes before using the insulation drying modules.
- The valves are maintenance-free. No lubrication is required.
- Maintenance and repair work should only be performed by Trotec. If such work is performed by third parties, the guarantee and liability become void.
- The DA 4 casing is made of ABS plastic. White discolouring might be created by material tension. Such discolouring, which is similar to cracking, has

no impact on the functionality of the device and is not a defect. By supplying hot air, e.g. by means of a blow dryer, the original status can be restored.

- Any deformation of the casing, due to external impacts (e.g. shocks or blows) can be rectified, if applicable, by suitable thermal treatment. Please contact our customer service.

08. FAULTS AND ERROR RECTIFICATION

No air or an insufficient amount of air is suctioned in:

- Check that the lines to the core drilling holes are free.
- Check that the lines between the DA 4 and the water extractor are free.
- Check the 3 ducts of the DA 4. Hoses which have been removed must be transparent.
- Check the water extractor in accordance with the operating manual.
- Check the compressor in accordance with the operating manual.

The device fails to control the suction flow:

- Ensure that the device is switched on.
- Check the display.
- Check the valves for clogging. For this purpose, dismount the supply and exhaust air hoses 0 and take a look through the connection nozzles.

Error messages (display):

“USB flash drive full”

- Remove the USB flash drive, connect it to a computer and check if it is full. The DA 4 USB flash drive has a sufficient capacity to archive data for 2000 days of drying.

“No USB flash drive”

- Check whether the USB flash drive has been removed from the USB port of the DA 4.

„Room humidity“

- The humidity of the environment must be at least 20% drier than the process air. Otherwise adverse drying conditions obtain and the warning alert appears in the display.

“MD PIN error”

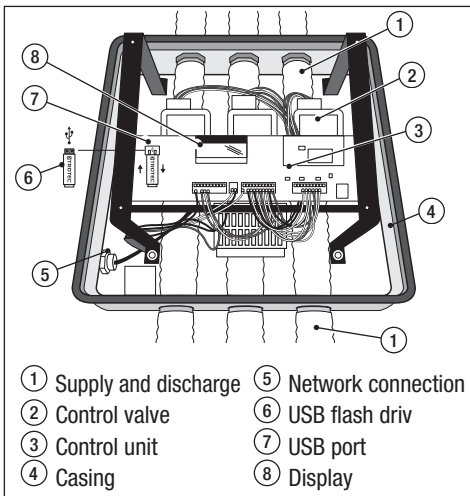
- The PIN on the MODEM.cfg file is possibly incorrect. Please check the PIN specified in the file. You can find the PIN number in the documents of your SIM card.

10. TECHNICAL DATA

Article number	(DA 4) 6.100.000.032
Article number	(DA 4 M) 6.100.000.033
Connection voltage	1~230 V
Dimensions	435 x 435 x 255 mm
Weight	7.2 kg
Air transportation connections	2 x 3 nozzles with 38mm Ø

09. INTERNAL VIEW OF THE DA 4

The lower image shows the schematic structure of the device with:



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