

## Anexa tehnica, Lot 2, Frigider pentru reactivi cu usa transparenta 300-400L

### Model Vestfrost AKG 397

Parametri solicitati	Parametri oferiti
<p>Frigider pentru reactivi cu usa transparenta 300-400L</p> <p>Cod 140720</p> <p>Descriere Frigidere proiectate pentru a stoca produse de laborator, culturi și probe la temperaturi de obicei între 2 și 8 grade Celsius. Aceste frigidere constau în mod obișnuit dintr-o cameră cu un interior rezistent la coroziune (oțel inoxidabil de obicei), minimizarea riscului de alterare, contaminare și / sau coroziune a conținutului.</p> <p>Parametrul Specificația</p> <p>Configurație mobil</p> <p>Capacitatea 300-400 l</p> <p>Număr de rafturi <math>\geq 6</math></p> <p>Ușa Număr <math>\geq 1</math></p> <p>Descriere transparenta</p> <p>Mecanism blocare cu cheie</p> <p>Roți da</p> <p>Frîne da</p> <p>Lumină interior da</p> <p>Construcție interioară materiale anti-bacterial prevazut pentru prelucrare</p> <p>Construcție exterioară cu acoperire anticorozivă</p> <p>Afisaj temperatură digital</p> <p>Alarme acustică vizuală</p> <p>Răcire ventilată</p> <p>Temperatura reglabilă 2 ... +8 °C</p> <p>Omogenitatea/ uniformitatea termică <math>\pm 2</math> °C</p> <p>Alimentare 220 V, 50 Hz</p> <p>Refrigerent fără CFC / HCFC</p> <p>Zgomot &lt; 50 dB</p>	<p>Frigider pentru reactivi cu usa transparenta 381L</p> <p>Cod 140720</p> <p>Descriere Frigidere proiectate pentru a stoca produse de laborator, culturi și probe la temperaturi de obicei între 2 și 20 grade Celsius. Aceste frigidere constau în mod obișnuit dintr-o cameră cu un interior rezistent la coroziune (PVC), minimizarea riscului de alterare, contaminare și / sau coroziune a conținutului.</p> <p>Parametrul Specificația</p> <p>Configurație mobil</p> <p>Capacitatea 381l</p> <p>Număr de rafturi 5</p> <p>Ușa Număr 1</p> <p>Descriere transparenta</p> <p>Mecanism blocare cu cheie</p> <p>Roți da</p> <p>Frîne da</p> <p>Lumină interior da</p> <p>Construcție interioară materiale anti-bacterial prevazut pentru prelucrare (PVC)</p> <p>Construcție exterioară cu acoperire anticorozivă (otel vopsit)</p> <p>Afisaj temperatură digital</p> <p>Alarme acustică vizuală</p> <p>Răcire ventilată</p> <p>Temperatura reglabilă 2 ... +20 °C</p> <p>Omogenitatea/ uniformitatea termică 2,5 / -1,2 °C</p> <p>Alimentare 220 V, 50 Hz</p> <p>Refrigerent fără CFC / HCFC</p> <p>Zgomot 41 dB</p>



PHARMACY REFRIGERATORS

# **SAFE STORAGE OF MEDICINE**



### YOUR BENEFITS

**Vestfrost Solutions has always developed new innovative features to be ahead of the high demand for medical cooling.**



#### Low Noise

We realize that our products are often placed in our user's immediate work environment. That's why it is important for us to contribute to a healthy work environment by keeping our products as quiet as possible, without compromising their performance.



#### Environment Friendly

Keeping power consumption low is not only about reducing our customers operational costs, it's also a matter of supporting them in reducing the environmental impact. On that same note we are also proud to state that our products are 80% recyclable on average.

Additionally, Vestfrost has been using natural refrigerants for more than 15 years, which means that our products are 100% CFC and HCFC free. Consequently, they carry virtually no impact on the ozone layer or the global warming.



#### User Friendly

We understand that our products serve a role as facilitator for the end user. With that in mind we develop products from a user-perspective – They must be intuitive to use, easy to operate and effortless to clean, so that the user can concentrate on what's important for them.

## TEMPERATURE PERFORMANCE



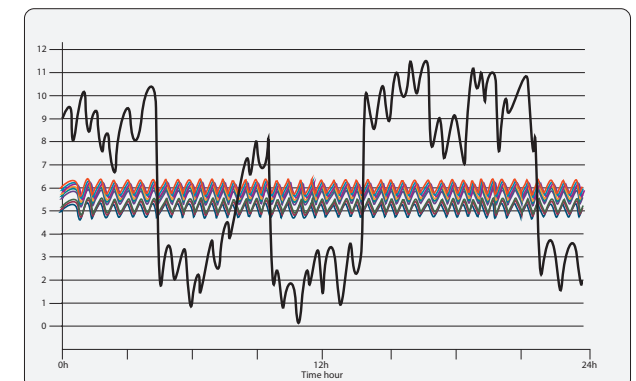
**An often overlooked, but essential parameter is the temperature performance of the refrigerator.**

Many types of medicine are susceptible to damage if not maintained in ideal temperature conditions throughout its life cycle. This poses a considerable risk both to the patients receiving the potentially damaged or ineffective medicine, and to the pharmacists in having to discard their expensive inventory.

A refrigerator's Temperature performance is therefore essential and yet often overlooked, due to lack of information or the complexity associated with understanding it.

### UNIFORMITY GRAPH

*Illustration of a 9-point test on a Vestfrost 397 with a set point of 5°C*



### Here are 3 key indicators of temperature performance:

- **Temperature stability** - The precision in terms of maintaining a set-point temperature
- **Temperature accuracy** - How closely readings will match those of a calibrated standard
- **Temperature uniformity** - The potential variation in temperature between different points (*top & bottom i.e. - see graph*)

Looking at those parameters you will find that domestic-, food- & even some biomedical refrigerators, are not adequate for safe storage of medicine.



A German Study showed an average value of 20.000€ in Medicine being stored in refrigerators at pharmacies

- What's your risk?



### What's different?

Typically a good quality biomedical refrigerator is fitted with up to 5 probes, accurately monitoring the temperature at different points inside the cabinet, ensuring that the compressor works optimally.

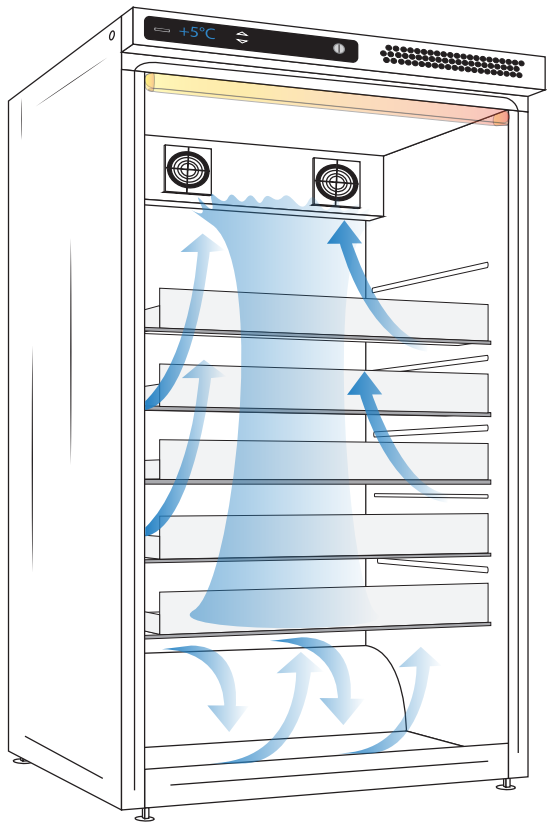
Better panels, construction and airflow are also contributing factors to a good temperature performance.

# AIRFLOW

Distribution of the airflow inside the cabinet will improve temperature uniformity.

Another contributing factor to the safe storage of medicine, is the addition of fans. By generating airflow in the cabinet they improve temperature uniformity & stability by eliminating "hot and cold spots" which you would see in domestic refrigerators & refrigerators with no or inadequate airflow.

These hot and cold spots often entails that areas of your storage space would not be suited for medicine, as the temperature conditions can affect both the quality and effectiveness of the medicine.

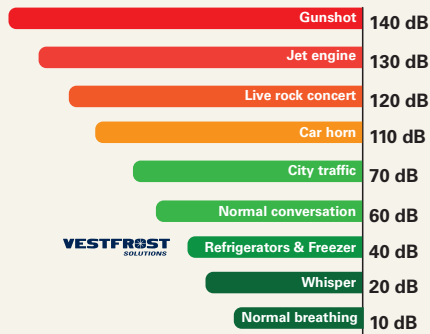


## Low noise

Biomedical appliances are located all over the world at various HealthCare and Life Science workplaces, from Hospitals and pharmacies to the local practitioner and laboratories. These can be busy environments where experts need to be able to concentrate and focus, to be at their best.

Operating under these circumstances we consider it vital to develop products that emit the lowest possible noise without compromising the performance.

A healthy work environment is critical not only for the well-being of the staff, but also for the output of their work.



# DOCUMENTATION & RISK REDUCTION

## Visual & Acoustic Alarms

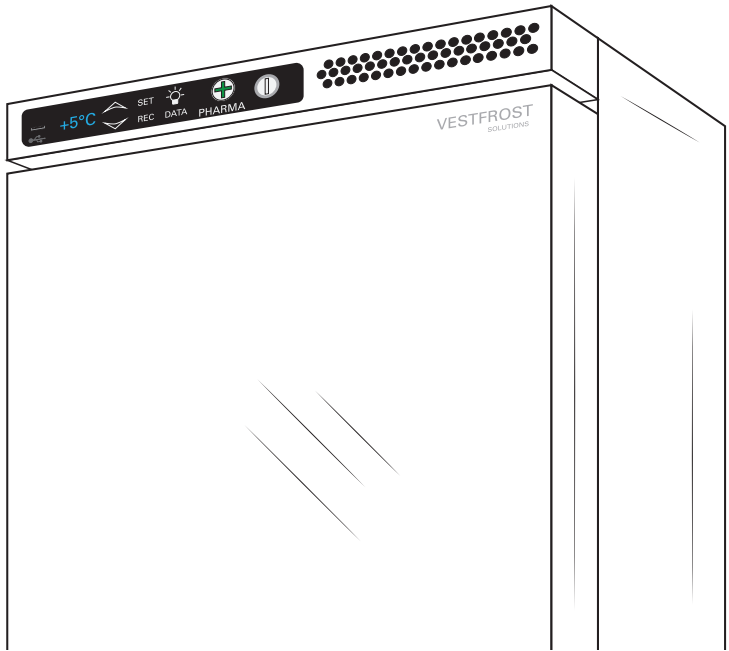
- High/Low Temperature
- Open Door
- Probe Failure
- Power Failure

## Adjustable Parameters

Change settings to fit your requirements

## Datalogger

Logs the temperature on each of the 5 probes and any alarms that may have occurred. With a capacity of 35.000 logs, it will store up to 3 years of operation, easily retrieved via USB connection



## Freeze Protection

Independent controller will shut off compressor to prevent your medicine from freezing, in the event of a malfunction

## Accurate Temperature Display

With 5 individual probes, the controller will accurately indicate the cabinet temperature



## Professional controller

Refrigerators intended for domestic use or storage of food, is equipped with a basic controller, and are often placed inside the cabinet, obscuring visibility and can result in unnecessary door openings, which affects the temperature performance. Others are placed at floor level, which is considered a contaminated area to Hospitals & pharmacies, and is ergonomically impractical to use.

Above is an illustration of some of the key advantages gained with a professional Vestfrost Pharmacy controller.



Our safe and reliable options.

With professional biomedical refrigerators from Vestfrost you reduce the risk to your valuable and sensitive storage. Our series of biomedical refrigerators comes in a variety of sizes, making it possible to pick a size that covers the requested capacity.

Larger sized cabinets use more energy, but if the capacity they offer is not really necessary it is worth considering a smaller model. Energy savings can be upwards of EUR 100 annually. As standard - our models are equipped with our BioChill™ shelf, offering a flat surface to prevent medicine packages from tipping and becoming unorganized and made in high quality & perforated aluminium which retains cold and improves airflow.

We offer a wide range of accessories giving you the flexibility to build the model the way you prefer to organize the storage. True to our commitment towards a sustainable future, the series has been made to not have a negative impact on the environment and are marked with our “Environmental friendly – icon” as your guarantee.



Vestfrost



DIN 58345




SPECIFICATIONS	R-90	R-138	337	397
Temperature range, C°	+2 to +20	+2 to +20	+2 to +20	+2 to +20
Dimensions, H x W x D, mm	652 x 595 x 642	857 x 595 x 642	1550 x 595 x 638	1919 x 595 x 638
Volume gross/net, liters	90 / 76	138 / 117	306 / 281	381 / 351
Shelves	1 + ½	2 + ½	4 + ½	5 + ½
Noise, dB	46	44	41	41
Energy consumption, kWh/24h	0,4	0,4	0,5	0,8

ACCESSORIES




Flexibility



**BioChill™ Shelf**

Features


- Perforated for airflow
- Made in Aluminum to retain cold
- Max loading: 20kg



**Stacking kit**

Features

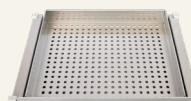
- Stack tabletop and/or undercounters
- 1 footprint for multiple temperature ranges



**BioChill™ Basket**

Features


- Perforated for airflow
- Made in ABS
- Max loading: 20kg



**BioChill™ Drawer**

Features


- Perforated for airflow
- Made in Aluminum to retain cold
- Divider kit included
- Max loading: 20kg



**Wire Shelf**

Features


- Good airflow
- Max loading: 20kg



**Glass Door**

Features

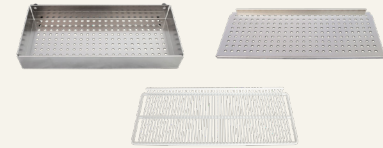
- Transparent
- Doubled layerd glass



**Extra Hardware**

Contains


- Backup Battery
- Safety Thermostat
- Probe bottle



**Bottom Storage**

Features

- Small Tray
- Small Alu shelf
- Small wire shelf



**Castors**

Features

- Functional on multiple surfaces
- Brakes to ensure stable installation
- 4x for max mobility

ISO 9001,  
13485, 14001 &  
18001 OHSAS  
Certified

# PROFESSIONAL SOLUTIONS

Vestfrost Solutions is a global developer and manufacturer of innovative and efficient refrigerators and freezers for the professional market. With more than 50 years' experience, we have strong records within manufacturing supplied to the global professional industry, where temperatures must be reliable and precise at all times. We employ numerous initiatives to reduce costs of product usage and to minimize environmental impact.

The continuously expanding product line is based on extensive research and thoroughly tested technology; all products honoring the highest requirements in terms of safety, quality and usability.

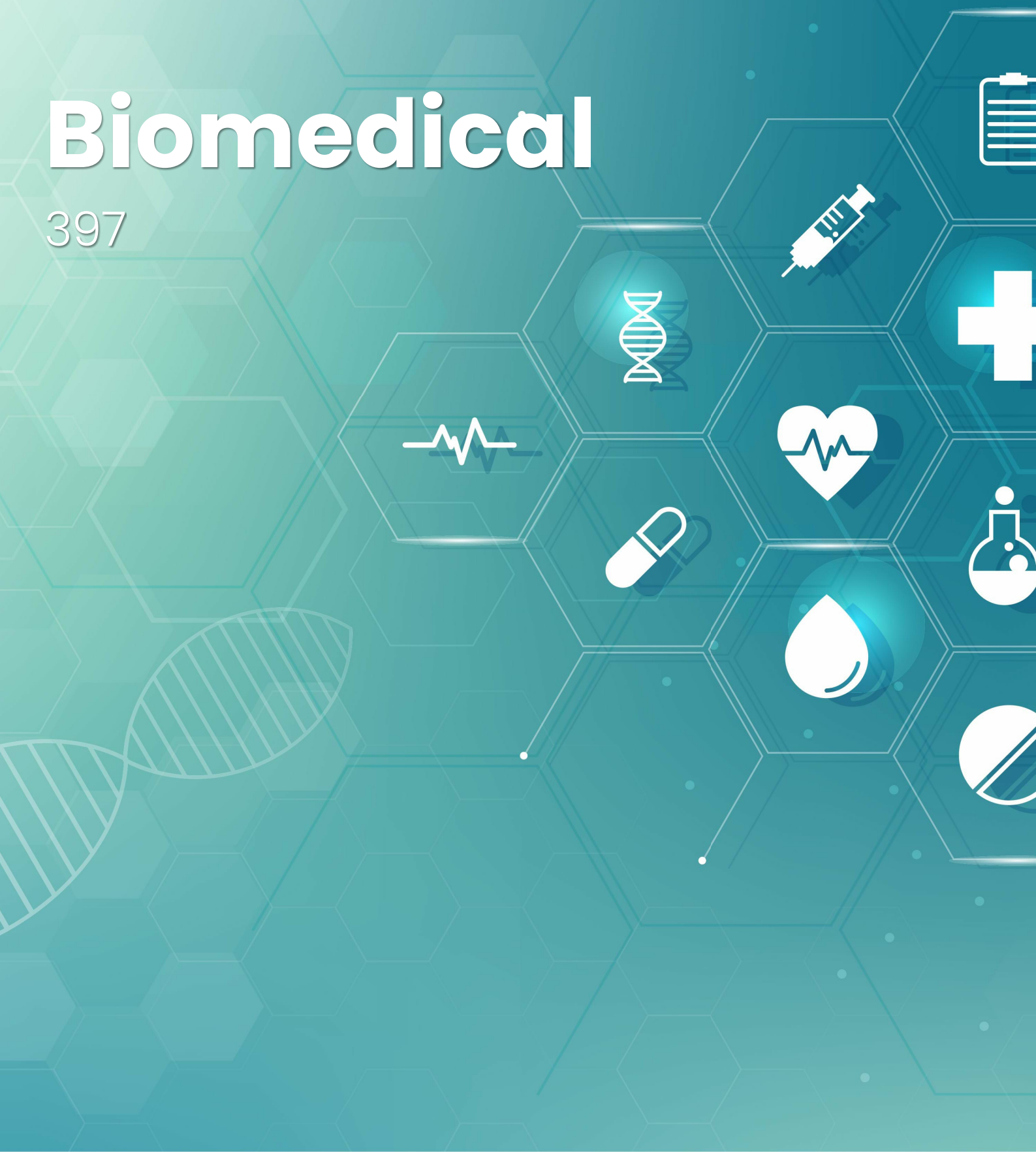
For more information, please visit our website:  
**[www.vestfrostsolutions.com](http://www.vestfrostsolutions.com)**





# Biomedical





397



## 397

### Pharmacy Refrigerator

The pharmacy refrigerator ensures reliable storage of medicine. The Model is equipped with external digital temperature display and fully electronic temperature control that ensures a correct set temperature between +2°C to +20°C. It features; Open door, high/low alarm, contact for remote alarm, porthole for external monitoring systems, dual ventilators for optimal uniformity in temperatures and for the extra hardware version power failure alarm.

-  **Energy Efficient**
-  **Very Low Noise**
-  **Stable and Uniform Temperature**
-  **ETR-system™**





## 397 | Gallery



## 397 |

Construction	Value
Dimension	1919x595x638 mm
Dimension inner	1587x518x460 mm
Weight	95 / 93 gross/net
Package weight	2 kg
Material inner cabinet	PVC Kg. gross/net
Material outer cabinet	Painted steel Kg. gross/net
Insulation type	Polyurethane with cyclopentane
Insulation thickness	35 mm
Type of packaging	Plastic with EPS
Mobility	2x Feet 2x Rollers

## 397 |

Storage	Value
Volume	381 / 351
Shelves	5
Half shelf	1

## 397 |

Features	Value
Safety thermostat	Optional
Lock	✓
LED light	✓
Battery backup	Optional
Porthole	✓
Porthole size	14,8 mm
Dry contact	✓
Reference bottle	✓
Door closure	—
Door reversibility	✓
Automatic hold 90°	—

## 397 |

Alarms	Value
High / Low temperature	✓
Open door	✓
Power failure	—
Probe failure	✓

## 397 |

Test	Value
Voltage	220-240 V
Frequency	50 Hz
Max ambient	32 °C
Max Humidity	65 %
Test condition	20

## 397 |

Operation	Value
Temperature range	+2 to +20 °C
Uniformity in performance	2,5 / -1,2 °C
Pull down time (from test condition to fabric setpoint)	50 Minutes
Hold over time (from fabric SP to critical point)	72 Minutes
Noise	41 dB
Energy 24 hours	0,8 kWh/24h
Instant Power Consumption	N/A kW
Heat Rejection	N/A W
K-Value	N/A W/m <sup>2</sup> k

## 397 |

Cooling components	Value
Refrigerant/amount	R600a / 60g Type & gram
Number of compressors	1
Internal air distribution (Type)	Dynamic
Number of probes	5
Defrost	✓

## 397 |

Controller	Value
Controller	Dixell
Controller type	XW737K
USB Connection	Yes
Data connection	MODBUS
Controller abilities	Logging of data & alarms
Controller languages	Digits
Log numbers	35000
Temperature graph in controller	—

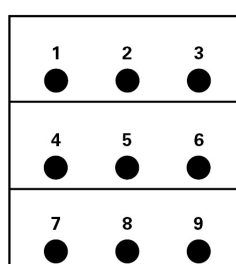
## Temperature mapping

### Test overview

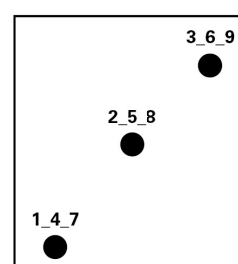
Test type	9-point test
Test environment	Controlled conditions, empty cabinet
Ambient temperature	20°C
Humidity	60%
Set-point	5°C
Sensors used	25gr tinned brass formed as a cylinder with a diameter of 15,2mm
Installation	Appliance installed according to instruction manual conditions
Refrigerant	R600a

### Sensor position

#### Front View



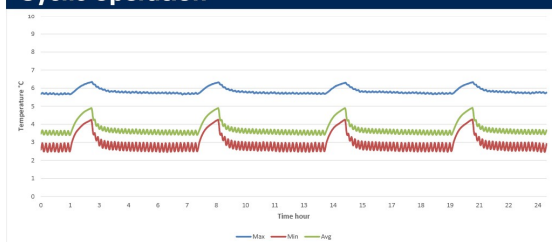
#### Top View



### Sensor temperature

Sensor position	P1	P2	P3	P4	P5	P6	P7	P8	P9
Max.	6,3	4,9	4,9	5	4,8	5	4,8	4,3	4,4
Avg.	5,8	4,2	4,2	3,3	3,2	3,3	3,8	3,1	3,2
Min.	5,6	4	4	2,8	2,7	2,8	3,4	2,6	2,7

### Cyclic operation



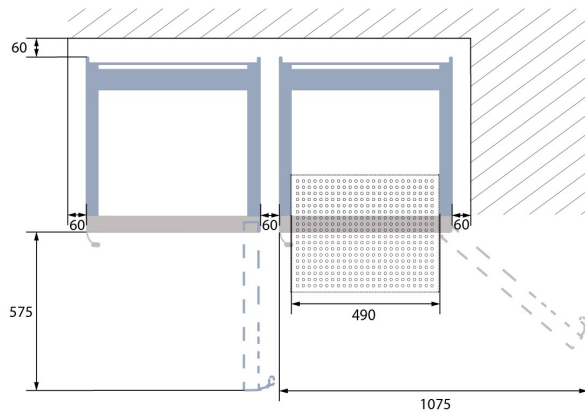
### Warm up & Pull down



### Typical Performance data

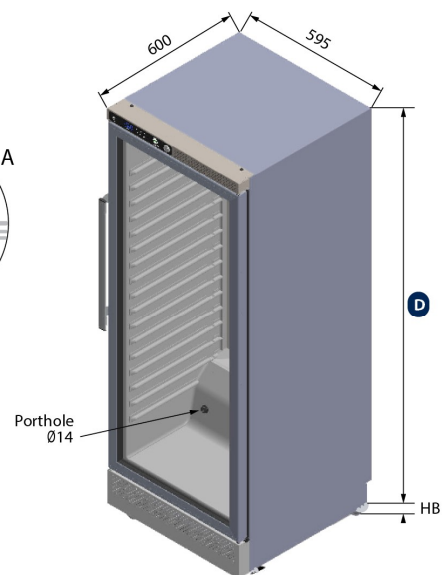
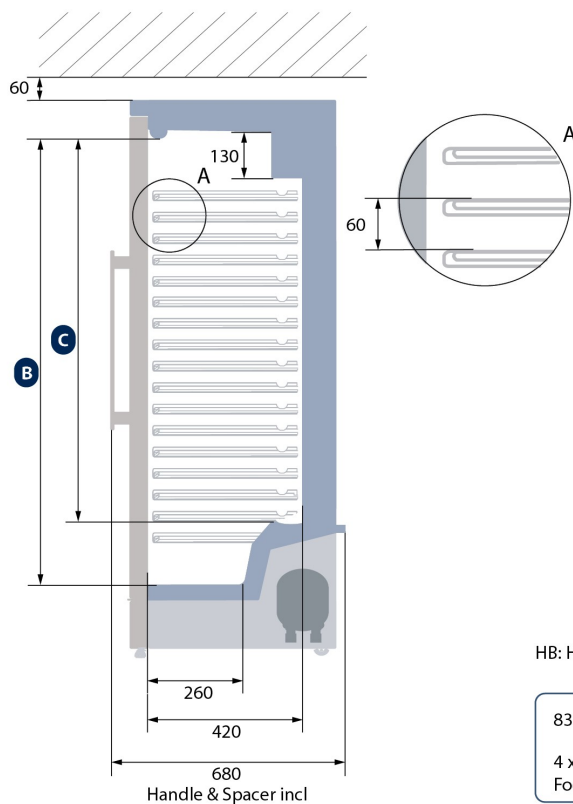
Avg. cabinet temperature	3,8°C
Peak variation from set-point	+2,5/-1,2°C
Stability in avg.	2,7°C
1 min. door open recovery to 6°C avg. temperature	15 min.
Cycle rate on/off	2,6/9,4 min.
Duty cycle	21,6%
Energy consumption	0,73 kWh/day
Pull down time to 6°C avg. temperature	50 min.
Hold over time from 5°C to 10°C	72 min.
Sample temperature does not exceed	8°C

## Dimensions



Model	B	C	D
AKS 337	1260	965	1535
AKS 397	1570	1175	1835

All measurements are in millimeters



HB: Height of base (HB is ajustastable when given value is xx-xxx)

83-101  
4 x Wheel with  
Footmaster

20-58  
13  
Front:  
2 x Ajustable foot  
Back:  
2 x Castor



