



medical systems

Your global partner to save lives.



## FR / MF | Deep Freezers & Plasma Storage Freezers



- > Low-temperature storage of plasma and other blood products at  $-41^{\circ}\text{C}$  /  $-35^{\circ}\text{C}$
- > According to DIN 58375 & Medical Device 93/42/EEC



### BIOMEDICAL REFRIGERATION

Innovative and reliable refrigeration solutions

04/2017

292.9707.70



[www.bmedicalsistemas.com](http://www.bmedicalsistemas.com)



medical systems

FR / MF range



Freezers for the low-temperature storage of plasma and other substances under optimum conditions

> according to DIN 58375 & Medical Device 93/42/EEC

B Medical Systems's Biomedical Freezer range is the perfect solution for a safe storage and handling of temperature-sensitive preparations such as plasma and other blood products in conformity with national and international norms and guidelines. Models FR 250 - 750 G are available as 220 V (50/60 Hz) version, model MF 290 SG as 220 V (50/60 Hz) & 115 V (60 Hz) versions and model MF 110 SG as 115 V (60Hz) version.



The Safety Standards developed by B Medical Systems define certain significant technical features of a product. These ensure the safe storage of the preparations as well as the trend-setting safety of the user.

**G** The B Medical Systems Gold Safety Standard efficiently complements the safety requirements of the B Medical Systems Silver Safety Standard and therefore exceeds even the official standards. Gold models are denominated with a "G".

**S** The B Medical Systems Silver Safety Standard ensures the reliable and safe operation of all B Medical Systems refrigerators and deep freezers. Safety for the stored preparations and the user. Silver models are denominated with a "S".

**G** The new "green" models (denominated with a "G") convince by their technical optimizations in terms of economy and environmental protection. Characteristic features are :

- use of natural gases as refrigerants
- 40-60% less energy consumption
- up to 40% less power needed
- over 80% less heat ejection

In addition, the new "green" models stand out because of improved hold over times thanks to optimized door insulation and drastically reduced noise level for more workplace convenience.

Model	FR 110 GG	FR 250 - 750 G	MF 110 SG	MF 290 SG	MF 755 GG
DIN 58375 ("Plasma Storage Freezers")	■	■	■	■	■
GMP Clean Room Class A / ISO 5 (ISO EN 14644-1)	□	□	-	-	-
GMP Clean Room Class B / ISO 6 (ISO EN 14644-1)	-	-	□	□	□
B Medical Systems Electronic	■	■	■	■	■
Key-operated power switch (power ON/OFF)	■	■	■	■	■
Safety door lock	■	■	■	■	■
Digital temperature indicator (display: 0.1 digits)	■	■	■	■	■
Controlled fan cooling system for constant temperature and even temperature distribution across the entire refrigerating chamber. Automatic fan switch-off when front door opens	-	■	-	-	■
Self-contained alarm system with integrated battery takes over the alarm function and temperature value measurements in case of power failure for at least 48 hours	■	■	■	■	■
Acoustic/visual alarm signal in case of temperature alarm and power failure	■	■	■	■	■
All relevant data of temperature alarm and power failure alarm are stored in the alarm history. Such as date and time of start and end, min. max and average temperature	■	■	■	■	■
Alarm function test: simulation of a temperature rise or drop in order to test the alarm functionality	■	■	■	■	■
Control via self-diagnostic system	■	■	■	■	■
Defrosting (automatic)	-	■	-	-	-
Defrosting (manual)	■	-	■	■	■
Door opening alarm	■	■	■	■	■
Remote transmission alarm signal (via potential-free contact) in case of temperature alarm (change-over contact)	■	■	■	■	■
Remote transmission alarm signal (via potential-free contact) in case of power failure (change-over contact)	■	■	■	■	■
Automatic closing of the front door below a door opening angle of 90°	-	■	-	-	■
Interior made from stainless steel	■	■	-	-	■
Climate class (ambient temperature range) SN (+10°C to +32°C)	■	■	■	■	■
Smooth castors with stabilizers for optimum flexibility of movement	□	■	-	-	■
RS 485 interface for the display of all operating and control functions (hardware and software settings) via DMN monitoring software on a peripheral device (computer)	■	■	■	■	■
DMN Software package	■	■	■	■	■
DCU - Data Communication Unit	□	□	□	□	□

■ standard □ optional - not available



	FR 110 GG	FR 250 G	FR 410 G	FR 490 G	FR 750 G	MF 110 SG	MF 290 SG	MF 755 GG
Gross volume	106 l	246 l	408 l	489 l	738 l	110 l	290 l	753 l
Net volume	104 l	167 l	319 l	395 l	620 l	104 l	265 l	733 l
Storage capacity : plasma bags at 450 / 200-350 ml each	54 / 72	120 / 160	240 / 320	300 / 400	450 / 525	69 / 69	168 / 168	450 / 550
External dimensions (H x W x D)	820 x 560 x 580 mm	1305 x 850 x 785 mm	1735 x 850 x 785 mm	1950 x 850 x 785 mm	1990 x 910 x 985 mm	900 x 595 x 630 mm	1830 x 595 x 625 mm	1990 x 910 x 950 mm
External dimensions (with mounted temperature recorder)	-	-	-	-	-	1075 x 595 x 630 mm	1990 x 595 x 625 mm	-
Inner dimensions (H x W x D)	495 x 470 x 455 mm	655 x 680 x 552 mm	1085 x 680 x 552 mm	1300 x 680 x 552 mm	1352 x 730 x 760 mm	685 x 410 x 430 mm	1498 x 460 x 435 mm	1352 x 730 x 760 mm
Net weight (with standard equipment)	78 kg	153 kg	188 kg	207 kg	258 kg	47 kg	92 kg	326 kg
Set temperature (preset)	-41°C	-41°C	-41°C	-41°C	-41°C	-35°C	-35°C	-41°C
Set temperature (setting range) can be adjusted in steps of 0.1°C	-32°C to -41°C	-32°C to -41°C	-32°C to -41°C	-32°C to -41°C	-32°C to -41°C	-32°C to -35°C	-32°C to -35°C	-20°C to -86°C
Temperature cold / warm alarm limit (preset)	-45°C / -32°C	-45°C / -32°C	-45°C / -32°C	-45°C / -32°C	-45°C / -32°C	-40°C / -30°C	-40°C / -30°C	-45°C / -32°C
Control sensor	PT1000 2-WIRE 1/3DIN CL.B	PT1000 2-WIRE 1/3DIN CL.B	PT1000 2-WIRE 1/3DIN CL.B	PT1000 2-WIRE 1/3DIN CL.B	PT1000 2-WIRE 1/3DIN CL.B	PT1000 2-WIRE 1/3DIN CL.B	PT1000 2-WIRE 1/3DIN CL.B	PT1000 2-WIRE 1/3DIN CL.B
Precision (from -80°C to +180°C)	± 0,2°C	± 0,2°C	± 0,2°C	± 0,2°C	± 0,2°C	± 0,2°C	± 0,2°C	± 0,2°C
Display sensor	PT1000 2-WIRE 1/3DIN CL.B	PT1000 2-WIRE 1/3DIN CL.B	PT1000 2-WIRE 1/3DIN CL.B	PT1000 2-WIRE 1/3DIN CL.B	PT1000 2-WIRE 1/3DIN CL.B	PT1000 2-WIRE 1/3DIN CL.B	PT1000 2-WIRE 1/3DIN CL.B	PT1000 2-WIRE 1/3DIN CL.B
Precision (from -80°C to +180°C) in reference body / 100 ml DOW corning 200-5CST (Silicon Oil)	± 0,2°C	± 0,2°C	± 0,2°C	± 0,2°C	± 0,2°C	± 0,2°C	± 0,2°C	± 0,2°C
Frequency 220-240V	50 Hz	50 Hz	50 Hz	50 Hz	50 Hz	50 Hz	50 Hz	50 Hz
Power 220-240V	300 W	500 W	500 W	500 W	600 W	135 W	190 W	1800 W
Energy consumption 220-240V	4.00 kWh/24h	6.10 kWh/24h	7.40 kWh/24h	7.80 kWh/24h	7.10 kWh/24h	1.70 kWh/24h	2.30 kWh/24h	7.10 kWh/24h
Heat emission 220-240V	142 Kcal/h	430 Kcal/h	430 Kcal/h	430 Kcal/h	515 Kcal/h	53 Kcal/h	75 Kcal/h	390 Kcal/h
Compressor running time 220-240V	55%	43%	55%	57%	50%	46%	45%	25%
Noise level (at 1m height & 1m distance) 220-240V	47 dB(A)	58 dB(A)	58 dB(A)	58 dB(A)	58 dB(A)	41 dB(A)	44 dB(A)	54 dB(A)
Accu data / function time of the control panel when power failure	12V -7 AH / 48h	12V -7 AH / 48h	12V -7 AH / 48h	12V -7 AH / 48h	12V -7 AH / 48h	12V -7 AH / 48h	12V -7 AH / 48h	12V -7 AH / 48h
Climate class (ambient temperature range)	SN (+10°C to +32°C)	SN (+10°C to +32°C)	SN (+10°C to +32°C)	SN (+10°C to +32°C)	SN (+10°C to +32°C)	SN (+10°C to +32°C)	SN (+10°C to +32°C)	SN (+10°C to +32°C)
Relative humidity at ambient temperature	≤ 75%	≤ 75%	≤ 75%	≤ 75%	≤ 75%	≤ 75%	≤ 75%	≤ 75%
Defrosting technique	manual	automatic (hot gas)	automatic (hot gas)	automatic (hot gas)	automatic (hot gas)	manual	manual	manual
Refrigerant type	R290	Isceon 89	Isceon 89	Isceon 89	R507	R290	R290	R290/R170
Door insulation (polyurethane)	45 mm PU + 20 mm VIP	100 mm	100 mm	100 mm	85 mm	90 mm	35 - 85 mm	65 mm PU + 20 mm VIP
Casing insulation (polyurethane)	25 mm PU + 20 mm VIP	85 - 95 mm	85 - 95 mm	85 - 95 mm	90 mm	58 - 92 mm	67.5 - 75 mm	70 mm PU + 20 mm VIP
Hold over time	84 min (from -30°C to -23°C)	210 min (from -40°C to -18°C)	210 min (from -40°C to -18°C)	210 min (from -40°C to -18°C)	210 min (from -40°C to -18°C)	72 min (from -35°C to -23°C)	45 min (from -35°C to -23°C)	210 min (from -40°C to -18°C)
Safety class	I	I	I	I	I	I	I	I
European Medical Device Directive	93 / 42 / EEC	93 / 42 / EEC	93 / 42 / EEC	93 / 42 / EEC	93 / 42 / EEC	93 / 42 / EEC	93 / 42 / EEC	93 / 42 / EEC
Material inner body	Stainless steel (V2A - 1.4301)	Stainless steel (V2A - 1.4301)	Stainless steel (V2A - 1.4301)	Stainless steel (V2A - 1.4301)	Stainless steel (V2A - 1.4301)	Polystyrene (PS)	Styrol (SAN)	Stainless steel (V2A - 1.4301)
Material outer casing & door	Galvanized sheet steel (STO2Z-AZ150)	Galvanized sheet steel (STO2Z-AZ150)	Galvanized sheet steel (STO2Z-AZ150)	Galvanized sheet steel (STO2Z-AZ150)	Galvanized sheet steel (STO2Z-AZ150)	Galvanized sheet steel (STO2Z-AZ150)	Galvanized sheet steel (STO2Z-AZ150)	Galvanized sheet steel (STO2Z-AZ150)
Material Drawers	Stainless steel (V2A - 1.4301)	Stainless steel (V2A - 1.4301)	Stainless steel (V2A - 1.4301)	Stainless steel (V2A - 1.4301)	Stainless steel (V2A - 1.4301)	Polystyrene (PS)	Polystyrene (PS)	-
Material Wire Shelves	Wire DIN177, PA11 coated	Wire DIN177, PA11 coated	Wire DIN177, PA11 coated	Wire DIN177, PA11 coated	Wire DIN177, PA11 coated	-	-	-
Material N-Rack	-	Polycarbonate, transparent	Polycarbonate, transparent	Polycarbonate, transparent	Polycarbonate, transparent	-	-	-
Color outer casing	White (similar to RAL9010)	White (similar to RAL9010)	White (similar to RAL9010)	White (similar to RAL9010)	White (similar to RAL9010)	White (similar to RAL9010)	White (similar to RAL9010)	White (similar to RAL9010)
Color contrasts	Blue (similar to RAL5002)	Blue (similar to RAL5002)	Blue (similar to RAL5002)	Blue (similar to RAL5002)	Blue (similar to RAL5002)	Blue (similar to RAL5002)	Blue (similar to RAL5002)	Blue (similar to RAL5002)

Interior Equipment & Options (Concerning further information on accessories please see our separate leaflet "Racking & Storage Systems")

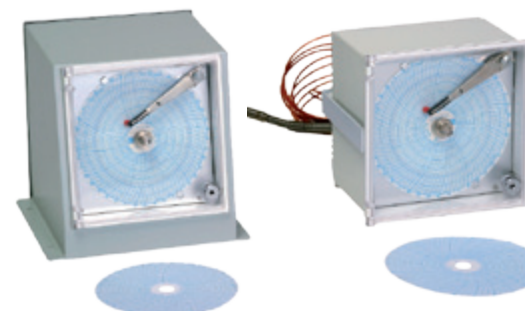
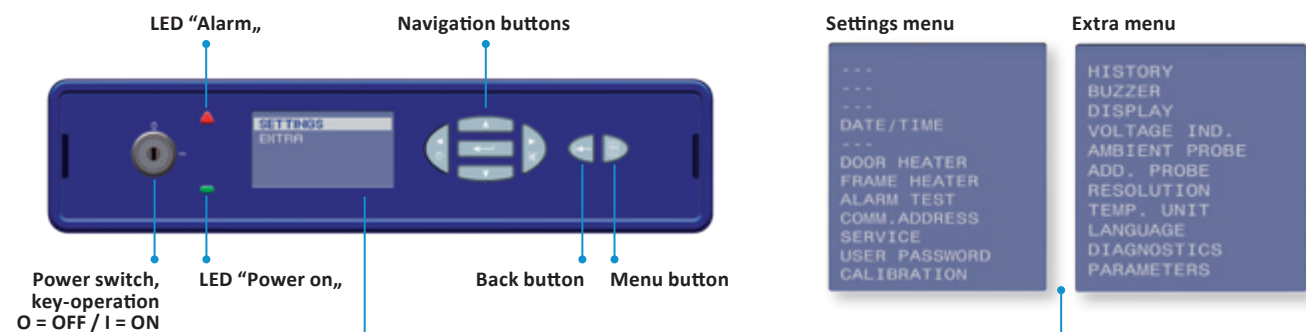
Separate interior doors in order to minimize the loss of refrigeration	-	2 ■	4 ■	5 ■	Version 1 5 ■	Version 2 5 ■	-	-	5 ■
Standard interior equipment	Drawers	2 ■	1 ■	2 ■	3 ■	3 ■	3 ■	5 ■	-
	Wire shelves	-	1 ■	2 ■	2 ■	2 ■	-	-	-
	ST-Shelf UF / Tin-Shelf (MF)	-	-	-	-	-	5 ■	2 ■	4 ■
GMP – clean room classification	A / ISO 5 □	A / ISO 5 □	A / ISO 5 □	A / ISO 5 □	A / ISO 5 □	A / ISO 5 □	B / ISO 6 □	B / ISO 6 □	B / ISO 6 □
RS 485 interface / DMN Software package	■	■	■	■	■	■	■	■	■
DCU - Data Communication Unit	□	□	□	□	□	□	□	□	□
Ambient temperature sensor	□	□	□	□	□	□	□	□	□
Potential-free contact in case of power failure	■	■	■	■	■	■	■	■	■
Integrated inlet for external sensor (installed by customer)	■	■	■	■	■	■	■	■	■
Additional reference bottle with reference fluid and fitting	□	□	□	□	□	□	□	□	□
Condenser filter	-	■	■	■	■	■	-	-	■
Smooth castors with stabilizers	□	■	■	■	■	■	-	-	■
External water cooling	-	□	□	□	□	□	-	-	□
Temperature recorder in form of a circular chart recorder / recording range : -50°C to 0°C	Integrated, for 24h or 7 days □	Integrated, for 24h or 7 days □	Integrated, for 24h or 7 days □	Integrated, for 24h or 7 days □	Integrated, for 24h or 7 days □	Integrated, for 24h or 7 days □	Mounted, for 24h or 7 days □	Mounted, for 24h or 7 days □	Integrated, for 24h or 7 days □
Door hinge Right / Left	■ / □	■ / □	■ / □	■ / □	■ / □	■ / □	■ / □	■ / □	■ / □
Wooden packaging for ocean transport / export	□	□	□	□	□	□	□	□	□

■ standard / □ optional / - not available

All values were measured at +25°C ambient temperature and without load (with inertial mass).



The new and innovative B Medical Systems Electronic (operation and control panel) assures thanks to its password protected settings menu optimum protection for your stored preparations.  
The menu structure of the modern and user-friendly graphic display offers a simple and intuitive utilization.



Temperature recorder (in form of a circular chart recorder) (optional, within the mounted casing for SILVER model range, integrated for GOLD model range)



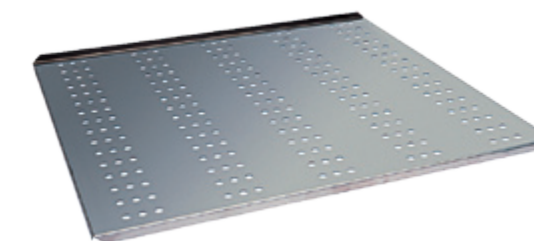
N-Racks with/without Front Cover can be subdivided into compartments (optional, for FR model range 250 - 750 G)

The new B Medical Systems Electronic also offers :

- > A wide range of adjustment and diagnostic facilities as well as additional protection / warning operations (via external alarm operations, histories and individual display signals).
- > An optional PT 100 sensor inlet to show the sensor's temperature data on the display as well as forwarding and further processing via a 4 ... 20 miliA outlet.
- > An optional 20 miliA outlet to transmit temperature data of a sensor connected to the electronic.
- > Connection facilities for additional (optional) temperature sensors.
- > DMN (Data Monitoring Network) and the (optional) DCU (Data Communication Unit) allows illustration of texts on the product's display.



Remote temperature and power failure alarm



ST Cover - Wire Shelf (optional, for FR model range 250 - 750 G)

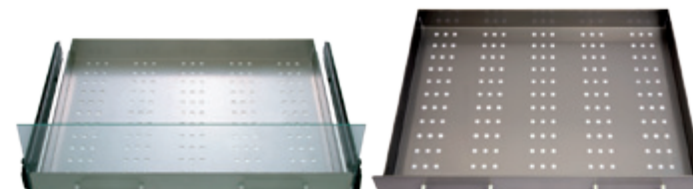
Equipment / Options (extract)



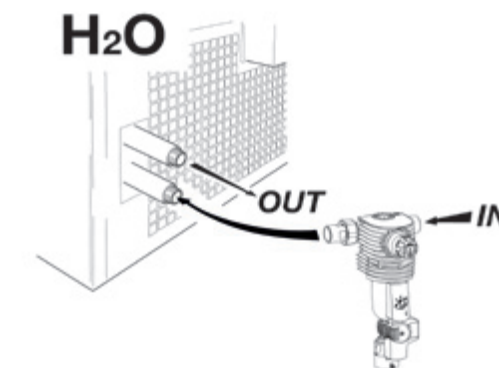
Rack 750 for the storage of plasma bags (optional, for FR model range 250 - 750 G)



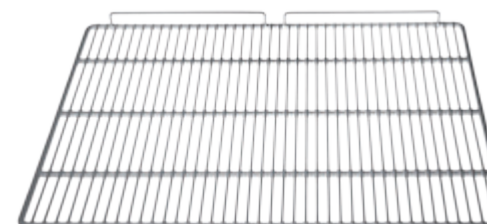
ST-Rack for the storage of plasma bags (optional, for FR model range 250 - 750 G and MF 755 GG)



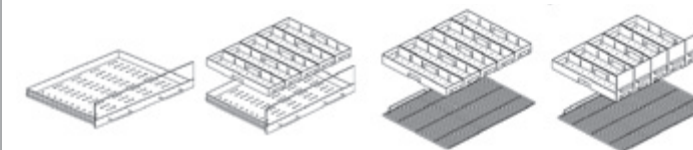
ST-Drawers with/without Front Cover, on telescopic runners with safety stop (optional for FR model range 250 - 750 G)



Water cooling, external (ex factory) (optional, for FR model range 250 - 750 G)



Wire Shelves



Loading options

## DMN - Data Monitoring Network

Universal software for collection, long-term recording and visualization of temperature data.

- > Complete activity list (password protected).
- > Integrated event and activity history of all appliance components.
- > Graphical visualisation of all temperature curves.
- > Connection to existing or third-party appliances via network technology (LAN, WLAN, WAN).
- > Simultaneous data monitoring and recording.
- > Possibility for specific and individually configurable alarm forwardings, e. g. via email, SMS (with optional GSM module).
- > Simple and intuitive utilization.
- > Essential price advantage compared to a traditional circular chart recorder and its spare parts.
- > Free of charge for all Gold & Silver ranges.
- > Real-time temperature output for third-party software.

### Your essential advantages :

- Access to the data within your entire network via one central database.
- Economy of time and money as regular changes of recorder paper, ink and battery is not necessary.



## DCU - Data Communication Unit

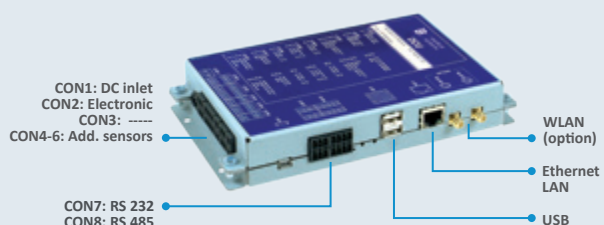
Hardware module that notes all operating conditions and passes them through to a central data base – via local network, on which devices are connected.

- > Interface connection of B Medical Systems appliances to an existing network.
- > The DCU offers direct connection to the Ethernet, even wireless, to the serial BUS RS 485, as well as to the central building control system (4 ... 20 mA).
- > Possibility of connection of actors (4 ... 20 mA out).
- > Digital IN/OUT (customer-specific use of these connections is programmable).
- > The integrated USB port allows stored data to be written to an external memory stick.
- > Recording and storage of relevant data of the appliance.
- > The DCU replaces the paper temperature recorder.
- > The DCU works with all Gold electronics from 2000 on.
- > All data are recorded and saved in the data base of the DMN and are available for analysis at any time.

- > Possibility of connection of several additional self-sufficient temperature sensors (up to 4 PT1000 & 2 PT100).

### Your essential advantages :

- One integrative system for collecting all temperature relevant appliances and ambients.
- Many different connection facilities allow flexible upgrades for individual projects.



DMN & DCU in combination offer a highly flexible system that is adaptable to specific customer requirements

- > Complete & legally safe documentation of temperature data
- > Comprehensive applications and diagnostic possibilities.