FR/DF SERIES
Freezers and ULT Freezers

N-smart

FR / DF SERIES

Freezers and ULT Freezers

DirectFREEZE™
FAST, CONTACT FREEZING

With its cooling coils entirely situated inside the chamber, unlike other brands whose coils are outside the walls of the chamber, 100% of the cooling power is available to freeze the samples and keep them frozen. The placement of the coils throughout the storage volume provides unbeatable homogeneity, so that all samples are maintained under identical conditions, ensuring that evaluations done using these samples can be compared with confidence.

Since sample containers can be placed directly on the shelves containing the cooling coils, heat is removed by conduction that is many times more efficient than relying on conventional convection through the air.

• Freezing through the cooling coils located inside the shelves

• Faster freezing than conventional freezers that use only convection

• All cooling power is used for the freezing of the samples, not the body

• Excellent temperature stability and homogeneity with direct cooling inside the chamber

• Fast and efficient freezing since the samples are directly in touch with the cooling source

• Optimized recovery time after a door opening

Fast Freezing

DirectFREEZE™

TECHNICAL SPECIFICATIONS

	FR 290	FR 490	FR 590	DF 290	DF 490	DF 590
Minimum Temperature	-41 °C*			-86 °C**		
Freezing System	DirectFREEZE™ cooling coils in shelves inside the chamber					
Control System	N-Smart™					
Display	4,3" Colourful LCD Display					
Chamber Configuration	3 independent compartments with insulated inner doors	4 independent compartments with insulated inner doors		3 independent compartments with insulated inner doors	4 independent compartments with insulated inner doors	
Temperature Homogeneity	±3°C***					
Temperature Stability	±0.5°C***					
Temperature Alarm Range	Set point +5°C / +10°C			Set point +5°C / +25°C		
Remote and Central Alarm Contact	For all alarm conditions					
Alarm Back-up	12-hour with automatically recharged battery					
Insulation	High density injected polyurethane					
Internal Material	Stainless steel					
External Material	Epoxy-polyester powder coated stainless steel					
Chamber Volume, Litres	260 (Up to 18,000 cryotubes in cryoboxes)	455 (Up to 32,000 cryotubes in cryoboxes)	560 (Up to 40,000 cryotubes in cryoboxes)	260 (Up to 18,000 cryotubes in cryoboxes)	455 (Up to 32,000 cryotubes in cryoboxes)	560 (Up to 40,000 cryotubes in cryoboxes)
Power Consumption	900 W	900 W	900 W	1600 W	1600 W	1600 W
Power Supply	230 V, 50 Hz					
Internal Dimensions (WxDxH) mm	420 x 630 x 995	555 x 630 x 1320	555 x 770 x 1320	420 x 630 x 995	555 x 630 x 1320	555 x 770 x 1320
External Dimensions (WxDxH mm	680 x 975 x 1630	820x 975 x 2010	820 x 1120 x 2010	680 x 975 x 1715	820x 975 x 2035	820 x 1120 x 2035
Packing Dimensions (WxDxH) mm	1030x1020x1950	1030x1020x2140	1310x970x2230	1030x1020x1950	1030x1020x2140	1310x970x2230
Net / Packed Weight kg.	210 / 245	255 / 295	282 / 414	245 / 272	285 / 330	312 / 444

*At 30°C ambient   **At 20°C ambient   *** Measured from the samples

FACTORY FITTED OPTIONS

DF XXX Y   Weekly temperature chart recorder 0°C / -100°C   FR XXX Y   Weekly temperature chart recorder 0°C / -50°C

OPTIONS AND ACCESSORIES

A 08 191   AlerText™ GSM alarm module
K 13 009   NuveWarn™ remote alarm system with 10 m cable
A 08 195   NuveCloser™ Software CD with 3 m. RS 232 cable
A 08 135 CO_2 back up unit
A 08 203   Rack with two drawers   (DF/FR 290)
A 08 204   Rack with three drawers   (DF/FR 290)
A 08 152   Rack with two drawers   (DF/FR 490)
A 08 150   Rack with three drawers   (DF/FR 490)
A 08 196   Rack with two drawers   (DF 590)
A 08 197   Rack with three drawers   (DF 590)
A 08 137   Rack for 135x135x50 mm PP cryoboxes
                (Rack capacity: 20 boxes) (DF-FR 290/490)
A 08 180   Rack for 135x135x50 mm cryoboxes
                (Rack capacity: 20 boxes) (DF-FR 290/490)
A 08 151   Rack for 135x135x75 mm cryoboxes
                (Rack capacity: 16 boxes) (DF-FR 290/490)
A 08 198   Rack for 133x133x75 mm cryoboxes
                (Rack capacity: 20 boxes) (DF/FR 590)
A 08 199   Rack for 137x137x50 mm cryoboxes
                (Rack capacity: 25 boxes) (DF/FR 590)

A 08 200   Rack for 135x135x50 mm PP cryoboxes
                (Rack capacity: 25 boxes) (DF/FR 590)
A 08 138   PP Cryobox 133x133x52 mm capacity 9 x 9 tubes
A 08 165   PP Cryobox 133x133x75 mm capacity 9 x 9 tubes
A 08 171   Cryobox 133x133x50 mm
A 08 172   10x10 Divider for up to Ø 12 mm tubes.
                Divider height: 30 mm.
A 08 173   9x9 Divider for up to Ø 13.6 mm tubes
                Divider height: 30 mm
A 08 155   Cryobox 135x135 mm Height 75 mm
A 08 158   10x10 Divider for up to Ø 12 mm tubes
                Divider height: 65 mm.
A 08 159   9x9 Divider for up to Ø 13.6 mm tubes
                Divider height: 65 mm.
A 08 160   Diagram paper for chart recorder 0°C / -100°C
                (Pack of 100)
A 08 070   Pen for chart recorder

When choosing dividers, take into account the diameter of the cap on the cryotube. Other types of cryoboxes and dividers can be supplied on request.
Contact us for custom storage requirements.

OPTIMIZED FUNCTIONALITY AND RUGGED DESIGN

A cooling coil is at the top (naturally the warmest part) of every chamber to reduce temperature gradients. Thick shelves, incorporating the coils, block the gaps between inner doors, limiting air exchange and cooling any air that enters in before it reaches the samples. In the long term, snow is created instead of ice because of the maintenance of the cold air in the sealed compartments.

• Independent compartments with insulated doors for decreasing air entry

• Minimized air exchange on opening reduces ice build-up and protects samples

• Compartment dimensions match commonly used cryoboxes

• Washable air filter for simple maintenance and top performance

• Perfect airtightness with soft gasket

• Heated contact surface of gasket to virtually eliminate icing-up

• Chamber made of stainless steel for long life and shelves made of aluminium for faster heat transfer

• Epoxy polyester powder coated stainless steel outer body

• Foamed-in-place high density polyurethane insulation

• Easy to move with their castors

RELIABLE AND POWERFUL CONTROL SYSTEM: N-Smart™

• Maximum information with highly visible 4,3" colourful LCD display

• Four context-sensitive function keys for versatile & easy use

• Password protected menu to secure run parameters and data

• With 5 Language options: Turkish, English, French, Russian, Spanish

• Icons make the operations easier for immediate understanding
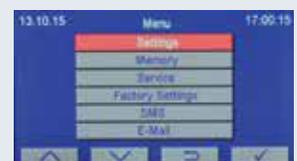
OPTIMAL SOLUTIONS FOR SAMPLE STORAGE

Our racking system design has been optimized to accommodate the maximum number of samples in the available space, optimizing return on your investment and minimizing the floor space required for storage. Our standard series responds to the majority of requirements and our custom manufacturing service ensures that we have an answer to your special needs

• Racks for most commonly used cryoboxes and storage vials

• Drawers for the storage of different types of samples such as plasma bags, flasks

• Custom made racks and drawers are available

RACKS FOR CRYOBOXES

Freezer Model	Code	Box Dimensions (mm) and Type	No. of cryoboxes per racks	No. of rack per freezer	Total no. of cryoboxes per freezer	Max. total tube capacity
DF/FR 290	A 08 137	13x135x50 mm PP Box	20	9	180	18,000
	A 08 180	13x135x50 mm Cardboard Box	20	9	180	18,000
	A 08 151	13x135x75 mm Cardboard/PP Box	16	9	144	14,400
DF/FR 490	A 08 137	13x135x50 mm PP Box	20	16	320	32,000
	A 08 180	13x135x50 mm Cardboard Box	20	16	320	32,000
	A 08 151	13x135x75 mm Cardboard/PP Box	16	16	256	25,600
DF/FR 590	A 08 200	13x135x50 mm PP Box	25	16	400	40,000
	A 08 199	13x135x50 mm Cardboard Box	25	16	400	40,000
	A 08 198	13x135x75 mm Cardboard/PP Box	20	16	320	32,000

DRAWERS

| Freezer Model	Code	Rack Type	Drawer Dimensions (mm)	No. of rack per freezer	Total no. of drawers per freezer
DF/FR 290	A 08 203	Rack with two drawers	192x530x143	6	12
	A 08 204	Rack with three drawers	192x530x95	6	18
DF/FR 490	A 08 152	Rack with two drawers	260x530x143	8	16
	A 08 150	Rack with three drawers	260x530x95	8	24
DF/FR 590	A 08 196	Rack with two drawers	260x665x143	8	16
	A 08 197	Rack with three drawers	260x665x95	8	24

FULL TRACEABILITY AND REMOTE ACCESS

• Operating parameters tracked digitally or graphically against time

• Massive data storage with internal memory which stores records

up to ten years with one hour intervals, digitally and graphically

• Selectable recording frequency for storing temperature data on

memory stick: 10 or 30 seconds, 1, 5, 30 or 60 minutes

• PC connection through USB port

• Ethernet port for remote access through internet by means of optional

NuveCloser™ software

• NuveCloser™ allows access to operating parameters, memory, failure

history and other technical parameters

• Optional battery operated weekly chart recorder with key lock providing permanent record of storage conditions with its high resolution
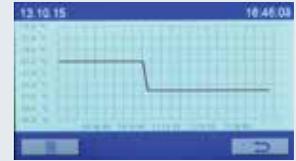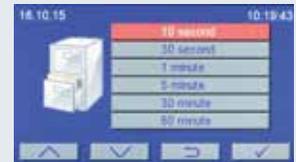
MAXIMUM SAFETY FOR HIGH VALUE SAMPLES

NUVE knows that the contents of a low temperature freezer are usually worth many times the cost of the freezer itself. That is why we have incorporated numerous features dedicated to security.

No need to worry what is happening in your absence. A full set of alarm are built in and various optional features will inform you instantly and wherever you are.

• Password protected control system

• Door with key lock

• Key operated mains power switch to protect the samples

• Audible and visual alarm system for :

  - High temperature conditions - Power failure - Open door

  - Temperature sensor failure   - Refrigeration failure - Clogged air filter
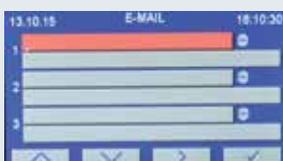
• Colour of the display changes to red in case of any alarm condition

• Automatically rechargable battery for alarm system

• Display of the actual temperature even at power failure

• Memory for the last 50 failures for easy servicing

• Remote failure diagnostics by means of NuveCloser™ software

• Sending e-mails up to five e-mail addresses with the details of failure

• Standard remote and central alarm ports

• Optional battery-operated 7-day chart recorder

• Optional AlerText™ SMS alarm system for ultimate security

• Optional NuveWarn™ remote alarm system

• Optional CO2 back-up system extends protection in case of failure (DF only)