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DFR / DMF | Deep Freezers for the storage of temperature-sensitive products



> Low-temperature storage of temperature-sensitive preparations at -41°C / -35°C



BIOMEDICAL REFRIGERATION

Innovative and reliable
refrigeration solutions



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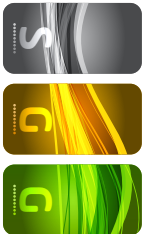
DFR / DMF range



Freezers for the low-temperature storage of temperature-sensitive products under optimum conditions

B Medical Systems's Biomedical Freezer range is the perfect solution for a safe storage and handling of temperature-sensitive preparations or samples in conformity with national and international norms and guidelines.

Models DFR 250 - 750 G are available as 220 V (50/60 Hz) version, model DMF 290 SG as 220 V (50/60 Hz) & 115 V (60 Hz) versions and model DMF 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.



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".



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".



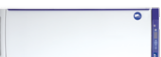
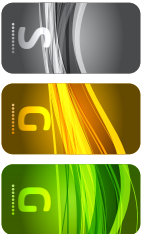
The new "green" models (denominated with a "G") convince by their technical optimizations in terms of economy and environmental protection.

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	DFR 110 GG	DFR 250 G	DFR 410 G	DFR 490 G	DFR 750 G	DMF 110 SG	DMF 290 SG
GMP Clean Room Class A / ISO 5 (ISO EN 14644-1)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
GMP Clean Room Class B / ISO 6 (ISO EN 14644-1)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
B Medical Systems Electronic	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Key-operated power switch (power ON/OFF)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Safety door lock	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Digital temperature indicator (display 0.1 digits)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Controlled fan cooling system for constant temperature and even temperature distribution across the entire refrigerating chamber. Automatic fan switch-off when front door opens	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
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	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Acoustic/visual alarm signal in case of temperature alarm and power failure	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
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	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Alarm function test: simulation of a temperature rise or drop in order to test the alarm functionality	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Control via self-diagnostic system	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Defrosting (automatic)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Defrosting (manual)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Door opening alarm	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Remote transmission alarm signal (via potential-free contact) in case of temperature alarm (change-over contact)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Remote transmission alarm signal (via potential-free contact) in case of power failure (change-over contact)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Automatic closing of the front door below a door opening angle of 90°	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Interior made from stainless steel	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Climatic class (ambient temperature range) SN (+10°C to +32°C)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Smooth castors with stabilizers for optimum flexibility of movement	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
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)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
DMN software package	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
DCU - Data Communication Unit	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
■ standard □ optional - not available							





Gross volume	DFR 110 G6
Net volume	106 l
External dimensions (H x W x D)	104 l
External dimensions (with mounted temperature recorder)	820 x 560 x 580 mm
Inner dimensions (H x W x D)	-
Net weight (with standard equipment)	495 x 470 x 552 mm
Set temperature (preset)	78 kg
Set temperature (setting range) can be adjusted in steps of 0.1 °C	-41°C
Temperature cold alarm limit (preset)	-20°C to -41°C
Temperature warm alarm limit (preset)	-45°C
Control sensor	-32°C
Precision (from -80°C to +180°C)	PT1000 2-WIRE 1/3DIN CL.B ± 0.2°C
Display sensor	PT1000 2-WIRE 1/3DIN CL.B ± 0.2°C
Precision (from -80°C to +180°C) in reference body / 100 m DOW carrying 200-5CST (Silicon Oil)	± 0.2°C
Frequency 220-240V	50 Hz
Power 220-240V	300 W
Energy consumption 220-240V	4.00 kWh/24h
Heat emission 220-240V	142 Kcal/h
Compressor running time 220-240V	55%
Noise level (at 1m height & 1m distance 220-240V	47 dB(A)
Accu data / function time of the control panel when power failure	12V -7 AH / 48h
Climate class (ambient temperature range)	SN (+10°C to +32°C)
Relative humidity at ambient temperature	5 / 75%
Defrosting technique	manual
Refrigerant type	R290
Door insulation (polyurethane)	45 mm PU + 20 mm VIP
Casing insulation (polyurethane)	25 mm PU + 20 mm VIP
Hold over time	84 min (from -30°C to -23°C)
Safety class	1
EMC directive	2004 / 108 / EEC
Low voltage directive	2006 / 95 / EEC
Material inner body	Stainless steel (V2A - 1.4301)
Material outer casing & door	Galvanized sheet steel (StO2Z-AZ150)
Material Drawers	Stainless steel (V2A - 1.4301)
Material Wire Shelves	Wire DIN177, PA11 coated
Material N-Rack	-
Color outer casing	White (similar to RAL9010)
Color contrasts	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	-
Standard interior equipment	2 ■ 2 ■ ST-Shelf UF
ATEX category III, zone 2, interior	Conform ■
GMP – clean room classification	A / ISO 5 □
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 □
Door hinge Right / Left	■ / □
Wooden packaging for ocean transport / export	□

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

DFR 410 G	408 l
	319 l
	1735 x 850 x 785 mm
	-
	1085 x 680 x 552 mm
	188 kg
	-41°C
	-20°C to -41°C
	-45°C
	-32°C
	PT1000 2-WIRE 1/3DIN CL.B ± 0.2°C
	PT1000 2-WIRE 1/3DIN CL.B ± 0.2°C
	PT1000 2-WIRE 1/3DIN CL.B ± 0.2°C
	50 Hz
	500 W
	7.40 kWh/24h
	430 Kcal/h
	55%
	58 dB(A)
	12V -7 AH / 48h
	SN (+10°C to +32°C)
	5 / 75%
	automatic (hot gas)
	Iscelon 89
	100 mm
	85 - 95 mm
	210 min (from -40°C to -18°C)
	1
	2004 / 108 / EEC
	2006 / 95 / EEC
	Stainless steel (V2A - 1.4301)
	Galvanized sheet steel (StO2Z-AZ150)
	Stainless steel (V2A - 1.4301)
	Wire DIN177, PA11 coated
	Polycarbonate, transparent
	White (similar to RAL9010)
	Blue (similar to RAL5002)

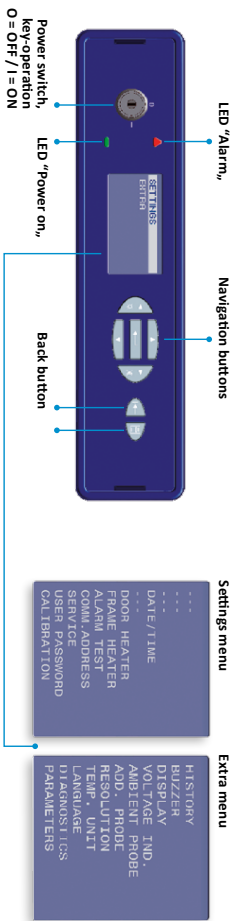
DFR 490 G	738 l
	620 l
	1990 x 910 x 985 mm
	-
	1352 x 730 x 760 mm
	258 kg
	-41°C
	-20°C to -41°C
	-45°C
	-32°C
	PT1000 2-WIRE 1/3DIN CL.B ± 0.2°C
	PT1000 2-WIRE 1/3DIN CL.B ± 0.2°C
	PT1000 2-WIRE 1/3DIN CL.B ± 0.2°C
	50 Hz
	600 W
	7.10 kWh/24h
	515 Kcal/h
	50%
	58 dB(A)
	12V -7 AH / 48h
	SN (+10°C to +32°C)
	5 / 75%
	automatic (hot gas)
	R507
	85 mm
	90 mm
	210 min (from -40°C to -18°C)
	1
	2004 / 108 / EEC
	2006 / 95 / EEC
	Stainless steel (V2A - 1.4301)
	Galvanized sheet steel (StO2Z-AZ150)
	Stainless steel (V2A - 1.4301)
	Wire DIN177, PA11 coated
	Polycarbonate, transparent
	White (similar to RAL9010)
	Blue (similar to RAL5002)

Version 1	Version 2
5 ■	5 ■
3 ■	-
2 ■	-
-	5 ■
Conform ■	Conform ■
A / ISO 5 □	A / ISO 5 □
□	□
□	□
□	□
■	■
■	■
■	■
□	□
□	□
□	□
Integrated, for 24h or 7 days □	Integrated, for 24h or 7 days □
■ / □	■ / □
□	□

3 ■	7 ■
-	-
Conform ■	Conform ■
B / ISO 6 □	B / ISO 6 □
□	□
□	□
□	□
■	■
■	■
■	■
□	□
□	□
□	□
Mounted, for 24h or 7 days □	Mounted, for 24h or 7 days □
■ / □	■ / □
□	□

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.

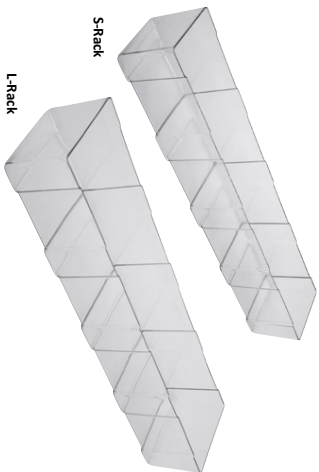
The menu structure of the modern and user-friendly graphic display offers a simple and intuitive utilization.



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 mA outlet.
- > An optional 20 mA 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.

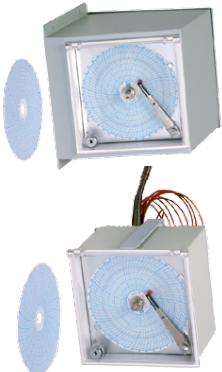
Equipment / Options (extract)



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



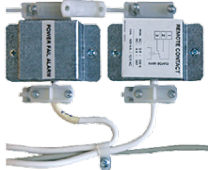
ST-Rack for the storage of plasma bags
(optional, for DFR model range 250 - 750 G)



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 DFR model range 250 - 750 G)



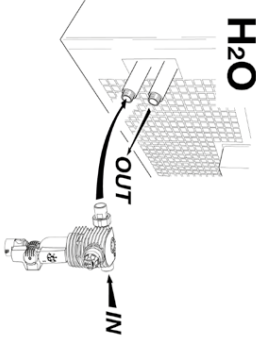
Remote temperature and power failure alarm



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



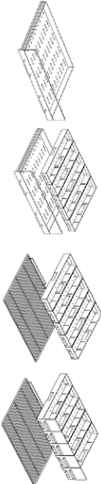
ST-Drawers with/without Front Cover, on telescopic runners with safety stop (optional for DFR model range 250 - 750 G)



Water cooling, external (ex factory)
(optional, for DFR 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) or via DECT.
- > 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

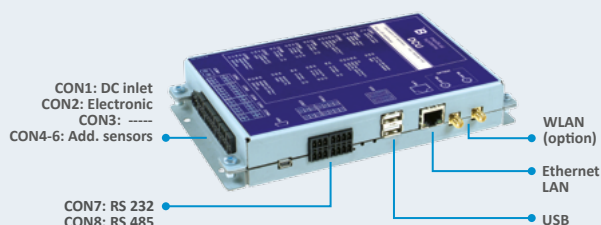
Hardware module that notes all operating conditions and passes them through to a central data base – via local network, on which devices are connected.

- > 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.