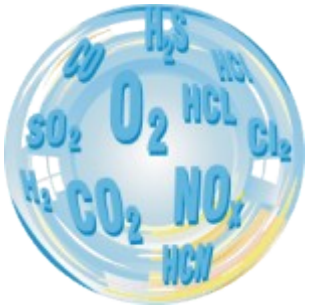

MD3 PORTABLE, PELTIER GAS DRYER

User guide

Version: 1.0
10/2015

madur
ELECTRONICS

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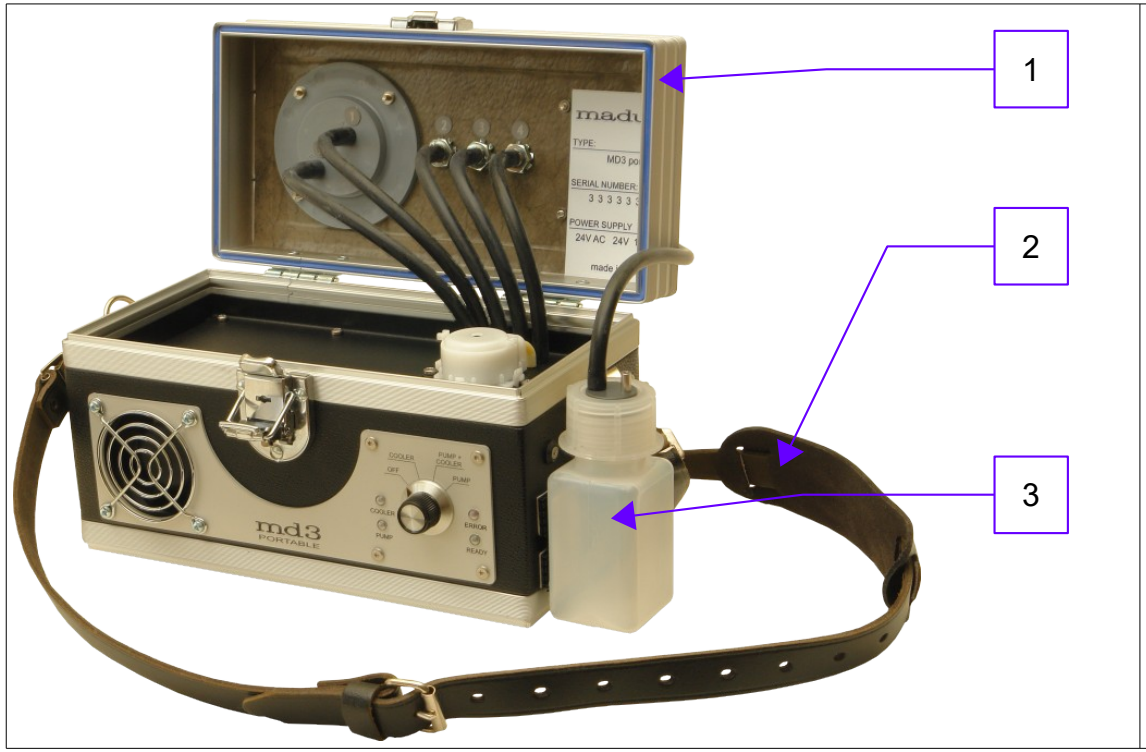
1. INTRODUCTION

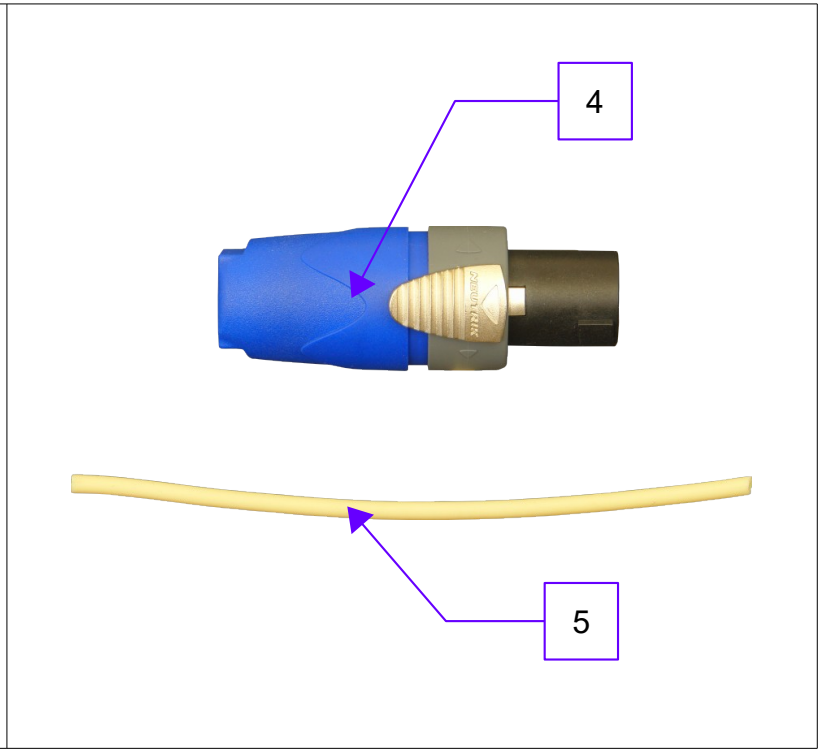
Portable MD3 dryer is compact, lightweight gas dryer. It provides gas sample conditioning for further analysis with gas analysers. Gas conditioning covers filtering of gas sample with glass microfibre filter 2µm pore and drying with help of efficient peltier cooler – gas is being dried by enforced, rapid condensation of vapour and removal of condensate with peristaltic pump.

Dryer is antonymous device: thanks to built-in gas pump it can collect gas sample on its own (gas pump can be disabled by user, e.g. when gas analyser has pump and provides sample collection).

Dryer is prepared to work from different power sources, including battery packs, what makes it very usable in remote locations deprived from power sources.

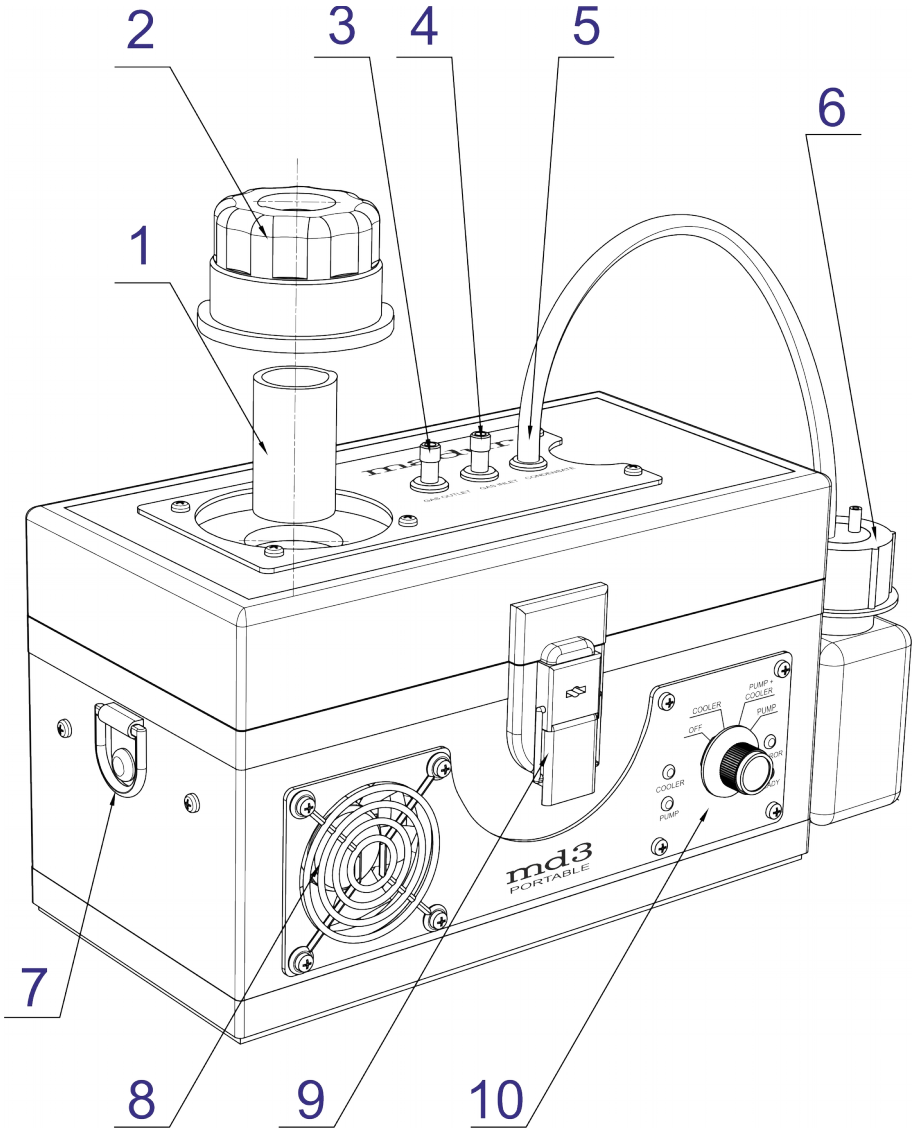
2. PACKAGE CONTENT



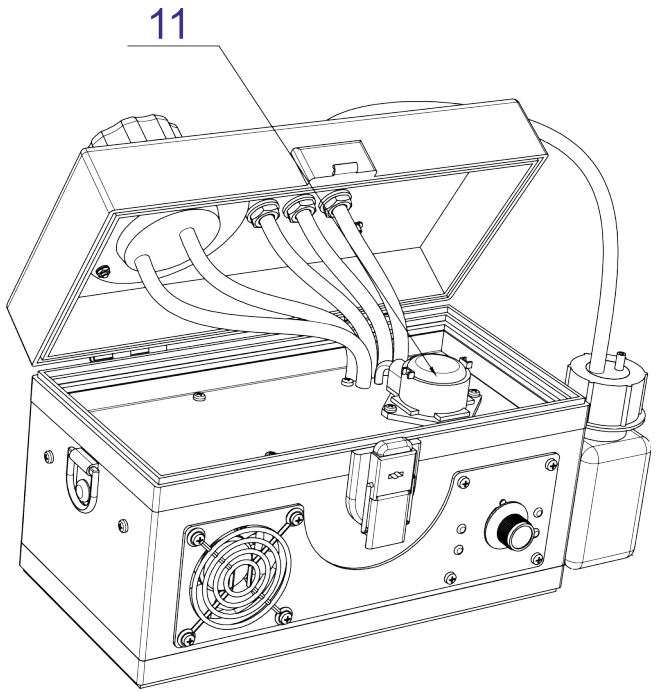


1) Gas dryer
2) Shoulder strap
3) Condensate trap
4) Cable plug – to install on power source (connect to battery)
5) Peristaltic pump's replacement tube: 15cm Flidprene tubing 2,0x4,0mm

3. CONSTRUCTION

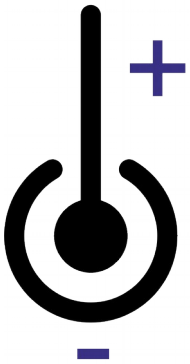


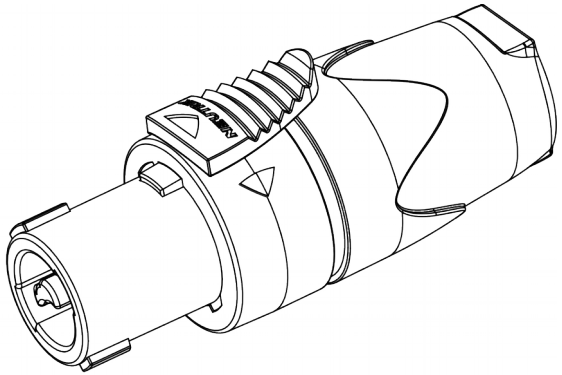
1. Filter insert (madur code for replacement: 614Z0020B)
2. Filter's cap
3. Gas outlet – connect to analysers
4. Gas inlet – connect to sample source
5. Condensate outlet – connect to condensate trap
6. Condensate trap
7. Holder for shoulder strap
8. Fan for Peltier cooler module
9. Top cover clamp
10. Control panel (please see more in chapter 5)
11. Peristaltic pump

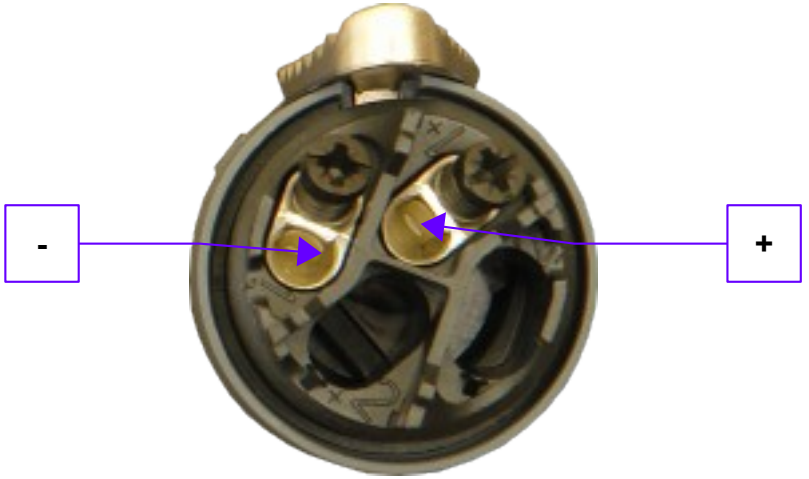


4. PREPARING DRYER TO WORK

MD3 gas dryer works from DC supply in range 15 ÷ 45VDC. User can connect battery, or other DC voltage supply (power supply module). Dryer is delivered with matching electric plug that must be connected to power source. Please prepare the plug according to the pictures below. **Polarity of supply is very important. In case of incorrect connection, safety fuse trips. In such case it must be replaced – please see chapter 7 for more information.**



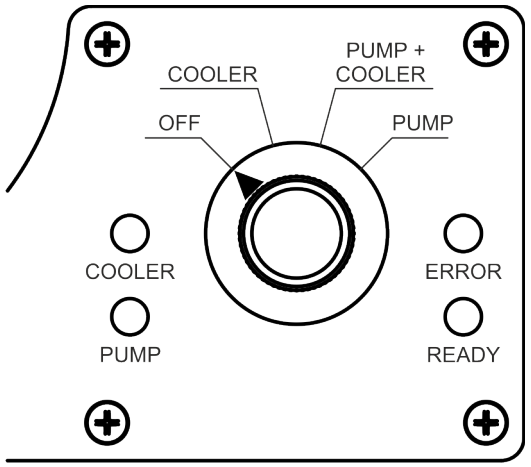




Electric plug – inside view

Dryer does not control the charge level of connected battery. For this reason it is advised to control battery status on regular basis.

5. CONTROL PANEL



Dryer can wok in several modes. Selection of mode is done via the work knob installed on side of the dryer.

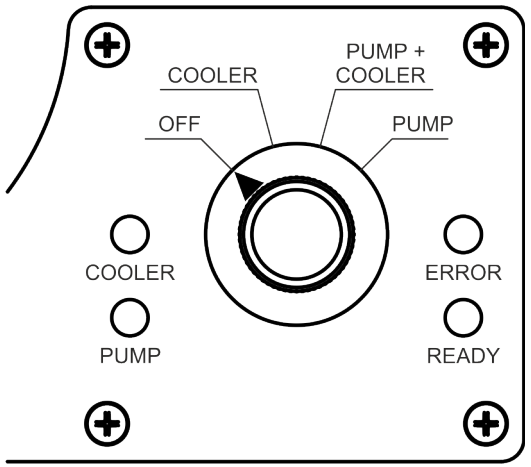
- OFF
  Dryer is turned off.

- COOLER
  Only Peltier cooler and peristaltic pump are enabled.
  Peltier cooler works to maintain target temperature (factory set to 6°C).
  If the temperature of cooler's radiator exceeds 31°C, fan is enabled.

- PUMP + COOLER
  Peltier and peristaltic pump are enabled. Fan works if radiator's temperature exceeds 31°C.
  When Peltier cooler reaches target temperature, gas pump is enabled – dryer starts to collect samples

- PUMP
  Gas pump is enabled. If radiator's temperature exceeds 41°C fan is also enabled.
  Peltier cooler and peristaltic pump are disabled.

6. DRYER STATUS – LED BEHAVIOUR



Dryer status is indicated with 4 LED diodes. Each diode indicates different status:

PUMP
- blue, constant – peristaltic pump is working
- yellow, constant – gas pump is working
- pink, constant – both pumps are working

COOLER
- LED off – cooler is disabled
- blue, yellow flashing interchangeably – cooler is working and cooling down (current temperature > target temperature)
- blue, constant – cooler is working but not cooling down (target temperature was reached)

READY
Behaviour of diode depends on the selected work mode (selected from Control panel):

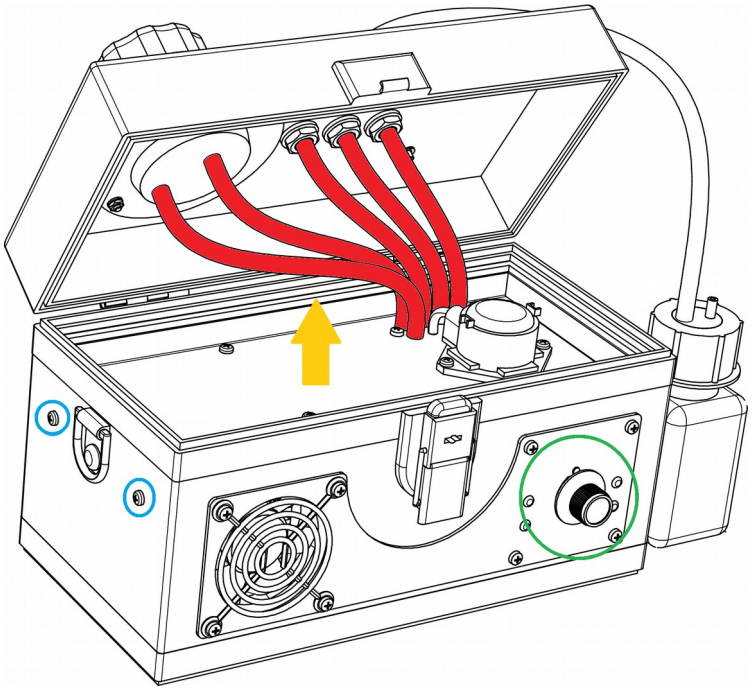
mode PUMP – green, constant
mode PUMP + COOLER or COOLER:
- green, constant – cooler's temperature = target temperature
- green, constant – cooler's temperature < target temperature and cooler's temperature >= radiator temperature + 30°C
  both of the aforesaid are considered as correct working conditions
- green, slowly flashing – none of the above is met

ERROR
- red, flashing fast – despite cooling down, the cooler's temperature is not dropping or increasing; radiator is overheated

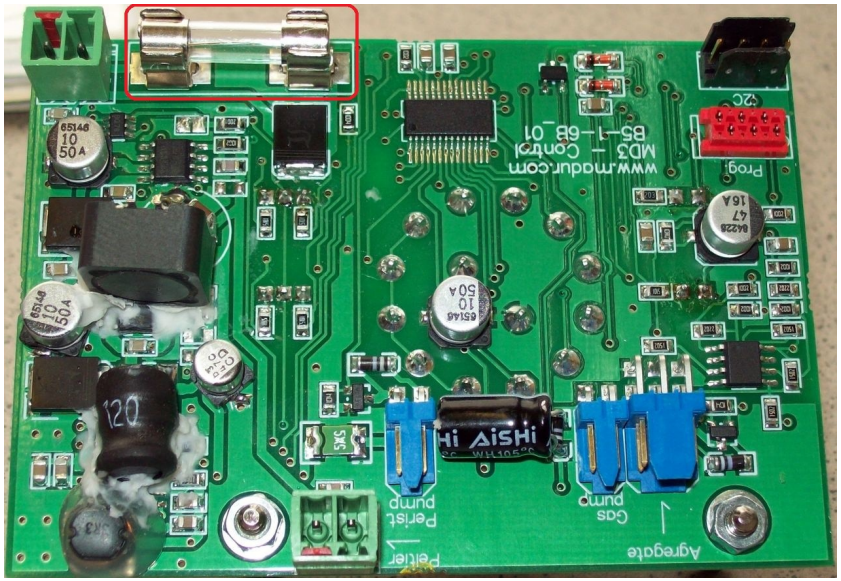
7. REPLACEMENT OF SAFETY FUSE

MD3 gas dryer is protected against some of electric malfunctions, like improper connection of power supply (wrong polarity) with electric fuse. In case gas dryer is not working despite it is connected to power source, the first thing to check is the safety fuse. It is installed on the dryer's control board, inside the casing, right behind the control panel (picture blow, marked in green color).

To access the fuse, please follow these instructions:



- Disconnect gas tubes (picture, red color)
- Remove 4 screws at the side of the dryer (picture, blue color)
- Lift the inside cover, where peristaltic pump is installed (picture, orange color)



Location of the safety fuse on a control board.

Fuse type: 5x20mm, 5A, fast

8. TECHNICAL DATA

Dimensions (W x H x D)	283 x 168 x 199 mm (max with electric plug connected)
Weight	~2700g
Casing	Wood and stainless steel
Working conditions	T: 0÷40°C, RH: 5÷90% (non condensing)
Storing conditions	0÷55°C
Supply voltage	15÷45 VDC
Power dissipation	Max 20W
Electric plug type	NEUTRIK NL2MP
Gas filter inlet	Glass microfibre / pore size= 2µm / ID= 25 / h=42 (madur code: 614Z0010B)
Peristaltic pump	type: SR 10/30, voltage:12VDC Peristaltic pump works in cycles – is enabled for 5 sec for a 32 sec of entire cycle.
Gas pump	type: SP 550, voltage: 3VDC

9. TECHNICAL DATA – DIMENSIONS