

BMT Eye-Level Intelligent Touch Screen Controller Series

ULTRA LOW TEMPERATURE DEEP FREEZERS



The pioneer of the temperature control

- 1918 – Creation of the Couprie Company, the origin of our current activity
- 1920 – First centrifuge
- 1925 – First baby warmer for premature baby
- 1926 – First poupinel (sterilizer)
- 1927 – First bacteriological incubator
- 1948 – First low temperature equipment
- 1970 – First -86°C (-123°F) deep freezer
- 1979 – First Component Thermal Conditioner -80°C/+250°C (-112°F/+482°F)
- 2008 – First vented incubator with a disinfection cycle
- 2009 – Introduction of the predictive Intellidiag® system on -45°C/-86°C (-49°F/-123°F) deep freezers
- 2010 – First refrigerated vented incubator with a 160°C/2h30 disinfection cycle (320°F/2.50h)

Since 2009, **FROILABO** is a member of the Techcomp Group alongside other scientific manufacturers such as Precisa Gravimetrics in Switzerland. With more than 100 years of experience in temperature and humidity control, **FROILABO** offers a product range from -86°C to 250°C (-123°F to -148°F) with precision and homogeneity rarely achieved by other manufacturers and in accordance to the only European norm in force: **EN60068-3-11** Using a FROILABO product keeps samples safe as well as the operator and protect the environment.

Our commitment to the environment is daily and is expressed by the selective use of “noble” material (stainless steel inner chamber), the use of recycled material (electroplated external case) and the recycling of all waste.

All **FROILABO** equipment is created and developed in France.

Precision for life

The UNIQUE TECHNOLOGY: Maximum protection of the samples

Based on the well-known and proven double stage compressors cascade technology, the efficient pipe architecture of the FROILABO cooling system combined with a high refrigerant velocity allows extreme simplification of the refrigeration system. This significantly reduces the risk of blockages and therefore the need for regular and expensive maintenance.



BMT Eye-Level Intelligent Touch Screen Controller Series

- Easy temperature setting
- High/Low temperature alarm
- CO₂ / N₂ backup system trigger
- 24V back up battery
- BOSS product protection system
- Data history display and data logger
- User password
- Remote alarm contacts
- 4GB smart SD card data storage
- Service mode for service engineer



Main Screen:

Password required for enter setting mode, time out in one minute without action

Default system level password: 0000

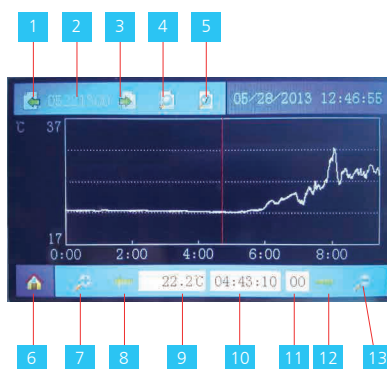
Default user level password: 1234

1. Press to enter alarm setting window.
2. Press to silence/enable alarm sound.
3. Press to enter data logging setting window.
4. Press to start /stop data logging. System will confirm before turn off data logging.
5. Press to enter Date/Time setting window. Data logging need to be off to access Time setting.
6. Press to change user level password.
7. Press to enter temperature set point setting window.
8. Press to access data logging window.



Data/Graph Screen:

1. Press to open previous log file
2. Display current log file opened (format: MMDDYYxx)
3. Press to open next log file
4. Press to search for a specific log file name (format: MMDDYYxx)
5. Display last 7 days data (Graph jump back 6 days before today)
6. Press to return to main screen
7. Press to zoom in around the red line
8. Press to move the red line one data point left
9. Display the actual temperature on the red line
10. Display the time of current data point on the red line
11. Display the active alarm code on the red line
12. Press to move the red line one data point right
13. Press to zoom out to the whole data file



High/Low alarm setting window:

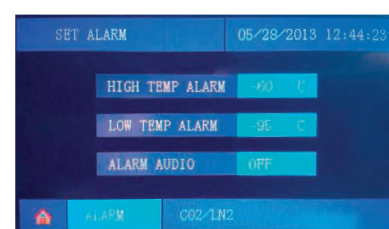


High/Low alarm setting window
HIGH TEMP. ALARM input range
(-85 °C to -10 °C)

LOW TEMP ALARM input range
(-99 °C to -85 °C)

ALARM AUDIO (ON / OFF)

CO₂/LN₂ Alarm Setting Window:



ALARM LIMIT input range (-70 °C to -50 °C)
ALARM AUDIO (ON / OFF)

Large storage capacity

2 ml cryo-vials

- 340 liters: 24 000
- 515 liters: 36 000
- 690 liters: 48 000
- 1000 liters: 72 000

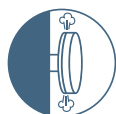


Storage, up to 72,000 ml Cryotubes (1000L). The Largest capacity with small footprint available on the market.

A large selection/choice of drawers and racks allowing any kind of sample storage



Reliable & Durable Cooling and Control System



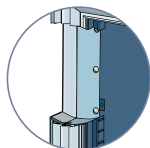
Heated decompression valve for easy opening (pressure equaliser)

Heated silicone 3 lips seal limits frost generation

Insulated inner door, color coded

Stainless steel inner chamber with round corners

Adjustable stainless steel lining and fitting



Insulation by Vacumm insulated Panels (VIP)

Door key lock

Front access washable condenser filter

4 castors and 2 level adaptors

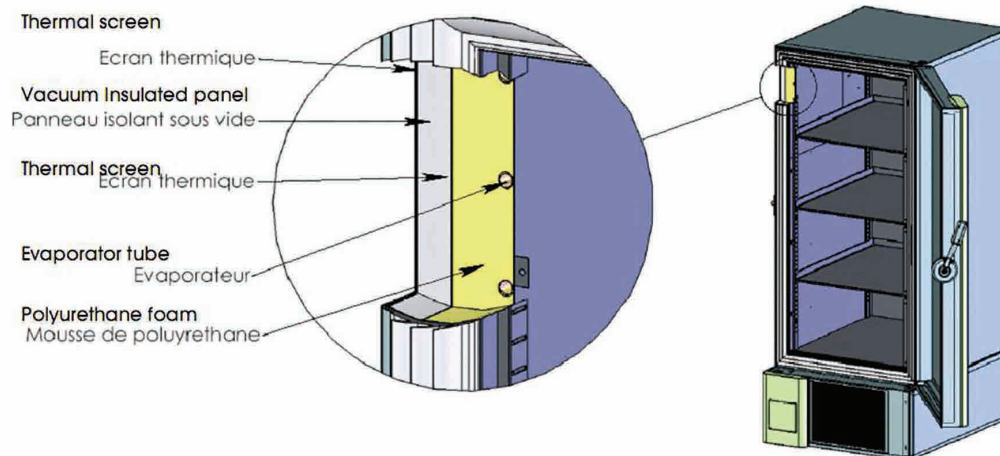


Better Temperature Insulation & Energy Conservation

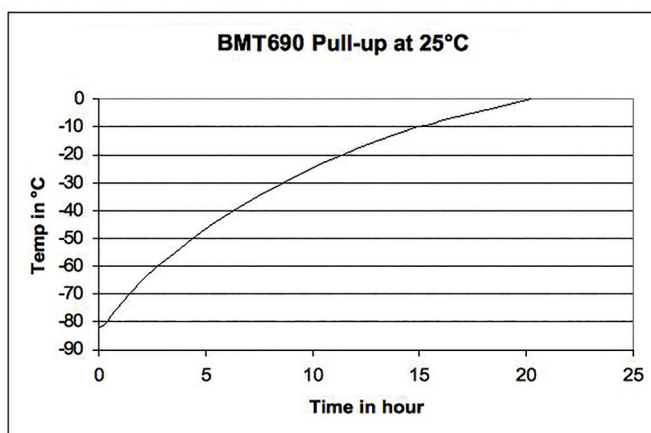
Vacuum insulated panel

Benefits compare with foams or fiber layer

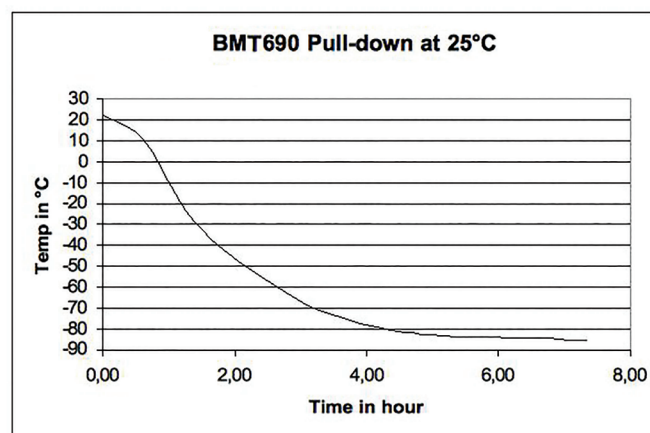
- Better Temp. insulation quality
- Slim construction
- Increased storage capacity with same footprint
- Transportation width : Even for 680L model can pass standard 900mm doorway



Froilabo -UNIQUE CONCEPTION : Achieve Excellent Performances



When Power cut off temperature change from -80 °C to 0 °C more than 20 hours

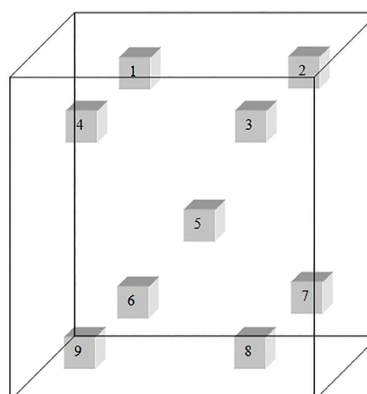


Strong Cooling Power and low pressure operation design. Room temperature to -80 °C less than 4 hours

Excellent Performances

- Stability : ± 1 °C at -80 °C
- Excellent temperature homogeneity: better than ± 3 °C at -80 °C
- From ambient (23 °C) to -70 °C less than 4hrs (BM690)
- Quick temperature recover after door open & close
- Operation up to 35 °C ambient temp

Temperature uniformity (9points measuring)



BM515 set point=-80°C, no load			
sensor	max	min	middle of cycle
1	-77.9	-79.7	-78.8
2	-77.8	-79.4	-78.6
3	-78.2	-79.8	-78.9
4	-78.1	-79.6	-78.8
5	-80.8	-82.0	-81.4
6	-79.9	-80.9	-80.3
7	-79.9	-81.0	-80.4
8	-79.3	-80.1	-79.7
9	-79.4	-80.5	-79.9
average temp		-79.7	
homogeneity		± 2.3	
max temp		-77.6	
min temp		-82.1	

Specifications

MODEL	BMT 340		BMT 515		BMT 690		BMT 1000	
STRUCTURAL SPECIFICATIONS								
External dimensions (mm) HxWxD	1280 x 900 x 995		1640 x 900 x 995		2000 x 900 x 995		2000 x 1200 x 995	
Internal dimensions (mm) HxWxD	716 x 630 x 752		1076 x 630 x 752		1436 x 630 x 752		1436 x 920 x 752	
Gross Capacity	340 Litres		515 Litres		690 Litres		1011 Litres	
Gross Weight	223 Kg		267 Kg		330 Kg		390 Kg	
External Finish	Galvanised. steel with epoxy paint							
Inner tank	Stainless steel 441							
Insulation	Vacuum panel + Polyurethane							
Door	Galvanised steelwith epoxy paint Vacuum panel+ Polyurethane insulation							
Inner door	2 pcs		3 pcs		4 pcs		4 pcs	
Shelves	1 pc stainless steel 441		2 pc stainless steel 441		3 pc stainless steel 441		3 pc stainless steel 441	
Door seal	Triple lip silicone seal							
Shelves	1st stage	2nd stage	1st stage	2nd stage	1st stage	2nd stage	1st stage	2nd stage
Type of compressor	hermetically sealed 1 CV	hermetically sealed 3/4 CV	hermetically sealed 1.5 CV	hermetically sealed 1 CV	hermetically sealed 1.5 CV	hermetically sealed 1 CV	hermetically sealed 1.5 CV	hermetically sealed 1.5 CV
Refrigerant	R417A	R508a	R417A	R508a	R417A	R508a	R417A	R508a
Oil	Polyolester - UH ISO 32							
Expansion	Capillary							
Condenser	Standard Air (water condenser option)							
Ambient temperature	+18 to +32 °C							
Working temperature	-80 °C							
Electrical Voltage	230V ~ 50 Hz							
Protection	aM 16 A							
Conformities	European directives:							
	97/23/CEE The pressure equipment directive							
	2004/108/CEE EMC directive							
	2006/42/CEE on machinery and amending directive 98/37/EC							
	2006/95/CEE Low voltage directive							
Accessories	Harmonised standards							
	EN 61010-1 Safety requirements for electrical equipment for measurement, control and laboratory use							
Options	1 set of key, rear spacer, decompression valve, condenser filter, manual							
Temperature control	temperature recorder CNGOPT5000115							
	Cryo accumulator CNGOPT5000123						Nil	
	inventory rack see Accessories Table							
Running control	temperature controller with keypad input							
	setting range : -70 °C / -85 °C						-70 °C /-80 °C	
Control panel	High and Low stage compressor: On-Off Control							
	Green light + main On/Off switch							
CONTROL SPECIFICATIONS								
Temperature sensor	Pt.100 W							
Display	Intelligent Touch Screen Controller							
	LED 0.1 °C graduation red for chamber temp / green for set temperature							
Data Log And Display	Temperature Profile Graph Screen display							
Data Storage and Transfer	4G SD Card (not included the SD Card)							
Temperature alarm	factory set high alarm -60 °C, low alarm -95 °C							
Door alarm	after 2 min, buzzer, red light alarm, remote alarm switch							
Filter alarm	buzzer, red light alarm, remote alarm switch							
Power failure alarm	buzzer, red light alarm, remote alarm switch							
Remote alarm	contact capacity 5A, 250 VAC, 5A, 30 VDC							
Power fuse	16A 230V							
Compressor protection	Internal overload protection -L stage compressor pressure switch 24 bars automatic reset with 2.5 min temporisation -H stage compressor pressure switch 24 bars manual reset by On/Off with main switch							
Delay of compressor starting	when 1st cool down 2.5 min between H stage and L stage							
PERFORMANCE SPECIFICATIONS								
Cooling performance at the center of chamber (at 25°C no load)	-85 °C						-80 °C	
Temperature control range	-70 °C to -85 °C						-70 °C to -80 °C	
Power source	230V, 50Hz / 220V, 60Hz / 110V, 50/60Hz							
Rated power consumption	1100W		1800W		1800W		2300W	
Noise level	< 55dBA							
Maximum pressure	24 bars							

Accessories

INTERIOR FITTINGS

Reference	Nb of shelves	Usable height (mm)	Cryoboxes* capacity *133x133x51mm	Deep freezer racks capacity 340/515/690/1000
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UPRIGHT MODELS 340/515/690/1000

Racks with drawers 288x730x343

BM/EL2T690	2	164	60	4 / 6 / 8 / 12
BM/EL3T690	3	109	60	
BM/EL4T690	4	80	40	
BM/EL5T690	5	63	50	
BM/EL6T690	6	53	60	

Racks with fixed shelves 140x730x343

BM/EL3E690	3	109	30	8 / 12 / 16 / 24
BM/EL4E690	4	80	20	
BM/EL5E690	5	63	25	
BM/EL6E690	6	54	30	

Racks for microplates 142x740x330

BM/ELMP690	2	140	160 x 96 well plates	8 / 12 / 16 / 24
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Baskets 142x740x330

BM/TIR	1	330		8 / 12 / 16 / 24
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CHEST MODEL 340/515/690

Upright racks 144x140x737

BM/12EBV	For cryo-boxes 133x133x51	12	20 / 28 / 40
BM/7EBV	For cryo-boxes 133x133x95	7	

Baskets 340x288x368

BM/PAN	Bulk			20 / 28 / 40
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ADDITIONAL SHELVES

For model 175L	For model 340/515/690L	For model 1000L
BM/ETA1	BM/ETA2	BM/ETA3

Options

Reference	Description
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Common options

BM/CRYO2	Cryo-reservoir for BM340, temperature increase delayed by additional +/- 6h	Option	
BM/CRYO3	Cryo-reservoir for BM515, temperature increase delayed by additional +/- 6h	Option	
BM/CRYO4	Cryo-reservoir for BM690, temperature increase delayed by additional +/- 6h	Option	
BM/OPT8	On/off Switch, key lock	Option	Not available
BM/N2	LN ₂ backup system, 1m80 DN10 transfer hose included	Option	On request
BM/CO2	Co ₂ backup system, 3m transfer hose included	Option	Included

Traceability

BM/OPT2	Pt 100 ohm probe, 3 wires, 4-20 mA (-100°C to +50°C). Rear output on connectors	Option
BM/OPT3	K thermocouple probe (-100°C to +50°C). Rear output on connectors	Option
BM/OPT4	Pt 100 ohm probe, 3 wires (-100°C to +50°C). Rear DIN connector	Option
BM/OPT5	Probe with 3 meters cable for external calibration	Option
BM/OPT6	Certified temperature probe	Option
BM/OPT9	RS485 port for data transfer	Option
BM/OPT7	0°C to -100°C circular chart recorder, 1 run for 7 days	Option
BM/OPT11	Cable entry port with gland on decompression valve	Option

Qualification

BM/QP	PQ : Performance qualification protocol	Option
BM/QIQO	IQ/OQ : Installation and operational protocol manual	Option



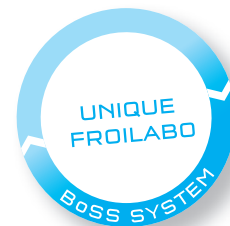
These equipments are produced on an ISO9001 certified site.

THE UNIQUE CONCEPTION: Maximum protection of the cooling system

- Oil separator and depressurization tank free (reduces maintenance)
- Common refrigerant: R417A and R508A (CFC and HCFC free)
- Low operating pressure / Very limited pressure drop
- Low return temperature of the gas ($<0^{\circ}\text{C}$) into the compressors keeping them operating at low temperature (extension of the compressor operating life)
- Maintenance can be made by non «cascade specialist» technician

THE BoSS SYSTEM : Maximum protection of the samples

The samples protection must be efficient in any circumstance, even in unlikely case of low voltage/electronic system outage. The BoSS system compensates for that potential issue and will engage the compressors permanently, maintaining a permanent deep freeze production.



- Preservation of the samples
- 30 hours regulation on batteries; then direct connection to the power source (110V or 220/230V) of the compressors
- No emergency maintenance required / easy problem identification for the service engineer

VACUUM PANEL INSULATION (VIP)

- 15% reduction of the power consumption
- 22% improvement of the temperature rise in case of power failure
- Larger storage capacity with the same foot print

UNRIVALLED performance:

- Excellent homogeneity $< \pm 3^{\circ}\text{C}$ at $-80^{\circ}\text{C}/-112^{\circ}\text{F}$ and exceptional stability $\pm 1^{\circ}\text{C}$ at $-80^{\circ}\text{C}/-112^{\circ}\text{F}$
- Fast cooling: from 22°C to -81°C (71°F to -113°F) in 4h (690L)
- Fast set temperature recovery after door opening
- Sustain ambient temperature (environment) up to $35^{\circ}\text{C}/95^{\circ}\text{F}$

SPECIFICATIONS

- Maximised storage capacity vs footprint (up to 72000 cryo-tubes / 1.25m^2)
- Door way access (h: 2m x w: 0,8m)
- Sound level $<53\text{dB}$



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