

# Laboratory Refrigerator

MODEL	TEMPERATURE RANGE	SET POINT	CAPACITY (LITRES)	EXT. DIMENSIONS (W x D x H cm)	DOOR TYPE
LB 4000NFP	+10°C ÷ +2°C	-25°C (Adj.)	400 NET	67 x 64 x 204	Hinged Solid Door



**HOLD OVER TIME: 140/180min. (r.t. 23°C/25°C ; Full Load)**  
**Dry Contact for Remote Alarm Connection (NC,NO)**  
**Back-up Battery 12V/2.1Amp – 36/48hrs Autonomy**

**Colour:** Grey, White or any RAL colour  
**Structure:** Internal and external Steel Laminated Plate with FINGER PRINT PROOF TECHNOLOGY™ to assure a Bacteria-Static Activity  
**Insulation:** Polyurethane Foam, CFC FREE, 42Kg/m3, thick. 60mm  
**Refrigeration type:** Ventilated (NO-FROST)  
**Defrosting:** Automatic with condensing water evaporation, el. heater  
**Electric power:** 1 / 210-240Volt / 50-60Hz, 8 Amp  
**Electrical characteristics:** Shortage Protection, Power Stabilizer with Linear Regulation of Voltage for power pick (+/- 20 Volts).  
**Compressor:** No.1 Hermetic Type – ½ HP , 500Watt  
**Refrigerant gas:** R452a (R404a compatible) OR R290 (natural gas)  
**Door:** No 1 Solid Door with Magnetic Gasket  
**Inner setting:** 5 to 8 Adjustable Steel Grids / Drawers / Shelves  
**Lighting:** LED lamp active when door opening, 120cm long, 6000K  
**Electronic controller:** Hi Efficiency Display LCD , Accuracy 0.1°C  
**Castors and Wheels:** 4 Wheels + 2 adjustable feet

**MAIN Visual and acoustic alarm for:**

- HI and LOW temperature
- Open door
- Devices failure
- Probes failures

**MAIN OPTIONS:**

DTLSD3 - Data Logger Touch Screen 5"  
 TC - Twin Compressor  
 ESEDL - Electronic Lock with Password for each user and access log to monitor the openings.  
 CHAUT - Self Closing Door with stopper at 95°  
 HLO – Insulated hole for External Probe Ø25mm  
 CS2/CS2AI - Sliding S/S AISI304 or Aluminum Drawers  
 SH2 - Sliding S/S Shelves made in AISI 304 Scotch Brite  
 3G/SMS – Online connection with FREE CLOUD service and SMS Alarm System. Weekly Report when connected online  
 WI-FI – Bridge WI-FI for online connection with FREE CLOUD service, weekly report, automatic alarm sending and warnings  
 HC - Humidity Controller  
 LW – Lockable swivel wheels  
 RS485 – Serial Port for BMS or PC Connection  
 ETH – RJ45 connection with Ethernet CMBUS BRIDGE TCP for PC Connection and remote monitoring functions

**OPTIONS:**

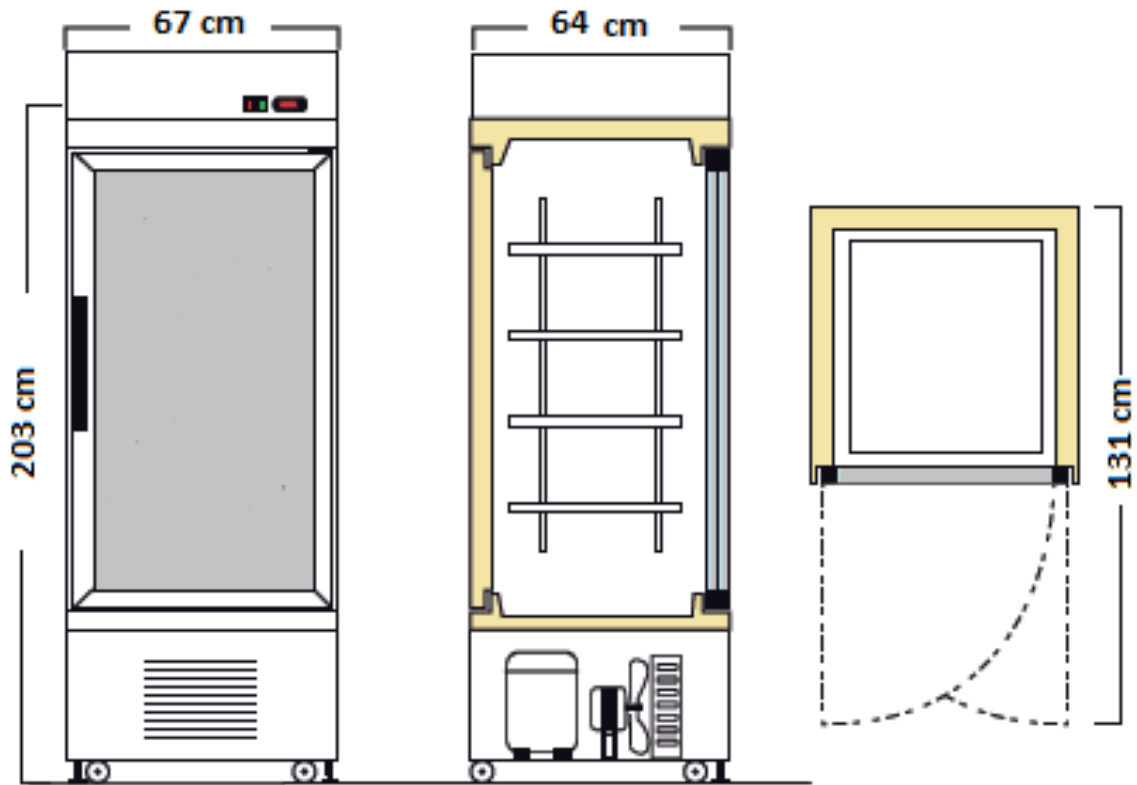
**DATA LOGGER TFT5" (DTLSD3-1T)**



**DUAL COMPRESSOR (TC)**



**INNER CONFIGURATIONS**  
**STANDARD SET UP WITH GRIDS**



**INNER SET-UP , FURTHER OPTIONS**



SLIDING S/S AISI 304 SCOTCH BRITE PERFORATED SHELVES ON BALL BEARINGS



SLIDING ALUMINUM OR S/S AISI 304 DRAWERS ON BALL BEARINGS WITH OR WITOUT DIVISORS

# OPTION DATA LOGGER FLEX PHARMA with WI-FI CONNECTION

## FLEX PHARMA

### HIGH PERFORMANCE CONTROLLER WITH BUILT-IN CONNECTIVITY

Temperature controller for static and ventilated refrigeration units at positive and negative temperature dedicated to the health sector; built-in WiFi module and Data Logger.



#### EMPLOYMENT UNIT

Range [-86°C ... +15°C]

- BLOOD BANK
- HOSPITAL REFRIGERATORS
- PHARMACEUTICAL REFRIGERATORS
- LABORATORY REFRIGERATORS

#### FUNCTIONS

- Monitor probe and the simultaneous display
- Test circuit and battery recharge
- Warning and recording of network failure
- Electric-key output driver
- Alarms and faults list with circular register
- Data Logger with clock and maintenance supercap
- Anti-ice function with safety thermostat
- Consistency check between the installed probes
- Buzzer with auto-silence and reset function
- Wireless parameters programming
- OEM Cloud supervision
- User supervision through app and web pages
- Weekly graphic report by mail
- Email alert messaging

#### PANEL DISPLAY

- Dimensions: L182 x H38 x D23mm
- Drilling template: L150 x H31mm
- Low voltage power by controller board
- Recessed, flush, under glass mounting
- 5 keys capacitive keyboard
- White and blue 7-segments display
- Data Logger (3Mb flash memory)
- Real Time Clock with super capacitor
- WiFi module built-in and alarm buzzer

#### CONTROLLER BOARD

- Power Supply: 230Vac - 50/60Hz
- Nr 3 NTC probes [-49.9, +99.9]°C Res. 0.1°C
- Nr 2 PT1000 probes [99.9, +99.9]°C Res. 0.1°C
- Nr 4 Digital inputs (door switch, HP, LP, Thermal)
- Nr 1 Backup battery 12Vdc input
- Nr 6 Relais: 30A-10A SPDT-10A-10A-8A-3A
- Nr 1 Alarm relay SPDT
- Nr 1 Led bar 12/24V power supply input
- Nr 1 Led bar dimmered output [max 2A]
- Nr 1 Electric key output driver
- On-board connector for inserting modules: Ethernet, Modbus TCP, Modbus RS485, Inverter with electronic fan modulation outputs.

Features subject to change without notice

# OPTION DATA LOGGER DTLSD3 (N.I.T.S.) TFT 5" with USB

## Six excellent reasons to choose **TEKNALAB**

### 1 INTERACTIVE TOUCH PAD

A touch pad with 5 dynamic backlit keys simplifies navigation for the user. The central key is backlit by a RGB led which varies in colour according to the refrigeration unit operation.

Even from a distance it is easy to check the operating status of the refrigerator.

### 2 REAL-TIME GRAPH

The temperature is shown on the screen with a graphical display that substitutes the now obsolete electro-mechanical thermograph.

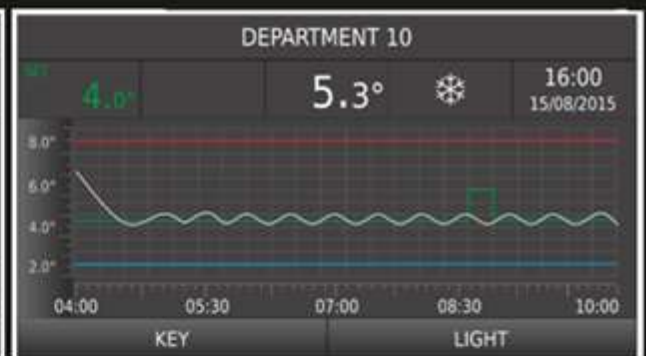
The feature is integrated with a 10 year memory of the recorded data and list of events regarding temperatures and operation variables.

### 3 PREDICTIVE DIAGNOSTICS

In the mid-long term time period a relay fault is one of the most common failure to occur. In order to prevent this all relay switching are read with a representation of the remaining life expectancy of the component, and a warning is given when the threshold is about to be reached.

TFT COLOR  
GRAPH DISPLAY

KEYBORD TOUCH  
WITH RGB BACKLIT



### 4 EFFICIENCY & SECURITY

The Smart Defrost function measures the level of frost on the evaporator and launches the defrosting only when necessary to maintain an always efficient operation of the refrigerator and to reduce consumption compared to traditional defrosting by time.

Thermostat control with evaporator probe in case of thermostat probe fail.

### 5 DUAL CORE

A second powered micro-controller analyses the operation of the board, reads the coldroom temperature and mains voltage; a warning is given when the value are over or under the threshold defined by parameters to safeguard compressor life and electronics components.

### 6 CONNECTIVITY

USB port for downloading thermo-regulation data and parameter settings. Optional Bridge devices Ethernet - Wi-Fi - 3G complete the global connectivity between devices towards CLOUD Velex for monitoring and teleservice features via browser (PC or Smartphone) through credential access.

# Control functions dedicated to each specific field of refrigeration: blood banks, laboratory and pharmacies

## FUNCTIONS

### Thermostat control

Regulation on central set with double hysteresis in cooling action for systems with single and double stage (superfreezers)

Heating action for climatized rooms.

### Defrosting

Defrosting mode: electric, hot gas, stop compressor with activation from the touch pad, by a timer, by a clock and by the automatic detection of ice.

### Fan management

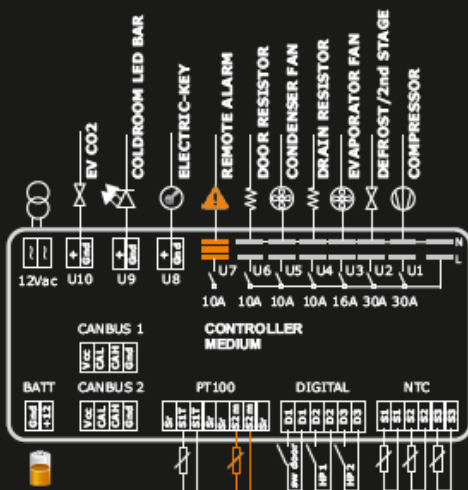
Condenser fans control within a range of temperatures to guarantee the correct thermal exchange.

Evaporator fans control to maintain humidity and to block the flow of hot air into the coldroom during defrost phase.

### Programmable outputs

Any of the following actions can be associated to every relay: compressor, defrosting, evaporator fans, condenser fans, door resistance, glass resistance, drainage resistance, active load light, heating action and 2nd stage compressor action for superfreezers.

outputs wiring example



## DEDICATED FUNCTIONS

### Redundancy

Double power supply for the logic.

A second micro-controller is designated to the function of diagnosis, battery charge and the reading and registration of temperature in normal conditions and in mains failure status.

For ventilated units in case of thermostat probe failure the regulation is transferred to the evaporator probe.

The temperature of the technical compartment is constantly monitored with a warning when it reaches the safety threshold.

The output and operation status is shown by exterior led (*expert points*).

### PT100 probe monitor

PT100 precise independent monitor probe with a 0.1°C of resolution for thermo-registration and high and low temperature alarms with a coherence check between its readings and thermostat probe with alert for any possible unbalance.

### NTC/PT100 thermostat probe

Two thermostat probe inputs are provided to regulate the temperature both of the ventilated unit with NTC probe and of the superfreezers -86°C with PT100 probe.

### Back-up battery

Back-up batteries are connected in a recharging circuit, with periodic tests, charging status and substitution alert. In case of a mains failure they provide 24 hours of power supply.

### Electric-Key Driver

Solid state output controls an electric-key with password access.

### Led bar driver

A solid state output can be configured to directly control the coldroom light by led bars with automatic functions of switching on, turning off and energy savings.

### CO2 valve driver

A solid state output controls the CO2 solenoid valve in normal conditions and in the event of mains failure for the freezer units that foresee this.

## Driver Board

Power Supply	12Vac 50/60Hz >=6VA
Dimensions	L200 x H110 x P35 mm
Inputs	N°3 NTC [-50.0, 70.0]° N°3 Digital N°2 PT100 [-99.9, 50.0]°
Relais Out	N°2 x 30A + N°1 x 16A N°3 x 10A + Alarm 10A
Drivers	Led Bar - EV CO2 Electric-key
Gates	2xCANBUS

## Display Board

Power Supply	from Driver Board
Housing	plastic ABS
Dimensions	L160 x W52 x H25 mm
Dima	L154 x W49 mm
Keyboard	5 Keys Touch with RGB backlit
Display	TFT 2.41" 320x240 pixel
Gateway	CANBUS USB for data exchange