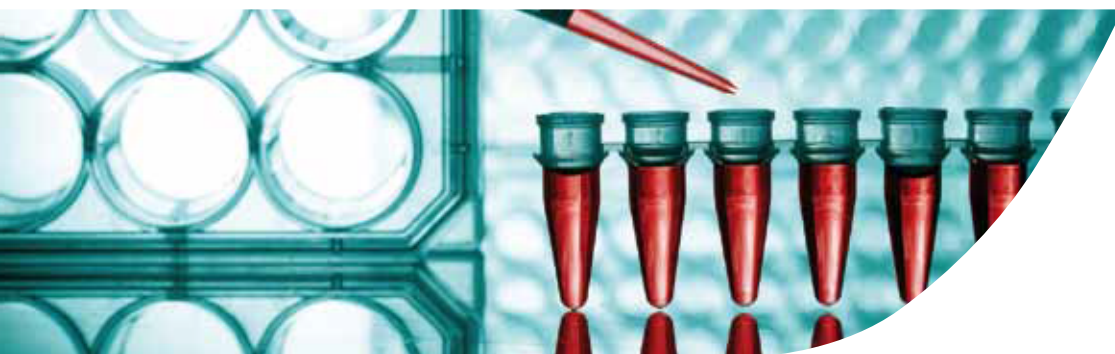
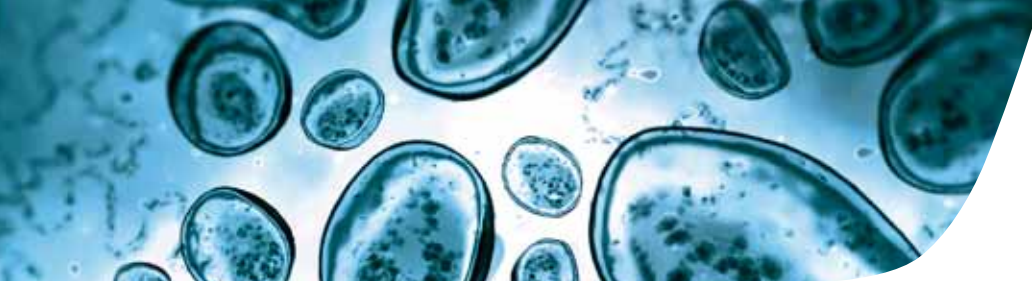


# DEEP FREEZERS



Ref : DEEP-FREEZERS/E/rev2

 **Froilabo**  
Precision for life



# ULTRA LOW TEMPERATURE DEEP FREEZERS

Supported by more than 60 years of experience in climatic engineering, **FROILABO** offers a wide range of upright or chest, -45°C and -86°C deep freezers. Based on a unique concept, this equipment provides the benefit of innovative technical solutions enabling unrivalled performances (i.e. homogeneity  $\pm 3^{\circ}\text{C}$  at  $-80^{\circ}\text{C}/-112^{\circ}\text{F}$ ) and perfect sample preservation under any circumstances.

The Intellidiag® technology is the perfect illustration of Froilabo expertise. Constant monitoring of a freezer's parameters will allow detection of any critical drift in its performance and enable prediction and prevention of any potential risk to the samples. In addition, the user has the opportunity to remotely control a deep freezer and be automatically informed of any kind of incident (door open, etc...)

**FROILABO** expertise also enables deep freezer adaptation to customer's requirements such as water cooled condenser, remote compressors or complete remote machinery.

We always try to keep sample storage cost as low as possible and this is why **FROILABO** offers the largest storage capacity (up to 72000 2ml cryo vials) on a minimal footprint.

Froilabo has been partner of the **Our Polar Heritage Mission** as part of **the International Polar Year**.



## 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

# BM

## A 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 expansive maintenance.



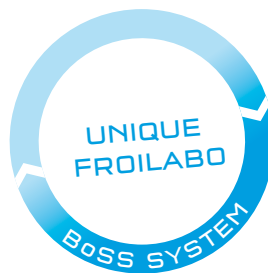
## A UNIQUE CONCEPTION: Maximum protection of the cooling system

- 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



## VACUM PANEL INSULATION (VIP)

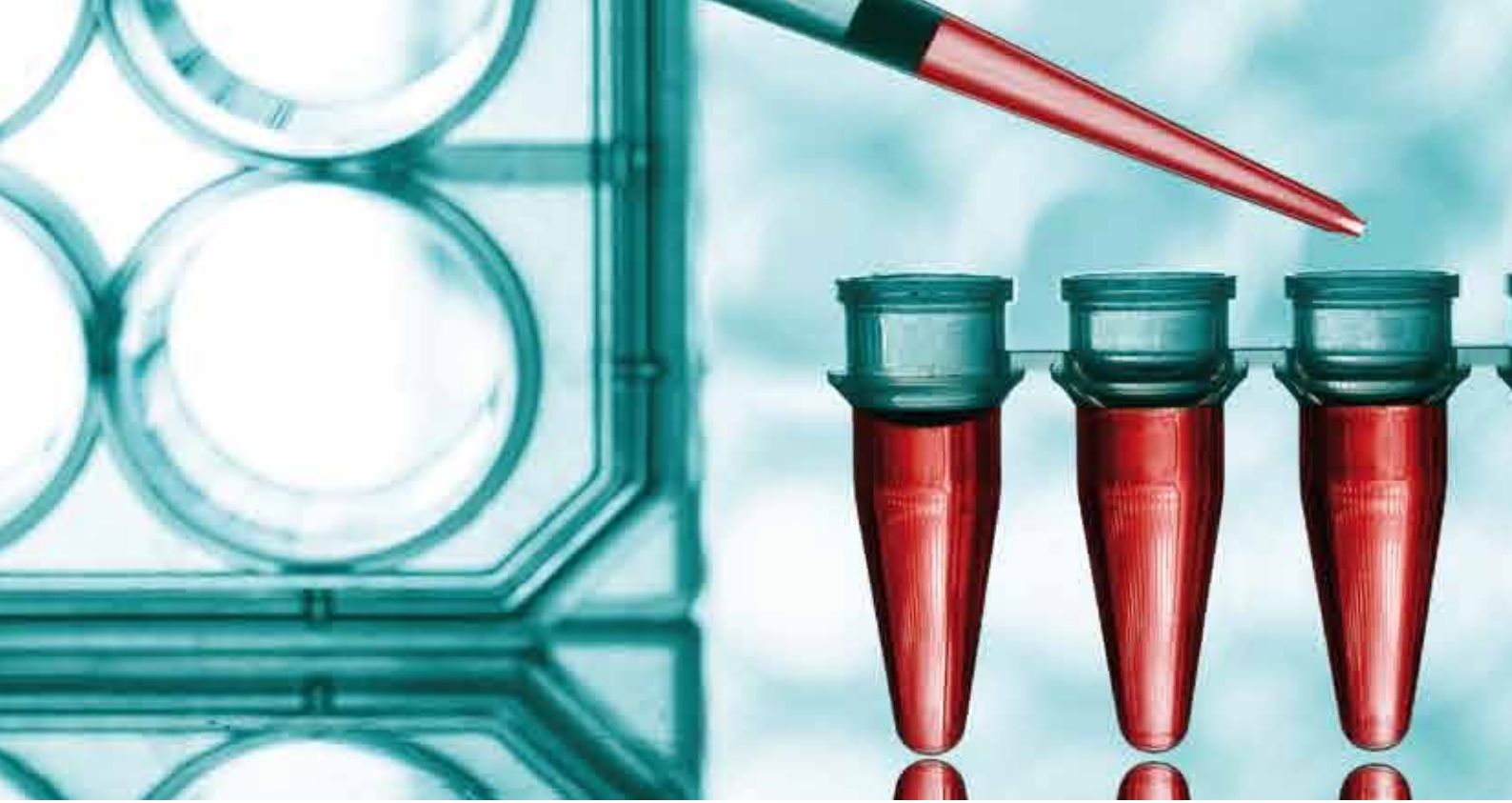
- 15% reduction of the power consumption
- 22% improvement of the temperature rise in case of power failure
- Larger storage capacity with the same foot print

## 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  $22^{\circ}\text{C}$  to  $-81^{\circ}\text{C}$  ( $71^{\circ}\text{F}$  to  $-113^{\circ}\text{F}$ ) 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 /  $1.25\text{m}^2$ )
- Door way access (h: 2m x w: 0,8m)
- Sound level  $<53\text{dB}$

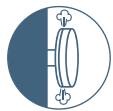


## SAMPLES ALWAYS UNDER OBSERVATION

- Audible and visible high and low temperature alarm
- Door open, power failure and blocked condenser alarm
- Supplied with alarm battery back-up

## REGULATION

- Dual digital display of the set and actual temperature
- Temperature electronic regulator assisted by industrial automation
- Pt100 ohm sensor for the regulation and display



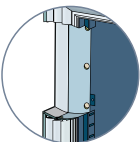
Heated decompression valve  
for easy opening  
(pressure equaliser)

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



# BMS

## BIO MEMORY STAR

Based on the Bio Memory, Froilabo has developed and integrated the unique INTELLIDIAG© predictive maintenance system which will provide over many years the highest safety for your samples.



## PREDICTIVE MAINTENANCE AND REMOTE CONTROL

By monitoring the critical parameters (compressor's activity, pressure etc...), INTELLIDIAG© detect and analyse the operation drifts of the freezer and make possible predictive diagnostics to prevent potential failure or malfunction.

Every BMS deep freezer has its own fix IP address which allows remote control and communication when connected by LAN, Ethernet or Internet. In case of alarm or warning message, emails will be sent automatically up to 4 different addresses.

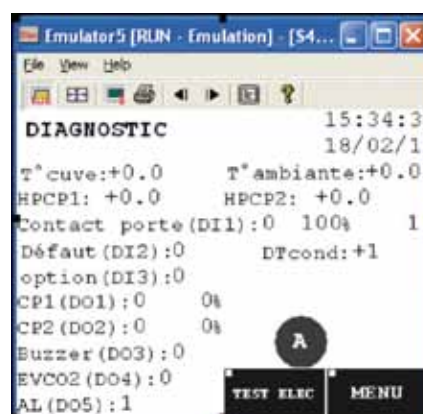
5.7" touch screen enable driving the display of the freezer's information and parameters related to its performance. Short-cut function keys enable quick access to different functions, diagrams, alerts, incidents list, maintenance information and CO2 back-up management (standard on a BMS).

### Additions to the BMS specifications:

- Password protected keyboard
- CO<sub>2</sub> backup
- Ethernet / Internet / LAN port
- Predictive maintenance
- Error message
- Alert message by email



BMS touch screen



Diagnostic display



## TECHNICAL SPECIFICATIONS

	Capacity (litre)	External dimensions (H x W x D) mm	Inner dimensions (H x W x D) mm	Max. cryo-tubes capacity	Number of compartments	Net weight (kg)	Power supply
<b>VERTICAL MODEL</b>							
BM/BMS 175	175	1335x875x670	620x630x452	12000	2	185	230V/50Hz
BM/BMS 340	340	1280x875x970	716x630x752	24000	2	223	230V/50Hz
BM/BMS 515	515	1640x875x970	1076x630x752	36000	3	267	230V/50Hz
BM/BMS 690	690	2000x875x970	1436x630x752	48000	4	330	230V/50Hz
BM/BMS 1000	1000	2000x1200x970	1436x920x752	72000	4	390	230V/50Hz
<b>BUILT-IN MODEL</b>							
BMP/BMSP 175	175	810x1275x680	620x630x452	12000	2	180	230V/50Hz
<b>CHEST MODEL</b>							
BMH 340	340	1032x1380x794	765x716x630	24000	1	233	230V/50Hz
BMH 515	515	1032x1740x794	765x1076x630	36000	1	277	230V/50Hz
BMH 690	690	1032x2100x794	765x1436x630	48000	1	340	230V/50Hz
BMH 1000	1000	1050x2100x1084	765x1436x920	72000	1	430	230V/50Hz

### To order

230V / 50Hz		
	-45°C	-86°C
<b>VERTICAL MODEL</b>		
175 litres	BM17545	BM17586
340 litres	BM34045	BM34086
515 litres	BM51545	BM51586
690 litres	BM69045	BM69086
1000 litres	BM100045	BM100082*
<b>BUILT-IN MODEL</b>		
175 litres	BMP17545	BMP17586

230V / 50Hz		
	-45°C	-86°C
<b>HORIZONTAL MODEL</b>		
175 litres	BMH17545	BMH17586
340 litres	BMH34045	BMH34086
515 litres	BMH51545	BMH51586
690 litres	BMH69045	BMH69086
1000 litres	BMH100045	BMH100082*

\*Set at -82°C in production

220V-60Hz and 110V-50/60 Hz available

Water condenser: just add **/W** to the above references

# ACCESSORIES

## INTERIOR FITTINGS

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

### 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
------------	---	-----	----------------------	------------------

#### Baskets 142x740x330

BM/TIR	1	330		8 / 12 / 16 / 24
--------	---	-----	--	------------------

### 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	Bulck	20 / 28 / 40
--------	-------	--------------

## ADDITIONAL SHELVES

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

## OPTIONS

Reference	Description	BM	BMS
-----------	-------------	----	-----

#### Common options

BM/CRYO1	Cryo-reservoir for BM175, temperature increase delayed by additional +/- 6h	Option	
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 <sub>2</sub> backup system, 1m80 DN10 transfer hose included	Option	On request
BM/CO2	Co <sub>2</sub> backup system, 3m transfer hose included	Option	Included

#### Traçability

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	
BMS/WIFI	WIFI	Not available	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.



DISTRIBUTOR :

**Froilabo**  
Precision for life

5, Avenue Lionel Terray - 69330 Meyzieu - FRANCE  
Tél. : +33 4 78 04 75 75 - Fax : +33 4 78 04 75 76  
www.froilabo.com - froilabo@froilabo.com