



Operation Manual for Drying Storage Cabinet with Drying Unit U-5002

(software version 4-09 and above)

Applicable to the following cabinets:

MSD-601-52, MSD-1202-52, MSD-1222-52 HSD-241-52, HSD-351-52, HSD-472-52, HSD-702-52, HSD-1404-52, HSD-1406-52, HSDi-351-52, HSDi-702-52, HSDi-1404-52, HSD-1104-52, HSD-1106-52, HSDF-1704-52 XSD/XSDB-701-52, XSD/XSDB-1402-52, XSDV series and SDR series,

Contents

1. Safety Information
2. Specification
3. Start-Up
4. Settings
5. Calibration
6. Maintenance
7. Troubleshooting
8. CE Declaration





1. Safety Information

Adherence to information provided in the Operation Manual

Being familiar with the basic safety information and regulations is essential for safe handling and failure-free operation of this dehumidifier.

- This Operation Manual contains the most important information required in order to safely operate the dehumidifier.
- Please ensure, all personnel operating the dehumidifier adheres to this Operation Manual and in particular to the safety information provided herein.
- Additionally, any rules and regulations with respect to accident prevention, applicable at the your respective location, are to be complied with.

Operator Obligations

The operator undertakes to exclusively authorize individuals to work at the dehumidifier, who:

- are familiar with relevant regulations on occupational safety and accident prevention, and have been trained in the dehumidifier's handling;
- are in possession of and/or have proven to possess the required expertise and know-how;
- have read and understood the safety information and precautions provided in this Operation Manual.
- Furthermore, the operator undertakes to regularly check its personnel's for a safety-conscious mode of practice.

Personnel Obligations

All personnel assigned to operate the dehumidifier, undertake to:

- comply with the relevant occupational safety and accident prevention regulations and follow the safety information and precautions provided herein, before operating the dehumidifier.

Organizational Measures

- Required personal protective equipment (PPE) is to be provided by the operator.
- All existent safety installations are to be inspected regularly.

Information-Related Safety Precautions

- Ensure the Operation Manual's general availability at the dehumidifier's application site.
- In addition to the Operation Manual, also provide for and ensure to comply with general as well as

local regulations on accident prevention and environmental protection.

- Ensure to keep all safety information and precautions applied to the dehumidifier in legible condition.





Intended Use

The dehumidifier is exclusively intended to dehumidify atmospheric air. Any deviating or exceeding deployment is considered unintended use. Tottech GmbH will not assume any liabilities for damage resulting therefrom.

Dehumidifiers must not be mounted in and/or exposed to the intake of liquids (e.g. filled tanks or sumps, flooded areas etc.).

Operation in and/or with potentially explosive ambience is not permissible.

Intended use also includes compliance with all information provided in the Operation Manual as well as adherence to the remarks made on

Hazards related to dryer handling

The dehumidifier was built in accordance with state-of-the-art technology and generally accepted technical safety requirements. Ensure to exclusively use it:

- for its intended use;
- in good order and condition with respect to safety.
- Ensure to immediately remedy any malfunction, which might impede the dehumidifier's safety.

Protective devices

- Generally ensure all protective devices to be properly installed and functional before operating the dehumidifier.
- Protective devices may only be removed:
 - a) after shutdown; and
 - b) as safeguarding against unintended restart.
- For delivery of subcomponents, the operator shall ensure the standard installation of protective devices.

Electrical hazards

- Works performed at the electrical power supply are to be executed by qualified electricians only.
- Ensure to always keep the control area locked. Access is to be granted to authorized and adequately equipped personnel only.
- In the event works are to be performed at live parts, ensure to provide for a second person who can switch off electricity, if necessary.





Hazards arising from hot surfaces

- During regeneration cycles, the ambient is re-fed with absorbed humidity by heating. This process may cause the dehumidifier's surface to heat up to approx. 60°C.
- Ensure not to touch the operating dehumidifier without wearing adequate protective equipment.
- Ensure the dehumidifier to be adequately aerated.
- Ensure to keep a minimum distance of 5 cm at the unit's back side.

Maintenance and servicing, troubleshooting

- The dehumidifier is maintenance-free.
- Ensure to inform operators prior to the commencement of maintenance activities.
- For repair works, switch dehumidifier to neutral and secure main switch against unexpected restart.
- Apply restart warning sign.
- Check unscrewed fastenings for secure tightness.
- After completion of repair works, check safety devices for functionality.

Dehumidifier modification

- Any modification, extension, and/or conversions to the dehumidifier are subject to Totech GmbH's written consent.
- Exclusively use original spare parts to ensure the dehumidifier's proper and safe function and operation.

Dehumidifier cleaning and disposal

Ensure proper handling and disposal of deployed substance and materials. This particularly applies to cleaning activities including the use of solvents.

Warranty and liability

Principally, we apply our "General Terms & Conditions", which the operator has been provided with upon contract conclusion at the latest. Warranty and liability claims in relation to personal injury and property damage shall be excluded if the same arise from one or more of the causes below:

- the dehumidifier's unintended use;
- the dehumidifier's improper and inappropriate installation, commissioning, operation, and/or maintenance;
- operation with defect safety devices or non-functional safety and protective devices;
- unauthorized modification or unauthorized alteration of the technical design;
- repair works performed in an inappropriate manner;
- disaster situations, impact by foreign objects, and events of force majeure.





2. Specification

Use

Dehumidifiers, which function according to the adsorption principle, are deployed for drying functions in process engineering, air-conditioning technology, and air-dehumidification in production and storage spaces, inside which products and installations require particularly low humidity. Drying Unit U-5002 with integrated humidity control has been specifically designed for being deployed in drying storage cabinets and drying rooms, in which a particularly low residual moisture content is of specific importance.

Operating conditions

In general, dehumidifiers made by Tottech are designed for initial conditions of 20-60°C at 0-60%RH. The process air's decreasing relative humidity and/or the regeneration air's increasing relative humidity will adversely affect dehumidification performance.

1. Ensure to exclusively operate the dehumidifier in ambient temperatures (control-side) ranging between -20°C and +40°C!
2. The process air's intake temperature may not exceed a maximum of +60°C; the regeneration air's intake temperature may not drop below the minimum of -15°C!
3. Ensure the intake air does not contain any free water (water drops)!
4. Ensure dehumidifiers are not mounted in and/or exposed to the intake of liquids (e.g. filled tanks or sumps, flooded areas etc.).
5. Any operation in and/or with potentially explosive ambience is not permissible.
6. In case contaminated air is used for pressure admission, ensure to consider respective adverse effects on the adsorbent!

Function

The device has been equipped with custom-programmable logic module, mounted in the drying unit. The respective module serves to control the device's humidity, temperature, and functions monitoring.

It provides an external display, indicating several reports such as malfunction, alarms, actual and pre-set values. Individual data can be retrieved by pressing the control panel's pushbuttons, whereas fault reports are given highest priority.

In order to ensure ideal dehumidification, the zeolite-filled filter cell will require adequate regeneration. During regeneration processes, active dehumidification is not feasible. To minimize the frequency of regeneration processes as well as the energy consumption related therewith, Tottech applies dynamic regeneration. That means, regeneration processes will be only initiated if needed, and will depend on nominal values. This state is given if set nominal values are not achieved within a period of 15 minutes. The intensity of initiated regeneration processes will automatically be adjusted to the requested nominal humidity, which will also save energy.





In case you have activated non-stop operation by setting a nominal value of "0", the device will continuously regenerate each 3 hours at maximum power. This operation mode will require significantly higher energy consumption.

In order to facilitate the cabinet's tempering an additional circulating air-heater - depending on respective design models - will be installed. The air temperature will be controlled by means of the logic module, integrated with the drying unit. The function is operated via the central text display. During the regeneration phase and by sensor failure the heater will be deactivated.

3. Start-Up

Handling with hoisting gear

Ensure to lift the device by means of fork lifts or with secured harnesses. Do not use pipe connections or other attachment parts as lifting points.

Installation

With respect to the device's installation, please adhere to the following:

- Do not expose the device to weather. Only special weatherproof models are suitable for outdoor installation.
- Ensure the intended installation site to be plane and capable of carrying the dehumidifier's operating weight. The device does not require foundation.
- Provide for a clearance of at least the device's width (height) for repair and maintenance/servicing works at the operating side and the inspection lids, in particular at the rotor.



- A) Dehumidifiers may not be mounted in and/or exposed to the intake of liquids, e.g. filled tanks or sumps, flooded installation sites etc.**
- B) Operation in and/or with potentially explosive ambience is not permissible.**





Start-up

Prior to **initial operation**, ensure to check all mechanical and electrical connections for secureness and leak-tightness. Also remove possible soiling.

The drying unit has been designed for a supply voltage of 230 V / 50 Hz, and may exclusively be operated with the respective voltage .

Connect the plug to a safety socket. If the device does not immediately start automatically, it is in standby mode. In that case, please press the [ON]-button in order to activate the device.

The cabinet's initializer will then start. As soon as initialization has been completed, the main menu will appear on the display, and the ventilators will start. Following initialization, the program will start with regeneration of the absorber. The display will indicate "Regeneration". Furthermore, it will indicate relative humidity and temperature of the cabinet's/room's interior. The (optional) green signal light will indicate the respective state by means of a blinking green signal. After the regeneration process's completion, the device will switch to drying mode, which is indicated by a continuous green-colored signal. After regeneration which takes about 20 minutes the heater inside the cabinet will be activated. The preset temperature will be reached after approximately 4 hours. After the preset value has been reached the temperature will stay at the preset level.

The cabinet is enabled immediately after start-up; its full drying performance will be achieved after approx. 1 h.

In order to **switch off** the device, please press the [ON]-button during the drying operation, located on the external display. Keep the pushbutton pressed for 3 seconds. This power-off function will switch the device to idle mode, and deactivate all control outputs and display functions. However, the device itself will remain switched on. Consequentially, please always disconnect the device from the mains connection if maintenance/servicing activities are performed. This function is during regeneration deactivated.





4. Settings

Pressing the [SET]-button for 3 seconds will open the setup menu. It allows for defining respective setting by means of the buttons [+] and [-]. Briefly pressing the [SET]-button again will open the following reference input menus in sequence:

- language
- nominal value humidity
- limit value humidity alarm
- delay humidity alarm
- nominal value temperature (only available with integrated heater)
- deviation temperature alarm (only available with integrated heater)
- delay temperature alarm (only available with integrated heater)

If neither the buttons [SET] nor [+] [-] are pressed for a period of 20 seconds, the program will automatically switch back to the standard display.

4.1 Language Menu

This function serves to define your local language. Available are:

1. German
2. English
3. French
4. Italian

Alternative languages are available on request.

The lower section of this menu provides information on the current software version.





4.2 Nominal Value Humidity

The reference input menu "Humidity" serves to define requested relative humidity in percent, which - if undercut - will shut down active dehumidification processes. If the nominal value is not achieved within a period of 15 minutes, the device will automatically initiate a regeneration process.

Setting a value of "0" will activate the drying unit's non-stop operation. This will realize the lowest possible residual humidity content by maximum energy use. Regeneration will take place in fixed intervals of 3 hours.

4.3 Nominal Value Humidity Alarm

Pressing the [SET]-button again will open the Alarms Menu. It serves to define humidity alarm limit value, which activates audible - or optionally visible - alarm, if exceeded.

The alarm will activate an acoustic signal, and switch on the signal light's flashing light. Briefly pressing the [SET]-button will serve to acknowledge the audible alarm. It will then be reactivated for new alarms. Both, the alarm signal on the display as well as the signal light are automatically deleted upon correction of respective alarm causes.

4.4 Delay Humidity Alarm

This display serves to define the humidity alarm delay, which prevents short-term humidity increases from triggering alarms.

4.5 Nominal Value Temperature

This menu will be available if the optional heater has been installed. It serves to define the temperature requested for the cabinet. In case the defined nominal value is below cabinet temperature / ambient temperature, the heater will not be activated.





4.6 Temperature Alarm

Pressing the [SET]-button again will open the menu Temperature Alarm. It serves to define the deviation (difference) from set nominal values, which will activate audible or - optionally - visible alarms, if being undercut or exceeded.

The alarm will activate an acoustic signal, and switch on the signal light's flashing light. Briefly pressing the [SET]-button will serve to acknowledge the audible alarm. It will then be reactivated for new alarms. Both, the alarm signal on the display as well as the signal light are automatically deleted upon correction of respective alarm causes.

4.7 Delay Temperature Alarm

This display serves to define alarm delays for temperature decreases, in order to prevent short-term temperature decreases or increases from triggering alarms.

Please note that the heater will be deactivated during regeneration processes. This may cause short-term decreases (max. 20 minutes) in the cabinet's temperature.

4.8 Doors Alarm

The alarm delay for doors alarm has been preset to 90 seconds, and does not allow for modification.

In the event doors are opened for longer periods, the alarm will activate an acoustic signal, and switch on the signal light's flashing light. Briefly pressing the [SET]-button will serve to acknowledge the audible alarm. It will then be reactivated for new alarms. Both, the alarm signal on the display as well as the signal light are automatically deleted upon correction of respective alarm causes.

4.9 Interlocking

Simultaneously pressing the buttons [+] [-] for 5 seconds will cause the indication "Interlocking Activated" to appear on the display. The control system is now protected from unintended parameter readjusting. Currently set parameters can be viewed but not modified. If you request to modify the settings, please press the buttons [+] [-] for another 5 seconds, until the display indicates "Unlocked". You can now access all functions unrestrictedly again.

4.10 Manual Regeneration

This function is only available during drying operation. Switch the device to standby mode by keeping the [ON]-button pressed for 3 seconds. The following reactivation by briefly pressing the [ON]-button again will initiate a regeneration process. The required regeneration intensity will be defined automatically.





5. Calibration

Totech recommends annual calibration inspection or the system's recalibration by sensor replacement, respectively.

For the drying unit's calibration, we recommend the following two options:

1. Replacing the sensor by a factory-calibrated sensor. After detaching the screw-fastened retaining ring, the plug-in sensor can simply be unplugged. The replacement sensor is mounted in reverse order. Since all settings have been stored in the sensor, its replacement will serve to recalibrate the dehumidifier's overall measuring. Additional measurement equipment or software is not required.
2. Define deviations by means of a calibrated reference dew point meter (minimum accuracy $\pm 0.2\%$ RH or higher), and calibrate the sensor via the software's calibration function. This proceeding requires data connection to PC and software (for detailed instructions, please refer to the Software Manual).

6. Maintenance

Ensure to generally disconnect the dehumidifier from the electrical power supply before opening or disassembling the device.

Ensure all motors - in particular ventilators - are at standstill before reaching inside the device!

In case the dehumidifier was in operation, please allow a cooling time of at least 30 minutes before disassembling the device!

General maintenance, Dehumidifier U-5002 has been designed for maintenance-free long-term operation. A maintenance schedule does thus not exist.

Sensor replacement and calibration please proceed as described under item 5.

Repair works are to be performed by qualified Totech service engineers or adequately trained personnel only.





7. Troubleshooting

7.1. For malfunction:

- disconnect device from power supply completely, and restart after 10 seconds
- software update via memory module.
- check logic module and extension module as described under item 7.6.

7.2. Measuring fault, "Sensor Error" message, or missing measuring values:

- check plug connection of sensor and conversion board
- check sensor with HW4, and replace if necessary
- Check conversion board. In order to do so, activate fixed values at the sensor's analog output via HW4, and check gain 1:10. If necessary, replace board.

7.3. Communication error via RS232:

- In the event of restricted communication, check sensor with HW4, and replace if necessary.
- No communication
 - check connections at sensor base and conversion board
 - check the conversion board's voltage supply 24VDC
 - Check voltage supply 5VDC for sensor. Replace board, if necessary.

7.4. Display indicates "BM No Resp Press ESC":

- Malfunctioning connection between display and logic module.

Check plug connections of display, drying unit, and logic module.

(For checking, the display can be directly connected to the drying unit by means of an RS232 cable (1:1)).

- check logic module as described under item 6





7.5. No indication on display:

- check plug connections
- Check mains fuse 8AT in port, and replace if necessary. In case it should immediately reactivate, the drying unit is to be replaced.
- Check LED for illumination on power supply unit.
 - No LED illuminated --> check input-side power supply unit (230VAC); if present, the logic module is to be replaced.
 - Red LED illuminated --> disconnect secondary power supply unit. If red color remains, the power supply unit is to be replaced.
 - If illumination switches to green, identify and remedy cause for short-circuit fault.
 - Disconnect external optional equipment (alarm signal light, heater, N², ...) and re-check.
 - Disconnect display and re-check.

7.6. Logic module and extension module checking:

- green LED illuminated--> proper function
- red LED illuminated--> software update via memory module required. If the respective state remains, the logic module is to be replaced.
- no LED illuminated--> check voltage supply (24VDC); if present, the logic module is to be replaced.

7.7. Humidity too high

- insufficient air quantity --> convections vents covered
- door contact not open --> check door contact; replace, if necessary
- ventilator failure --> replace drying unit

7.8. Temperature too low

- heating module switched off --> switch on heating module
- heating module's power supply interrupted --> check mains connection
- plug connection to drying unit disconnected --> check plug connection
- heater or ventilator failure --> replace defect components





8. CE-Declaration

With this writing we:

Totech Europe BV,
Linge 28,
8252 PJ Dronten,

That the following Dry Cabinets are Fitted with U5002.

MSD-601-52, MSD-1202-52, MSD-1222-52 HSD-241-52, HSD-351-52, HSD-472-52, HSD-702-52, HSD-1404-52, HSD-1406-52, HSDi-351-52, HSDi-702-52, HSDi-1404-52, HSD-1104-52, HSD-1106-52, HSDF-1704-52 XSD/XSDB-701-52, XSD/XSDB-1402-52, XSDV series and SDR series,

confirm that the drying cabinet described corresponds with the fundamental safety and health demands of the following EC instructions:

EN55011: 1998+A1:1999+A2:2002

EN61000-6-2:2001

2006/95/EG

2004/108/EG

Totech Europe B.V.
Gerhard Kurpiela,

