





# LABORATORY / MEDICINE / PHARMACEUTICAL REFRIGERATORS

Biomedical Refrigeration I LR / ML (with solid door)

- → Safe storage of temperature-sensitive preparations at +4°C/+5°C
- → According to DIN 58345

www.dometic.lu

#### LR range



# Refrigerators for the storage of laboratory and pharmaceutical preparations being subject to cold chain and temperature sensitivity (according to DIN 58345)

The product range LR offers volumes from 106 to 746 litres.

Being in conformity with the Dometic Gold Safety Standard these models even exceed official safety standards.

Models LR 250 G - 750 G are available as 220 V and 115 V version.

Control of the storage temperature and documentation of the temperature changes can - depending on the application - be carried out via an optional temperature recorder (in form of a circular chart recorder) or via the optional DCU, through the Monitoring & Visualization Software DMN.





## Laboratory / Medicine / Pharmaceutical Refrigerators I +4°C

The Safety Standards developed by Dometic 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 Dometic Gold Safety Standard efficiently complements the safety requirements of the Dometic Silver Safety Standard and therefore exceeds even the official standards. Gold models are denominated with a "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	LR 110 G6	LR 250 G / GG	LR 410 G / GG	LR 490 G / GG	LR 750 G / GG
DIN 58345 (Refrigerators for drugs)					
GMP Clean Room Class A / ISO 5 (ISO EN 14644-1)					
Dometic 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					
Safety thermostat prevents dropping of the cold storage products' temperature below +2°C					
Interior lighting					
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/T (+10°C to +43°C)					
Smooth castors with stabilizers for optimum flexibility of movement					
RS485 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 – Dometic Communication Unit					

standard optional - not available













DIN 58345











Gross volume	106 I	2461	
Net volume	92 I	92   167	
External dimensions (H x W x D)	820 x 560 x 580 mm	1305 x 850 x 785 mm	
Inner dimensions (H x W x D)	495 x 470 x 455 mm	655 x 680 x 552 mm	
Net weight (with standard equipment)	69 kg	135/131 kg	
Set temperature (preset)	+4°C	+4°C	
Set temperature (setting range) can be adjusted in steps of 0.1 °C	+4°C to +15°C	+4°C to +15°C	
Cold alarm limit (preset)	+2°C	+2°C	
Warm alarm limit (preset)	+6°C	+6°C	
Control sensor	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	
Display sensor, optional	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	
Frequency 220-240 V	50/60 Hz	50/60 Hz 50 Hz	
Frequency 115 V	_	60 Hz –	
Power 220-240 V	80 W	215 W 120 W	
Power 115 V	_	295 W -	
Energy consumption 220-240 V	0.75 kWh/24h	1.40 kWh/24h   0.90 kWh/24h	
Energy consumption 115 V	_	1.30 kWh/24h –	
Heat emission 220-240 V	14 Kcal/h	26 Kcal/h 21 Kcal/h	
Heat emission 115 V	_	33 Kcal/h -	
Compressor running time 220-240 V	20%	15% 20%	
Compressor running time 115 V	_	13% –	
Noise level (at 1m height & 1m distance) 220-240 V	41 dB(A)	49 dB(A) 42 dB(A)	
Noise level (at 1m height & 1m distance) 115 V	-	55 dB(A) –	
Accu data / function time of the control panel when power failure	12V -7 AH / 48 hours	12V -7 AH / 48 hours	
Climate class (ambiant temperature range)	SN/T (+10°C to +43°C)	SN/T (+10°C to +43°C)	
Relative humidity range	≤ 75%	≤ 75%	
Defrosting technique	natural	natural	
Refrigerant type	R600a	R134a R600a	
Door insulation (polyurethane)	45 mm PU + 20 mm VIP	100 mm	
Casing insulation (polyurethane)	25 mm PU + 20 mm VIP	85 – 95 mm	
Hold over time	130 min (from +4°C to +10°C)	228 min (from +4°C to +10°C)	
Safety class	1	1	
EMC directive	2004 / 108 / EEC	2004 / 108 / EEC	
Low voltage directive	2006 / 95 / EEC	2006 / 95 / EEC	
GMP – clean room classification	A/ISO5	A/ISO5	
Material inner body	Stainless steel (V2A – 1.4301)	Stainless steel (V2A – 1.4301)	
Material outer casing & door	Galvanized sheet steel (STO2Z-AZ150)	Galvanized sheet steel (STO2Z-AZ150)	
Material Drawers	Stainless steel (V2A – 1.4301)	Stainless steel (V2A – 1.4301)	
Material Wire Shelves	Wire DIN 172-2, PA11 coated	Wire DIN 172-2, PA11 coated	
Material N-Rack	_	Polycarbonate, transparent	
Color outer casing	White (similar RAL 9010)	White (similar RAL 9010)	
Color contrasts	Blue (similar RAL 5002)		
ATEX category III, zone 2, interior (without light, only with inox wire shelves)	Ó	_	

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

Standard interior equipment	2 Wire Shelves ■	2 Wire Shelves
RS485 interface		
DMN Software package		
DCU LAN/WLAN		
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 for optimum flexibility of movement	_	
Interior lighting		
Integrated temperature recorder in form of a circular chart recorder/recording range: -10°C to +20°C	for 24h or 7 days □	for 24h or 7 days □
External water cooling	_	
Door hinge right		
Door hinge left		
Wooden packaging for ocean transport / export		

■ standard / □ optional / – not available

All values were measured at  $\pm 25\,^{\circ}\text{C}$  ambient temperature and without load (with inertial mass).

LR 490 G / GG

LR 750 G / GG







	408 I		
319			
1735 x 850 x 785 mm			
1085 x	680 x 552 mm		
	167/161 kg		
	+4°C		
	+4°C to +15°C		
	+2°C		
	+6°C		
PT1000 2-WIF	RE 1/3DIN CL.B		
	± 0,2°C		
PT1000 2-WIF	RE 1/3DIN CL.B		
	± 0,2°C		
50/60 Hz	50 Hz		
60 Hz	_		
240 W	120 W		
285 W	_		
1.60 kWh/24h	0.95 kWh/24h		
1.55 kWh/24h	_		
31 Kcal/h	24 Kcal/h		
42 Kcal/h	_		
15%	22%		
17%	_		
51 dB(A)	42 dB(A)		
55 dB(A)	-		
12V –7 AH / 48 hours			
	10°C to +43°C)		
- ' (	≤ 75%		
	natural		
R134a	R600a		
	100 mm		
85 – 95 mm			
258 min (from +4°C to +10°C)			
230 11111 (110111 +4 0 10 +10 0)			
2004 / 108 / EEC			
2006 / 95 / EEC			
A / ISO 5			
Stainless steel (V2A – 1.4301)			
Galvanized sheet steel			
(STO2Z-AZ150)			
Stainless steel (V2A – 1.4301)			
Wire DIN 172-2, PA11 coated			
Polycarbonate, transparent			
White (similar RAL 9010)			
Blue (similar RAL 5002)			

489 I			
	395 I		
1950 x	850 x 785 mm		
1300 x	680 x 552 mm		
	182/176 kg		
	+4°C		
	+4°C to +15°C		
	+2°C		
	+6°C		
PT1000 2-WIF	RE 1/3DIN CL.B		
	± 0,2°C		
PT1000 2-WIF	RE 1/3DIN CL.B		
	± 0,2°C		
50/60 Hz	50 Hz		
60 Hz	_		
265 W	120 W		
320 W	_		
1.80 kWh/24h	1.00 kWh/24h		
1.90 kWh/24h	_		
35 Kcal/h	27 Kcal/h		
44 Kcal/h	_		
17%	25%		
16%	_		
51 dB(A)	42 dB(A		
55 dB(A)	_		
12V –	7 AH / 48 hours		
SN/T (+10°C to +43°C)			
≤ 75%			
	natural		
R134a	R600a		
100 mm			
	85 – 95 mm		
258 min (from	+4°C to +10°C)		
	1		
2004 / 108 / EEC			
2	2006 / 95 / EEC		
	A / ISO 5		
Stainless steel (V2A - 1.4301)			
Galvanized sheet steel			
(STO2Z-AZ150)			
Stainless steel (V2A - 1.4301)			
Wire DIN 172-2, PA11 coated			
Polycarbonate, transparent			
White (similar RAL 9010)			
Blue (similar RAL 5002)			

	746 I			
620 I				
1990 x 910 x 985 mm				
1352 x	1352 x 730 x 760 mm			
	219/213 kg			
	+4°C			
	+4°C to +15°C			
	+2°C			
	+6°C			
PT1000 2-WIF	RE 1/3DIN CL.B			
DT1000 0 14/15	± 0,2°C			
P11000 2-WIF	RE 1/3DIN CL.B			
50/00 11	± 0,2°C			
50/60 Hz	50 Hz			
60 Hz	100.144			
280 W	120 W			
330 W	1 10 13/1/15/04/5			
1.90 kWh/24h	1.10 kWh/24h			
2.00 kWh/24h	07 1/2 21/2			
48 Kcal/h 57 Kcal/h	27 Kcal/h			
20%	26%			
20%	2070			
51 dB(A)	42 dB(A)			
55 dB(A)	72 UD(A)			
	7 AH / 48 hours			
	10°C to +43°C)			
3.0.1	≤ 75%			
	natural			
R134a	R600a			
	85 mm			
	90 mm			
216 min (from	+4°C to +10°C)			
,	í			
20	004 / 108 / EEC			
2	2006 / 95 / EEC			
	A / ISO 5			
Stainless steel (V2A – 1.4301)				
Galvanized sheet steel				
(STO2Z-AZ150)				
Stainless steel (V2A – 1.4301)				
Wire DIN 172-2, PA11 coated				
Polycarbonate, transparent				
White (similar RAL 9010) Blue (similar RAL 5002)				
Blue (sir	milar KAL 5002)			



4 Wire Shelves ■	5 Wire Shelves ■
for 24h or 7 days □	for 24h or 7 days □

5 Wire Shelves ■
for 24h or 7 days □

#### ML range



# Refrigerators for the storage of laboratory and pharmaceutical preparations being subject to cold chain and temperature sensitivity (according to DIN 58345)

The product range ML offers volumes from 155 to 1301 litres including one combined refrigerator/freezer model. Being in conformity with the Dometic Silver Safety Standard these models ensure a reliable and safe operation.

Control of the storage temperature and documentation of the temperature changes can - depending on the application - be carried out via an optional temperature recorder (in form of a circular chart recorder) or via the optional DCU, this through the Monitoring & Visualization Software DMN



## Laboratory / Medicine / Pharmaceutical Refrigerators I +5°C

The Safety Standards developed by Dometic 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 Dometic Silver Safety Standard ensures the reliable and safe operation of all Dometic 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	ML 155 SG	ML 320 S	ML 355 S	ML 360 CS	ML 580 S
DIN 58345 (Refrigerators for drugs)					
GMP Clean Room Class B / ISO 6 (ISO EN 14644-1)					
Dometic Electronic					
Key-operated power switch (power ON/OFF)					
Safety door lock					
Digital temperature indicator (display: 0.1 digits)					
Controlled fan cooling system ¹ for constant temperature and even temperature distribution across the entire refrigerating chamber. Automatic 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					
The alarm history on the operation and control panel stores all the relevant values during a temperature alarm, such as: min., max. and average temperature and also the duration of the alarm	•	•	•	•	•
Alarm function test: simulation of a temperature rise or drop in order to test the alarm system					•
Control via self-diagnostic system					
Safety thermostat <sup>1</sup> prevents dropping of the cold storage products' temperature below +2°C					
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)					
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 - Dometic Communication Unit					

■ standard □ optional - not available

<sup>1</sup> not for deep freezer of the refrigerator/deep freezer combination ML 360 CS













DIN 58345











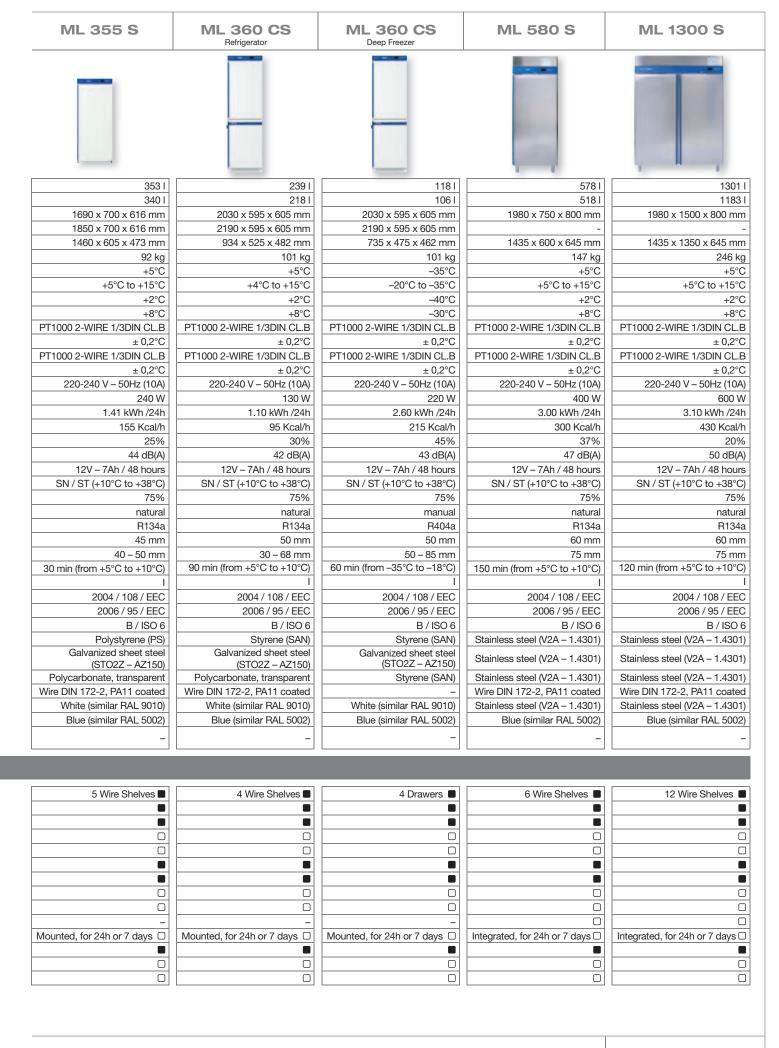
Gross volume	155	322
Net volume	141	274
External dimensions (H x W x D)	900 x 595 x 630 mm	1830 x 595 x 605 mm
External dimensions (H x W x D) (with mounted temperature recorder)	1075 x 595 x 630 mm	1990 x 595 x 605 mm
Inner dimensions (H x W x D)	745 x 495 x 455 mm	1496 x 500 x 455 mm
Net weight (with standard equipment)	46 kg	80 kg
Set temperature (preset)	+5°C	+5°C
Set temperature (setting range) can be adjusted in steps of 0.1 °C	+4°C to +15°C	+4°C to +15°C
Temperature cold alarm limit (preset)	+2°C	+2°C
Temperature warm alarm limit (preset)	+8°C	+8°C
Control sensor	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
Display sensor, optional	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
Voltage	220-240 V - 50Hz (10A)	220-240 V - 50/60Hz (10A)
Power	70 W	140 W
Energy consumption	0.54 kWh /24h	1.10 kWh /24h
Heat emission	12 Kcal/h	120 Kcal/h
Compressor running time	20%	29%
Noise level (at 1m height & 1m distance)	41 dB(A)	42 dB(A)
Accu data / function time of the control panel when power failure	12V – 7Ah / 48 hours	12V – 7Ah / 48 hours
Climate class (ambiant temperature range)	SN / ST (+10°C to +38°C)	SN / ST (+10°C to +38°C)
Relative humidity	75%	75%
Defrosting technique	natural	natural
Refrigerant type	R600a	R134a
Door insulation (polyurethane)	90 mm	70 mm
Casing insulation (polyurethane)	30 – 55 mm	50 – 55 mm
Hold over time	70 min (from +5°C to +10°C)	60 min (from +5°C to +10°C)
Safety class	I	I
EMC directive	2004 / 108 / EEC	2004 / 108 / EEC
Low voltage directive	2006 / 95 / EEC	2006 / 95 / EEC
GMP - clean room classification	B / ISO 6	B/ISO6
Material inner body	Polystyrene (PS)	Styrene (SAN)
Material outer casing and door	Galvanized sheet steel (STO2Z – AZ150)	Galvanized sheet steel (STO2Z - AZ150)
Material Drawers	Polycarbonate, transparent	Polycarbonate, transparent
Material Wire Shelves	Wire DIN 172-2, PA11 coated	Wire DIN 172-2, PA11 coated
Color outer casing	White (similar RAL 9010)	White (similar RAL 9010)
Color contrasts	Blue (similar RAL 5002)	Blue (similar RAL 5002)
ATEX category III, zone 2, interior	option, without light, only with inox wire shelves	option, without light, only with inox wire shelves

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

Standard interior equipment	3 Wire Shelves ■	6 Wire Shelves ■
RS 485 interface		
DMN Software package		
DCU - Dometic 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		
Interior lighting		
Smooth castors with stabilizers	_	_
Temperature recorder in form of a circular chart recorder / recording range: -10°C to +20 °C	Mounted, for 24h or 7 days □	Mounted, for 24h or 7 days □
Door hinge right		
Door hinge left		
Wooden packaging for ocean transport / export		

■ standard / □ optional / – not available

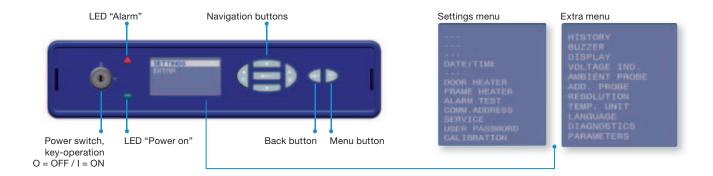
All values were measured at +25°C ambient temperature and without load (with inertial mass).



#### **Dometic Electronic**

The new and innovative Dometic 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 Dometic 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 4...20 mA outlet to transmit temperature data of a sensor connected to the electronic.
- → Connection facilities for additional (optional) temperature sensors.
- → DMN (Dometic Monitoring Network) and the (optional) DCU (Dometic Communication Unit) allows illustration of texts on the product's display.

# **Equipment / Options (extract)**

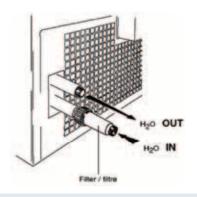


**Temperature recorder** (in form of a circular chart recorder) (optional, within the mounted casing for ML model range, integrated for LR model range)



Remote temperature and power failure alarm

# **Equipment / Options (extract)**



**Water cooling,** external (ex factory) (optional, for LR model range 250 G/GG – 750 G/GG)



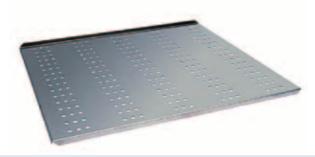
**ST-Drawers** with/without Front Cover, on telescopic runners with safety stop (optional, for LR model range)



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



Wire Shelves in different sizes, depending on model



**ST-Cover for Wire Shelf** (optional, for LR model range 250 G/GG - 750 G/GG)



**AL-Drawer** with telescopic rails with stop as standard (optional, for ML models)





**PC-Drawer** with sliding profiles as a standard (optional, for ML models)



AL-Kit (aluminium) for AL-Drawers



**PC-Kit (polycarbonate)** for PC-Drawers



## **DMN - Dometic 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 Dometic 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 - Dometic Communication Unit**

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

- → Interface connection of Dometic 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
- → 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

