



Turbo Air Speed up the Pace of Innovation

CAUTION!
PLEASE KEEP POWER
SWITCH ON BEFORE
OPERATING THIS EQUIPMENT

Glass Door Freezers Service Manual

Please read this manual completely before attempting to install or operate this equipment!

TGF-9F
TGF-13F
TGF-23F(B)
TGF-49F(B)
TGF-72F(B)

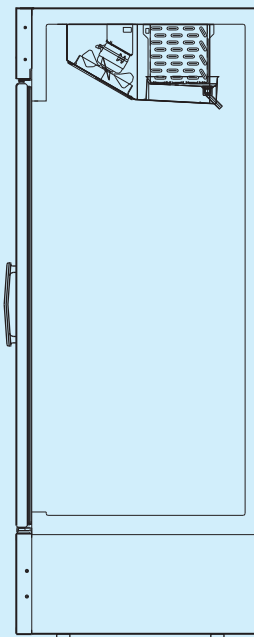
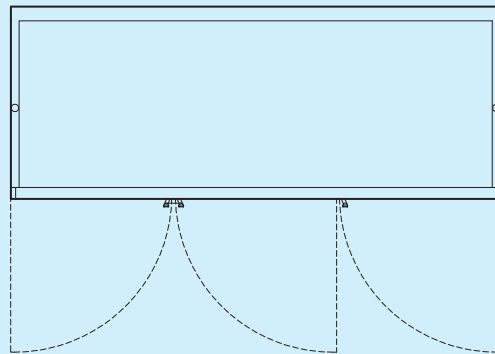


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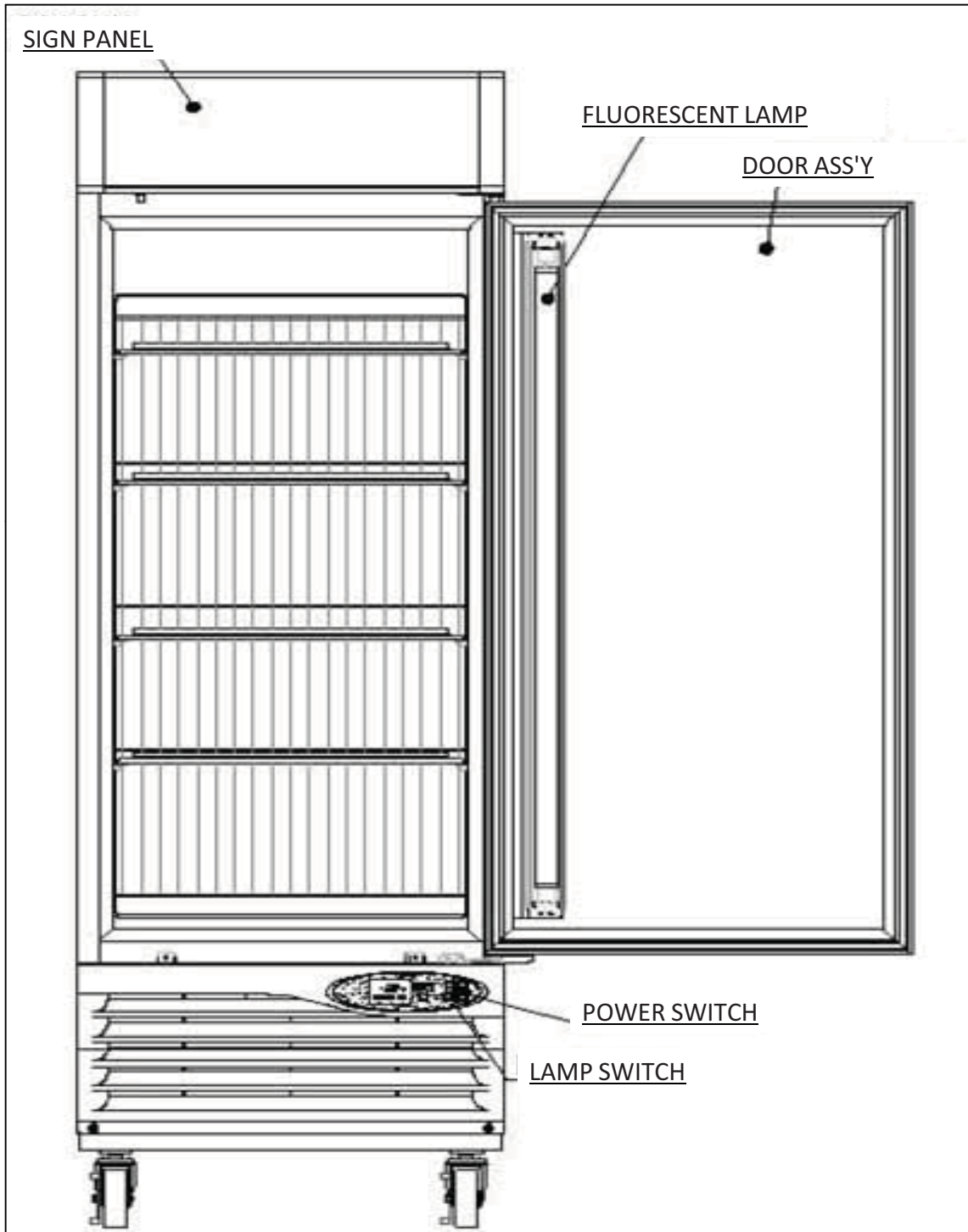
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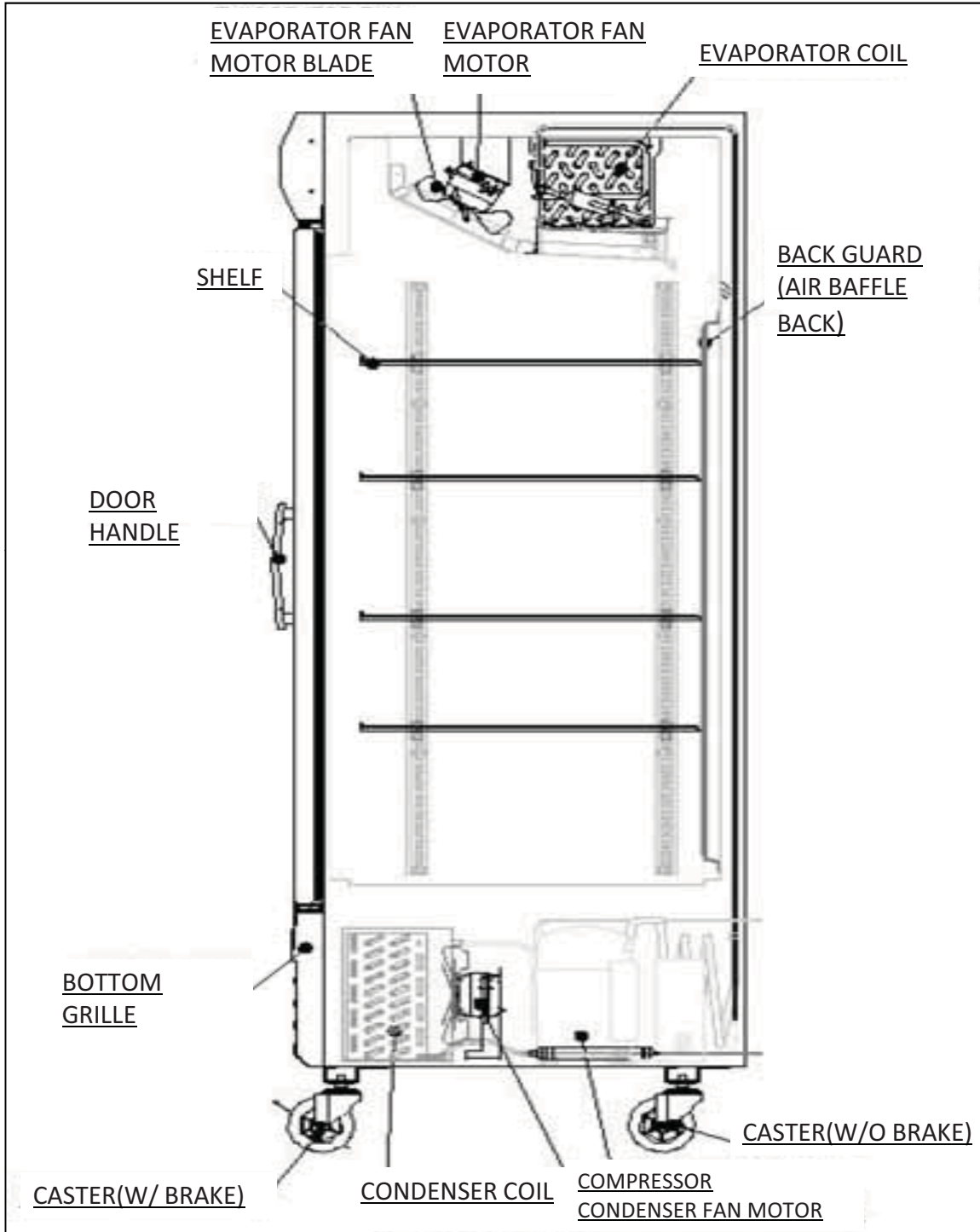
1. FEATURE CHART

FRONT VIEW (TGF-23F)



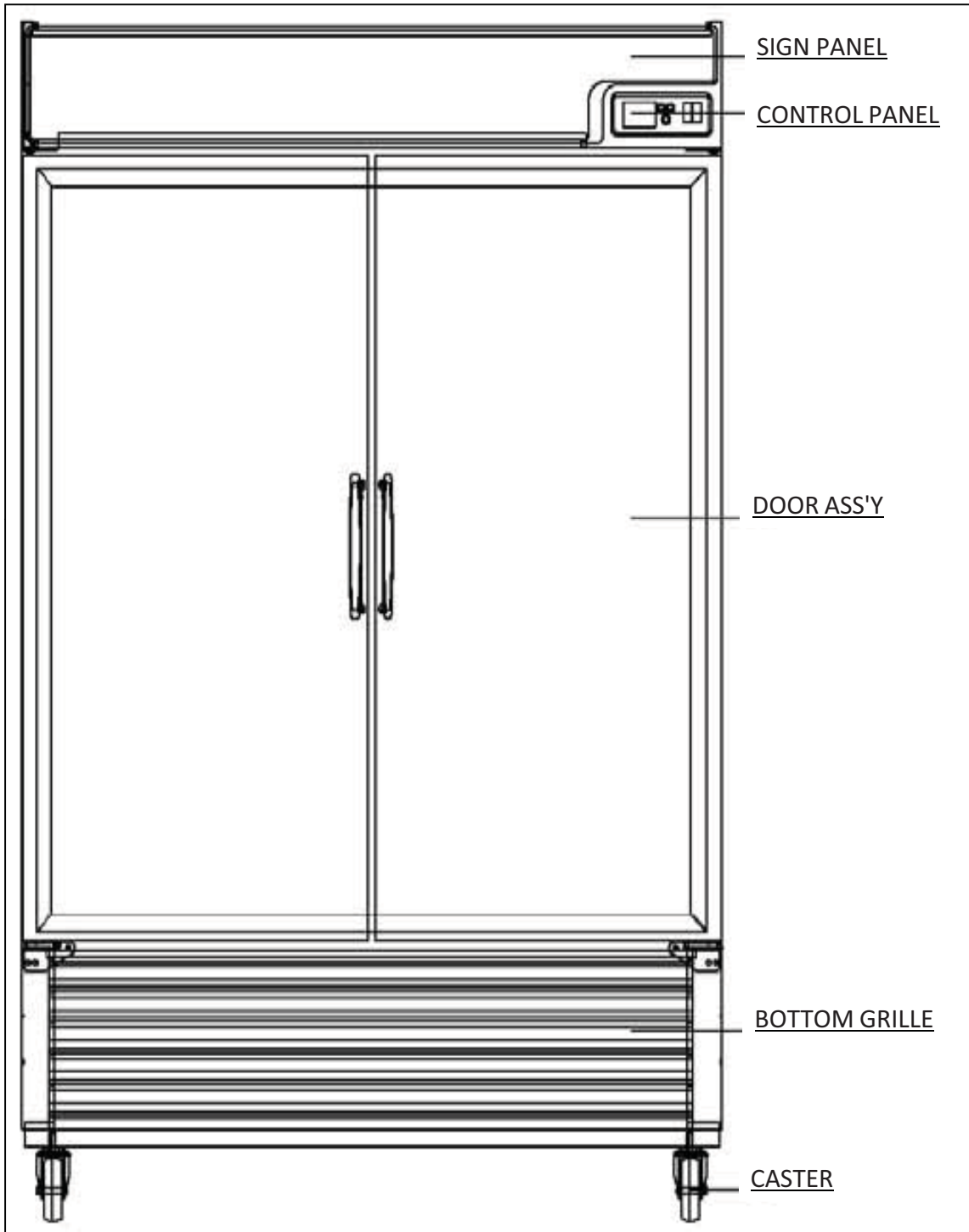
1. FEATURE CHART

SIDE VIEW (TGF-23F)



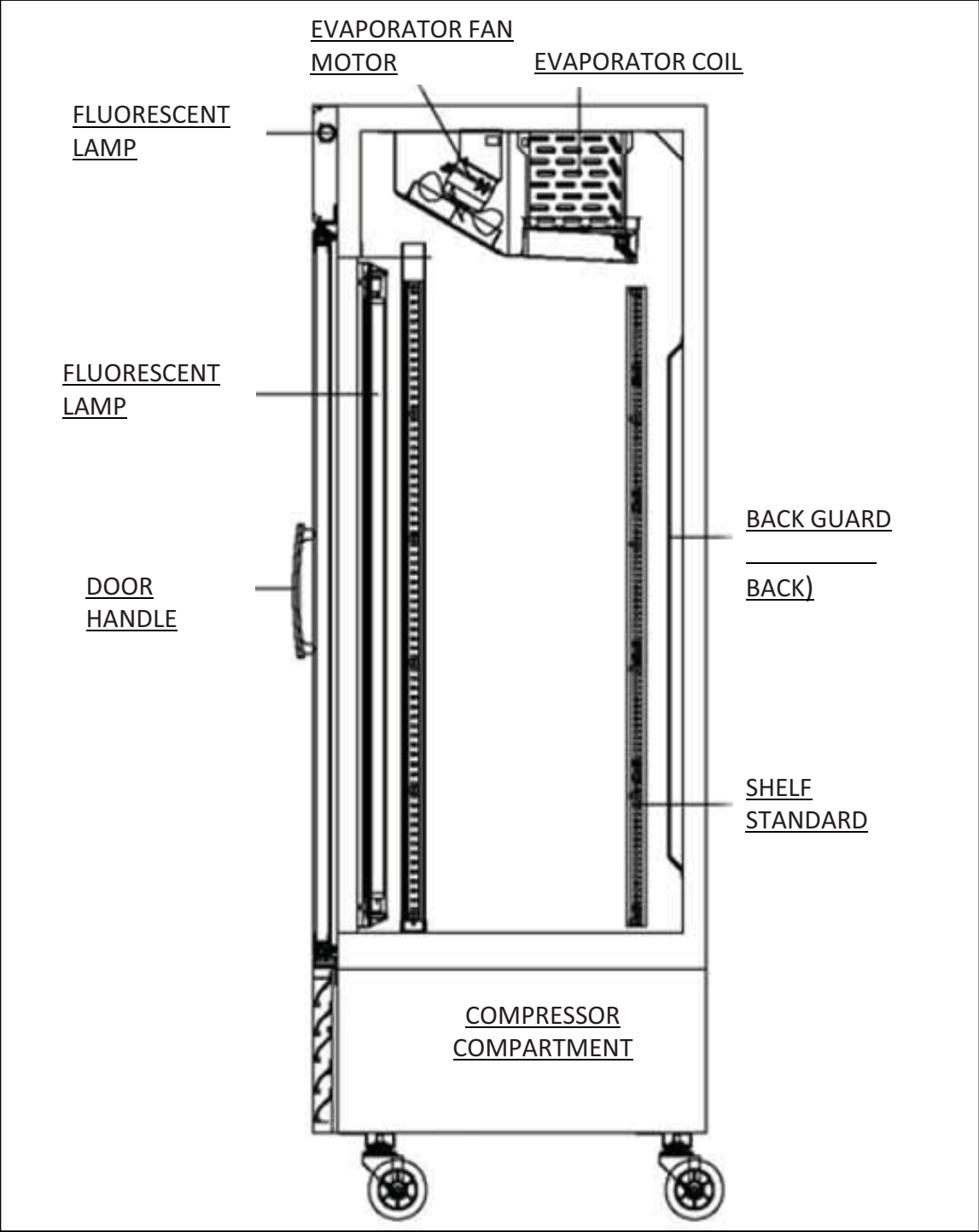
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FRONT VIEW (TGF-49F)



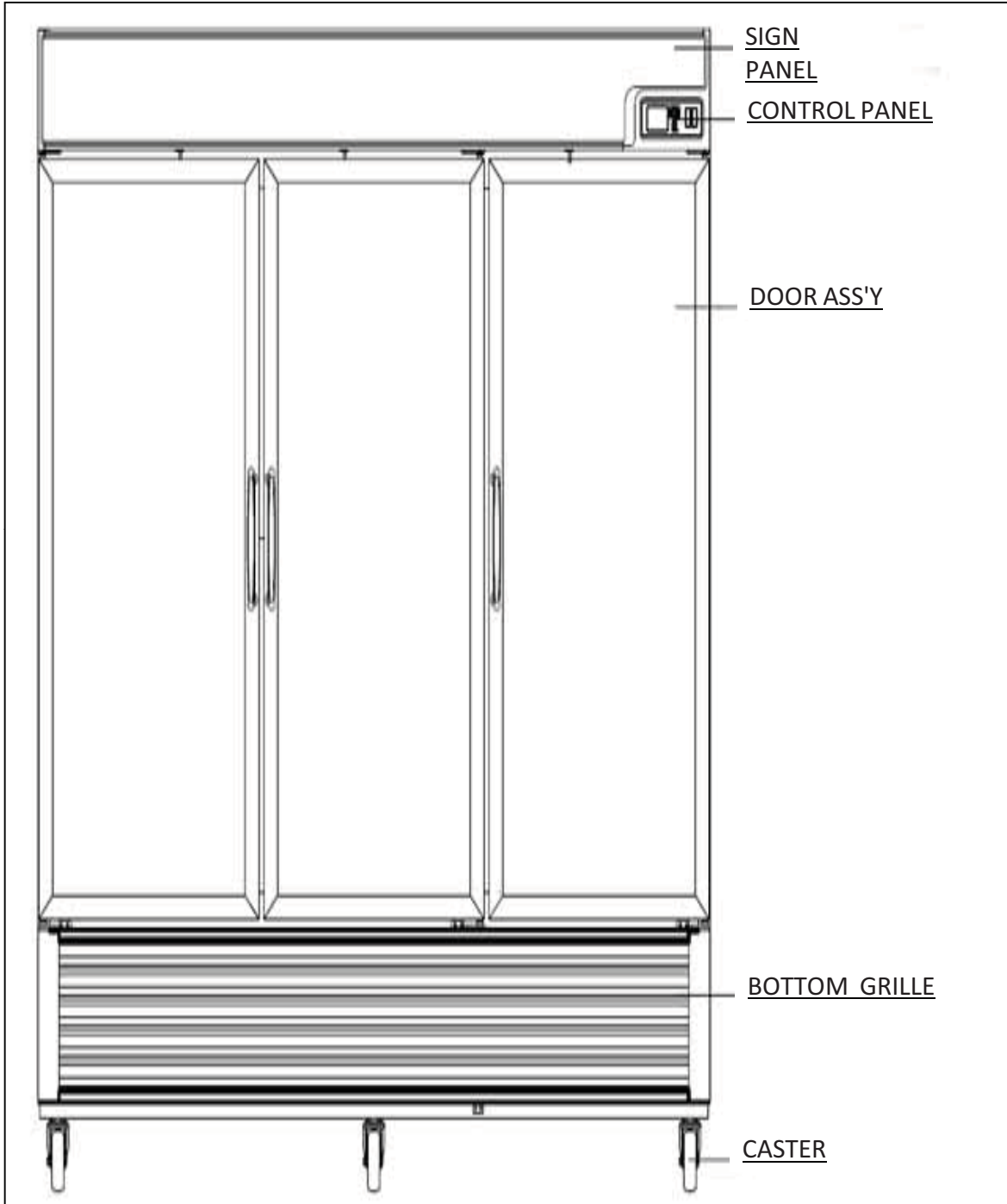
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SIDE VIEW (TGF-49F)



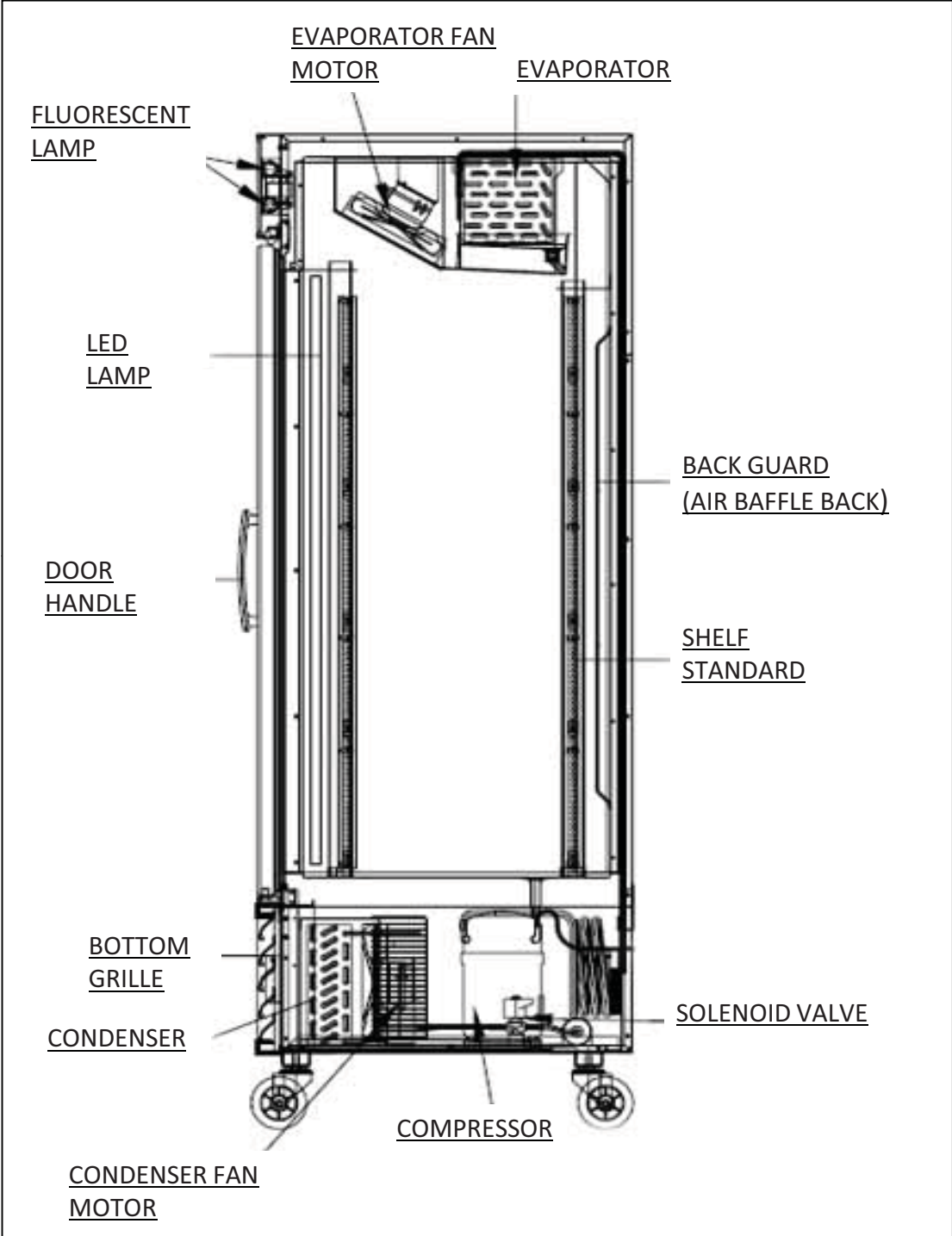
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FRONT VIEW (TGF-72F)



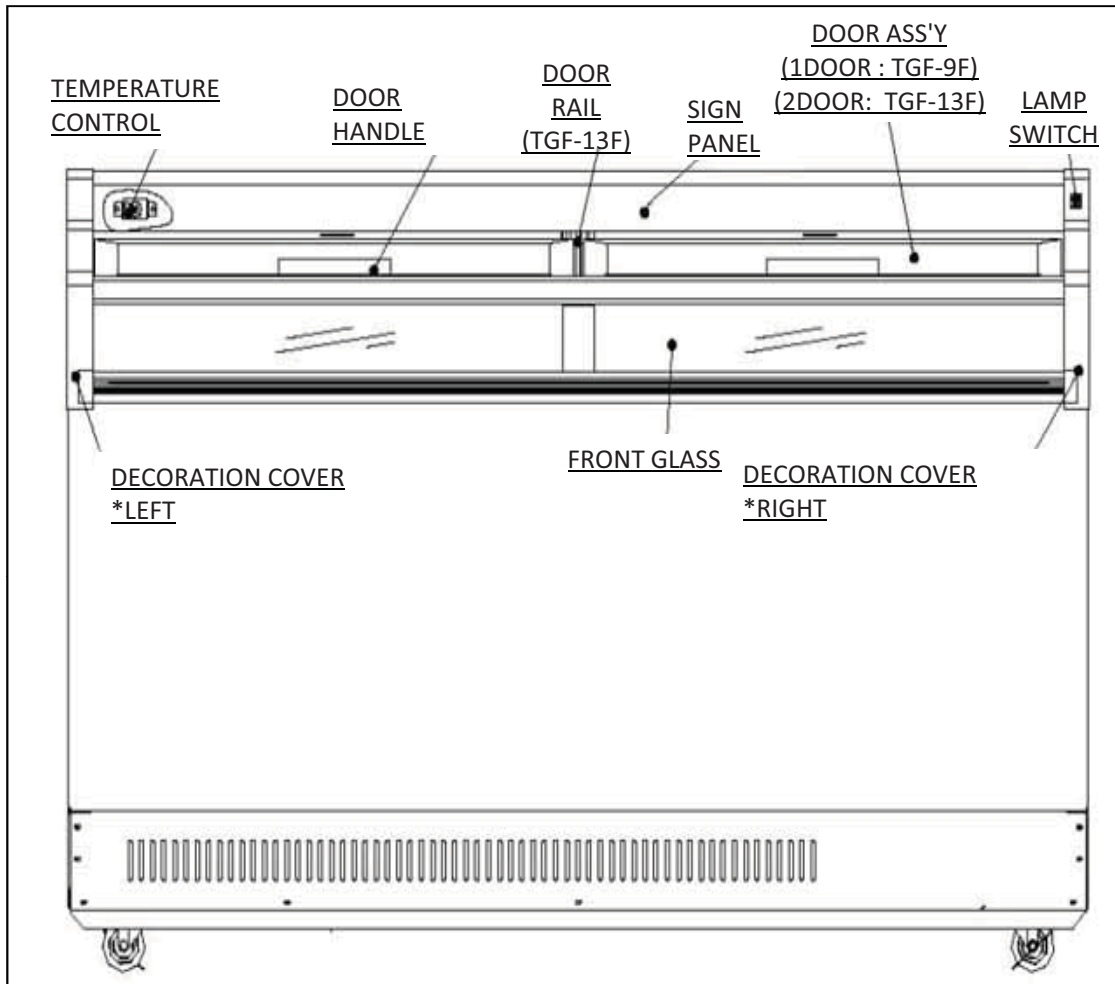
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SIDE VIEW (TGF-72F)



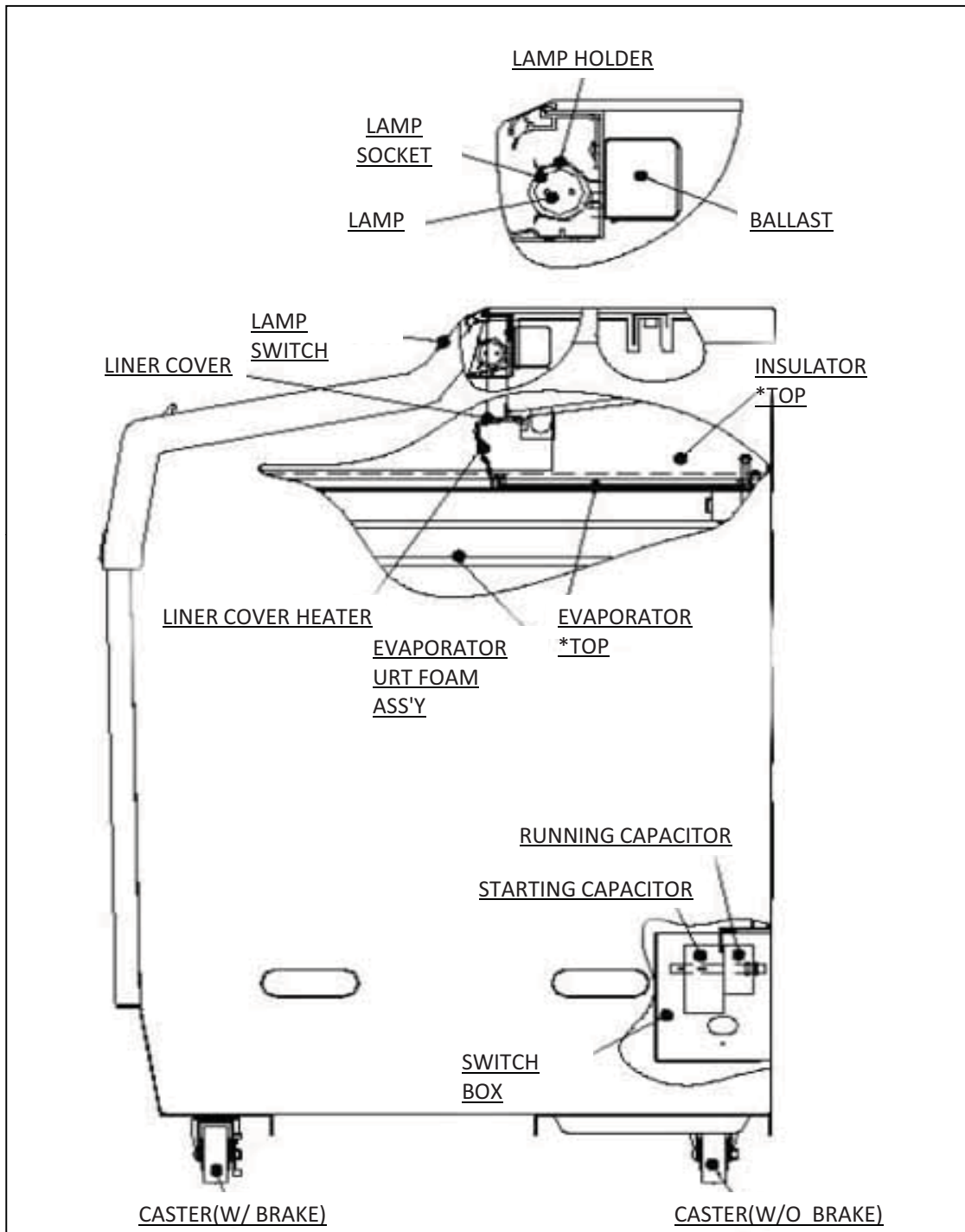
1. FEATURE CHART

FRONT VIEW (TGF-9F, 13F)



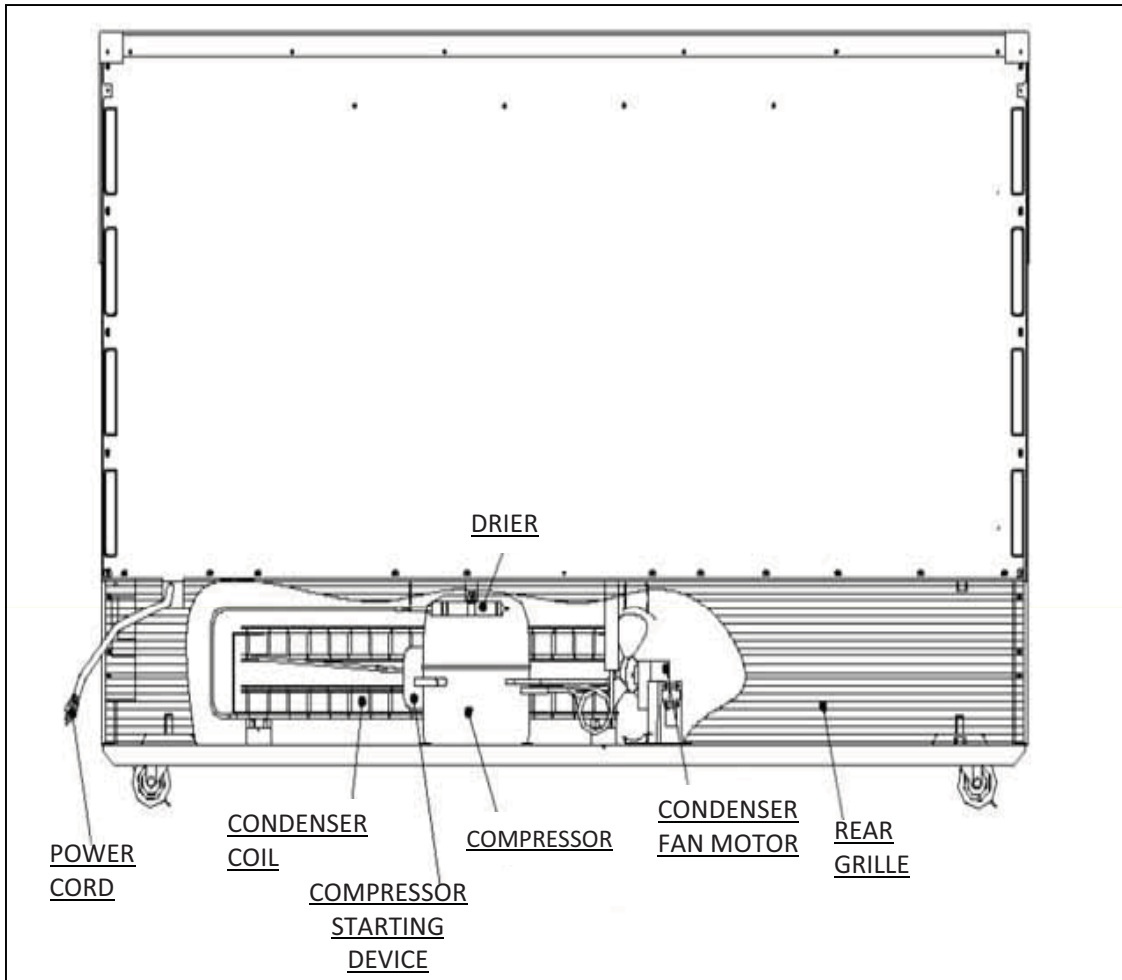
1. FEATURE CHART

SIDE VIEW (TGF-9F, 13F)



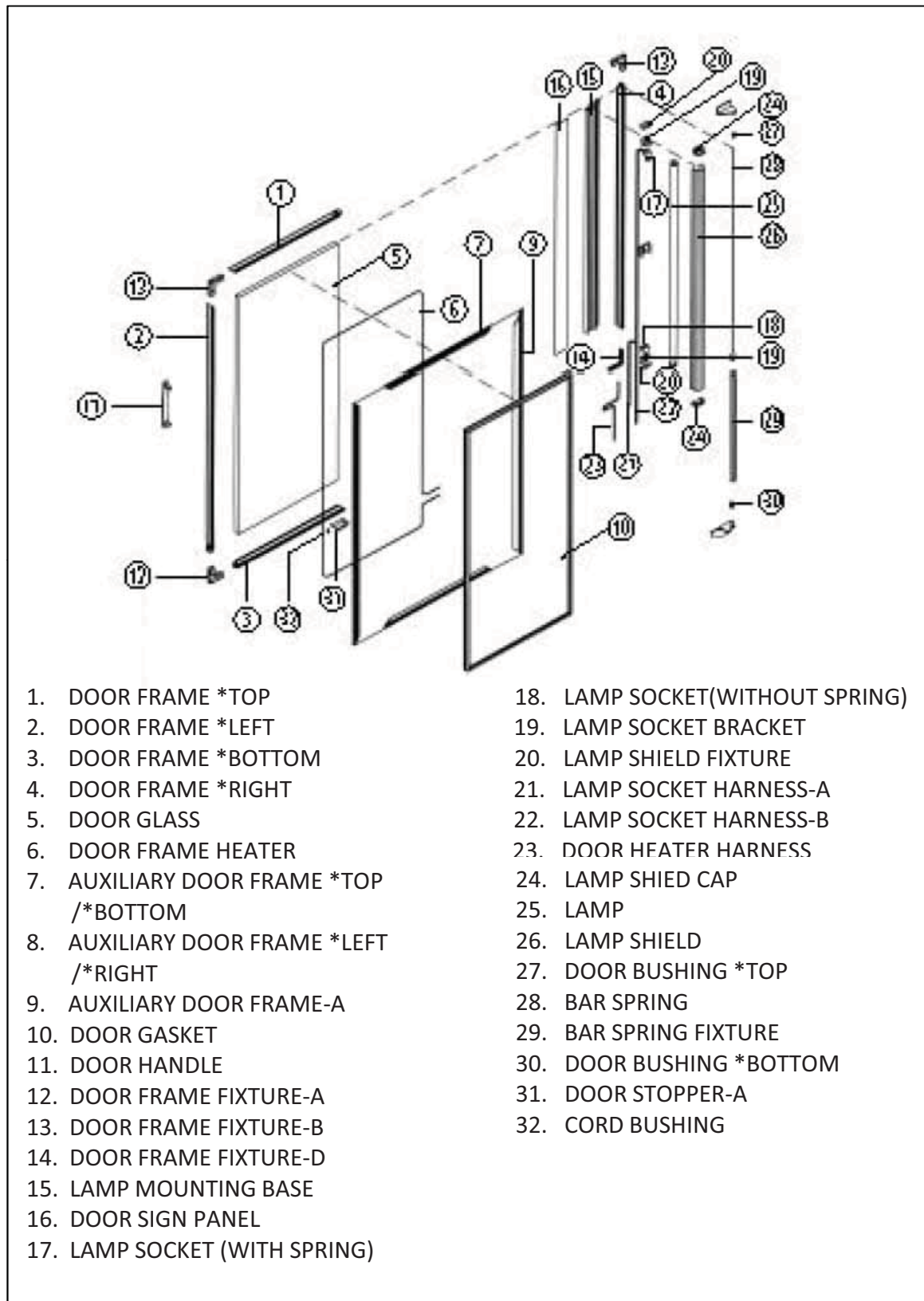
1. FEATURE CHART

REAR VIEW (TGF-9F, 13F)

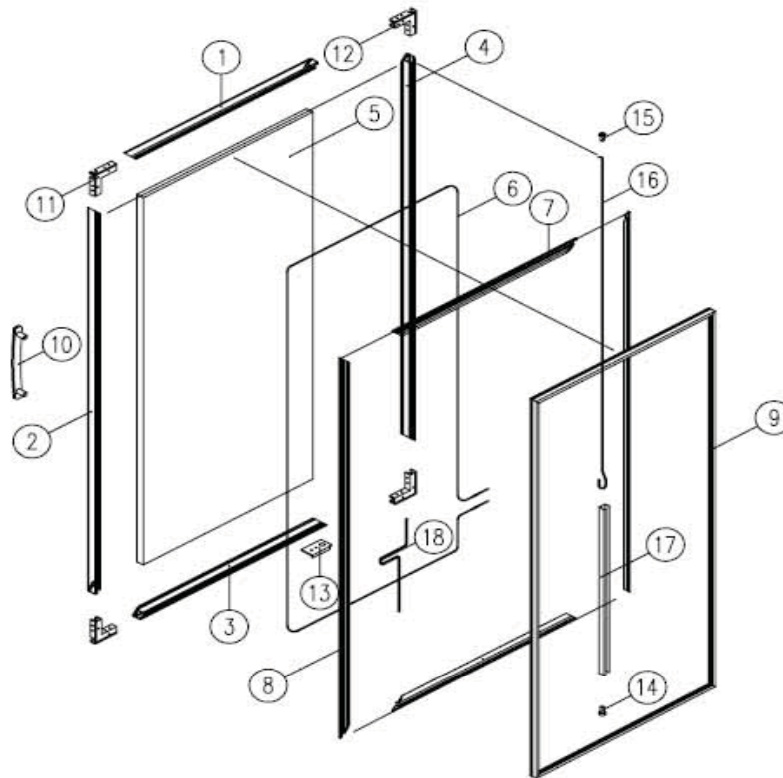


2. PART DETAILS

DOOR PARTS (TGF-23F)

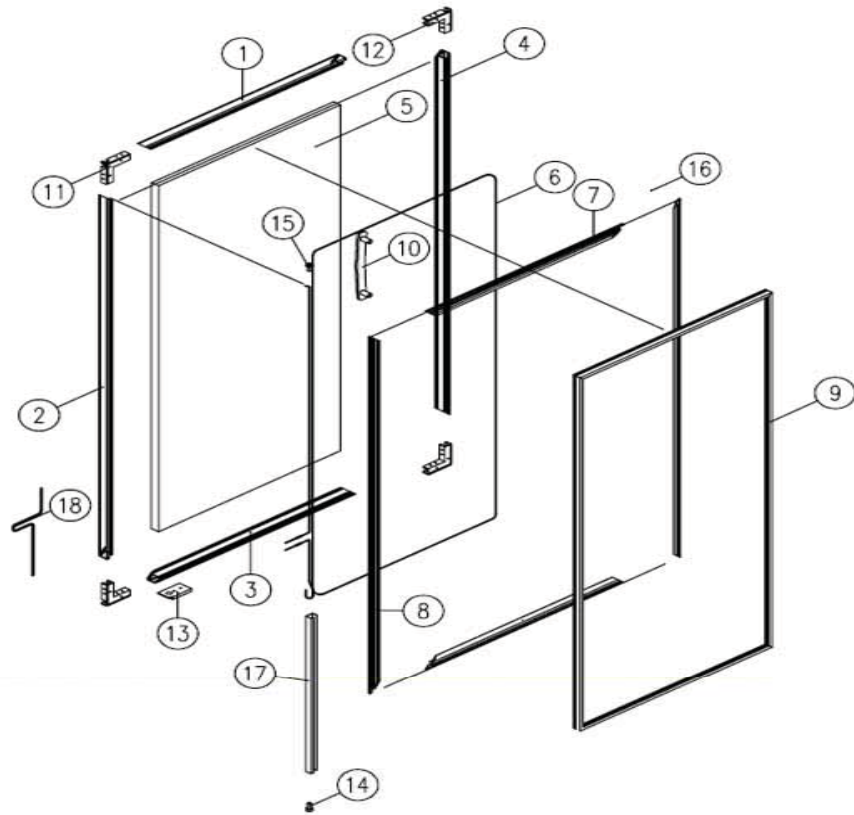


DOOR PARTS (TGF-49F, 72F) : ASS'Y DOOR *R



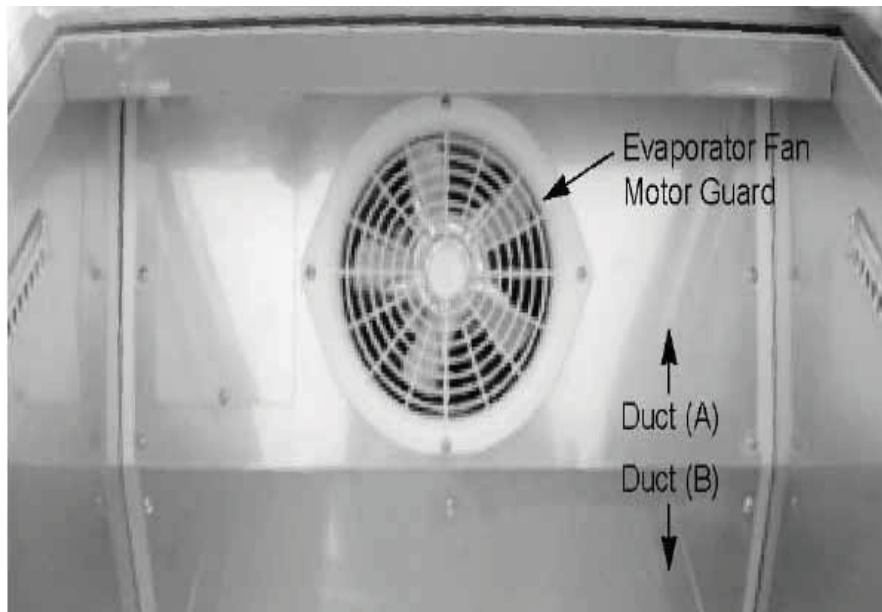
- | | |
|-------------------------|-------------------------|
| 1. DOOR FRAME *T | 12. FIXTURE DR-FRAME(B) |
| 2. DOOR FRAME *R *R | 13. STOPPER-DR(*T)A |
| 3. DOOR FRAME *U *R | 14. BUSHING DR-*U |
| 4. DOOR FRAME *L | 15. BUSHING DR |
| 5. WINDOW DR HEATER *R | 16. BAR SPRING |
| 6. HEATER DR FRAME | 17. FIXTURE DR-FRAME(C) |
| 7. FRAME DR-AUX(*T/*U) | 18. HARNESS DR |
| 8. FRAME DR-AUX(*L/*R) | |
| 9. GASKET AS | |
| 10. HANDLE DR | |
| 11. FIXTURE DR-FRAME(A) | |

DOOR PARTS (TGF-49F, 72F) : ASS'Y DOOR *L

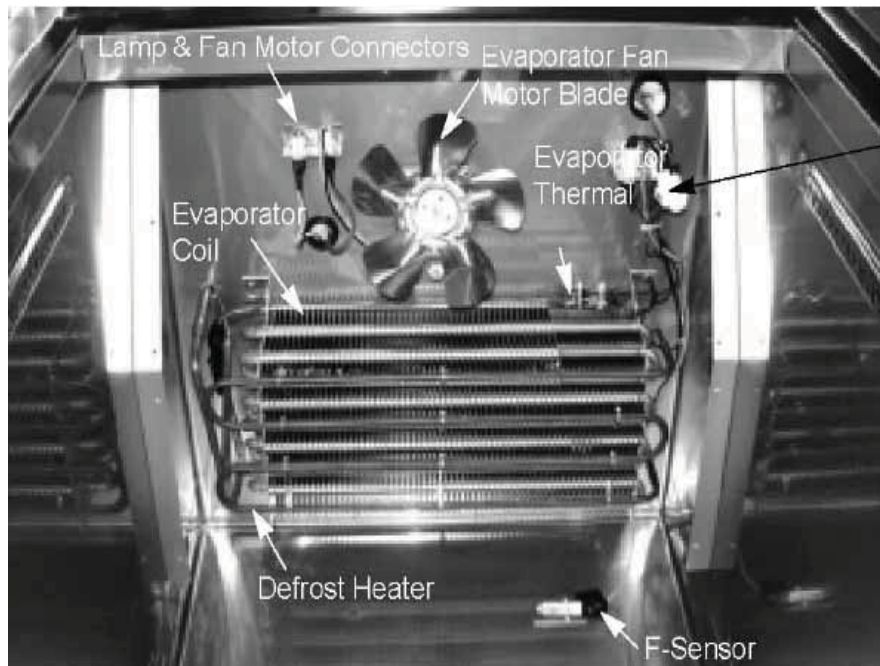


- | | |
|-------------------------|-------------------------|
| 1. DOOR FRAME *T | 12. FIXTURE DR-FRAME(B) |
| 2. DOOR FRAME *R *R | 13. STOPPER-DR(*T)A |
| 3. DOOR FRAME *U *R | 14. BUSHING DR-*U |
| 4. DOOR FRAME *L | 15. BUSHING DR |
| 5. WINDOW DR HEATER *R | 16. BAR SPRING |
| 6. HEATER DR FRAME | 17. FIXTURE DR-FRAME(C) |
| 7. FRAME DR-AUX(*T/*U) | 18. HARNESS DR |
| 8. FRAME DR-AUX(*L/*R) | |
| 9. GASKET AS | |
| 10. HANDLE DR | |
| 11. FIXTURE DR-FRAME(A) | |

DUCT (TGF-23F)



DUCT (TGF-23F)



DUCT (TGF-72F)

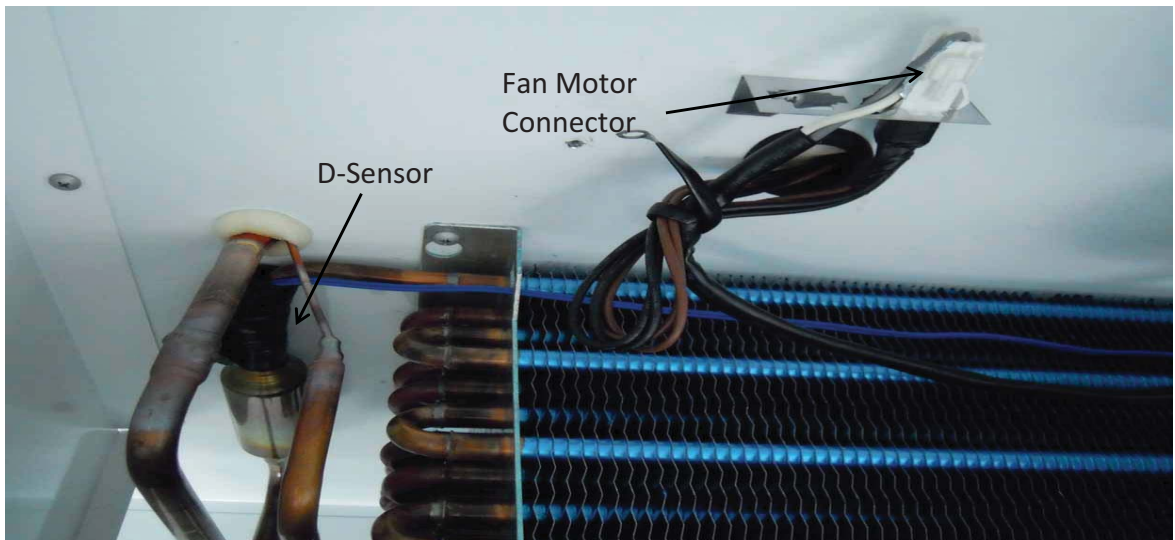
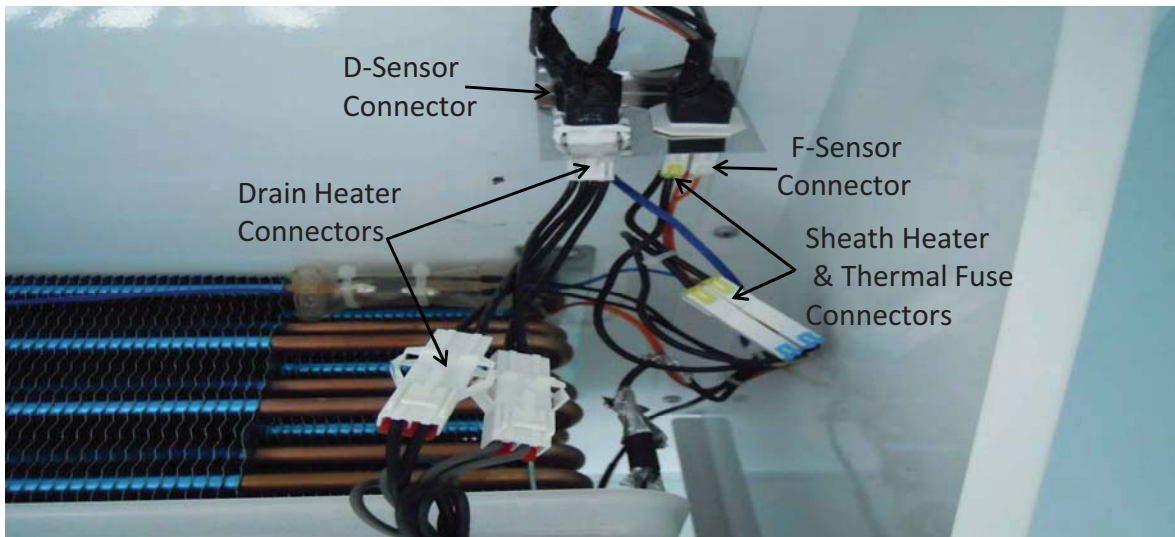
DUCT *L



DUCT *R

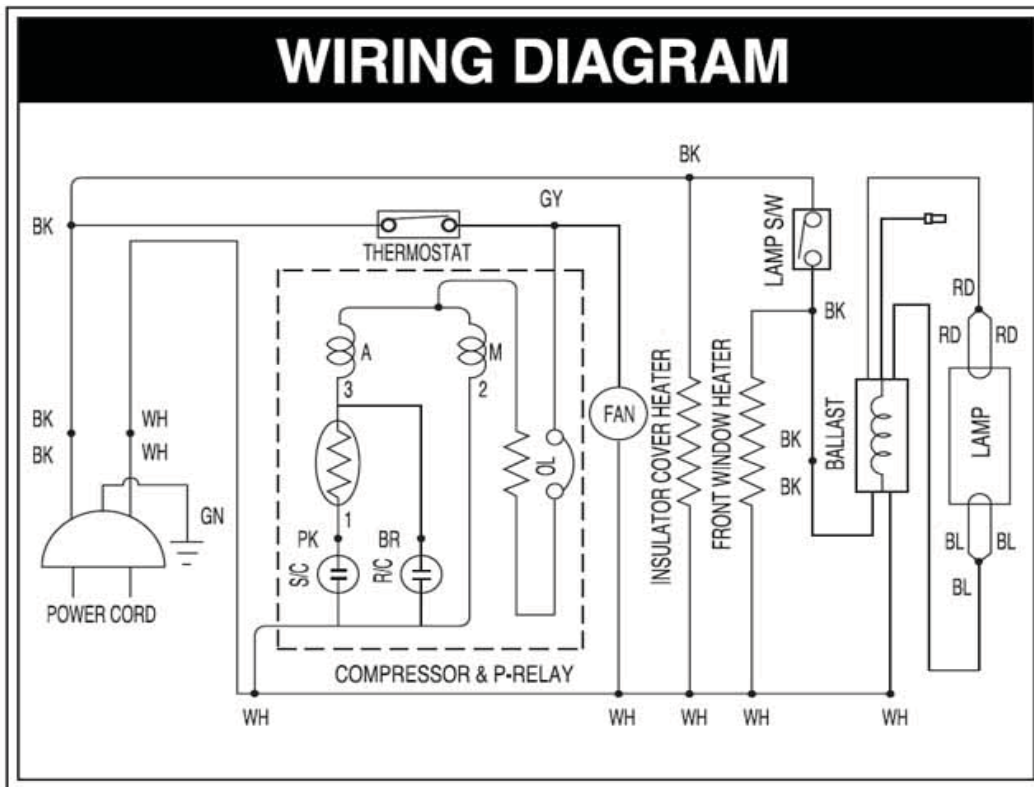


F-Sensor

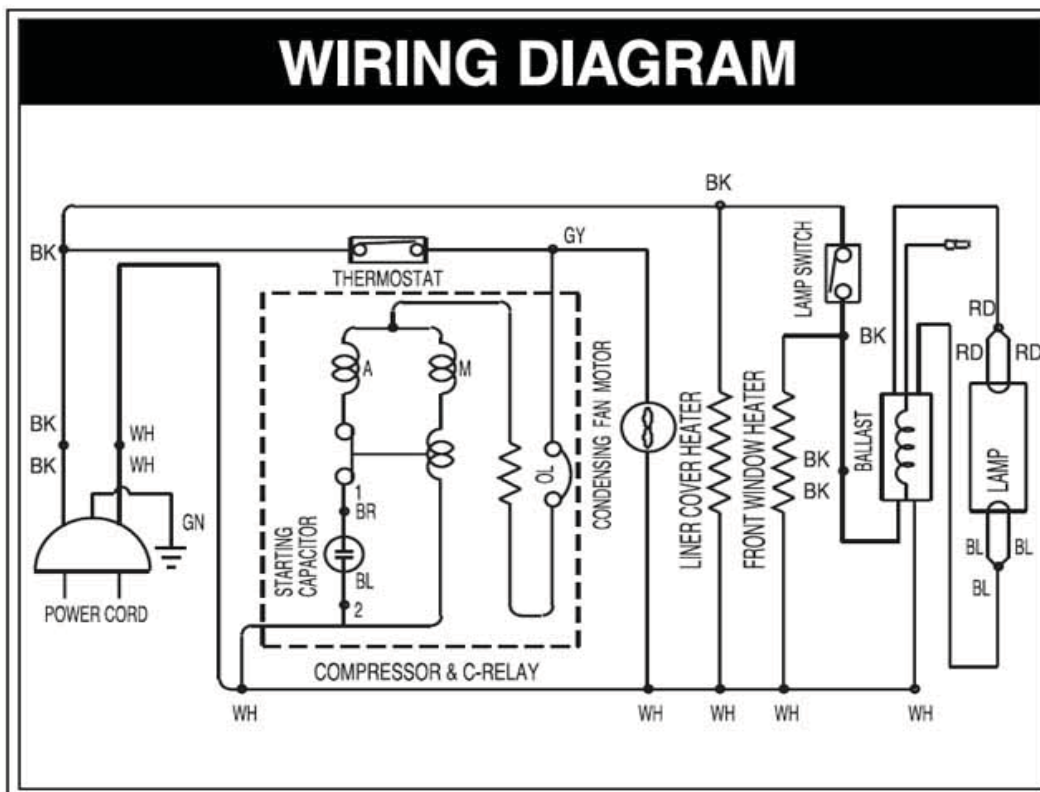


3. WIRING DIAGRAM

Model : TGF-9F

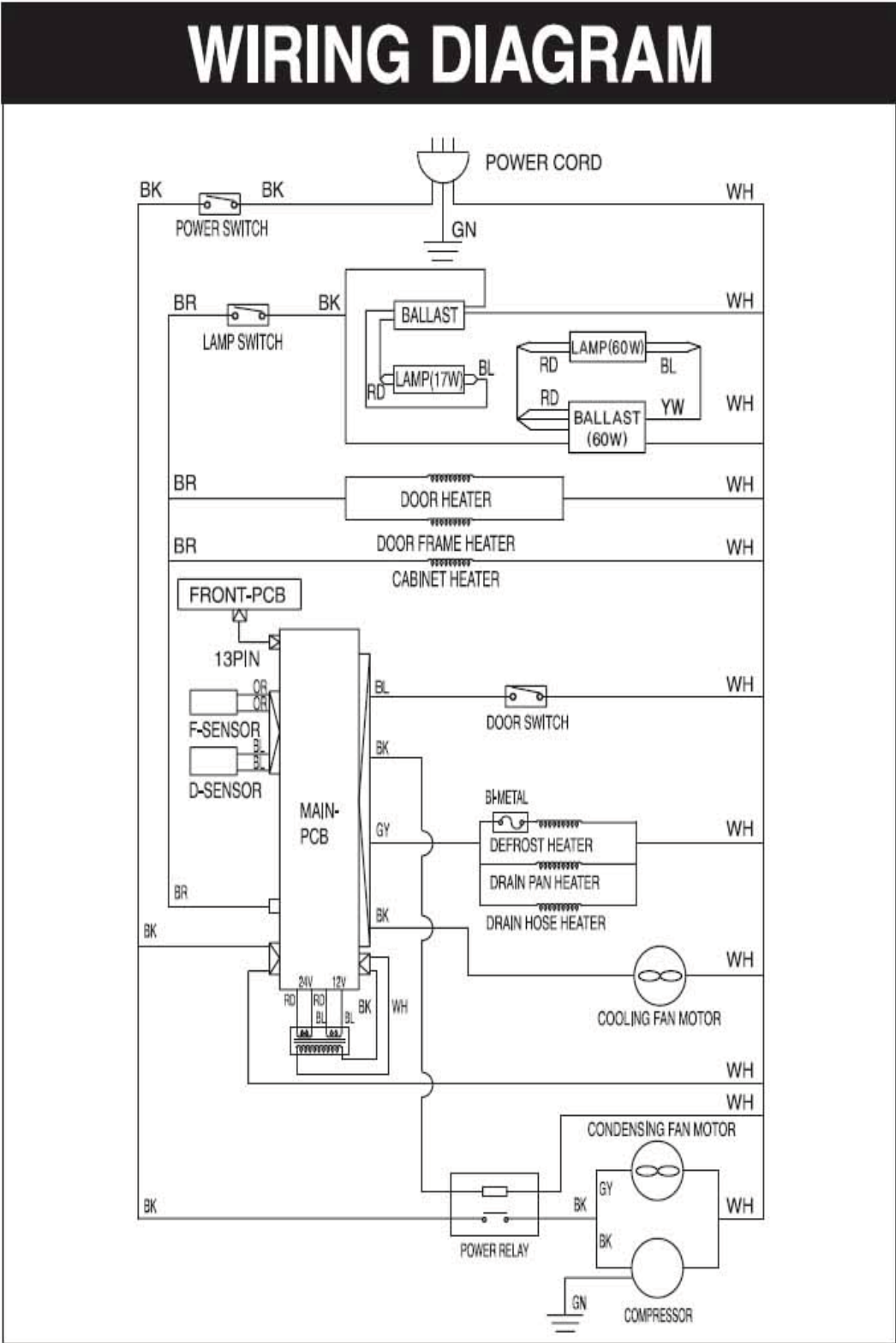


Model : TGF-13F



WIRING DIAGRAM

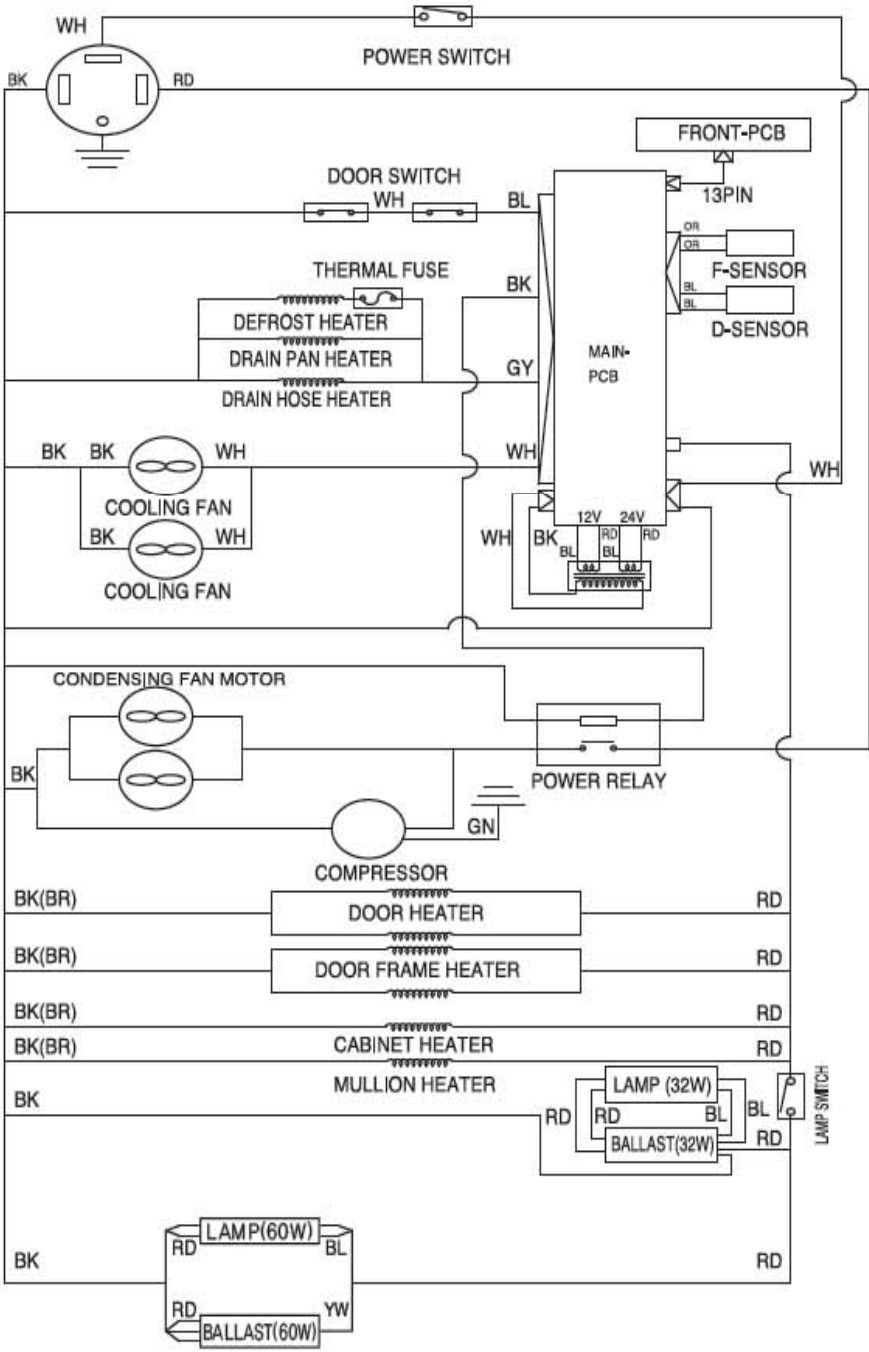
Model : TGF-23F



WIRING DIAGRAM

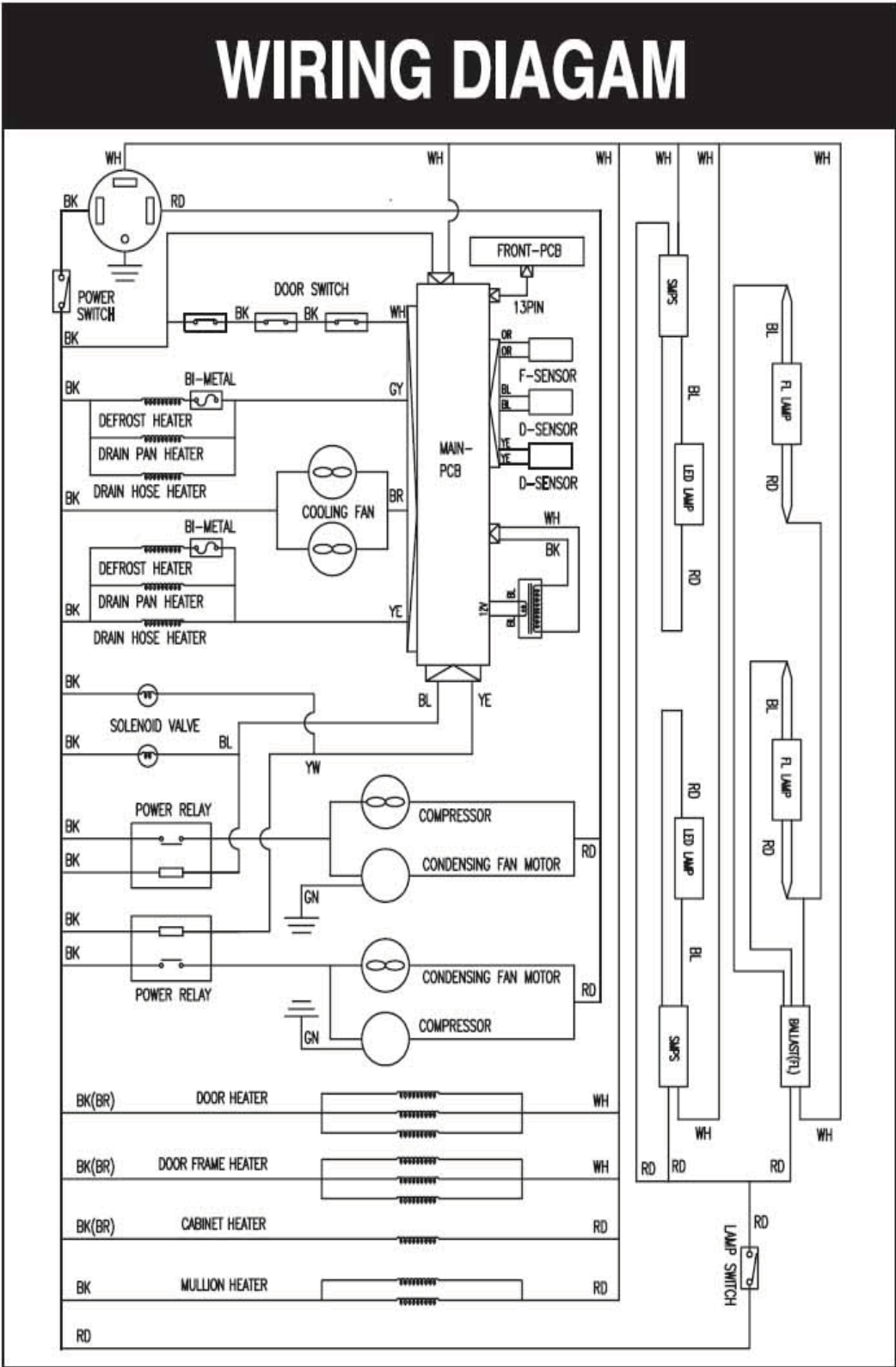
Model : TGF-49F

WIRING DIAGAM



WIRING DIAGRAM

Model : TGF-72F



4. MAIN COMPONENTS

COMPRESSOR

Model	PART NAME	PART NO.	HORSE POWER	CAPACITY	TYPE OF MOTOR	CURRENT (RLA)	MAKER
TGF-9F	HBL27YE-1	3952127G10	1/4 HP	896 BTU/h (226Kcal/h)	LBP (CSR)	3.7A	DAEWOO
TGF-13F	AEZ2415Z	30200N4400	1/3 HP	1,459 BTU/h (368Kcal/h)	LBP (CSIR)	5.6A	TECUMSEH
TGF-23F	CAJ2432Z	30200R1000	2/3 HP	3,200 BTU/h (807Kcal/h)	LBP (CSR)	7.0A	TECUMSEH
TGF-49F	CAJ2464Z	30200R1900	1.5 HP	6,452 BTU/h (1,627Kcal/h)	LBP (CSR)	5.6A (220V)	TECUMSEH
TGF-72F	CAJ2464Z(×2)	30200R1900	1.5 HP	6,452 BTU/h (1,627Kcal/h)	LBP (CSR)	5.6A (220V)	TECUMSEH

Model	BASIC COMPRESSOR			EXCHANGEABLE COMPRESSOR		
	PART NAME	MOTOR TYPE	MAKER	PART NAME	MOTOR TYPE	MAKER
TGF-9F	HBL27YE-1	LBP (CSR)	DAEWOO	AEA1410YXA	LBP (RSIR)	TECUMSEH IN USA
TGF-13F	AEZ2415Z	LBP (CSIR)	TECUMSEH IN FRANCE	AEA2411ZXA	LBP (CSIR)	TECUMSEH IN USA
TGF-23F	CAJ2432Z	(CSR)	IN FRANCE	AJA2425ZXA	(CSR)	IN USA

COMPRESSOR RELAY, OVERLOAD

Model	RELAY	PART NO.	OVERLOAD	PART NO	MAKER	NOTE
TGF-9F	PTC S068	3952127G10	4TM-783SHB	3817910601	DAEWOO	
TGF-13F	3ARR12(KP*479)	-	AE85FLY4		TECUMSEH	
TGF-23F	3ARR3*5**	-	GA3PJU00		TECUMSEH	
TGF-49F	3ARR3*3A*	-	CST16AHSF		TECUMSEH	
TGF-72F	3ARR3*A*	-	CST16AHSF		TECUMSEH	

MAIN COMPONENTS

COMPRESSOR CAPACITOR

Model	STARTING	PART NO.	RUNNING	PART NO.	MAKER	NOTE
TGF-9F	200V / 100 μ F	401RD35050	230V / 10 μ F	400EL15130	DAEWOO	
TGF-13F	160V / 250 μ F	-	-	-	TECUMSEH	
TGF-23F	160V / 315 μ F	-	400V / 30 μ F	-	TECUMSEH	
TGF-49F	330V / 125 μ F	-	400V / 20 μ F	-	TECUMSEH	
TGF-72F	330V / 125 μ F	-	400V / 20 μ F	-	TECUMSEH	

CONDENSER FAN MOTOR

Model	PART NAME	PART NO.	POLE	Q'TY	BLADE	SIZE	MAKER
TGF-9F	DAI-6152DEUA©	3963339920	2P	1EA	ZITEL 4	110mm	DAEYOUNG
TGF-13F	IS-3225DWSK-1	3963326010	2P	1EA	ZITEL 6	150mm	SUNG SHIN
TGF-23F	IS-4420DWSG-1	3963320410	4P	1EA	AL 5	250mm	SUNG SHIN
TGF-49F	DAI-8204DWSQ-1	3963336200	4P	2EA	AL 4	225mm	DAEYOUNG
TGF-72F	DAI-8204DWSQ-1	3963336200	4P	2EA	AL 4	250mm	DAEYOUNG

EVAPORATOR FAN MOTOR

Model	PART NAME	PART NO.	POLE	Q'TY	BLADE	SIZE	MAKER
TGF-23F	IS-4420DWSN-2A	3963328120	4P	1EA	AL 5	175mm	SUNG SHIN
TGF-49F				2EA		175mm	
TGF-72F				2EA		200mm	

THERMOSTAT

Model	PART NAME	PART NO.	TYPE	MAKER
TGF-9F	GNA(F)-107DC	30283N0100	NORMAL	SHIN HAN
TGF-13F				

EVAPORATO DEFROST HEATE

Model	PART NAME	PART NO.	Electrical Rating	MAKER
TGF-23F	SHEATH HEATER	30228L0803	445W	SANG DO
TGF-49F		30228L0701	600W	
TGF-72F		30228L0701	600W	

MAIN COMPONENTS

BALLAST

Model	PART NAME	PART NO.	Q'TY	WATT	TYPE	MAKER
TGF-9F	B232IUNVHP-B	30285R1220	1	30W	INSTANT	UNIVERSAL
TGF-13F	B232IUNVHP-B	30200F7320	1	32W		
TGF-23F	B232IUNVHP-B	30285R1220	1	17W		
	WH7-120-L	30200R3112	1	60W		FULHAM
TGF-49F	B232IUNVHP-B	30285R1220	1	32W		UNIVERSAL
	WH7-120-L	30200R4301	1	60W		FULHAM
TGF-72F	B232IUNVHP-B	30200H7420	1	32W		UNIVERSAL

FLUORESCENT LAMP

Model	PART NAME	PART NO.	Q'TY	LENGTH	BULB	MAKER
TGF-9F			1	36"	T8	PHILIPS or GE
TGF-13F	TLD32W/865	30236D0511	1	48"	T8	
TGF-23F	F17T8/SP41/ECO	30236H0510	1	24"	T8	
	F48T12/CW	30236R1100	1	48"	T12	
TGF-49F	TLD32W/865	30236D0511	1	48"	T8	
	F48T12/CW	30236R1100	1	48"	T12	
TGF-72F	TLD32W/865	30236D0511	2	48"	T8	

LED & SMPS

Model	PART NAME	PART NO.	Q'TY	WATT
TGF-72F	LAMP LED	30236R2000	2	29W
TGF-72F	SMPS	30284R0100	2	-

SWITCH

Model	PART NAME	RATING	PART NO.	MAKER
TGF-9F TGF-13F	LAMP SWITCH (BLACK)	125V/15A	30281Q0101	LIGHT COUNTRY
TGF-23F TGF-49F TGF-72F	LAMP SWITCH / (GREEN) POWER SWITCH (RED)	125V/20A	30281R0101 / 30281R0201	SIGNAL LUX

MAIN COMPONENTS

TRANSFORMER & MAIN PCB

Model	PART NAME	PART NO.	SPEC	MAKER
TGF-23F TGF-49F	TRANSFORMER	30284L0110	DWS-115U	NAM SUNG
TGF-72F	TRANSFORMER	30284L0120	DWS-1310U	
TGF-23F TGF-49F	MAIN PCB	30243R0200	2GF1151	DAE SHIN
TGF-72F	MAIN PCB	30243R0300	3GF1151	

5. ELECTRONIC CONTROLLER INSTURCTUION

HOW TO USE THE DISPLAY PANEL

- The user is able to set the temperature value inside the appliance.
- Uninterrupted pull down during 'TURBO FREEZE' mode.
- The factory defaults of temperature is '-7°F'.
- Operating temperature is between 5°F and -17°F by using the up or down arrow keys.



- 7-Segment LED
- Display status except 'DEFROST' mode

- The compressor continuously operates for 120 minutes under 'TURBO FREEZE' mode.
- If 'TURBO FREEZE' button is pushed again during 'TURBO FREEZE' mode, then 'TURBO FREEZE' mode is terminated.

[TGF-49F / 72F]



- The user is able to set the temperature value inside the appliance.
- Uninterrupted pull down during 'TURBO FREEZE' mode.
- The factory defaults of temperature is '-7°F'.
- Operating temperature is between 5°F and -17°F by using the + or - keys.



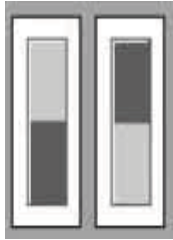
ELECTRONIC CONTROLLER INSTRUCTION

FUNCTION TABLE

No	Control Function	Control Objects	Contents	Remark																																																																																										
1	Initial Operation	Buzzer Fan Lamp 7-Segment LED	<ol style="list-style-type: none"> Buzzer will be ring within 2 seconds when you turn on the power switch. 7-segment LED displays the temperature value inside the appliance. Compressor will be run if evaporator's temperature is higher than 38.3°F(3.5°C). Once powered, compressor will not run for 3 minutes. The fluorescent lamp will come on when the temperature value inside the appliance is reached 23°F(-5°C). If the temperature in a cooler is lower than -50°F or higher than 50°F, 7-segment LED displays 'LO' or 'HI' respectively. Evap. Fan Motor will be run if D-sensor affixed to the coil senses lower than 14°F or 10 minutes have passed after the electrical cord is plugged in. 																																																																																											
2	Temperature Control	Compressor Evap. Fan Motor Cond. Fan Motor 7-Segment LED	<ol style="list-style-type: none"> You can set the desired temperature from 5°F to -17°F by using the up or down arrow keys (the + or - keys). 7-segment LED will display a setting temperature when you push the up or down arrow keys (the + or - keys). 7-segment LED will indicate real temperature after setting the value. Buzzer rings once whenever each button is pressed. Compressor is automatically in its on or off cycle state relating to the return air detection of F-sensor . Compressor will not be running for 3 minutes after off cycle even though F-sensor is in its operational range. Evap. Fan Motor runs continuously except the door is opened and the freezer is on defrost mode. Evap. Fan Motor will be running within 3 seconds when the door is closed. Compressor On/Off Temperature(°F) <table border="1" style="margin: 10px auto; border-collapse: collapse; text-align: center;"> <tbody> <tr> <td>Setting Value</td> <td>5</td> <td>4</td> <td>3</td> <td>2</td> <td>1</td> </tr> <tr> <td><i>Comp On</i></td> <td>9</td> <td>8</td> <td>7</td> <td>6</td> <td>5</td> </tr> <tr> <td><i>Comp Off</i></td> <td>1</td> <td>0</td> <td>-1</td> <td>-2</td> <td>-3</td> </tr> <tr> <td>Setting Value</td> <td>0</td> <td>-1</td> <td>-2</td> <td>-3</td> <td>-4</td> </tr> <tr> <td><i>Comp On</i></td> <td>4</td> <td>3</td> <td>2</td> <td>1</td> <td>0</td> </tr> <tr> <td><i>Comp Off</i></td> <td>-4</td> <td>-5</td> <td>-6</td> <td>-7</td> <td>-8</td> </tr> <tr> <td>Setting Value</td> <td>-5</td> <td>-6</td> <td>-7</td> <td>-8</td> <td>-9</td> </tr> <tr> <td><i>Comp On</i></td> <td>-1</td> <td>-2</td> <td>-3</td> <td>-4</td> <td>-5</td> </tr> <tr> <td><i>Comp Off</i></td> <td>-9</td> <td>-10</td> <td>-11</td> <td>-12</td> <td>-13</td> </tr> <tr> <td>Setting Value</td> <td>-10</td> <td>-11</td> <td>-12</td> <td>-13</td> <td>-14</td> </tr> <tr> <td><i>Comp On</i></td> <td>-6</td> <td>-7</td> <td>-8</td> <td>-9</td> <td>-10</td> </tr> <tr> <td><i>Comp Off</i></td> <td>-14</td> <td>-15</td> <td>-16</td> <td>-17</td> <td>-18</td> </tr> <tr> <td>Setting Value</td> <td>-15</td> <td>-16</td> <td>-17</td> <td></td> <td></td> </tr> <tr> <td><i>Comp On</i></td> <td>-11</td> <td>-12</td> <td>-13</td> <td></td> <td></td> </tr> <tr> <td><i>Comp Off</i></td> <td>-19</td> <td>-20</td> <td>-21</td> <td></td> <td></td> </tr> </tbody> </table>	Setting Value	5	4	3	2	1	<i>Comp On</i>	9	8	7	6	5	<i>Comp Off</i>	1	0	-1	-2	-3	Setting Value	0	-1	-2	-3	-4	<i>Comp On</i>	4	3	2	1	0	<i>Comp Off</i>	-4	-5	-6	-7	-8	Setting Value	-5	-6	-7	-8	-9	<i>Comp On</i>	-1	-2	-3	-4	-5	<i>Comp Off</i>	-9	-10	-11	-12	-13	Setting Value	-10	-11	-12	-13	-14	<i>Comp On</i>	-6	-7	-8	-9	-10	<i>Comp Off</i>	-14	-15	-16	-17	-18	Setting Value	-15	-16	-17			<i>Comp On</i>	-11	-12	-13			<i>Comp Off</i>	-19	-20	-21			
Setting Value	5	4	3	2	1																																																																																									
<i>Comp On</i>	9	8	7	6	5																																																																																									
<i>Comp Off</i>	1	0	-1	-2	-3																																																																																									
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3	Turbo Freeze	Compressor Evap. Fan Motor Cond. Fan Motor 7-Segment LED	<ol style="list-style-type: none"> If the 'Turbo Freeze' button is pressed, the 'Turbo Freeze' mode will be starting. If the 'Turbo Freeze' button is pressed again during 'Turbo Freeze' mode, the turbo freeze mode cancelled. Uninterrupted pull down during 'Turbo Freeze' mode, the up/down arrow or +/- keys will not be operated. 7-segment LED will continuously flash 'T.F' during 'Turbo Freeze' mode. The compressor & condenser fan motor operate for 120 minutes. 																																																																																											


ELECTRONIC CONTROLLER INSTRUCTION

FUNCTION TABLE

No	Control Function	Control Objects	Contents	Remark																														
3	Turbo Freeze	Compressor Evap. Fan Motor Cond. Fan Motor 7-Segment LED	<p>6. If the 'Turbo Freeze' button is pressed under defrost mode, 7-segment LED will flash 'T.F', but 'Turbo Freeze' mode will start after defrost mode is terminated.</p> <p>7. If defrost mode occurs during 'Turbo Freeze' mode, the defrost mode will start after the turbo freeze mode is terminated.</p> <div style="display: flex; justify-content: space-around; align-items: center;">   </div>																															
4	Determination of Defrost		<p>1. Defrost mode is initiated via time interval setting.</p> <p>2. Time interval can be set by shifting DIP SWITCH on the PCB board.</p> <p>3. Time interval setting value is as follows ; [DIP S/W]</p> <table style="margin-left: auto; margin-right: auto; border-collapse: collapse;"> <thead> <tr style="border-top: 1px solid black; border-bottom: 1px solid black;"> <th style="padding: 5px;">No. 1</th> <th style="padding: 5px;">No. 2</th> <th style="padding: 5px;">Cycle Time (hours)</th> </tr> </thead> <tbody> <tr> <td style="text-align: center; padding: 5px;">0</td> <td style="text-align: center; padding: 5px;">0</td> <td style="text-align: center; padding: 5px;">12</td> </tr> <tr> <td style="text-align: center; padding: 5px;">1</td> <td style="text-align: center; padding: 5px;">0</td> <td style="text-align: center; padding: 5px;">10</td> </tr> <tr> <td style="text-align: center; padding: 5px;">0</td> <td style="text-align: center; padding: 5px;">1</td> <td style="text-align: center; padding: 5px;">8</td> </tr> <tr style="border-bottom: 1px solid black;"> <td style="text-align: center; padding: 5px;">1</td> <td style="text-align: center; padding: 5px;">1</td> <td style="text-align: center; padding: 5px;">6</td> </tr> </tbody> </table> <div style="text-align: center; margin-top: 10px;">  </div> <p style="text-align: center; margin-top: 10px;">(where, the defrost period is half when the appliance is initially powered up.)</p> <p>4. Factory default is the 3rd portion of cycle time above. (see the above)</p>	No. 1	No. 2	Cycle Time (hours)	0	0	12	1	0	10	0	1	8	1	1	6																
No. 1	No. 2	Cycle Time (hours)																																
0	0	12																																
1	0	10																																
0	1	8																																
1	1	6																																
5	Defrost Function	Heater Compressor Evap. Fan Motor Cond. Fan Motor	<p>1. Defrost Step</p> <table style="margin-left: auto; margin-right: auto; border-collapse: collapse; width: 80%;"> <thead> <tr style="border-top: 1px solid black; border-bottom: 1px solid black;"> <th style="padding: 5px;"></th> <th style="padding: 5px;">Pre-cool</th> <th style="padding: 5px;">Heater</th> <th style="padding: 5px;">Pause</th> <th style="padding: 5px;">Fan Delay</th> </tr> </thead> <tbody> <tr> <td style="padding: 5px;"><i>Comp.</i></td> <td style="padding: 5px;">on</td> <td style="padding: 5px;">off</td> <td style="padding: 5px;">off</td> <td style="padding: 5px;">on</td> </tr> <tr> <td style="padding: 5px;"><i>E-fan motor</i></td> <td style="padding: 5px;">on</td> <td style="padding: 5px;">off</td> <td style="padding: 5px;">off</td> <td style="padding: 5px;">off</td> </tr> <tr> <td style="padding: 5px;"><i>C-fan motor</i></td> <td style="padding: 5px;">on</td> <td style="padding: 5px;">off</td> <td style="padding: 5px;">off</td> <td style="padding: 5px;">on</td> </tr> <tr> <td style="padding: 5px;"><i>Heater</i></td> <td style="padding: 5px;">off</td> <td style="padding: 5px;">on</td> <td style="padding: 5px;">off</td> <td style="padding: 5px;">off</td> </tr> <tr style="border-bottom: 1px solid black;"> <td style="padding: 5px;"><i>Max time</i></td> <td style="padding: 5px;">30 min</td> <td style="padding: 5px;">40 min</td> <td style="padding: 5px;">3 min</td> <td style="padding: 5px;">5 min</td> </tr> </tbody> </table> <div style="display: flex; justify-content: space-around; margin-top: 20px;"> <div style="width: 45%;"> <p>If D-sensor temperature is over 50°F, heater goes off.</p> <p>If D-sensor is in error, heater automatically goes off for 40min after activated.</p> </div> <div style="width: 45%;"> <p>If D-sensor temperature is lower than 14°F, evap. fan motor turns on immediately.</p> </div> </div>		Pre-cool	Heater	Pause	Fan Delay	<i>Comp.</i>	on	off	off	on	<i>E-fan motor</i>	on	off	off	off	<i>C-fan motor</i>	on	off	off	on	<i>Heater</i>	off	on	off	off	<i>Max time</i>	30 min	40 min	3 min	5 min	
	Pre-cool	Heater	Pause	Fan Delay																														
<i>Comp.</i>	on	off	off	on																														
<i>E-fan motor</i>	on	off	off	off																														
<i>C-fan motor</i>	on	off	off	on																														
<i>Heater</i>	off	on	off	off																														
<i>Max time</i>	30 min	40 min	3 min	5 min																														

ELECTRONIC CONTROLLER INSTRUCTION

FUNCTION TABLE

No	Control Function	Control Objects	Contents	Remark
5	Defrost Function	Heater Compressor Evap. Fan Motor Cond. Fan Motor	<p>A. Pre-cool step</p> <ol style="list-style-type: none"> It prevents from excessive high temperature during defrost mode. Compressor, cond. fan motor and evap. Fan motor run continuously during pre-cool step. 7-segment LED shows the temperature inside the cabinet. If F-sensor temperature is lower than -22°F or maximum time of pre-cool step interval for 30 minutes, the pre-cool step goes off. 'Turbo Freeze' mode is enabled just once during pre-cool step. <p>B. Heater defrost step</p> <ol style="list-style-type: none"> To minimize the risk of icing up, the defrost heater is run periodically. 7-segment LED display 'dF' when the defrost heater is energized. The defrost heater is either terminated by the temperature of D-sensor rising above 47°F (8.3°C) or exceeding a maximum running time, 40 minutes. If D-sensor temperature does not reach 47°F in 40 minutes, error code will be showed on LED display panel.  <p>C. Pause step</p> <ol style="list-style-type: none"> To ensure that refrigeration system has the time to be stabilized, compressor & fan motors have a minimum rest time after heater defrost mode. Time = 3 min, LED Display panel will be showed 'dF'. <p>D. Fan delay step</p> <ol style="list-style-type: none"> Max. Time = 5 min Only Comp. is ON. If D-sensor temperature goes down under 14°F in 5 minutes, evap.fan motor turns on immediately. 	
6	Manual Defrost	Heater Compressor Evap. Fan Motor Cond. Fan Motor	<p>A. Press the 'Turbo Freeze' button 5 times while pressing the both up/down (or +/-) keys.</p> <p>B. On manual defrost mode</p> <ol style="list-style-type: none"> The pre-cool step is omitted. Heater defrost step is run. The next procedure is the same as that of defrost mode. 	
7	Comp Restart Prevent	Compressor Cond. Fan Motor	<p>A. Compressor will not be running for 3 minutes after off cycle even though F-sensor is in its operational range.</p>	
8	Power Failure Back up Function	Compressor Evap. Fan Motor Cond. Fan Motor	<p>A. Compressor will not be running for 3 minutes after power failure.</p> <p>B. Only Evap. Fan Motor is ON.</p>	
9	Door Open Alarm Function	Buzzer 7-segment LED	<p>A. The LED Display panel will read 'DOOR' icon and will not flash 'FAN' icon.</p> <p>B. Before sounding the buzzer</p> <ol style="list-style-type: none"> Door Open more than 30 seconds, the buzzer will sound 3 times. Door Open more than 60 seconds, the buzzer will sound 5 times. 	

ELECTRONIC CONTROLLER INSTRUCTION

FUNCTION TABLE

No	Control Function	Control Objects	Contents	Remark
9	Door Open Alarm Function	Buzzer 7-segment LED	3. Door Open more than 5 minutes, the buzzer will continuously sound.	
10	Buzzer Function	Buzzer	A. Beep sound rings once after initial power up. B. Beep sound rings whenever each button is pressed. C. If the door remains open for a certain time, beep sound rings. (see door open alarm function)	
11	Error Display	7-segment LED	A. Press up(+) arrow key 5 times while pressing both down(-) and turbo freeze button simultaneously, and error display mode will be done. B. Beep sound rings whenever each button is pressed. C. If there is no error, there will be no change on the 7-segment LED. D. Error code can be seen by pressing down(-) key. E. Error display mode will be transferred to normal display mode.	
12	Fuzzy Defrost	Heater Compressor Evap. Fan Motor Cond. Fan Motor	The defrost step will be started as specified in below conditions. A. The compressor has run for 30 minutes. B. There is no door open for 30 minutes. C. The temperature of D-sensor is lower than 5°F. D. The temperature of F-sensor is higher than D-sensor's temperature by 53.6°F for 10 minutes.	

ELECTRONIC CONTROLLER INSTRUCTION

SELF-DIAGNOSIS TABLE

Code	Content	Perception Method	Freezer Operation State
F1	F-sensor Malfunction	- . Sensor shorted - . Sensor disconnected	- . The compressor runs for 30 minutes and rests for 5 minutes repeatedly.
D1	D-sensor Malfunction	- . Sensor shorted - . Sensor disconnected	- . Defrost heater may operate it. - . If F-sensor temperature is higher than 28.4°F, the heater goes off. - . Defrost heater turns on for 20 minutes if F-sensor is in error mode too.
C1	Cycle, Comp. Malfunction	- . The temperature of D-sensor is over 32°F even though the compressor has been running for 30 minutes.	- . Normal operation (Compressor is automatically turned on and off by F-sensor.)
F3	Defrost Malfunction	- . The temperature of D-sensor doesn't reach 47°F within 40 minutes.	- . Defrost heater will be come on every time for 40 minutes. - . If the D-sensor's temp. reaches 47°F within 40 minutes, defrost heater will be turned off immediately.

SENSOR DESCRIPTION

Sensor	Operation	Description	Remarks
F-sensor	- . Thermistor (Change-in resistance type) - . Return air detection leaving from evaporator coil	- . Wire color is orange.	
D-sensor	- . Thermistor (Change-in resistance type) - . Detection of evaporator coil surface	- . Wire color is blue.	

6. PARTS LIST

Part Name	Part Number	Description	Model				
			9F	13F	23F	49F	72F
Castor							
Castor	30265H0010	1/2 "stem (TP3625-21-HR)	2	2			
Castor	30265H0020	1/2 "stem (TP3625-22-HR TLB)	2	2			
Castor	30265L0400	w/o brake			2	2	3
Castor	30265L0300	w/ brake			2	2	3
Compressor							
Compressor	3952127G10	HBL27YE-1	1				
Compressor	30200N4400	AEZ2415Z		1			
Compressor	30200R1000	CAJ2432Z			1		
Compressor	30200R1900	CAJ2464Z				1	2
Compressor Relay	30227M3600	PTC S068	1				
Compressor Overload	3817910601	4TM-783SHB	1				
Compressor Relay Ass'y	30200N4500	Including Harness	1				
Running Capacitor	400EL15130	230V/10 μ F	1				
Starting Capacitor	401RD35050	200V/100 μ F	1				
Power Relay	30281H03350	GMC-30P2 (110V)			1	1	2
Power Supply Cord	30213A1004	KKP-30B (탈피)	1	1			
Power Supply Cord	30213A1014	KKP-30B (1P HOUSING)			1		
Power Supply Cord	30213Q0400	HBL2411 (125V/250V, 20A)				1	
Power Supply Cord	30213Q0500	HBL2711 (125V/250V, 30A)					1
Condenser							
Condenser Coil	30244N2800	Steel	1				
Condenser Coil	30200N5312	Steel		1			
Condenser Coil	30200R2002	Cu + Al			1		
Condenser Coil	30200R3300	Cu + Al				1	
Condenser Coil	30200A2212	Cu + Al					2
Condenser Fan Motor	3963339920	DAI-6152DEUA \odot	1				
Condenser Fan Motor	3963326010	IS-3225DWSK-1		1			
Condenser Fan Motor	3963320410	IS-4420DWSG-1			1		
Condenser Fan Motor	3963336200	DAI-8204DWSQ-1 (220V/60Hz)				1	2
Condenser Fan Motor Blade	3011802220	Zitel 4 (Φ 110mm)	1				
Condenser Fan Motor Blade	30218F0110	Zitel 6 (Φ 150mm)		1			
Condenser Fan Motor Blade	30218A0300	Al 4 (Φ 250mm)			1		2
Condenser Fan Motor Blade	30218A0200	Al 4 (Φ 225mm)				1	
Glass							
Front Glass	3025510110	T12	1				
Front Glass	3025500100	T12		1			
Door Glass	30255N0110	T4	1				
Door Glass	30255N0300	T4		2			
Door Glass	30255R0100	T24			1		
Door Glass	30255R0200	T24, Right				1	2
Door Glass	30255R0300	T24, Left				1	1
Door Gasket	30223R0201	PVC-S			1	2	3
Lamp Socket (A)	30230R1100	w/o spring			1	1	
Lamp Socket (B)	30230R1000	w/ spring			1	1	
Lamp Shield	30242R1000	PC			1	1	

PARTS LIST

Part Name	Part Number	Description	Model				
			9F	13F	23F	49F	72F
Glass							
Lamp Shield Cap	30209R0300	ABS			2	2	
Lamp Socket Bracket	30206R105P	SPG, Painted			2	2	
Lamp Shield Fixture	30206R1100	EGl, Painted			2	2	
Door Handle	3022600103	ABS	1	2			
Door Handle	30226G0101	Al Die-Casting			1	2	3
Sign Panel							
Ballast	30285R1220	B232IUNVHP-B (30W)	1				
Ballast	30200F7320	B232IUNVHP-B (32W)		1			
Ballast	30285R1220	B232IUNVHP-B (17W, 32W)			1	1	
Ballast	30200R3112	WH7-120-L			1		
Ballast	30200R4301	WH7-120-L				1	
Ballast	30200H7420	B232IUNVHP-B (32W)					1
Lamp	30236A0900	TLD30W/865 (30W)	1				
Lamp	30236D0511	TLD32W/865 (32W)		1		1	2
Lamp	30236H0510	F17T8/SP41/ECO (17W)			1		
Lamp	30236R1100	F48T12/CW (60W)			1	1	
Lamp Holder	3083005000	SK-10, OD28	1	1			
Lamp Socket	3027900113	Including Harness	1				
Lamp Socket	30279N0100	Including Harness		1			
Lamp Socket	30227R1001	Including Harness			1		
Lamp Socket	30227R2400	Including Harness				1	2
Lamp Switch	30281Q0101	125V/15A (R19 series)	1	1			
Lamp Switch	30281R0101	125V/20A (Green, 81 series)			1	1	1
Power Swtich	30281R0201	125V/20A (Red, 81 series)			1	1	1
Sign Panel	302141020P	PVC-H	1				
Sign Panel	30214N160P	PVC-H		1			
Sign Panel	30242R1001	PC			1		
Sign Panel	30274R0100	PC				1	
Sign Panel	30274R1700	PC					1
Decoration Cover (Left)	30214N0100	ABS Plastic, Gray	1	1			
Decoration Cover (Right)	30214N0200	ABS Plastic, Gray	1	1			
Sign Frame *Left	30222A2400	ABS			1		
Sign Frame *Right	30222A2500	ABS			1		
Sign Frame *Left	30222R2200	ABS				1	1
Sign Frame *Right	30222R2300	ABS				1	1
Bottom Grille							
Bottom Grille	30224R0103	ABS			1		
Bottom Grille	30200L490P	Painted (White)				1	
Bottom Grille	30200R7900						1
Thermostat & PCB							
Shelf	30278R0101	Wire, White			4		
Shelf	30250R0500	Wire, White (Right)				4	
Shelf	30250R0600	Wire, White (Left)				4	
Shelf	30278R0300	Wire, White					12
Back Shelf	30250R0400	Wire, White			1	2	3
Shelf Support	30220L1001	Stainless Steel			4	8	12
Shelf Clip	30220L0900	PA-6			16	32	48

7. REPLACEMENT OF MAIN COMPONENTS

TGF-23F

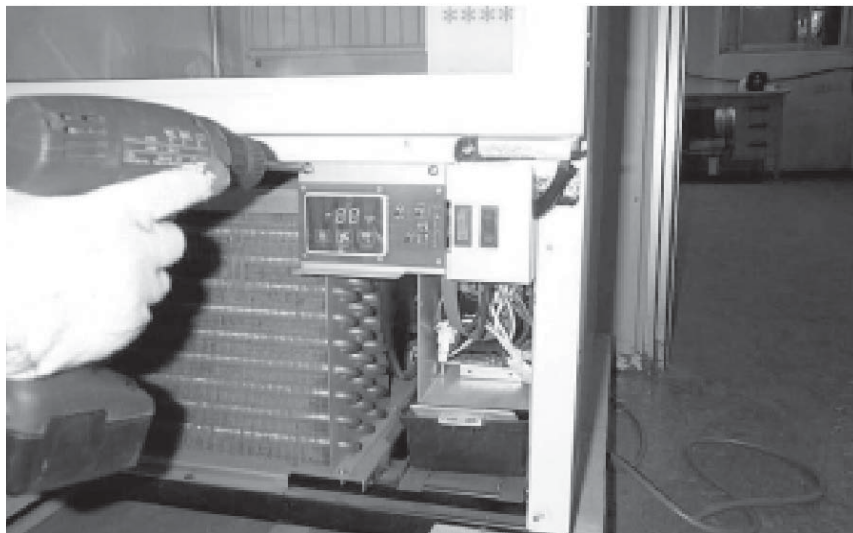
BOTTOM GRILLE PARTS

- . MAIN PCB, TRANSFORMER, POWER RELAY
- . DISPLAY PCB

A. Remove Bottom Grill by unscrewing the four screws.



B. Remove the Bracket of Display PCB

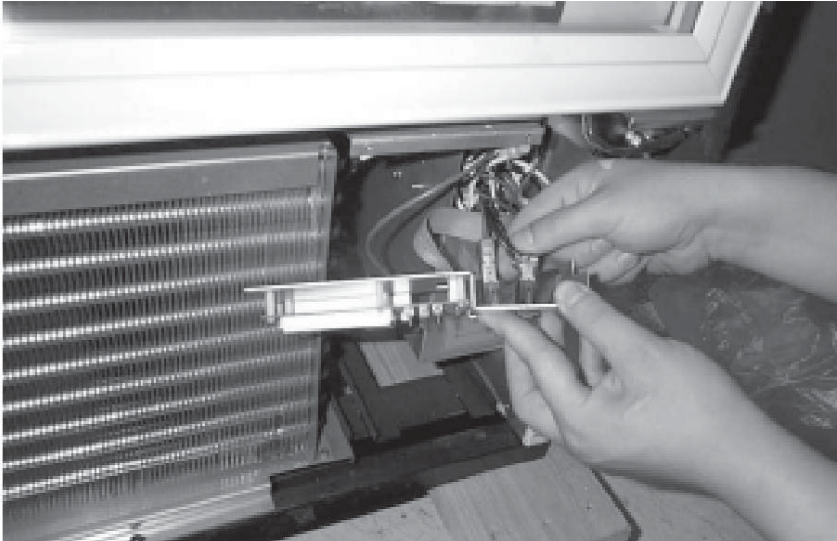


REPLACEMENT OF MAIN COMPONENTS

TGF-23F

C. Disconnect Connectors and receptacles.

- Replace the Power Switch, Lamp Switch of Display PCB



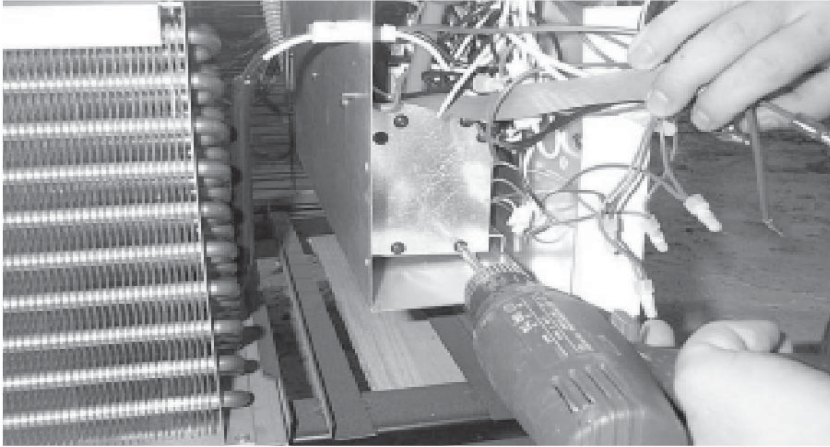
D. Remove the Electrical box (Switch Box) Cover.



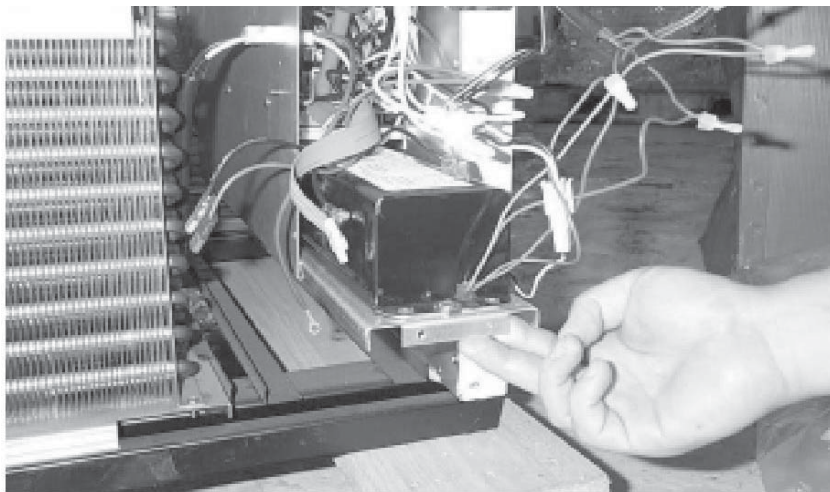
REPLACEMENT OF MAIN COMPONENTS

TGF-23F

E. Remove the fixture

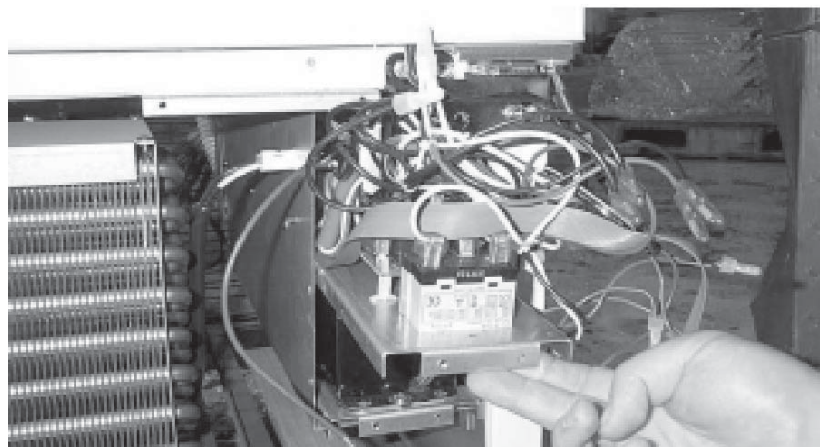


F. Replace the Ballast.



G. Replace the Main PCB Transformer and Power Relay.

1. Pull out the Base.
2. Replace the Parts.

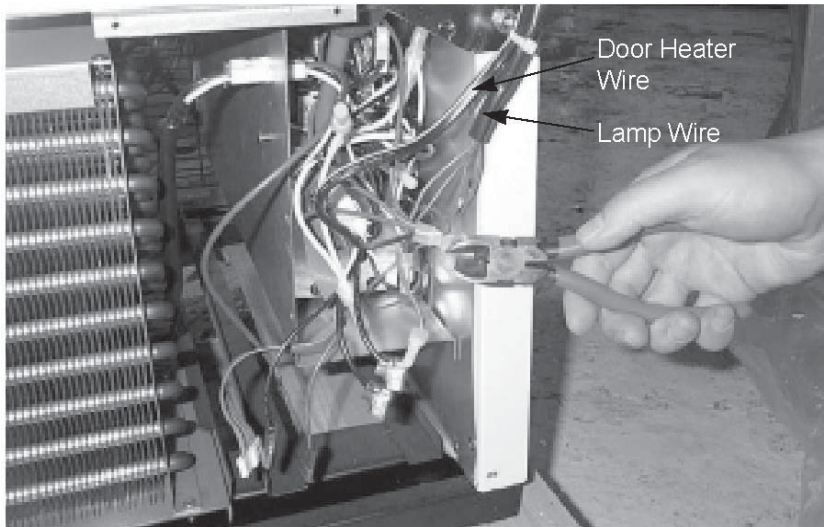


REPLACEMENT OF MAIN COMPONENTS

TGF-23F

REPLACING DOOR

- A. Disassemble bottom grills as described section 7-1, A,B,C,D
- B. Disconnect the door heater and lamp wire.



- C. Remove the Sign Frame(Left, Right) by unscrewing the four screws of each side.



REPLACEMENT OF MAIN COMPONENTS

TGF-23F

D. Pull out sign panel to the Right side.



E. Remove the sign panel frame *Bottom.

- Replace the Ballast (Sign Panel)



REPLACEMENT OF MAIN COMPONENTS

TGF-23F

F. Remove the harness of door switch.

- Replace door Switch



G. Remove the door hinge top.

H. Lift the door and pull out the door wires.



REPLACEMENT OF MAIN COMPONENTS

TGF-49F / TGF-72F

BOTTOM GRILLE PARTS

- . CONDENSING UNIT, BALLAST, POWER RELAY

A. Remove Bottom Grill by unscrewing the four screws.



B. Disconnect Connector to replace the condensing unit.

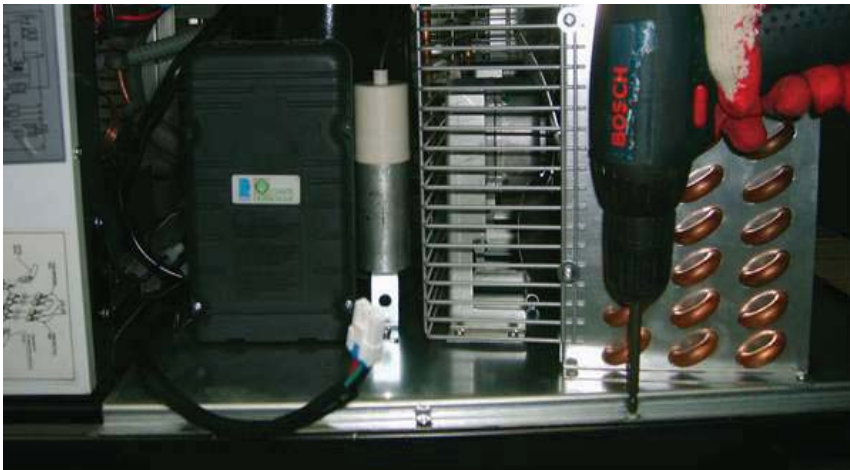


REPLACEMENT OF MAIN COMPONENTS

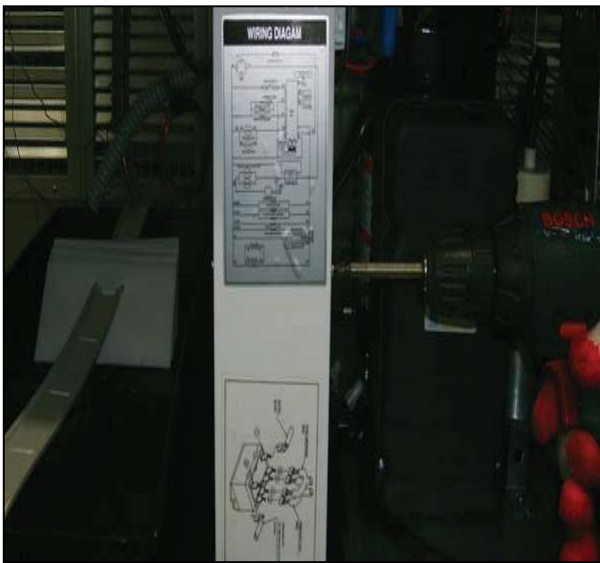
TGF-49F / TGF-72F

C. Unscrew the two Screws of Condensing unit.

1. Pull out the Condensing Unit.
2. Replace the Parts.



D. Disconnect Connector to replace the condensing unit.



TGF-49F



TGF-72F

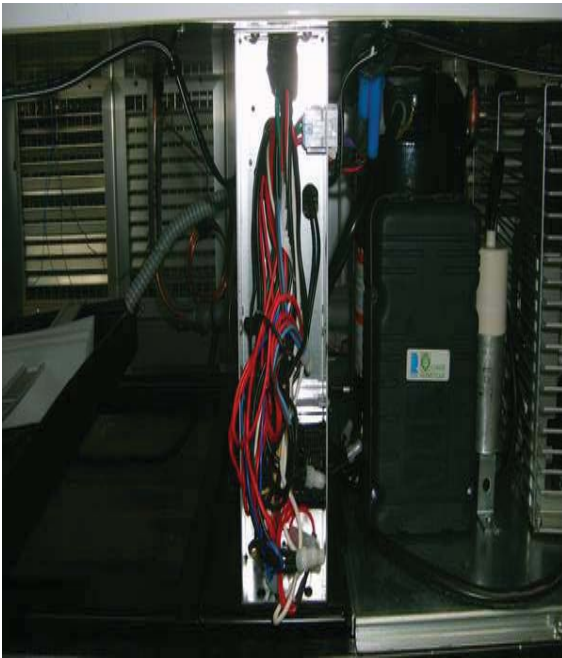
E. Unscrew the screws located on the rear of the junction box to replace the SMPS. (ONLY TGF-72F)

REPLACEMENT OF MAIN COMPONENTS

TGF-49F / TGF-72F

F. Remove the Electrical box (Switch Box) Cover.

* Replace the power Relay (TGF-49F : 1EA, TGF-72F : 2EA)

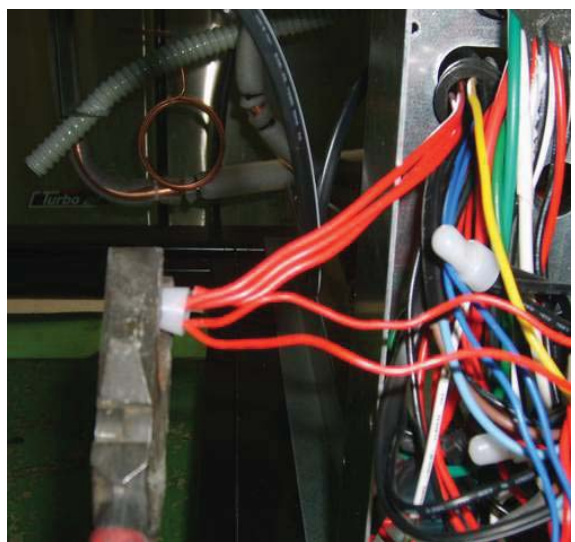
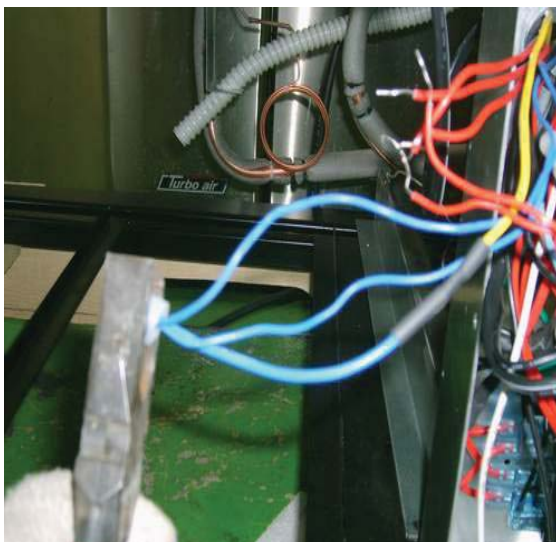


TGF-49F



TGF-72F

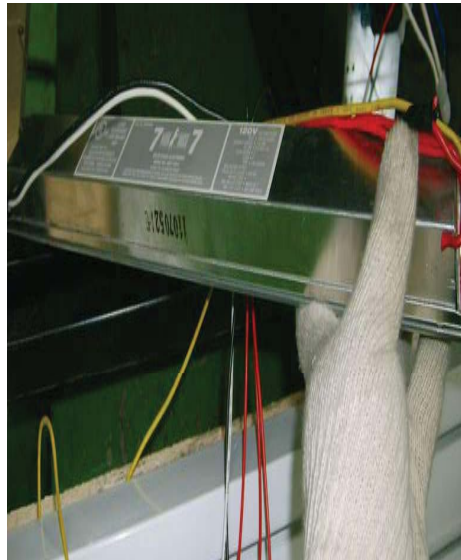
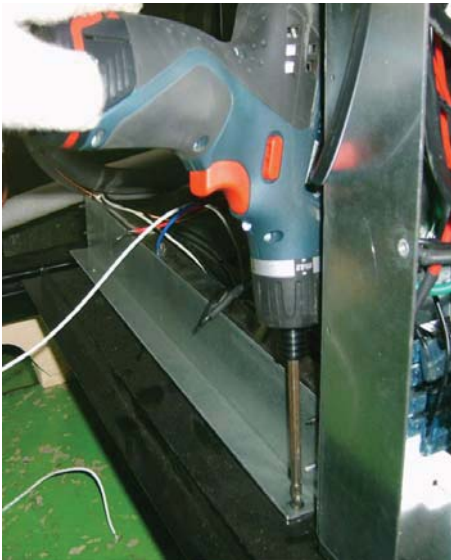
G. Disconnect wires to replace the ballast (ONLY TGF-49F)



REPLACEMENT OF MAIN COMPONENTS

TGF-49F / TGF-72F

H. Replace the Ballast (ONLY TGF-49F)



REPLACEMENT OF MAIN COMPONENTS

TGF-49F / TGF-72F

ADVERTISING PANEL PARTS

- PCB, TRANSFORMER, BALLAST, POWER SWITCH, LAMP SWITCH

A. Remove Advertising Frame Left.

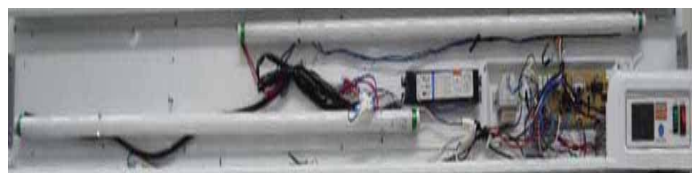


B. Pull out the Advertising Panel to the left side.

- Replace the parts



TGF-49F



TGF-72F