SECTION 1

GENERAL INFORMATION



INTRODUCTION:

This 400 Series Technical Service/Training Manual, Part #3756394, has been compiled to provide the most recent information on safety, installation, set-up, design, operation, features, troubleshooting, wiring diagrams, and repair procedures of the 400 Series units. This information will enable the service technician to troubleshoot and diagnose malfunctions, perform necessary repairs, and return a 400 Series unit to proper operational status.

The service technician should read the complete instructions contained in this training/service manual before initiating any repairs on a 400 Series unit.

IMPORTANT SAFETY INFORMATION:

Below are the Product Safety Labels used in this manual. The "Signal Words" used are **WARNING** or **CAUTION**

When reviewing this manual, please note these different safety labels placed in areas where awareness of personal safety and product safety should be taken.

Below each Product Safety Label is a description of the precautions to be taken when the signal word is observed.

A WARNING

INDICATES THAT HAZARDOUS OR UNSAFE PRACTICES COULD RESULT IN SEVERE PERSONAL INJURY OR DEATH

A CAUTION

Indicates that hazardous or unsafe practices could result in minor personal injury or product and/or property damage

In addition, please pay attention to the signal word "NOTE:", which highlights information that is especially important for the section it is in.

TECHNICAL ASSISTANCE:

If you should have any questions regarding this equipment, please contact:

Sub-Zero Freezer Co., Inc. Attn: Service Department P.O.Box 44988 Madison, WI 53744-4988

Customer Service & Parts Warranty Claims Phone (800) 222-7820

> Technical Assistance Phone (800) 919-8324

Customer Service & Technical Assistance Facsimile (608) 441-5887

> Parts Warranty Claims Facsimile (608) 441-5886

Service Department E-Mail Address customerservice@subzero.com

Office Hours 7:00 AM to 7:00 PM Central Time Monday - Friday

PART ORDERING:

Service parts must be ordered through an Authorized Sub-Zero Parts Distributor. Please note that the serial number of the unit being repaired is often important when ordering service replacement parts. Always refer to the Parts Price List for any parts that may have substitutions determined by serial number.

This manual is designed to be used by Authorized Service Personnel only. Sub-Zero Freezer Co., Inc. assumes no responsibility for any repairs made on Sub-Zero refrigeration units by anyone other than Authorized Service Technicians.

TΔ	RI	F	OF	CO	NT	FN	JT	5.
I proq				UU	1.41	March 1	w r	- L

Pag	je#		Page #
Section 1 - General Information		Functions of the Wine	
ntroduction	1-2	Storage Electronic Control System	3-7
mportant Safety Information		Sense and Display Average	
Technical Assistance		Compartment Temperatures	
Part Ordering		Supply Power to the Lighting System	3-8
Table of Contents		Supply Power to the Evaporator Fans	3-9
Narranty Information		Regulate Refrigerant Valve Activity and	
Model Description		Compressor and Condenser Fan Cycling	
Wine Storage Temperature Range &		(Prior to Serial #1944319)	3-10
Recommended Wine Storage/Serving Temp's	1-9	Regulate Refrigerant Valve Activity and	
toommonded vine storage corning ramp a		Compressor and Condenser Fan Cycling	
Section 2 - Installation Information		(Starting with Serial #1944319)	
	2.2	Control Wine Storage Off-cycle Defrost	3-12
Installation Considerations		Unique Wine Storage Electronic	-
Unit leveling (Model 424)		Control Input Operations	
Unit leveling (Model 427, 427R)		Temperature Units Selection Mode	
Unit leveling (Model 430)		Sabbath Mode	
Door Adjustment (Model 424)		Showroom Mode	3-15
Door & Drawer Adjustment (Model 427, 427R)		Wine Storage Temperature Alarm Feature	121 111
Door Adjustment (Model 430)		and Possible Error Indicators	
Door Stop Adjustment (Model 427, 427R)		Warm Temperature Alarm	
Door Stop Installation (Model 430)		Cold Temperature Alarm	
Door Panel Removal & Installation (All Models)	2-3	Thermistor Malfunction Error Indicators	
Stainless Steel Door Panel Removal & Installation	2 5	Wine Storage Diagnostic Mode	3-19
(Model 424)	2-3	Manual Wine Storage Refrigerant	
Overlay Door Panel Removal & Installation	2.5	Valve Activation Mode	
(Model 424) Door Panel Removal & Installation	2-3	Wine Storage Temperature Log Recall Mode	
(Model 427, 427R)	2.6	Wine Storage Temperature Log Index Chart	3-23
Drawer Panel Removal & Installation	2-0	427R Refrigerator Electronic Control System:	
(Model 427R)	2 7	Model 427R Refrigerator Electronic Control	
Stainless Steel Door Panel Removal & Installation	2-1	Terminology and Component Descriptions	3-2
(Model 430)	2.7	Model 427R Basic Refrigerator	
Framed & Overlay Door Panel Removal & Installation	2-1	Electronic Control System	3-25
(Model 430)	2_8	Model 427R Refrigerator Control	
(1/100/06/1430)	2-0	Board Layout & Summary Table	3-26
Section 3 - Electronic Control System Information		Model 427R Refrigerator Control Panel Layout	
•		427R Refrigerator Basic Electronic	
Nine Storage Electronic Control System:		Control Input Operations	3-28
Wine Storage Electronic Control		Refrigerator Section ON/OFF	
Terminology and Component Descriptions	3-2	Adjusting Refrigerator Set-Points	3-28
Basic Wine Storage Electronic Control System	3-3	Refrigerator Drawer Ajar Alarm ON/OFF	
Wine Storage Control		Functions of the 427R Refrigerator	
Board Layout & Summary Table		Electronic Control System	3-29
Wine Storage Control Panel Layout	. 3-5	Sense and Display Average	
Basic Wine Storage		Compartment Temperatures	3-29
Electronic Control Input Operations		Supply Power to the Lighting System	
Unit ON/OFF		Supply Power to the Evaporator Fan	
Adjusting Wine Storage Set-Points		Regulate Refrigerator Compressor Cycling	
Wine Storage Lighting System ON/OFF		(Prior to Serial #1944319)	3-32
Wine Storage Alarm Bell ON/OFF	3-6	Regulate Refrigerator Compressor Cycling	
		(Starting with Serial #1944319)	
		Refrigerator Off-cycle Defrost	3-34

Pag	je#	P	age#
Unique 427R Refrigerator Electronic		Model 424 Interior Mechanical Component	
Control Input Operations	3-35	Access & Removal	6-9
Temperature Units Selection mode		Control Board	6-9
Sabbath Mode		Control Panel Assembly	6-10
Showroom Mode	3-36	Upper Compartment Thermistor	6-10
Refrigerator Thermistor Malfunction Error Indicators 3	3-37	Lower Compartment Thermistor	6-10
Electronic Communication Error Indicators		Upper Evaporator Thermistor	
Model 427R Diagnostic Mode	3-38	Lower Evaporator Thermistor	6-11
		Upper Evaporator Fan Assembly	
Section 4 - Sealed System Information		Lower Evaporator Fan Assembly	
	10	Model 424 Sealed System Component	
HFC-134a Refrigerant Service Information		Access & Removal	6-12
General Rules for Working w/134a	4-2	Upper Evaporator Assembly	
Wine Storage Sealed System	1.0	Lower Evaporator Assembly	
Repair Procedures for 134a		Refrigerant Valve	
Sealed System Operation	4-4	Filter-Drier	
The Sub-Zero Wine storage Sealed System		Compressor	
Components and Their Role	4-4	Condenser	
The Sub-Zero Model 427R Refrigerator Sealed			
System Components and Their Role		Model 427 & 427R	
Sealed System Refrigerant Flow Diagrams		Model 427 & 427R Exterior Cosmetic and	
Model 424 Refrigerant Flow		Mechanical Component Access & Removal	6-15
Model 427 Refrigerant Flow		Kickplate / Grille	6-15
Model 427R Refrigerant Flow		Wine Compartment Light & Fan Switch	. 6-15
Model 430 Refrigerant Flow	4-9	Door Assembly	6-16
		Drawer Assembly (427R ONLY)	6-16
Section 5 - Air Flow & Fan Blade Spacing		Upper & Lower Hinge Assembly	6-16
Air Flow Diagrams & Fan Blade Spacing	5-2	Condenser Fan Assembly	6-17
Air Flow & Fan Blade Spacing (Model 424)		Refrigerant Valve Solenoid	6-18
Air Flow & Fan Blade Spacing (Model 427)		Model 427 & 427R Interior Cosmetic	
Air Flow & Fan Blade Spacing (Model 427R)		Component Access & Removal	6-18
Air Flow & Fan Blade Spacing (Model 430)		Wine Rack Assembly	
Control of States Control of S		Wine Storage Cabinet Slide & Slide Spacer	
Section 6 - Component Removal/Adjustment		Refrigerator Drawer Slide Assembly (427R ONLY)	6-19
	6.2	Drawer Closer (427R ONLY)	
WARNINGS & CAUTIONS	0-2	Upper Light Strip	
Model 424		Refrigerator Lighting Access (427R ONLY)	
Model 424 Exterior Cosmetic and Mechanical		Reed Switch (427R ONLY)	
Component Access & Removal	6-3	Evaporator Fan Cover	6-21
Kickplate	6-3	Wine Storage Evaporator Cover	6-21
Door Closer	6-3	Refrigerator Evaporator Cover (427R ONLY)	6-21
Door	6-4	Refrig. Evaporator Support Cover (427R ONLY)	
Light & Fan Switches		Model 427 & 427R Interior Mechanical	
Exterior Wrap Components (424FS ONLY)		Component Access & Removal	6-22
Condenser Fan Assembly		Wine Storage Control Board	
Refrigerant Valve Solenoid		Refrigerator Control Board (427R ONLY)	
Model 424 Interior Cosmetic Component		Wine Storage Control Panel Assembly	
Access & Removal	6-7	Lower Light Strip	
Wine Rack Assembly		Refrigerator Control Panel Assy (427R ONLY)	
Cabinet Slide, Spacer & Support Spacer		Wine Storage Compartment Thermistor	
Upper Light Strip		Wine Storage Evaporator Thermistor	
Upper & Lower Evaporator Fan Cover		Refrig. Compartment Thermistor (427R ONLY)	
Upper Evaporator Cover		Refrigerator Evaporator Thermistor (427R ONLY)	
Lower Evaporator Cover		Wine Storage Evaporator Fan Assembly	
Evaporator Support Cover	6-9	Refrigerator Evaporator Fan Assv (427R ONI Y)	

	Page #		Page #
Model 427 & 427R Sealed System Component		Section 7 - Parts Lists w/ Exploded Views	
Access & Removal	6-27	Model 424 Door	7-2
Wine Storage Evaporator	6-27	Model 424 Cosmetic	
Refrigerator Evaporator (427R ONLY)	6-28	Model 424FS Unique Cosmetic	
Refrigerant Valve	6-28	Model 424 Mechanical	
Wine Storage Filter-Drier	6-28	Model 424 Sealed System	
Refrigerator Filter-Drier (427R ONLY)	6-29	9 411.95	
Compressor	6-29	Model 427 Door	
Condenser	6-29	Model 427 Cosmetic	
Model 430		Model 427 Mechanical Model 427 Sealed System	
Model 430 Exterior Cosmetic and Mechanical			
Component Access & Removal	6-30	Model 427R Door	
Kickplate		Model 427R Cosmetic	
Drain Pan		Model 427R Mechanical	
Door Closer		Model 427R Sealed System	7-26
Door Assembly		Model 430 Door	7-28
Louvered Grille		Model 430 Cosmetic	7-30
Panel Grille		Model 430 Mechanical	7-32
Light Switch & Fan Switch		Model 430 Sealed System	7-34
Condenser Fan Assembly			
		Section 8 - Troubleshooting Guides	
Refrigerant Valve Solenoid	0-33	Wine Storage Diagnostic Worksheet Information &	
Model 430 Interior Cosmetic Component	6 24	Instructions	8-2
Access & Removal		Wine Storage Diagnostic Worksheets	
Wine Rack Assembly		General Troubleshooting Guide	
Upper Light Strip		Sealed System Diagnostic information	
Cabinet Slide, Spacer & Support Spacer		Normal Operating Pressures Chart	
Evaporator Fan Cover		Pressure Indications Chart	
Evaporator Cover		427R Refrigerator Sealed System Repair	0-70
Evaporator Support Cover	6-35	Procedures NOTE	0 16
Model 430 Interior Mechanical Component	0100		
Access & Removal		Wine Storage Sealed System Repair procedures	0-17
Control Board		Wine Storage Membrane Switch / Ribbon	0.40
Control Panel Assembly		Cable Test Procedure	8-18
Lower Light Strip		Continuo Trabaia I Data Tables	
Compartment Thermistor		Section 9 -Technical Data Tables	
Evaporator Thermistor		Model 424 Technical Data Table	9-2
Evaporator Fan Assembly	6-38	Model 427 Technical Data Table	
Model 430 Sealed System Component		Model 427R Technical Data Table	9-4
Access & Removal		Model 430 Technical Data Table	9-5
Evaporator Assembly			
Refrigerant Valve		Section 10 - Wiring Diagrams & Schematics	
Filter-Drier		Model 424 (Prior to Serial #1944319)	10-2
Compressor	6-39	Model 424 (Starting with Serial #1944319)	
Condenser	6-39	Model 427 (Prior to Serial #1944319)	
		Model 427 (Starting with Serial #1944319)	
		Model 427R - Wine (Prior to Serial #1944319)	
		Model 427R - Wine (Starting with Serial #1944319)	
		Model 427R - Refrig. (Prior to Serial #1944319)	
		Model 427R - Refrig. (Starting w Serial #1944319)	
		Model 430 (Prior to Serial #1944319)	
		Model 430 (Frior to Serial #1944319)	
		wide 700 (Starting With Schal #1344313)	10-20



WARRANTY INFORMATION:

This page contains a summary of the 2, 5 & 12 Year Warranty that is supplied with every 400 Series unit. This is followed by a summary of the two special warranties: The Non-Residential Warranty which applies to units installed in non-residential applications, and the Display/Model Home Warranty which applies to distributor or dealers display units and units in model homes, sold three years after date of manufacture. The last entries on this page are details and notes about the warranties.

TWO, FIVE & TWELVE YEAR Warranty Summary

- Two year TOTAL PRODUCT warranty, *parts and labor.
- Five Year SEALED SYSTEM warranty, **parts and labor.
- Sixth through Twelfth year LIMITED SEALED SYS-TEM warranty, sealed system **parts only.

ONE & FIVE YEAR Non-Residential Warranty Summary (Example: Office, Boat, etc.)

- One Year TOTAL PRODUCT warranty, *parts and labor.
- Five year LIMITED SEALED SYSTEM warranty, sealed system **parts only.

ONE & FIVE YEAR Display/Model Home Warranty Summary (Display units sold three years after date of manufacture)

- One Year TOTAL PRODUCT warranty, *parts and labor.
- Five year LIMITED SEALED SYSTEM warranty, sealed system **parts only.

Warranty Details:

• * Total Product Parts includes, but is not limited to the following:

Electronic Control System Components, Fan & Light Switches, Fan Motors & Blades, Defrost & Drain Heaters, Defrost Terminators, Drain Pans, Drain Tubes, Wiring, Light sockets & bulbs, Door hinges, Door closers & Cams, Compressor Electricals, etc. . .

 ** Sealed System Parts include the following:
 Compressors, Condensers, Evaporators, Filter-Driers, Heat-exchangers, All Tubing That Carries the Freon.

NOTE: Condenser Fan Motors, Freon, Solder and compressor electricals are NOT considered sealed system parts.

Warranty Notes:

- All warranties begin at the time of the unit's initial installation.
- All Warranty and Service information collected by Sub-Zero is arranged and stored under the unit serial number. This information is now also stored under the customer's last name.

NOTE: Sub-Zero still requests that you have the model and serial number available whenever contacting the factory or parts distributor.

• The serial number tag for models 427, 427R, and 430 is located on the bottom side of the compartment divider, directly behind the control panel. (See Figures 1-1, 1-2) For model 424 it is on the upper compartment ceiling (not shown)

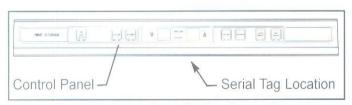


Figure 1-1. Serial Tag Location

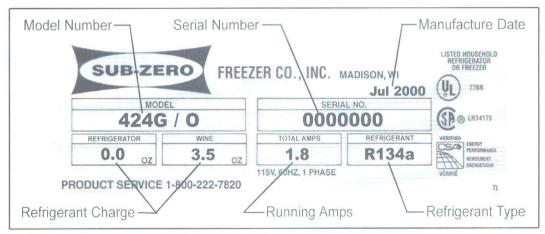


Figure 1-2. Serial Tag Layout

MODEL DESCRIPTIONS:

This section briefly describes the models covered in this 400 Series Technical Service/Training Manual. There are four basic model configurations (*Models 424, 427, 427R, and 430*), with esthetic variations of the exterior cosmetic components. This manual will address the four basic configurations in most cases.

The following diagrams (Figures 1-3 to 1-6) explain the 400 Series model numbering system.

Figure 1-3. Model 424



• 400 Series - 24" Wide - Glass/CarBon (or Black) Steel Wrapped Door 424G/B • 400 Series - 24" Wide - High Altitude Glass/CarBon (or Black) Steel Wrapped Door 424HAG/B • 400 Series - 24" Wide - Glass/Overlay Panel Application Door 424G/O • 400 Series - 24" Wide - High Altitude Glass/Overlay Panel Application Door 424HAG/O • 400 Series - 24" Wide - Glass/Platinum Steel Wrapped Door 424G/P • 400 Series - 24" Wide - High Altitude Glass/Platinum Steel Wrapped Door 424HAG/P · 400 Series - 24" Wide - Glass/Stainless Steel Wrapped Door 424G/S • 400 Series - 24" Wide - High Altitude Glass/Stainless Steel Wrapped Door 424HAG/S • 400 Series - 24" Wide - Solid/CarBon (or Black) Steel Wrapped Door 424S/B • 400 Series - 24" Wide - Solid/Overlay Panel Application Door 4245/0 • 400 Series - 24" Wide - Solid/Platinum Steel Wrapped Door 424S/P • 400 Series - 24" Wide - Solid/Stainless Steel Wrapped Door 424S/S • 400 Series - 24" Wide - Free Standing - Stainless Steel Wrapped Unit - Glass Door 424FS/G 400 Series - 24" Wide - Free Standing - Stainless Steel Wrapped Unit - High Altitude Glass Door 424FS/HAG • 400 Series - 24" Wide - Free Standing - Stainless Steel Wrapped Unit - Solid Door 424FS/S



Figure 1-4. Model 427

NOTE: Door panels for this model sold separately.

• 400 Series - 27" Wide - Glass Door

427HAG • 400 Series - 27" Wide - High Altitude Glass Door

• 400 Series - 27" Wide - Solid Door



NOTE: Door panels for this model sold separately.

• 400 Series - 27" Wide - Refrigerated Drawers - Glass Door on Wine Storage Section

427RHAG • 400 Series - 27" Wide - Refrigerated Drawers - High Altitude Glass Door on Wine Storage Section

• 400 Series - 27" Wide - Refrigerated Drawers - Solid Door on Wine Storage Section

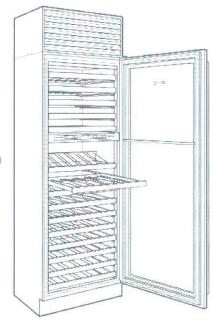


Figure 1-6. Model 430

430G/B • 400 Series - 30" Wide - Glass/CarBon (or Black) Steel Wrapped Door

430HAG/B • 400 Series - 30" Wide - High Altitude Glass/CarBon (or Black) Steel Wrapped Door

• 400 Series - 30" Wide - Glass/Framed Panel Application Door

430HAG/F • 400 Series - 30" Wide - High Altitude Glass/Framed Panel Application Door

430G/O • 400 Series - 30" Wide - Glass/Overlay Panel Application Door

430HAG/O · 400 Series - 30" Wide - High Altitude Glass/Overlay Panel Application Door

430G/P • 400 Series - 30" Wide - Glass/Platinum Steel Wrapped Door

430HAG/P • 400 Series - 30" Wide - High Altitude Glass/Platinum Steel Wrapped Door

430G/S • 400 Series - 30" Wide - Glass/Stainless Steel Wrapped Door

430HAG/S • 400 Series - 30" Wide - High Altitude Glass/Stainless Steel Wrapped Door

430S/B • 400 Series - 30" Wide - Solid/CarBon (or Black) Steel Wrapped Door

430S/F • 400 Series - 30" Wide - Solid/Framed Panel Application Door

430S/O • 400 Series - 30" Wide - Solid/Overlay Panel Application Door

430S/P • 400 Series - 30" Wide - Solid/Platinum Steel Wrapped Door

430S/S • 400 Series - 30" Wide - Solid/Stainless Steel Wrapped Door



Sub-Zero Wine Storage Temperature Range, Recommended Wine Storage Temperatures and Recommended Wine Serving Temperatures:

The table below shows the temperature range of the Sub-Zero Wine Storage Units. This table also shows the recommended temperatures for "serving" wines. Serving wines at the recommended temperatures will insure that white wines maintain their lively and interesting taste, and red wines will maintain their scent and flavor.

NOTE: For "long term storage" of all wines, the ideal temperature is 55°F / 13°C.

NOTE: The temperature range in the refrigerator drawer area of the 427R is 34°F / 1°C to 45°F / 7°C.

		Fahrenheit	Celsius	
Wine	Storage Unit Maximum Temperature	65°	18°	
Ires	Bordeaux	63°	17°	
Serving Temperatures	Red Burgundy	61°	16°	
	Beaujolais	54°	12°	
	Sherry	52°	11°	
	Rosés	48°	9°	
Wine	Dry White Wines	48°	9°	
nded	Champagne	46°	8°	
mme	Sweet White Wines	43°	6°	
Recommended	Sparkling Wines	41°	5°	
Wine Storage Unit Minimum Temperature		38°	3°	