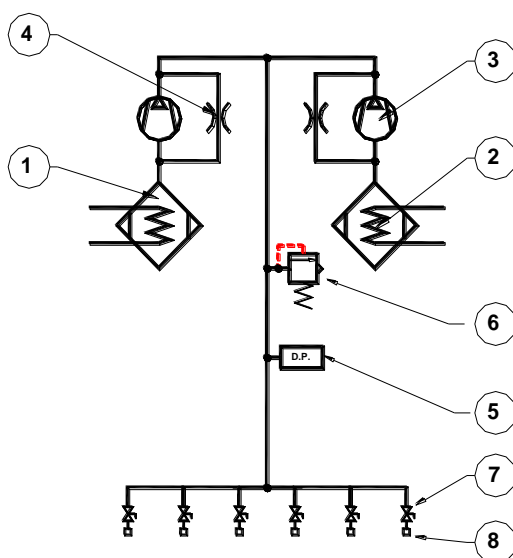




MINILAB DEHYDRATOR

USER MANUAL



- 1 DRYING TOWER
- 2 HEATER
- 3 PUMP
- 4 AIR BACKWASHING HOLE
- 5 HUMIDITY DETECTOR
- 6 SAFETY VALVE
- 7 SHUTOFF VALVE
- 8 DRY AIR OUTLET

C14336.011-E.MUA



1. FEATURES

Output pressure : factory set at 2 kPa, on request from 1 kPa to 6 kPa
(pressure is indicated on the rear label)

Maximum flow rate : 150 liters per hour

Safety valve : built in, set at 7 kPa \pm 15%

Output air dew point : better than -45°C , @ 20°C ambient temperature,
80% Relative Humidity

Desiccant regeneration : automatic by heating

Local alarms : power and system failures, low/high pressure, high
humidity

Remote alarms : the summary alarm is remotely signaled by a SPDT
relay

Optional remote monitoring interface : 10/100 Mbit Ethernet, auto-sensing

Led indications : power on, alarm codes

Acoustic noise : ≤ 50 dBA at 1 m far and 1,5 m high

Enclosure degree of protection : IP20 according to IEC529

Operating temperature : $-10^{\circ}\text{C} \div + 50^{\circ}\text{C}$

Storage temperature : $-40^{\circ}\text{C} \div + 70^{\circ}\text{C}$

Power supply std :

- 48/60 Vdc (from 36 to 72 Vdc)
- 100 – 240 Vac (from 90 to 264 Vac) 50/60 Hz,
with apposite power supply kit code K14524

Power consumption : $< 2,5$ W (at steady state without system leakage)
 < 55 W (max during regeneration phase)

Dimensions :

- 19" rack mounting:
L= 482; H= 88 (2U); D= 190 mm
- wall and floor mounting:
L= 482; H= 88; D= 216 mm
- frame N3 mounting:
L= 533; H= 88; D= 190 mm

Weight : about 4,2 kg

Standard outlets : 6 outlets, each with shut off valve

Outlets fitting : 7 mm diameter, others on request



Shock and vibration	
Transportation	: conform to ETSI EN 300 019-1-2, Class 2.3
Stationary use	: conform to ETSI EN 300 019-1-3, Class 3.1E
Low Voltage Directive	: 2006/95/EC
Electromagnetic Compatibility Directive	: 2004/108/EC
Safety Normative	: IEC/EN 60950-1
	Certified to CB, test ref. n° SE-64590A1
Electromagnetic Compatibility Normative	: EN 55022 class A and B
	EN 61000
	ETSI EN 301 489-1
	ANSI CFR 47 part 15
Environmental compliance	: 2011/65/EU (RoHS2)
	1907/2006 (REACH)
Quality assurance standard	: ISO 9001

2. DESCRIPTION

The MINILAB dehydrator is designed for continuous operation and automatic duty. It supplies dry air up to 150 l/h with dew point better than -45 °C.

The standard output pressure is 2 kPa, other pressures in the range from 1 to 6 kPa are available on request.

Dry air is vented by six independent air outlets with hose-tail fittings accessible from the back side of the equipment. Each outlet has an independent shutoff valve.

The air is dried through absorption by granular substances in two drying towers. While a tower dries (incoming air releases most of its molecules of water by adsorption) the other one is regenerated by heating and backwashing with a reverse dry air flow. The electronic microprocessor board controls drying cycles and adjusts cycles duration according to plant air needs.

Air is compressed by two diaphragm pumps. A fundamental feature of the MINILAB dehydrator is the continuous tracking of output pressure. The PWM (Pulse Width Modulation) technique is used to control the pumps speed to optimize pumps duty, power consumption, acoustic noise, and to improve reliability. Pumps speed control avoids mechanical pressure regulators that introduce undesirable pressure losses and a worst response to flow needs.

The equipment is designed for wall, floor, 19" and ETSI N3 standard racks mountings with 2 U modular height.

The MINILAB dehydrator does not need pre-settings nor warm up time before startup. It does not need preventive maintenance along its lifetime.

No radioactive or chemically hazardous components are used.

3. INSTALLATION

The MINILAB dehydrator is designed for wall mounting, floor mounting and for both 19" standard rack and N3 standard frame mountings.

The equipment is factory assembled for 19" rack mounting.

ETSI-N3 mounting brackets and the relevant screws are supplied in the ancillary kit.

3.1 Rack mounting

The dehydrator must be placed in the upper part of the rack without any other equipment on top.



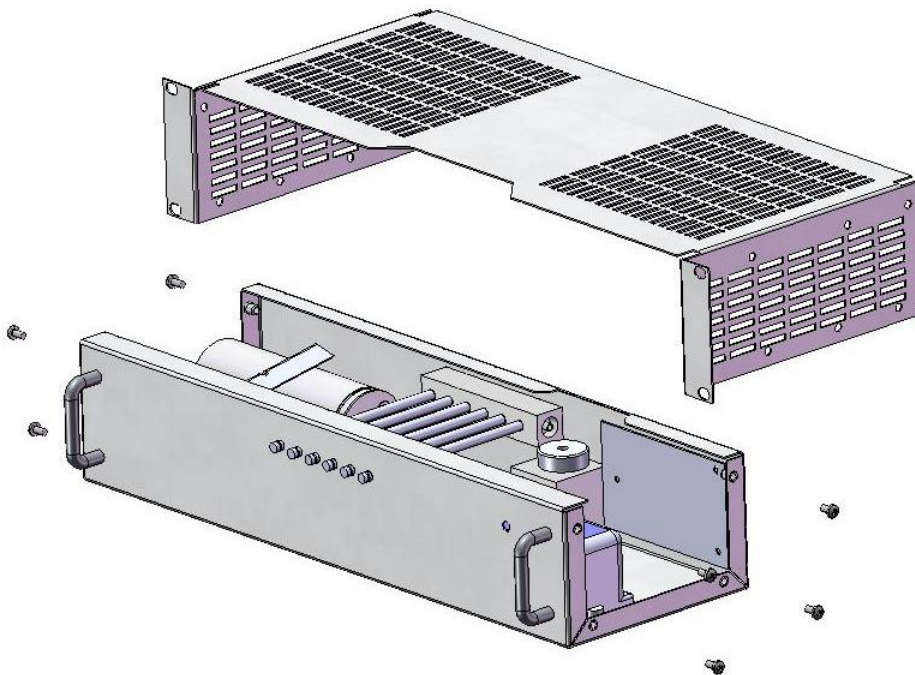
It is mandatory to leave at least one unit of free space from the top of the dehydrator to the closest equipment, in order to dissipate generated heat.

If the dehydrator has to be mounted on N3 rack, tighten the ETSI-N3 brackets with the same screws used for 19" rack mounting. Put the dehydrator into the frame and lock it with the screws supplied in the ancillary kit.

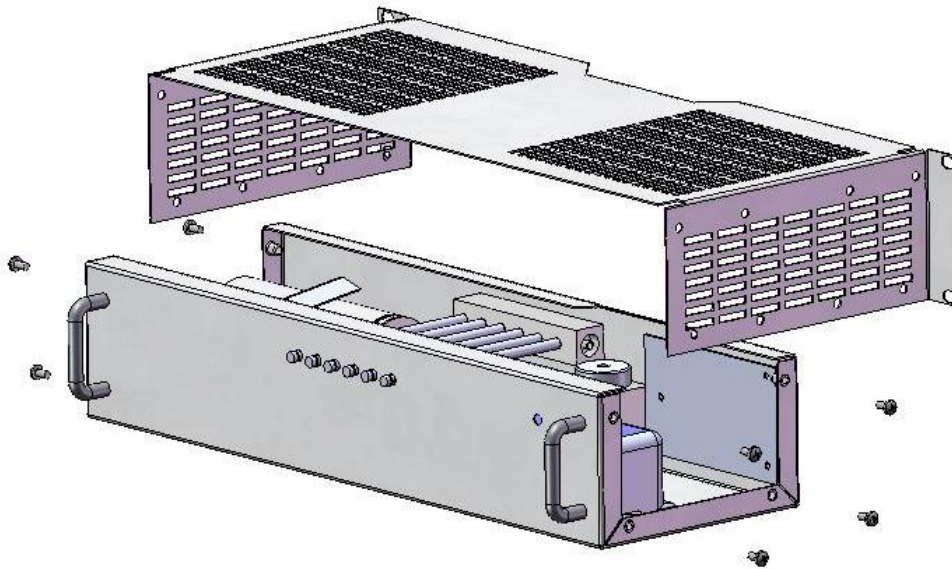
3.2 Wall and floor mounting

MINILAB dehydrator comes in 19" rack mount configuration. If wall mount configuration is desired, follow these steps:

- 1) Unscrew four pan-head screws on each lateral side of the box.
- 2) Pull the top cover out of the bottom case (as shown in the figure)



- 3) Turn the top cover around (with lateral wings facing backwards).



- 4) Slide the top cover into the bottom case; make sure that the top face of the cover is below the bend of the bottom case.
- 5) Fix the top cover to the case with screws.
- 6) Refer to chapter 6 for dimensions of fixing holes in the wall or in the floor.

3.3 Pneumatic connections

The MINILAB has six air outlets. Each outlet is equipped with an independent shutoff valve on front side.

Open, by pulling relevant knob, only valves corresponding to used outlets, keep all the others closed by pushing relevant knob.

3.4 Electrical connections

Two male connectors are placed on the rear side:

- **J1**, 3 pin D-sub-3W3-C, for DC power connection;
- **J2**, 9 pin IEC48B D series, for remote alarm output.



3.4.1 Power connection

An appropriate disconnect device shall be provided as part of the building installation. Disconnect the dehydrator from the supply for servicing.

Protection for short-circuit and earth failures of power conductors is a function assigned to installation area system.



The dehydrator requires a protective and functional earthing.

The earthing terminal is available in the power supply connector and it is marked with the symbol

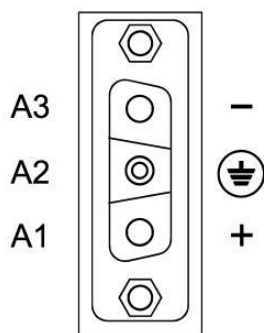
Note: protective earthing is mandatory only for power supply above 60Vdc. Functional earthing is always necessary.

Never connect the MINILAB dehydrator to power supply before having checked for correct type and rated voltage. See Power rating marking on the rear side of the dehydrator.

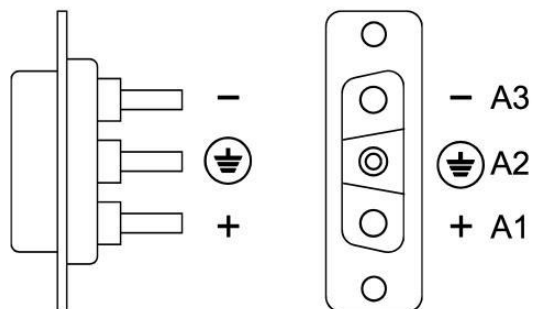
Connect power cable wires to the J1 connector according to the following pinout. It is recommended to use at least 0,5 mm² wires.

J1 - power terminal board pinout		
Pin number	Label	Function
A1	+	positive power supply input
A2		Protective earthing
A3	-	negative supply input

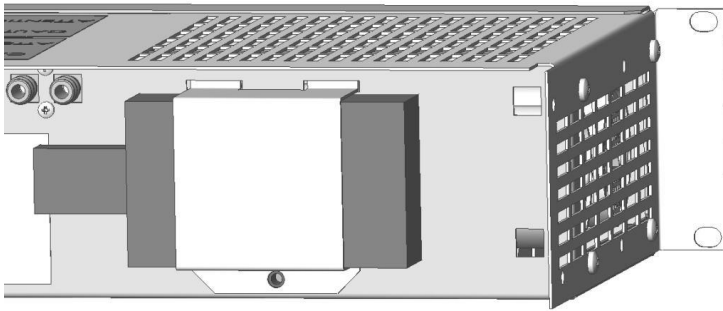
Solder the supply cables on the solder cup sockets and the earthing cable on the solder cup plug; put pins in the connectors as shows the following pictures respecting the right polarity (earthing pin is the central one). Insert the connector in the protective shell.



Fixed connector



Matching mating connector



An apposite power supply adapter kit can be provided (PN K14524) if MINILAB is intended to be used with AC power supply (100-240 Vac, 50/60 Hz).

The adapter can be fixed on the MINILAB back side using the bracket and the screw provided in the kit..

Note: when using adapter kit protective and functional earthing is not necessary

3.4.2 Remote alarm output connection

A summary (OR) alarm is provided by an internal SPDT (Single Pole Double Throw) relay contacts.

The maximum switching current is 0,5 A dc/ac.

The maximum switching voltage is 60 Vdc or 42 Vac.

Note: in case of power failure the relay switches to alarm position.

Remote alarm connector, 9 pin IEC48B D series, is located on the rear panel. Connect the alarm transmission wires according to the following pinout:

J2 - alarm connector pinout	
Pin number	Function
1	Common
5	Closed on alarm
9	Open on alarm

3.5 Operation

Open the valves corresponding to the used air outlets before proceeding with first start up.

Once the dehydrator is powered, after a few seconds, dry air starts flowing out of the outlets and LED turns solid green.

Depending on the volume of user system to be pressurized, it may take some time for the output pressure to achieve factory set value. Dehydrator pressure alarms are enabled after 20 sec. from power on; then low pressure alarm is hold until the target pressure is met.

At the very first startup, it is recommended to purge the transmission line with dry air by keeping open the opposite side of the pressurized line for a period of time given by following formula: **purging time (hours) = (3 x V) / 100**

Where V is the pressurized plant volume in liters.

Close the opposite side of the pressurized plant after purging time. Alarms must be ignored during the purging phase.



3.6 Alarm LED indicator

Front LED is solid green during normal operation.

When LED turns red one or more alarms occurred. Type of alarm depends on whether LED is solid red or blinking red, also it depends on number of blinking:

Blinkings	Alarm
Solid red	System failure
1	High humidity
2	Low pressure
3	High pressure

Each blinking lasts 0.2 sec, repetition time is about 2 sec.

In case of two or more simultaneous alarms, first alarm blinking is followed by others in a continuous sequence.

Example: High Humidity Alarm + Low Pressure Alarm

☀ 2 sec. ☀☀ 2 sec. ☀ 2 sec. ☀☀

3.7 Alarms description

- **SYSTEM FAILURE** means a failure of the electronic control logic. The dehydrator is not working properly and must be replaced.
- **LOW PRESSURE** means that pressure is lower than the pressure threshold value (see §1 - Features). Possible cause is excessive output air leakages.

The standard low pressure alarm threshold is 1,5 kPa.

For MINILAB with target pressure < 2 kPa, the low pressure alarm is 0,5 kPa below target pressure.

Low pressure alarm is enabled 20 second after power on.

- **HIGH PRESSURE** means that pressure is higher than the high pressure alarm threshold value (see §1 - Features). In case of leakageless user system, possible cause of this alarm is the air thermal expansion.

The standard pressure threshold is 4,5 kPa.

For LAB2 with target pressure > 4 kPa the high pressure alarm is 0,5 kPa over target pressure.

High pressure alarm is enabled 20 second after power on.

- **HIGH HUMIDITY** means that the output air flow has a Relative Humidity higher than 10%. This alarm can turn on at first start-up if the dehydrator has been stocked for weeks in humid place; in this case the alarm must disappear within 24 hours after start-up.

During normal operation, this alarm indicates a dehydrator failure.

High humidity alarm is enabled 30 minutes after power on.



4. CORRECTIVE MAINTENANCE AND SPARE PART

The dehydrator does not require any preventive maintenance.

In case of dehydrator failure please contact Radio Frequency Systems Customer Service.

In case of servicing made by the user itself, Radio Frequency Systems will supply with the necessary spare parts and support.

Servicing does not require specialized personnel. No setting-up or calibration is needed.

In case of servicing, it is mandatory to keep the following in mind:



CAUTION: an appropriate disconnect device shall be provided as part of the building installation. Disconnect the dehydrator from the supply for servicing.



CAUTION: due to the high temperature of some parts inside the dehydrator, it is mandatory to wait for at least one hour after the switch-off, before servicing inside.

A list of spare parts available at service stock is given in the following table:

(Note: always mention the equipment P/N or S/N on orders)

Description	Cibred Sud Code
Electronic board 48-60 Vdc	C14630.002
Diaphragm pump	2PPBA737016S
Drying tower	C14350.002
Safety valve	C10843
Humidity detector	C5472.001

Optional add-on

Description	Cibred Sud Code
AC/DC power supply kit	K14524

Note: K14524 power supply kit allows AC Power Supply from 90 to 264 Vac 50/60 Hz.



5. OUTLINE

