Certification by...

☑ **CE & RoHS Certified**
☑ **KGMP Certified**
☑ **ISO 9001 Certified**
☑ **PL Insurance**
☑ **Validation(IQ&OQ) Service**

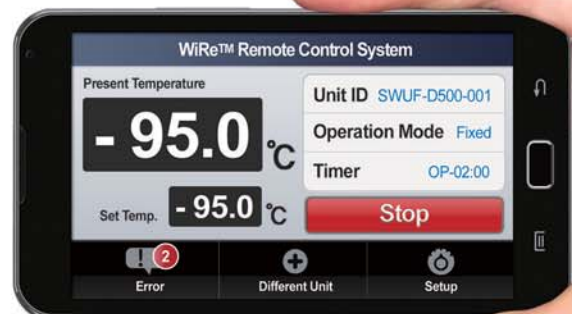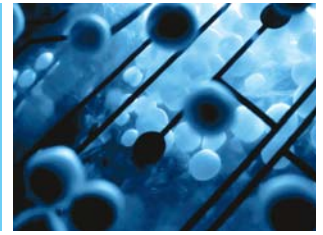# SmartCryo™ -86°C / -95°C Upright and Chest type Freezer

Dual SHFS™ — **SWUF-D** models -95°C

SHFS™ — **SWUF** models -86°C

Control in My Hand

WiRe™ Remote Control System

Present Temperature

- 95.0 °C

Unit ID SWUF-D500-001
Operation Mode Fixed
Timer OP-02:00

Set Temp. **- 95.0** °C

Stop

Error | Different Unit | Setup

DAIHAN Scientific
YOUR PARTNER *in* LABORATORY

Wisd
LABORATORY INSTRUMENTS

SmartCryo™ Ultra Low Temp. Freezer with Smart-Lab™ Controller

ULT Freezer is evolving like your Smart Phone in hand, and Smart TV at home.

The SmartCryo™ ULT Freezer is the innovation of the freezers. It has been equipped with 7-inch full-touch screen controller and integrated the most extensively applied Android System and Internet Connectivity.

Anytime! Anywhere! Anyhow!
You can monitor and control your freezers in your lab using your smart phone, tablet or on the web.

Smart-Lab™ Controller

- 7 inch full touch screen TFT LCD Controller of "Intuitive Use"
- Data Recording : On-Screen Temperature Chart and USB Storage for Recorded Data
- Internet Connectivity with WiFi
- Remote Monitoring and Control by WiRe™ Service
- Storage Management function: Record the location of samples in the chamber and find easily afterwards, on screen
- Self - Diagnostic Function : Automatic Check & Alarm for the Failures in Key parts

WiRe™ App & Web Service

- Innovative Service by DAIHAN Scientific based on Mobile and Web technology
- Support all different kinds of Web browser by HTML5 Standards
- Available in all the PCs, Laptops and MACs
- Offering Android App and Apple iOS App for Smart phone and Tablet
- Almost same UI as the Touch Screen Controller on the Equipment is available

Smart-Lab™ Controller of *SmartCryo*™ Ultra Low Temp. Freezer

① USB port:
   Data backup and program update of the controller
② Display of Present Temperature
③ Graph of Recorded Temperature
④ Configuration Setting with other functionss
⑤ Display of Set Temperature
⑥ LED Lamps indicating the operation status
⑦ Offset Setting
⑧ Storage Function to note the sample information in the chamber
⑨ Start / Stop
⑩ LCO$_2$ Injection

No Button. No Knob. Simply Touch!!
Full Touch Screen Controller and Internet Connectivity!!

The DAIHAN Smart-Lab™ Controller is embedded in SmartCryo™ ULT Freezer, which has a lot of useful functions like self-diagnostic function, data recording function, and storage management function and so on.

These functions are unique and innovative in the laboratory equipments.

Also this controller is connected with researcher's smart phone, tablet or labtop computer through Internet, by WiFi, so scientists are able to check all the equipments in the laboratory at any time, and at any place.

Features of Smart-Lab™ Controller

Main Display of Controller

» Ergonomic Screen Design

· 7″ Full Touch Screen TFT LCD
· Intuitive User Interface
· No-extra Button, knob or Switch
· All the main Functions and Parameters are displayed on the Main Screen.
· Simple Touch to set the Temperature, Time and other Parameters.

Temperature Chart Display

» Automatic Data Recording

· High Resolution Graphic Display.
· On-Screen Temperature Chart : Check the Temperature Record Graph on the Screen and could see the Details by Zoom-in & Zoom-out enabled at your finger tips.
· The Recorded Data could be transferred to PC by USB Memory.

Error Status Display

» Self Diagnostic Function

· Automatic Check & Alarm for Failures in Key Parts of the equipment.
· Real-time Notification of any Failure in the Equipment to the User(s), to the Service Man and to Supplier, through WiRe™ Service.
· Implemented by LIN and empowered by WiRe™ Service.

Storage Management Function

» Storage Management Function

· Record the location of samples in the chamber and find easily afterwards, on screen.
· Possible to easily and safely manage the location of sample in the chamber.
· Anyone could notice sample's history due to it is possible to take memo of sample location.

» Internet Connectivity with WiFi

· Internet Connectivity with WiFi
· WiRe™ App & Web Service : It is possible to monitor and control the SmartCryo™ ULT Freezer. through all smart phone, tablet on Web without restraint in time and place.

Innovative Technology to Improve the Quality of Human Life

*SmartCryo*TM **Ultra Low Temp. Freezer**
WiReTM **App & Web Service**

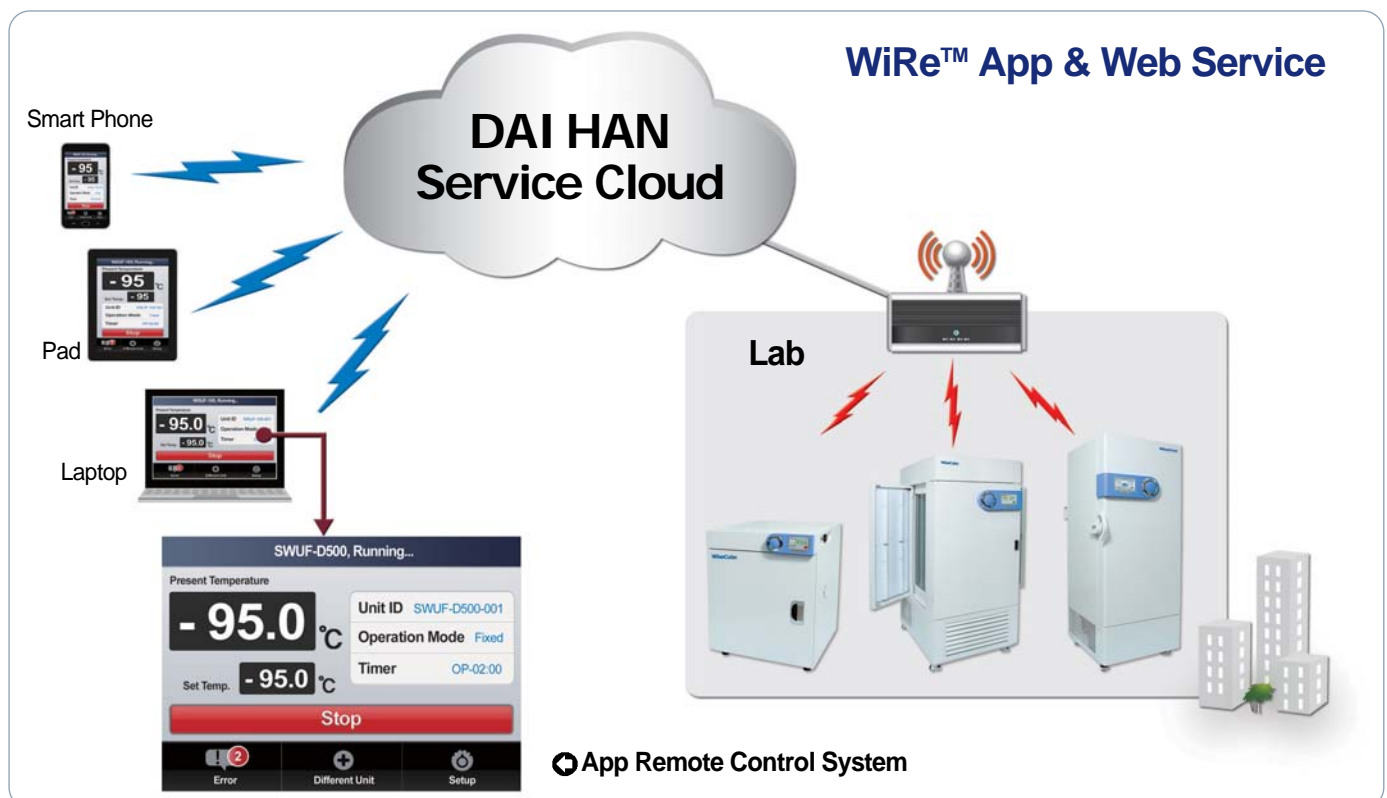## The DAIHAN WiReTM App & Web Service

Make your lab SMART with WiReTM App & Web Service offering with SmartCryoTM Ultra Low Temperature Freezers.

WiReTM App & Web service enables gathering, analyzing, and sharing of experimental data, and direct control of the unit is possible as well, anywhere and at any time.

When a defect of the unit occurs, it is processed by self-diagnostic system automatically. If you want to get safe and reliable data comfortably, it's a Smart choice to be Supported by WiReTM service.

*At anytime, Anywhere you are, and Anyhow, you can check and control the Freezer in your Lab **Using your Smart Phone or Web.***
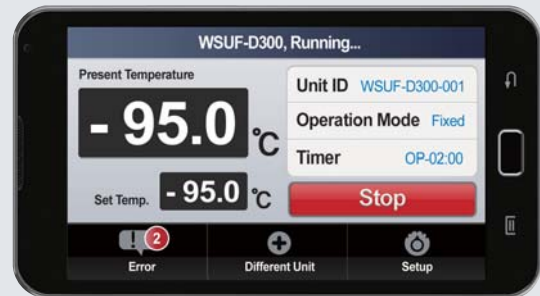

WiReTM App & Web Service

Smart Phone

Pad

Laptop

DAI HAN
Service Cloud

Lab

SWUF-D500, Running...

Present Temperature

- 95.0 °C

Unit ID   SWUF-D500-001
Operation Mode   Fixed
Timer   OP-02:00

Set Temp. **- 95.0** °C

Stop

Error   Different Unit   Setup

App Remote Control System

The Features of WiRe™ App & Web Service

Experiece the smart life at our work with SmartCryo™ ULT Freezer through WiRe™ App & Web Service !!
Once Smart-Lab™ Controller is connected with Ethernet or WiFi, you can control and monitor the unit with your own Smart Phone, Tablet PC and Laptop computer through WiRe™ App & Web Service anytime, anywhere.

- Developed by Advanced Web Technology
- Support all different kinds of Web browser by HTML5 Standards
- Almost same UI as the Touch Screen Controller on the Equipment is available
- Available in all the PCs, Laptops and MACs
- Offering Android APP and Apple iOS App

≫ WiRe™ Remote Control System

- Anytime, anywhere you are, and anyhow, you can check and control the Freezer in your Lab using your smart phone or web.
- It is possible to monitor and control the Smart-Lab™ equipment through all smart phone, tablet and web without restraint of time and place.

≫ Device Settings and User Registration

- A single unit can be remote controlled by multiple users
- A single user can remote control multiple units in the Lab
- Smart-Lab™ equipments offer registration of multiple users with simple account information
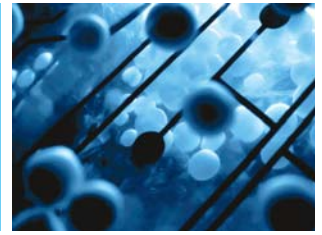

≫ Self Diagnostic Function

The Self-Diagnosis System senses a certain defect within the unit, and reports it to the service center through the servers operated by DAIHAN.
The Service Center verifies the defects of the unit received, and could offer prompt service.

Display Error Status Reporting

Innovative Technology to Improve the Quality of Human Life

SmartCryo™ Ultra Low Temp. Freezer with SHFS™ System
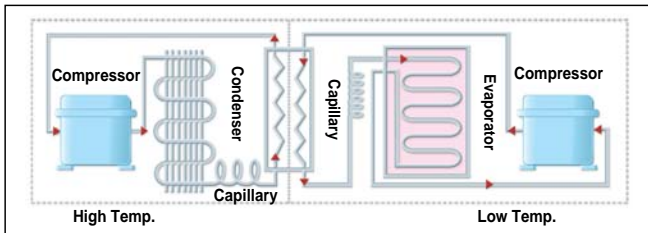
Innovation of Freezing System
DAIHAN SHFS™ System (Simplified Hi-Efficiency Freezing System)

Most of the Ultra-Low Temperature Freezers has two compressors cooperating with each other to drop the internal temperature down to -86 ℃ as shown in the following figure and its overall freezing mechanism is very complicated.
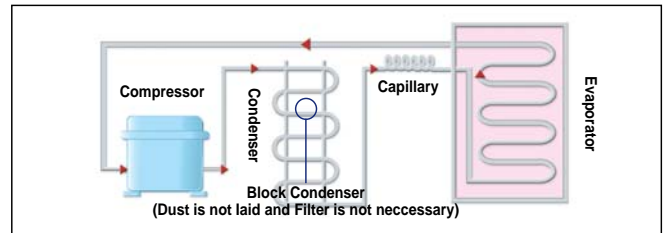
However, our new **SHFS**™ uses only single compressor. Even though, single set of a compressor, a capillary tube, a condenser and an evaporator is incorporated, it ensures the temperature down to -86 ℃ by an advanced control technology of the compressor and the process of specially mixed refrigerants. **SHFS**™ overcomes technical complexity of the typical cascaded double compressor system. Simplification of the freezing mechanism and electricity minimizes the noise, power consumption and failure of operation.

High-Efficiency! User Safety! Energy Conservation! Long Life time of **"The New Generation SHFS™"**

Simplified Hi-Efficiency Freezing System Mechanism : Easy Maintenance

Typical Cascaded Compressor System
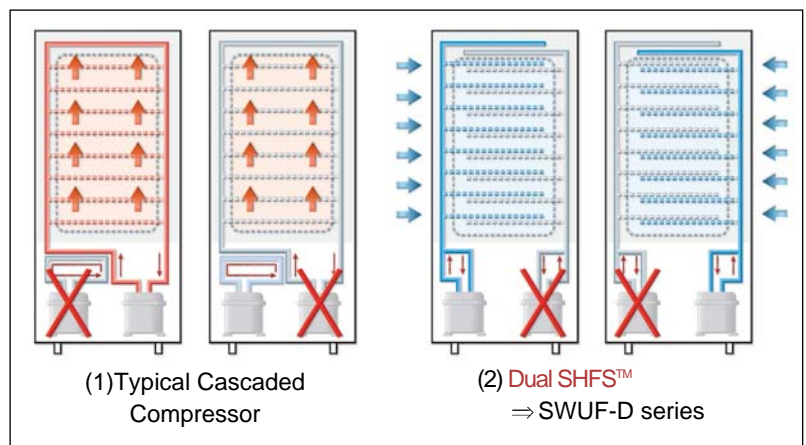Two Freezing cycles contribute Complicated mechanism

New **Simplified Hi-Efficiency Freezing System**
Single freezing cycle works only!!

Doubled Stability and Robustness! Dual SHFS™ (SWUF-D models)

We offer an extraordinary high-stability system powered by two **Simplified Hi-Efficiency Freezing System (SHFS™)** operating independently. Normally, both of the two compressors are running, and it drops the temperature inside the storage chamber down to −95°C. Even if one SHFS™ fails in operation by a certain unexpected problem, the other SHFS™ still works and maintains ultra-low temperature down to −80°C. It means one SHFS™ works as a 'backup' of the other SHFS™. This innovative mechanism realizes doubled stability, robustness and fault tolerance, which are the most important feature of the ULT freezer needed by all the customers.

▶ **The lowest temperature** of −95°C is ensured by **Dual SHFS™** system running independently and simultaneously

▶ **Fault Tolerance System**
  - **Realization of doubled stability and robustness**

▶ **Incomparable Fast and Powerful Freezing**
  - **Fast Recovery of Target Temperature**

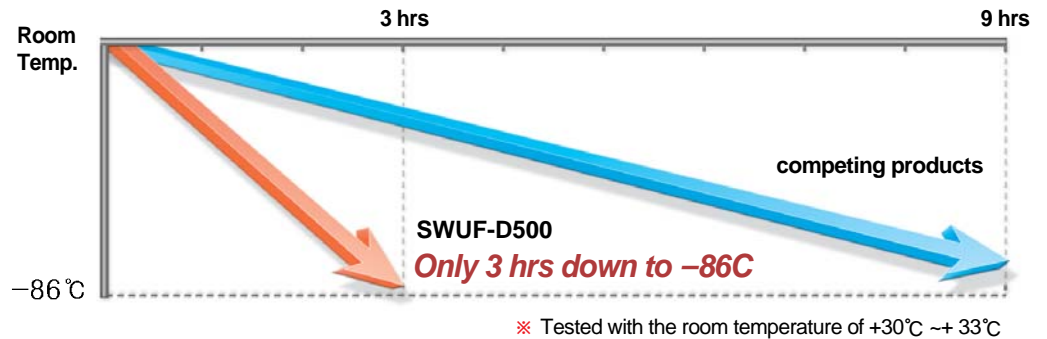(1)Typical Cascaded Compressor

(2) Dual SHFS™
⇒ SWUF-D series

(1) Complicated mechanism
    ⇒ **If one of compressor fails, temperature would go up**

(2) Even if one of the two SHFS™ fails to run, the other one is still running properly
    ⇒ **Minimum − 80 ℃**

≫ Fastest Freezing by SHFS™

▶ Comparison Data of Freezing Speed between competing products

Room Temp.

3 hrs

9 hrs

competing products

SWUF-D500
Only 3 hrs down to −86C

−86℃

※ Tested with the room temperature of +30℃ ~+ 33℃

▶ Time Taken to Reach Down to Ultra Low Temperature

Model Temp.	Dual SHFS™			SHFS™ *Simplified Hi-Efficiency Freezing System*				
	SWUF-D300	SWUF-D500	SWUF-D700	SWUF-300	SWUF-500	SWUF-80	WUF-41	WUF-51
	308Lit.	503Lit.	683Lit.	308Lit.	503Lit.	82Lit.	375Lit.	438Lit.
	Upright Type						Chest Type	
− 80℃				240min.	330min.	150min.	120min.	150min.
− 86℃	160min.	180min.		270min.	420min.		210min.	270min.
− 90℃			240min.			270min.		
− 95℃	270min.	300min.						

※ Tested with the room temperature of 30 ~ 33℃

≫ Simple Mechanism for high-efficiency and safety.

• It is not requested to have oil separator which separates oil from the compressor, Although oil separator is equipped, it is not possible to completely separate oil from the compressor, which possibly cause oil frozen problem in capillary.
• Not necessary to have expansion tank as temporary storage of high-pressure gas
• Using Block condenser without typical pins : Dust Free, Filter Free, more users friendly from maintenance and safety perspective, no need for filter cleaning

≫ Configuration for user's convenience

• With the adoption of thermal temperature sensor through cable port, it is possible to monitor and check the temperature using seperate instruments
• Equipped signal terminal to enable user to easily connect external temperature alarm system
• Automatic Vacuum Breaker to easily open the door against pressure difference between the chamber inside and outside

NC COM NO

Signal Terminal for External
Temp. Alarm System

Cable port for External Temp. Sensor

Upright Type −95℃ ULT Freezer

Wisd.*23 SmartCryo™ SWUF-D Upright Type −95℃ ULT Freezer, −95℃~−65℃

with Smart-Lab™ System, Dual SHFS™, Non-Freon Refrigerants, Automatic Vacuum Releasing System, 308-/ 393-/ 503-/714-Lit.

NEW

CE

RoHS Compliance

7-inch Smart-Lab™ Controller

Upright Type −95℃ Freezer (SWUF-D300)

❄ Smart-Lab™ System and Dual SHFS™

Dual SHFS™

▪▪▪ Application & Features

- Ergonomic 7″ Full Touch Screen TFT LCD(Smart-Lab™ Controller)
- WiRe™ App & Web Service.   • Storage Management Function
- Self-Diagnostic Function   • Automatic Data Recording
- Internet Connectivity with WiFi
- **Simplified Hi-Efficiency Freezing System** can freeze down to −86℃
  : realize robust and long life time.
- **Dual SHFS™**(Simplified Hi-Efficiency Freezing System) can freeze down to −95℃ and High-stability system can be offered.
  : If one of SHFS™ fails in operation, the other SHFS still works and maintains −80℃
- Automatic Vacuum Breaker - Easy to re-open the Door.
- Robust & Flexible design of Door Handle   • External Temp. Sensor Hole
- Easy Monitoring and Control - Eye level Controller
- CFC-free Refrigerants are used
- Use of Block Condenser removes filter and causes of related failure.
- Filter-free Mechanism lowers heat generated by the compressor
- Easy Maintenance and Improved Performance
- High-quality Insulation Panel and Inner Doors ensure defrosting around outer surface.
- Built in Standard Warning and Alarm Functions
- RS232 Communication Link and a Remote Control Software are supported
- KGMP Certified   • CE & RoHS Certified
- PL(Product Liability) Insurance

▪▪▪ Specification

Capacity & Model		308 Lit. "SWUF-D300"	393 Lit. "SWUF-D400"	503 Lit. "SWUF-D500"	714 Lit. "SWUF-D700"
Freezing System		Dual Simplified Hi-Effiency Freezing System(Dual SHFS™)			
Temp.	Range	−95℃ ~ −65℃			
		at room temperature of 30℃ and humidity of 70%			
	Sensor	PT100 Sensor			
Compressor		Hermetic Type			
Condenser Type		Block Condenser, No Pin, Filter Free Mechanism			
Refrigerant		HFC (CFC Free Refrigerant System)			
Controller & Display		7″ Full Touch Screen TFT LCD (Smart-Lab™ Controller)			
Shelves		Included 3 Stainless Steel Shelves			
Max. Q'ty of Racks		12pcs of 15(3 ×5)-Placed Rack (RFU3040)	16pcs of 15(3 ×5)-Placed Rack (RFU3040)	16pcs of 20(4 ×5)-Placed Rack (RFU50)	24pcs of 20(4 ×5)-Placed Rack (RFU50)
Material	Internal	Stainless Steel (#304)			
	External	Powder Coated Steel Plate			
	Inner Door	Powder Coated Stainless Steel (#304)			
Others		KGMP Certified, CE & RoHS Certified PL(Product Liability) Insurance, CFC-Free Refrigerants Touch-Screen TFT LCD Smart-Lab™ Controller Built in Standard Warning and Alarm Functions RS232 Communication Link, Remote Control Software			
Chamber Dimension (w ×d ×h)	Internal(mm)	470 ×500 ×1,310	600 ×500 ×1,310	600 ×640 ×1,310	880×620 ×1,310
	External(mm)	710 ×750 ×1,900	840 ×750 ×1,900	840 ×890 ×1,900	1,120 ×870 ×1,900
Net Weight		220 kg	260 kg	300 kg	320 kg
Packing Size (w ×d ×h) (mm) & Gross Weight		110 ×110 ×222	116 ×116 ×222	116 ×124 ×222	140 ×140 ×221
		300 kg	352 kg	352 kg	442 kg
Power Consumption		720 W	1.6 kW	1.6 kW	1.6 kW
Power Supply & Cord Plug*		1 Phase, AC 120V, 60Hz or AC 230V, 50 / 60Hz, with Cord /Plug			

∗ Other Specifications are available upon Customer's Request.
∗∗ 50Hz condition may cause 5% of temperature increase at −95℃ (SWUF-D700)

■■ Ordering Information

DH.SWUF01300 Upright Type −95 ℃ Freezer, **SWUF-D300,** −95 ℃~ −65 ℃, 308 Lit.,
  230V, with Power Cord
DH.SWUF01400 Upright Type −95 ℃ Freezer, **SWUF-D400,** −95 ℃~ −65 ℃, 393 Lit.,
  230V, with Power Cord
DH.SWUF01500 Upright Type −95 ℃ Freezer, **SWUF-D500,** −95 ℃~ −65 ℃, 503 Lit.,
  230V, with Power Cord
DH.SWUF01700 Upright Type −95 ℃ Freezer, **SWUF-D700,** −95 ℃~ −65 ℃, 714 Lit.,
  230V, with Power Cord
DH.SWUF02300 Upright Type −95 ℃ Freezer, **SWUF-D300,** Same as Above, but only **120V**
DH.SWUF02400   , **SWUF-D400,** Same as Above, but only **120V**
DH.SWUF02500   , **SWUF-D500,** Same as Above, but only **120V**
DH.SWUF02700   , **SWUF-D700,** Same as Above, but only **120V**
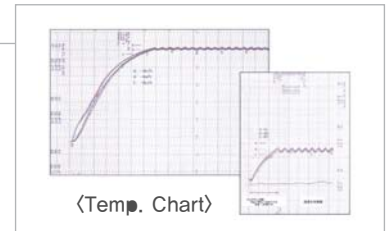
Rack System

Validation (IQ, OQ) Service
DH.SWUF31300 Validation Service(IQ, OQ), **SUFDV300**, for **SWUF-D300**
DH.SWUF31400   , **SUFDV400**, for **SWUF-D400**
DH.SWUF31500   , **SUFDV500**, for **SWUF-D500**
DH.SWUF31700   , **SUFDV700**, for **SWUF-D700**

※ Validation(IQ&OQ) Service

Providing IQ / OQ Documentation Service

- Installation Qualification & Operation Qualification
- Operation of High-Performance Validation Instrument
- Test and Documentation for Accuracy and Uniformity

〈Temp. Chart〉

It is possible to monitor and control the Smart-Lab™ equipment through all smart phone, tablet and web without restraint of time and place.
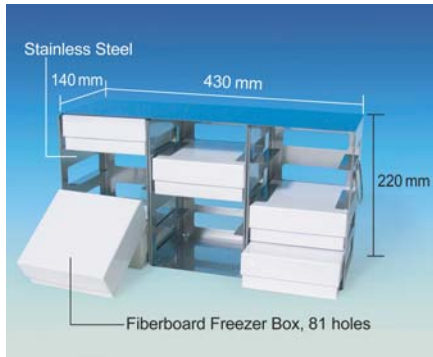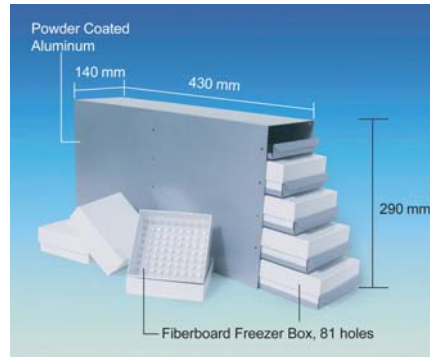
WiRe™ App & Web Service

7″ Full Touch Screen TFT LCD(Smart-Lab™ Controller)

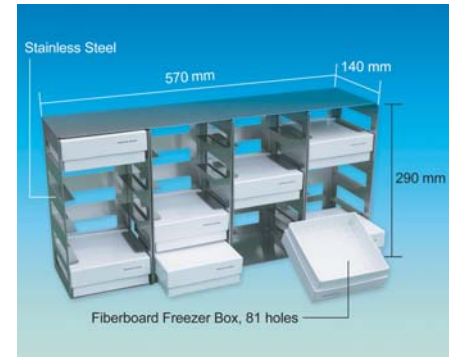## Wisd. WiseCryo™ Rack System for Freezer

▪▪▪ Rack System for Upright type Freezer

12 (3 ×4) -Placed Rack, Side Access
(RFU8SA)

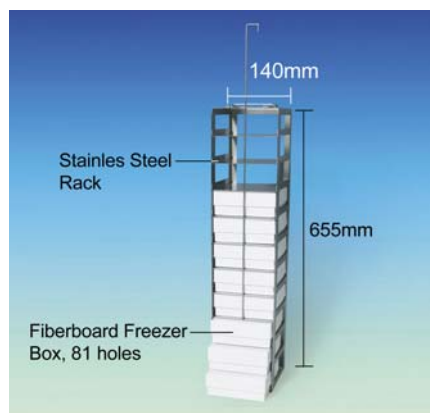15 (3 ×5) -Placed Rack,
Sliding Drawer **(RFU3040SD)**

20 (4 ×5) -Placed Rack, Side Access
(RFU50SA)

Model	RFU8SD	RFU8SA	RFU3040SD	RFU3040SA	RFU50SD	RFU50SA
Applicable Freezer	For Upright type					
	SWUF-80		SWUF-(D)300/400		SWUF-(D)500/700	
Q'ty of Available Boxes	12ea(3 ×4)		15ea(3 ×5)		20ea(4 ×5)	
Dimension (w ×d ×h mm)	140 ×430 ×220		140 ×430 ×290		140 ×570 ×290	
Rack Type	Sliding Drawer	Side Access	Sliding Drawer	Side Access	Sliding Drawer	Side Access
Material	Stainles Steel					

▪▪▪ Rack System for Chest type Freezer

7(1 ×7) -Placed Rack,
Side Access **(RFC7)**

11(1 ×11) -Placed Rack,
Side Access **(RFC11)**

Hard Board Freezer Box, 81 holes, with
Hard Board Divider or Polypropylene Divider

Model	RFC7	RFC11
Applicable Freezer	For Chest type	
	SWUF-(D)350C/500C/600C, WUF-11/21/31/41/51	
Q'ty of Available Boxes	7ea(1 ×7)	11ea(1 ×1)
Dimension (w ×d ×h mm)	140 ×140 ×385	140 ×140 ×665
Rack Type	Side Access	Side Access
Material	Stainles Steel	Stainles Steel

■■■ Ordering Information

For Upright type

DH.RFU8SD[*]   Rack, **RFU8SD**, Sliding Drawer, without boxes, 12 places, Stainless Steel, for **SWUF-80**

DH.RFU8SA[*]   Rack, **RFU8SA**, Side Access, without boxes, 12 places, Stainless Steel, for **SWUF-80**

DH.RFU3040SD[*]   Rack, **RFU3040SD**, Sliding Drawer, without boxes, 15 places, Stainless Steel, for **SWUF-(D)300/400**

DH.RFU3040SA[*]   Rack, **RFU3040SA**, Side Access, without boxes, 15 places, Stainless Steel, for **SWUF-(D)300/400**

DH.RFU50SD[*]   Rack, **RFU50SD**, Sliding Drawer, without boxes, 20 places, Stainless Steel, for **SWUF-(D)500/700**

DH.RFU50SA[*]   Rack, **RFU50SA**, Side Access, without boxes, 20 places, Stainless Steel, for **SWUF-(D)500/700**

For Chest type

DH.RFC11[*]   Rack, **RFC11,** 11 Places, Stainless Steel, For **all Chest Type Freezer**
DH.RFC7[*]   Rack, **RFC7,**   7 Places, Stainless Steel, For **all Chest Type Freezer**

   *-marks : without Fiberboard Freezer Box

Hard board Freezer Box

C11.001   Hard board Freezer Box, 81holes, with Hard Board Divider, w127 ×d127 ×h52mm
C11.002   , with PolyPropylene Divider, w127 ×d127 ×h52mm

Rack System

DAIHAN *Wisd* SmartCryo™ Freezer

DAIHAN Scientific Co., Ltd.
www.DAIHAN-Sci.com or *ALLforLAB*.com