Drying cabinet TS2011-DC

Operating instructions

User manual drying cabinet TS2011

Application

The drying cabinet can be used for drying and storage of different types of parts, assemblies, materials in the form of powders and granules.
In principle, it can be dried and stored everything, except:
Excluded are parts and materials in which the outgassing flammable gases. (EXPLOSION HAZARD)

Features

The drying cabinet consists essentially of the following components:
Metal cabinet with **external Drying unit** consisting of:
Zeolite, heating, turbine, control valves, humidity sensors and the electronic control with a display.

USB port for configuration software, diagnostic information and functions, firmware update, sending bug reports by email for support.

LAN port for the web interface, display the current moisture in the cabinet, the operating mode and status, diagnostic information and functions, MPFS update.

Delivery drying cabinet TS2011

- Drying cabinet TS2011
- 4 Shelf boards
- USB cable

Intended Use

Use the device only in accordance with the specifications described in the application. Any other use is considered improper and may result in property damage or even personal injury.
The manufacturer accepts no liability for damage caused by improper use.

Safety instructions

The unit was designed for a mains voltage of 230V 50/60 Hz.

Don't use the device if the housing or the power cord is defective or shows any other visible damage.

If the power cord is damaged, have it replaced by the manufacturer or by a qualified person in order to avoid a hazard.

If the unit emits smoke, burnt smells or is making an unusual noise, immediately unplug the power cord. If you can not resolve the problem, don't take the unit into operation again.

The device complies with protection class I and must be connected to a socket with the properly installed earthing conductor.

Interventions and repairs to the appliance must be carried out by authorized persons.
Unauthorised repairs result in loss of warranty and guarantee claims.

Never plug objects through the ventilation slots in the cover.

Use the device only indoors.

Clean the device and the interior with a damp cloth.

Danger of burns !!
During regeneration of the drying unit comes laterally out of the ventilation shaft extremely hot air (to 160 ° C).
Do not place flammable objects in this area and keeping adequate distance.

Does not dry solvent-based parts.
DANGER OF EXPLOSION

Mounting and Alignment

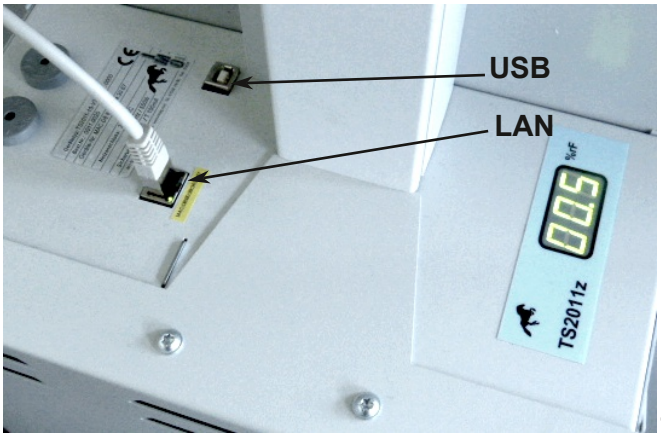
Positioning the unit to the desired location.
With the leveling feet align the device so that it is in level and that the doors can be easily opened / closed.

Make sure that the vents of the drying unit are not covered (At least 5 cm distance).

Commissioning

For commissioning, plug the power cord into a 230 V grounded outlet.
The unit has no power switch and therefore operates immediately.
The program starts with a check for: display, electronics, valves and turbine.
Whether subsequently the program drying or regeneration is started, it's depending on the degree of saturation of the zeolite.
The display shows the relative humidity (xx.x), which enters on the top of the cabinet, resp. exiting the cabinet below. In case of an error (Fxx) appears.
Regeneration is represented by ---
Door open is represented by [_]
Close the door is represented by | _ |
When the time for door open is exceeded, a buzzer indicating please close the cabinet door.
Service case is represented by S.xx.

Data interface = USB / LAN socket



Dry

During drying the cabinet operates in a circulating air operation, i.e. dry air is blown up into the cabinet, these flows downward, is sucked there and passed through the drying cartridge with the zeolite.
The air is removed from the moisture, its dry and re-introduced up into the cabinet. That means that the air in the cabinet is circulated constant.
In this process, the zeolite of the drying cartridge accumulates more and more water and the relative humidity of above injected air rises.
When the preset value of the relative humidity of the air blown at the top in the monitor program is reached, the regeneration of the drying cartridge is initiated.

Regenerate

During regeneration the valves are closed for the cabinet, that is at this time the cabinet is not flooded with dry air.

Regeneration takes about 1.5 hours.
Depending on the load and doorway intervals the cabinet is ready to dry for 1..4 days before it has to be regenerated again.
When the humidity of the air blown into the top of the cabinet exceeds the humidity value of 5% again, the regeneration process is started again.

The zeolite can be regenerated without losses indefinitely.

Energy balance

After regeneration, the humidity of the air blown into the cabinet is almost 0% RH.
This value is held to about 80% saturation of the zeolite and increases slowly then.
The cartridge contains 2.7 liters zeolite.
The zeolite can absorb about 350 g of water before it needs to be regenerated.
The absolute humidity (at 25 ° C and 60% rel. F.) is at about 15g water / m³ air. This corresponds to approximately 23m³ air.
Depending on the load of the cabinet and number of openings of doors, drawers, can be expected until the next regeneration with 1 ... 5 days.
For the duration of the regeneration of 1.5h is the power consumption 570 W.
During drying, the power consumption is approximately 30W.
If we count with 0.2 € per KWh, so the cost of electricity for the drying cabinet TS2011 will be about 30kWh x 0,2 € / KWh = 6 € / month. This indicates that the dry storage is the most effective way and also very inexpensive.

Error messages

The dry cabinet is equipped with a comprehensive error detection management.
The following errors are recognized:

F01: Mains Frequency Monitoring
F02: I²C Bus error
F03: RTC error / clock not found
F04: safety relay is not interrupted.
F11: humidity sensor above does not respond.
F12: humidity sensor below does not respond.
F13: temperature sensor missing above.
F14: temperature sensor missing below.
F18: humidity value above is within 255min not less than 10% RH declined.
F24: Regeneration cartridge Valve Top Rear control, temperature of upper humidity sensor> 55 ° C.
F26: Temperature of the humidity sensor above > 88 ° C.
F30: Motor or heating error
S01, S02: Service note, replace motor brushes

F40 TICK INIT
F41 FS INIT
F42 READ CONFIG
F43 STACK INIT
F44 FRAM ERROR
F45 FLASH ERROR

F50: Temperature during regeneration above 300 °, check turbine or Ventil top front
F52. The temperature of the heating had not achieved 100°C after 5 minutes
Check heating or relay
F54. The temperature of the heater is dropped of less than 150°C during the regeneration.
Check heating or relay
F56: Regeneration takes longer than 240min.
F57: The Main routine is not working properly.
F61: Motor or heating error

Start phase program

01 General Start
02 Init I2C
03 error ????
04 Tick Init
05 MPFS Init
06 App Config
07 Stack Init
08 Hardware Init OK so far.

Technical specifications

Changes in the interest of progress.

Manufacturer	IMO GmbH
Type designation	TS 2011
Power Supply	230V 50..60Hz
Power at dry	30W
Power at regenerating	550W
Time for regenerating about	1.5 h
Yearly energy consumption about	360KWh
Sound	40 dBA

TS 2011
Dimensions: 195 x (100 + 17) x 61 cm H x W x D
Color: light gray similar. RAL7035
4 shelves per cabinet, each (70 kg capacity)
Weight: 123 Kg

Monitor program

With our monitoring program, you have the ability to change the configuration file to store the moisture data of the cabinet and to visualize.

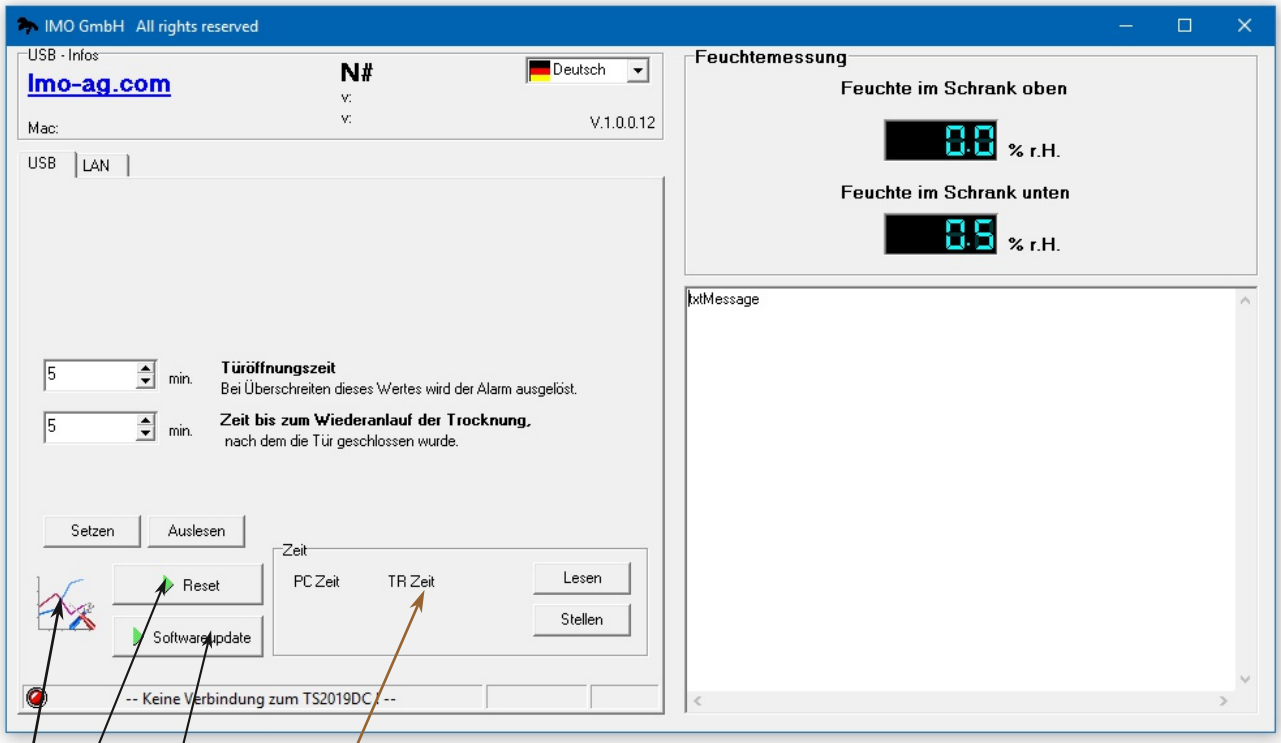
Installing the Monitor program

Download the **SoftwareTS2011_19DC** app from our Homepage on your computer and start the installation.
Now follow the instructions.
Thus, the monitor program will be installed with the associated drivers on your computer.

Now open the monitor program **TS2011_19DC** which is on your desktop.

Go to network. If not already available, select the IP number of your network and click on cabinet search. If your cabinet is connected to the network, the IP no. And the MAC address of the cabinet appear.

In order to work with the program, the cabinet's USB interface must be connected to the computer.



Serves only for the analysis of errors, here you can then check the individual values.

With the reset button the cabinet will be restarted.
This is to be equated with power off-on.

This button is used for uploading updates of software.

Setting the hardware clock of the cabinet.

If you enter in your browser the IP number of her cabinet, then opens it the **WEB** surface of the cabinet.